

Your Industrial Ethernet Solutions for Control and Automation

Product
Catalog

Gigabit Ethernet

Video / Audio
Ethernet I/O
DCS / PLC / PAC
HMI



 MTL
Instruments

MOXA®

Managed Ethernet Switches



Managed Ethernet Switches

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Managed Ethernet Switches

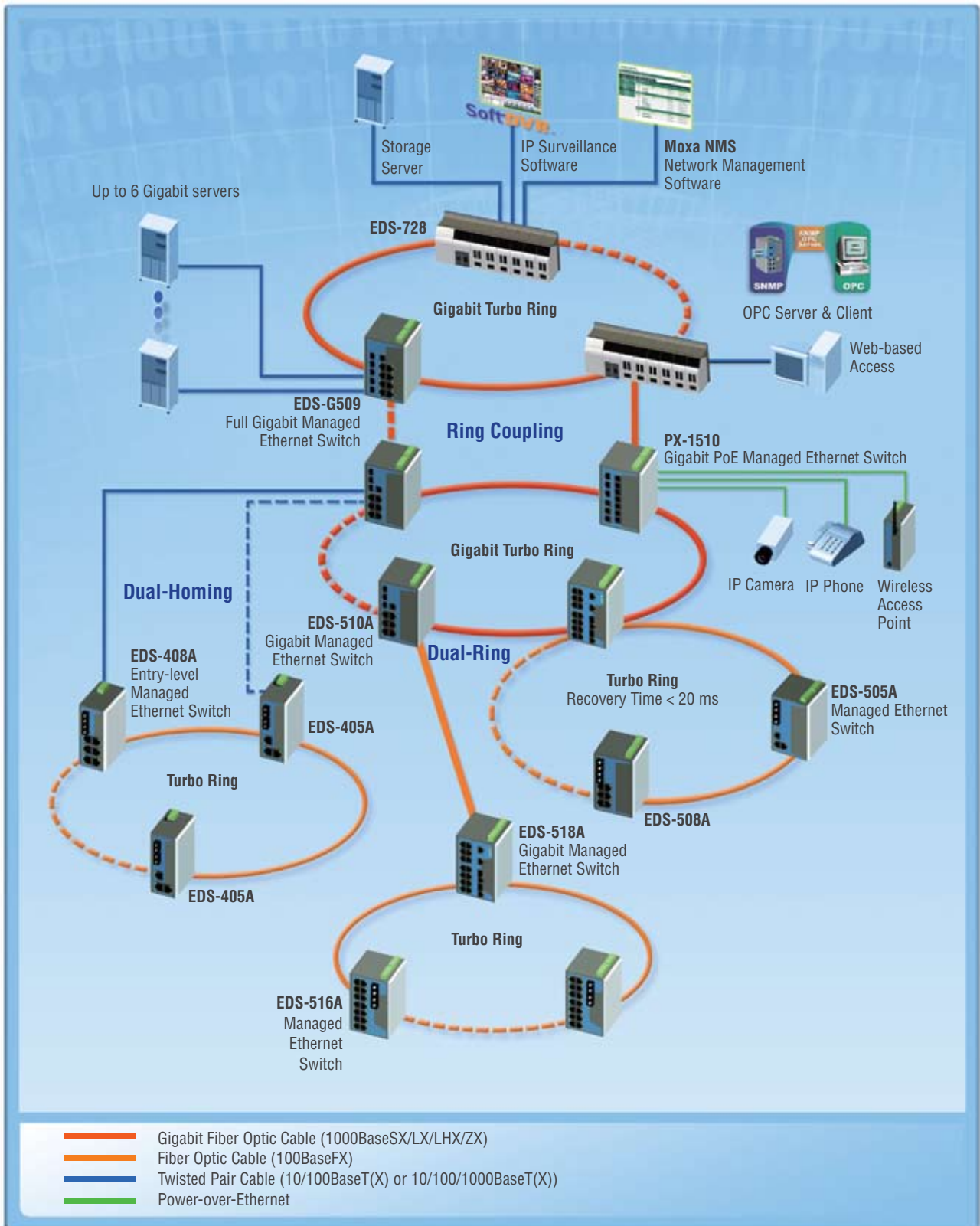
Wide Selection of Managed Ethernet Switches

Variety of Topologies for Flexible Network Planning

2

Managed Ethernet Switches

Solution Tutorial



Versatile Redundant Turbo Ring Topology for Flexible Network Planning

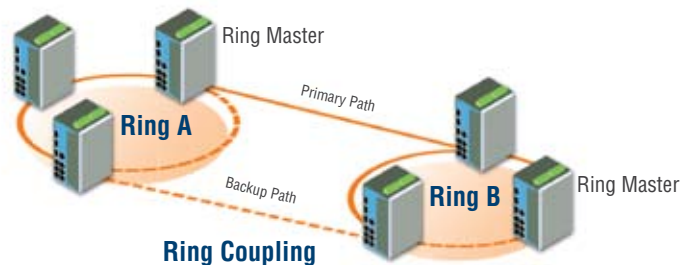
Gigabit Ethernet Redundant Ring

Ethernet is becoming the default data communication medium for industrial automation applications. In fact, it's not uncommon for video, voice, and high-rate industrial application data transfers to be integrated into one network. Moxa's EDS-G509/518A/510A and PX-1510, which come equipped with a redundant Gigabit Ethernet protocol called Gigabit Turbo Ring, gives system maintainers a convenient means of setting up a versatile yet stable Gigabit Ethernet network. With Gigabit Turbo Ring, if any segment of the network is disconnected, your automation system will be back to normal in few milliseconds.

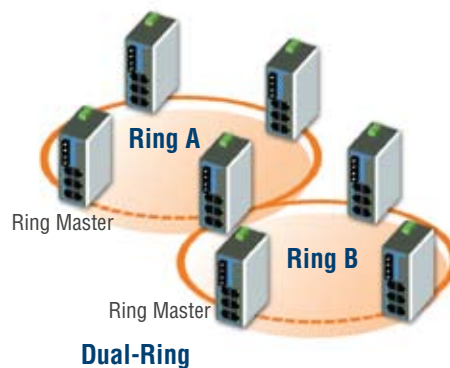
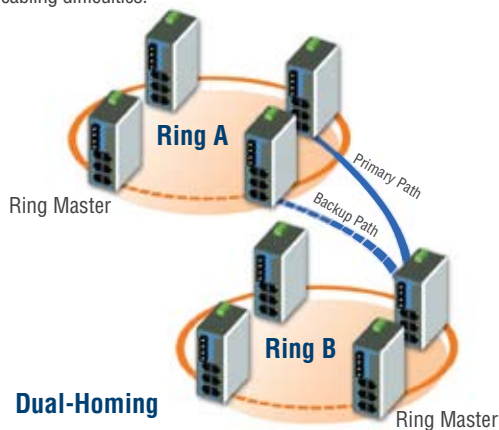


Coupling Several Turbo Rings for Distributed Applications

For some systems, it may not be convenient to connect all devices in the system to create one BIG redundant ring, since some devices could be located at a remote site. Turbo Ring's "Ring Coupling" function helps you separate those distributed devices into different smaller redundant rings, without any control line, but in such a way that the smaller rings will still be able to communicate with each other.

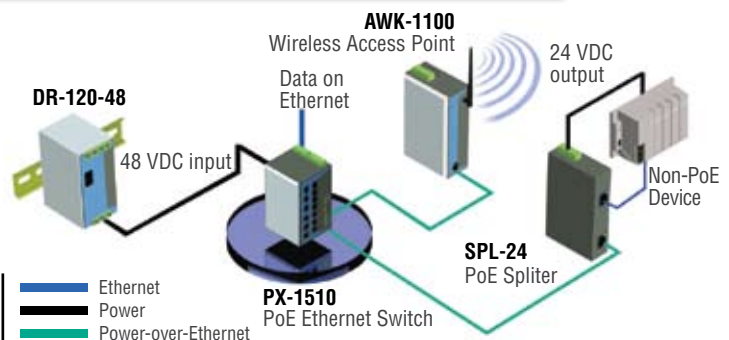


The advanced coupling technology allows you to diversify the connection to Turbo Ring and fit various installation environments. You can configure the network for "Dual-Homing," which involves coupling two separate rings with a single EDS Ethernet switch connecting to two independent connection points. The back-up path will be activated if the operating connection (primary path) fails, and the "Dual-Ring" function adds reliability by allowing a single EDS Ethernet switch to connect two separate rings for applications that present cabling difficulties.



Power-over-Ethernet Solution for Simple and Flexible Connections

Moxa provides a complete range of solutions for IEEE 802.3af PoE compliant units and Ethernet-enabled devices. The Gigabit PoE managed Ethernet switch, PX-1510, can be used not only to simplify wiring in the field, but also to provide advanced network control and management. In addition, the devices can be placed up to 328 feet (100 m) from a PSE.



Advanced Network Control and Management

Port Trunking for Flexible Network Connections

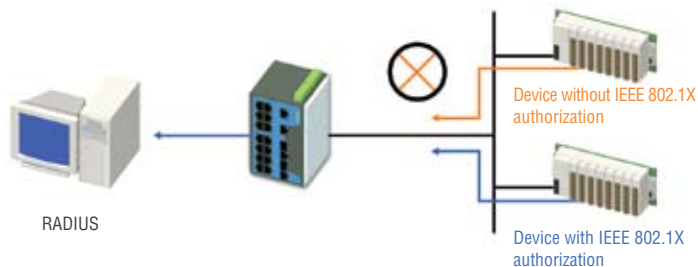
IEEE 802.3ad (LACP, Link Aggregation Control Protocol) provides flexible network connections and a redundant path for critical devices. For example, the EDS-G509 and EDS-500A allow users to set up a wider communication path by aggregating a trunk group. A maximum of eight ports can be assigned to one trunk group to optimize your network connection and redundant paths. When selected ports are grouped for trunking, LACP will exchange information to determine whether or not the ports selected in a group can be trunked together.



Up to 8 ports can be assigned to one trunk group

IEEE 802.1X Enhances User Authentication

The EDS-G509, EDS-500A, and PX-1510 series supports IEEE 802.1X (Port-based Network Access Control) to restrict port access to authorized users only. Authentication is done using the local user database or an external RADIUS (Remote Authentication Dial In User Service) server.



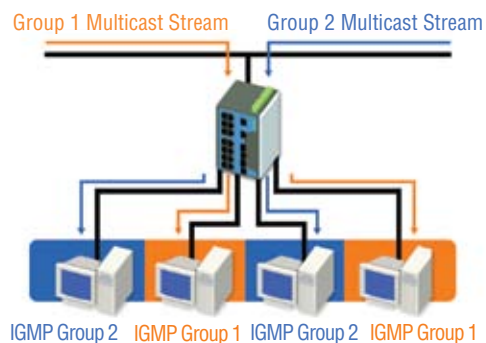
HTTPS and SSH Enhance Network Security

In order to protect data from being intercepted, the EDS-G509, EDS-500A, and PX-1510 series support the HTTPS and SSH protocols for transferring data over the Internet in an encrypted form. If you are changing the configuration of an Ethernet switch online, please make sure that it is done over HTTPS and SSH so that the data remains secure.



IGMP Snooping and GMRP for Filtering Multicast Traffic

The EDS-G509, EDS-500A, and PX-1510 series Ethernet switches support IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP snooping, which provide the ability to prune multicast traffic so that it travels only to those end destinations that require this kind of traffic. The overall effect is to reduce the amount of traffic on the Ethernet LAN.



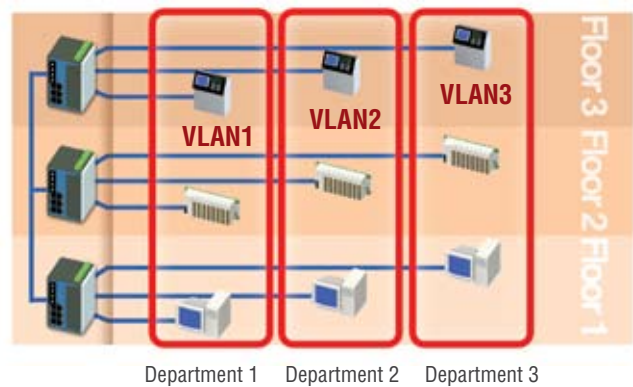
RMON for Efficient Network Monitoring and Proactive Capability

RMON (Remote Network Monitoring) is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. RMON provides you with comprehensive network fault diagnosis, planning, and

performance-tuning information, and helps you manage your network in a more proactive manner. If configured correctly, RMON probes deliver information before problems occur. This means that you can take action before the problems affect users.

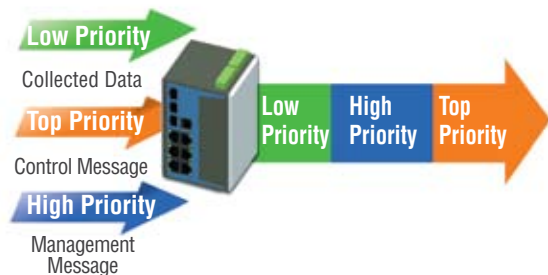
VLAN Eases Network Planning

A VLAN is a group of devices that can be located anywhere on a network, but which communicate as if they are on the same physical segment. VLANs can be used to segment your network without being restricted by physical connections—a limitation imposed by traditional network design. Besides, since all automation systems incorporate sensitive devices that must be protected from unauthorized access, it is very important to have some type of authentication system set up that only allows authorized users to access the system. If devices belong to different VLANs, they cannot communicate with each other, providing extra security and protection from unwanted invasion or traffic. The IEEE 802.1Q standard and GVRP protocol can exchange the same interoperable parameters to keep consistent VLAN settings over the entire network.



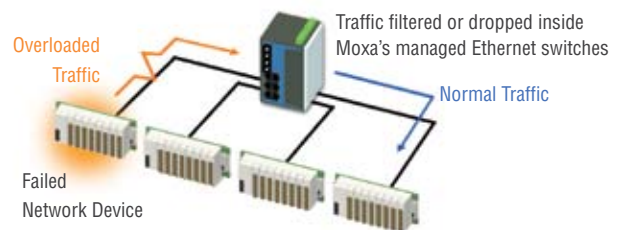
QoS Increases Determinism

Quality of Service (QoS) provides a traffic prioritization capability to ensure that important data is delivered consistently and predictably. Moxa's managed Ethernet switches can inspect IEEE 802.1p/1Q layer 2 CoS tags, and even layer 3 TOS information, to provide a consistent classification of the entire network. The QoS capability of the managed Ethernet switches improve your industrial network's performance and determinism for mission-critical applications.



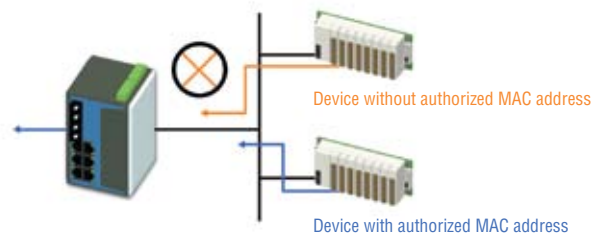
Bandwidth Management Prevents Unpredictable Network Status

Unlimited bandwidth should not be given to any single device on a network, particularly in light of what could happen if the device malfunctions. The most well-known problem is the broadcast storms caused by setting up the wrong topology, or by devices that malfunction. Moxa's managed Ethernet switches series not only prevent broadcast storms, but in addition the ingress/egress rate of unicast/multicast/broadcast packets can also be configured to give administrators full control of limited bandwidth to prevent unpredictable faults.



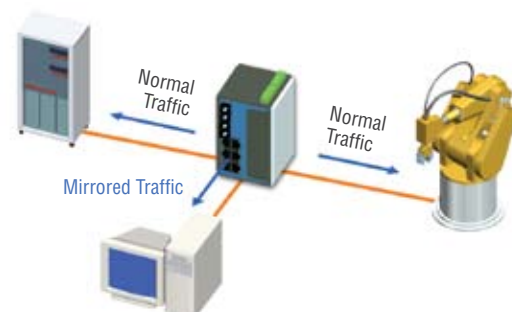
Port Lock Limits Accessed by MAC Address

The EDS-G509, EDS-500A, and PX-1510 Ethernet switches can use the Port Lock function to assign protected static MAC addresses to specific ports. Locked ports will not be able to learn other addresses, but only allow traffic that comes from the preset static MAC address, helping block unwanted invasion and usage.



Port Mirroring for Online Monitoring

In some cases, a network is so large that it is difficult to achieve the expected level of communications. Industrial communications applications use more of a command-response style than the file-transfer style used in office network environments. This means that when first setting up an industrial Ethernet network, control engineers may need to use a second port to monitor the actual activity between their devices and computer host. The mirroring port function on the Moxa's managed Ethernet switches help ensure that the system behaves as expected.



Automatic Warning by Event

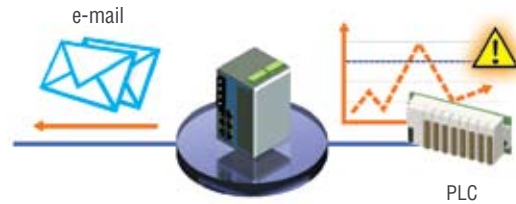
Since industrial Ethernet devices are often located at remote parts of a network, it may be hard for system administrators to know the status of such devices. The traditional way of determining device status is to poll devices periodically, but this is not “real-time” enough for many modern applications, and also wastes precious computing resources. A more modern solution to this problem is to use industrial

Ethernet switches that provide system maintainers with real-time alarm messages almost instantaneously when exceptions occur. In other words, warning messages are triggered actively when the events occur. In order to handle these requirements, industrial Ethernet switches need features such as:

Warning by e-mail

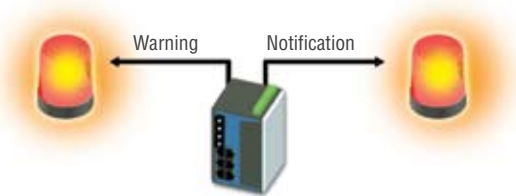
Moxa’s managed Ethernet switches send out a warning e-mail when an exception is detected, providing system managers with real-time alarm messages.

Switch Events		Port Events
Cold Start	Warm Start	Link On
Power On/Off	Authentication Failure	Link Off
Topology Change	Configuration Change	Traffic Overload



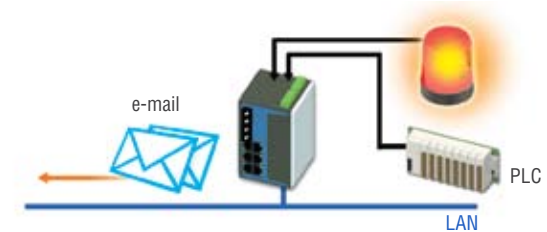
Warning by Relay Output

The managed Ethernet switches provide relay outputs that can be configured to indicate the importance of events when notifying or warning engineers in the field. In response, engineers can respond quickly and with the appropriate emergency maintenance procedures to higher priority messages.



DI for Integrating Other Important Sensors

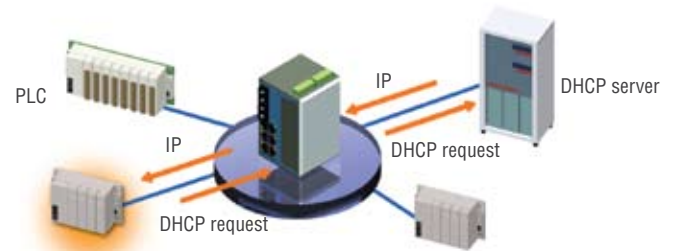
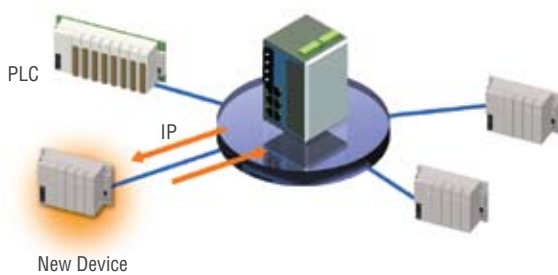
The EDS-G509, EDS-500A, and PX-1510 Ethernet switches have two digital inputs for integrating sensors into the Ethernet switches’ automatic alarm mechanism. This is done by redirecting warning messages to an IP network by e-mail notification.



Replacing Faulty Devices

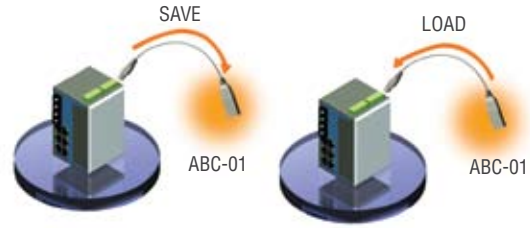
To reduce the effort required to configure IP addresses, Moxa’s managed Ethernet switches are equipped with DHCP/BootP server and RARP protocol, which are used to set up IP addresses of Ethernet-enabled devices automatically.

In additions, the managed Ethernet switches can also play a role of DHCP relay agent (with Option 82 support) to forward the DHCP requests and provide information details (such as the slot ID, port number and VLAN ID) for the authentication of DHCP server.



ABC-01 Provides a Seamless Backup Solution

Moxa's ABC-01 is designed to save and load the configuration of a Moxa EDS managed Ethernet switch. Simply plug the ABC-01 into the Ethernet switch's RS-232 console port, and then use the Ethernet switch's HMI utility to save or load the configuration. The ABC-01 makes it easy to manage your network, particularly when you need to back up or replace an Ethernet switch. You can quickly reinstall a substitute Ethernet switch (of the same model) or recover the entire system configuration if an Ethernet switch failure occurs.



Easy Browser-based Configuration

Moxa's managed Ethernet switches can be configured easily over the network by web browser, Telnet console, or a Windows utility provided by Moxa. In addition, it is simple to back up configuration parameters and update firmware in the managed Ethernet switches with these user-friendly tools.



Network Management with Moxa SNMP OPC Server Software

The Moxa SNMP OPC Server Pro software package can convert SNMP into OPC format. The vertical integration of SNMP management information into existing OPC-based SCADA packages gives the customer the ability to establish an Ethernet network management application that is integrated with existing visualization and control applications.



Comparison Chart for Managed Ethernet Switches

Model	Interface							Features									
	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Digital Output	Digital Input	DIP Switch	Turbo Ring	RSTP/STP	IGMP snooping/GMRP	Port Trunking/LACP	IEEE 802.1X/HTTP/SSH	SNMP/RMON	802.1Q VLAN	Port-based VLAN	QoS	ABC-01*
EDS-G509	9	9	-	-	2	2	√	√	√	√	√	√	√	√	√	√	√
EDS-518A	18	2	16	-	2	2	-	√	√	√	√	√	√	√	√	√	√
EDS-516A	16	-	16	-	2	2	-	√	√	√	√	√	√	√	√	√	√
EDS-510A	10	3	7	-	2	2	√	√	√	√	√	√	√	√	√	√	√
EDS-508A	8	-	8	-	2	2	√	√	√	√	√	√	√	√	√	√	√
EDS-505A	5	-	5	-	2	2	√	√	√	√	√	√	√	√	√	√	√
EDS-408A	8	-	8	-	1	-	√	√	√				√	√	√	√	√
EDS-405A	5	-	5	-	1	-	√	√	√				√	√	√	√	√
PX-1510	10	3	3	4	2	2	√	√	√	√	√	√	√	√	√	√	√

*ABC-01 is an RS-232 RJ45-based automatic backup configurator for Moxa's managed Ethernet switches. Please check page 11-1 for detailed information.

EDS-G509 Series

Preliminary

9G-port full Gigabit managed Ethernet switch



- > 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- > Fiber optic options for extending distance and electrical noise immunity
- > Turbo Ring, RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- > QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- > IEEE 802.1X, HTTPS, and SSH enhance network security



Introduction

The EDS-G509 is equipped with 9 Gigabit Ethernet ports and up to 5 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speeds or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of video, voice, and data across a network quickly. The redundant Ethernet Turbo Ring and RSTP/STP (IEEE

802.1w/D) increase system reliability and the availability of your network backbone. The EDS-G509 series is designed especially for communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

Features and Benefits

- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- ABC-01 (Automatic Backup Configurator) for system configuration backup

Specifications

Technology

Standards: IEEE 802.3 for 10BaseT,

IEEE 802.3u for 100BaseT(X) and 100Base FX,

IEEE 802.3ab for 1000Base(X),

IEEE 802.3z for 1000BaseSX/LX/LHX/ZX,

IEEE 802.3x for Flow Control,

IEEE 802.1D for Spanning Tree Protocol,

IEEE 802.1w for Rapid STP,

IEEE 802.1Q for VLAN Tagging,

IEEE 802.1p for Class of Service,

IEEE 802.1X for Authentication,

IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed

Fiber Ports: 100/1000BaseSFP slot

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, 10/100M/1000M, MASTER, COUPLER

DIP Switch: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: Two relay outputs with current carrying capacity of 1A @ 24 VDC

Digital Inputs: Two inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state "1"

- -30 to +3V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), 24 VAC (18 to 30 VAC), redundant dual inputs

Connection: Two removable 6-pin terminal blocks

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case

Dimensions (W x H x D): 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in.)

Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
 -40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL508 (Pending), EN60950-1 (Pending)

Hazardous Location:

UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending);
 ATEX Class I, Zone 2, Ex nC IIC (Pending)

Maritime: DNV (Pending), GL (Pending)

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: EN61000-4-2 (ESD), level 3
 EN61000-4-3 (RS), level 3
 EN61000-4-4 (EFT), level 3
 EN61000-4-5 (Surge), level 2
 EN61000-4-6 (CS), level 3
 EN61000-4-8
 EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

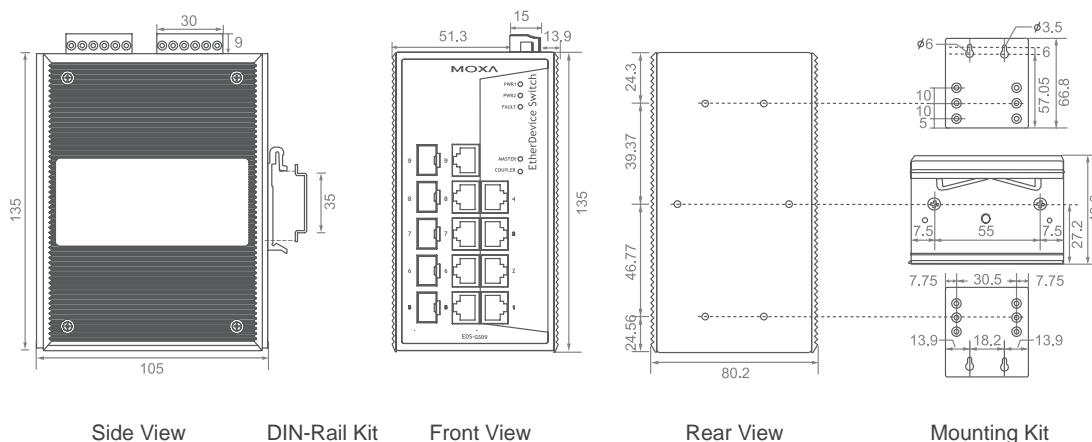
Vibration: IEC 60068-2-6

*Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

Dimensions (unit = mm)



Ordering Information

- **EDS-G509:** Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, 0 to 60°C
- **EDS-G509-T:** Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, -40 to 75°C

* EDS-G509 series supports up to 5 100/1000BaseSFP slots. Please see page 2-23 for the product information of SFP-1G series Gigabit Ethernet SFP modules.

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-4524:** 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-75-24:** 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-120-24:** 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high, 19" rack mounting kit

EDS-518A Series

16+2G-port Gigabit managed Ethernet switch



- > 2 Gigabit plus 16 fast Ethernet ports for copper and fiber
- > Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- > QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- > IEEE 802.1X, HTTPS, and SSH enhance network security
- > ABC-01 (Automatic Backup Configurator) for system configuration backup



Introduction

The EDS-518A is a standalone 18-port managed Ethernet switch that provides 2 combo Gigabit ports with built-in RJ45 or SFP slots for Gigabit optic communication. The Ethernet redundant Turbo Ring (recovery time < 20 ms) increases the reliability and speed of your

network backbone. The EDS-518A also supports intelligent network management functions, including QoS, IGMP snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, IEEE 802.1X, HTTPS, and SSH.

Features and Benefits

- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS-IEEE 802.1p and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- ABC-01 (Automatic Backup Configurator) for system configuration backup
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- DIN-Rail or panel mounting capability

Specifications

Technology

Standards: IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3ab for 1000BaseT(X), IEEE 802.3z for 1000BaseSX/LX/LHX/ZX, IEEE 802.3x for Flow Control, IEEE 802.1D for Spanning Tree Protocol, IEEE 802.1w for Rapid STP, IEEE 802.1Q for VLAN Tagging, IEEE 802.1p for Class of Service, IEEE 802.1X for Authentication, IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control Interface

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Fiber Ports: 100BaseFX (SC/ST connector), and 1000BaseSFP slot

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), MASTER, COUPLER

Alarm Contact: Two relay outputs with current carrying capacity of 1A @ 24 VDC

Digital Inputs: Two inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi Mode	Single Mode	Single Mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km ^a 4 km ^b	40 km ^c	80 km ^d
Saturation	-6 dBm	-3 dBm	-3 dBm

- a. 50/125 μ m, 800 MHz*km fiber optic cable
- b. 62.5/125 μ m, 500 MHz*km fiber optic cable
- c. 9/125 μ m, 3.5 PS/(nm*km) fiber optic cable
- d. 9/125 μ m, 19 PS/(nm*km) fiber optic cable

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs
Input Current (@ 24 V): 0.51A (EDS-518A), 0.61A (EDS-518A-MM, EDS-518A-SS)

Connection: Two removable 6-pin terminal blocks

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case

Dimensions (W x H x D): 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in.)

Weight: 1630 g

Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
 -40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location:

UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending);
 ATEX Class I, Zone 2, Ex nC IIC (Pending)

Maritime: DNV, GL

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: EN61000-4-2 (ESD), level 2
 EN61000-4-3 (RS), level 3
 EN61000-4-4 (EFT), level 2
 EN61000-4-5 (Surge), level 3
 EN61000-4-6 (CS), level 3
 EN61000-4-8
 EN61000-4-11
 EN61000-4-12

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

MTBF: 240,000 hrs

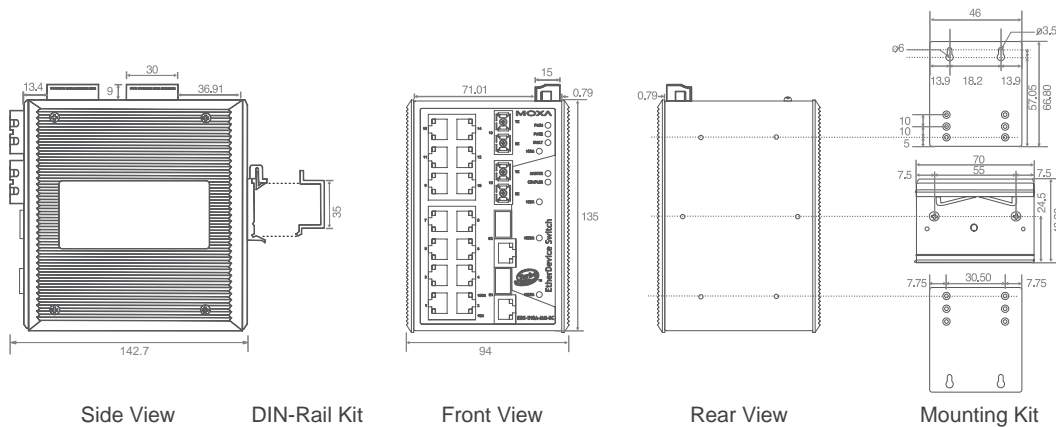
Database: Telcordia (Bellcore), GB

*Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

Dimensions (unit = mm)



Ordering Information

Product Model		Port Interface					
		Gigabit Ethernet	Fast Ethernet				
			Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*	10/100BaseT(X)	100BaseFX		
Multi Mode, SC Connector	Multi Mode, ST Connector	Single Mode, SC Connector			Single Mode, SC Connector, 80 km		
EDS-518A	EDS-518A-T	2	16				
EDS-518A-MM-SC	EDS-518A-MM-SC-T	2	14	2			
EDS-518A-MM-ST	EDS-518A-MM-ST-T	2	14		2		
EDS-518A-SS-SC	EDS-518A-SS-SC-T	2	14			2	
EDS-518A-SS-SC-80		2	14				2

* EDS-518A series supports 2 1000BaseSFP slots. Please see page 2-23 for the product information of SFP-1G series Gigabit Ethernet SFP modules.

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-4524:** 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-75-24:** 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-120-24:** 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high 19" rack mounting kit

EDS-510A Series

7+3G-port Gigabit managed Ethernet switch



- > 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- > Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- > QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- > IEEE 802.1X, HTTPS, and SSH enhance network security
- > ABC-01 (Automatic Backup Configurator) for system configuration backup



Introduction

The EDS-510A Gigabit managed redundant Ethernet switch is equipped with up to 3 Gigabit Ethernet ports, making it ideal for building a Gigabit Turbo Ring, but leaving a spare Gigabit port for uplink use. The Ethernet redundant Turbo Ring (recovery time < 20 ms) and RSTP/STP (IEEE 802.1w/D) can increase system reliability

and the availability of your network backbone. The EDS-510A series is designed especially for communication demanding applications such as process control, shipbuilding, ITS, and DCS systems, which can benefit from a scalable backbone construction.

Features and Benefits

- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management

- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks

Specifications

Technology

Standards: IEEE 802.3 for 10BaseT,

IEEE 802.3u for 100BaseT(X) and 100Base FX,

IEEE 802.3ab for 1000Base(X),

IEEE 802.3z for 1000BaseSX/LX/LHX/ZX,

IEEE 802.3x for Flow Control,

IEEE 802.1D for Spanning Tree Protocol,

IEEE 802.1w for Rapid STP,

IEEE 802.1Q for VLAN Tagging,

IEEE 802.1p for Class of Service,

IEEE 802.1X for Authentication,

IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Fiber Ports: 1000BaseSFP slot

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MASTER, COUPLER

DIP Switch: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: Two relay outputs with current carrying capacity of 1A @ 24 VDC

Digital Inputs: Two inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state “1”
- -30 to +3V for state “0”
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current (@ 24 V): 0.65A (EDS-510A-3GT)
 0.44A (EDS-510A-1GT2SFP)
 0.46A (EDS-510A-3SFP)

Connection: Two removable 6-pin terminal blocks

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case

Dimensions (W x H x D): 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in.)

Weight: 1170 g

Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
 -40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location:

UL/cUL Class I, Division 2, Groups A, B, C, and D;
 ATEX Class I, Zone 2, Ex nC IIC (Pending)

Maritime: DNV, GL

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: EN61000-4-2 (ESD), level 3
 EN61000-4-3 (RS), level 3
 EN61000-4-4 (EFT), level 3
 EN61000-4-5 (Surge), level 2
 EN61000-4-6 (CS), level 3
 EN61000-4-8
 EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

MTBF: 204,000 hrs

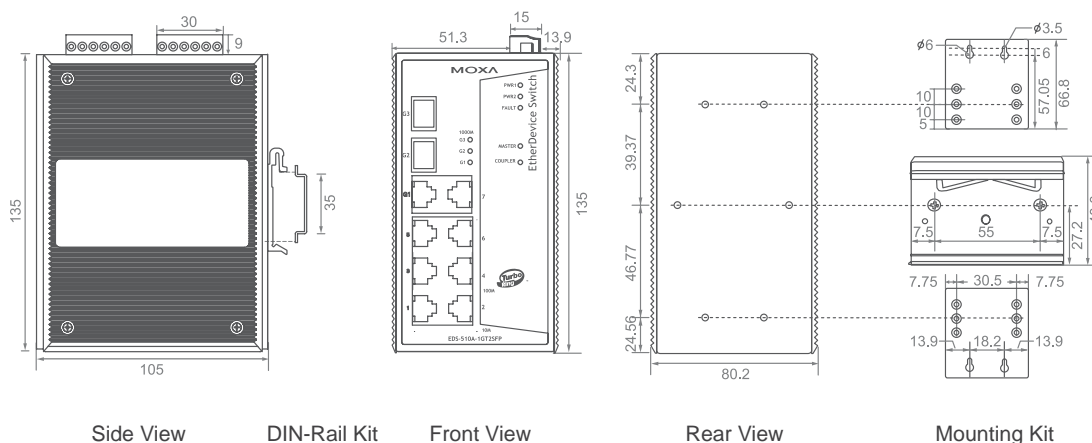
Database: MIL-HDBK-217F, GB 25°C

*Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

Dimensions (unit = mm)



Ordering Information

Product Model		Port Interface		
		Gigabit Ethernet		Fast Ethernet
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)
EDS-510A-3GT	EDS-510A-3GT-T	3		7
EDS-510A-1GT2SFP	EDS-510A-1GT2SFP-T	1	2	7
EDS-510A-3SFP	EDS-510A-3SFP-T		3	7

* EDS-510A series supports up to 3 1000BaseSFP slots. Please see page 2-23 for the product information of SFP-1G series Gigabit Ethernet SFP modules.

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-4524:** 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-75-24:** 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-120-24:** 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high, 19" rack mounting kit

EDS-516A/508A/505A Series

16-, 8-, and 5-port managed Ethernet switches



- > Plug-n-play Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- > QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON supported
- > Customer configured e-mail notification by exception
- > User-friendly web-based configuration and management
- > -40 to 75°C operating temperature (T models)
- > ABC-01 (Automatic Backup Configurator) for system configuration backup



Introduction

EDS-516A/508A/505A are standalone 16, 8, and 5-port managed Ethernet switches. With its advanced Turbo Ring (recovery time < 20 ms) technology and RSTP/STP (IEEE 802.1w/D), the EDS-516A/508A/505A switches increase the reliability and availability of your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. In addition,

the switches support several reliable and intelligent functions, including QoS, IGMP snooping/GMRP, VLAN, Port Trunking, SNMPv1/v2c/v3, IEEE 802.1X, HTTPS, SSH, and RMON, making the EDS-516A/508A/505A switches suitable for any harsh industrial environment.

Features and Benefits

- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks

Specifications

Technology

Standards: IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3x for Flow Control, IEEE 802.1D for Spanning Tree Protocol, IEEE 802.1w for Rapid STP, IEEE 802.1Q for VLAN Tagging, IEEE 802.1p for Class of Service, IEEE 802.1X for Authentication, IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, GMRP, LACP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX ports (SC/ST connector)

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER, 10/100M

DIP Switch: Turbo Ring, Master, Coupler, Reserve (508A and 505A only)

Alarm Contact: Two relay outputs with current carrying capacity of 1A @ 24 VDC

Digital Input: Two inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state "1"
- -30 to +3V for state "0"
- Max. input current: 8 mA

Optical Fiber

	100BaseFX		
	Multi Mode	Single Mode	Single Mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km ^a 4 km ^b	40 km ^c	80 km ^d
Saturation	-6 dBm	-3 dBm	-3 dBm

- a. 50/125 μm, 800 MHz*km fiber optic cable
- b. 62.5/125 μm, 500 MHz*km fiber optic cable
- c. 9/125 μm, 3.5 PS/(nm*km) fiber optic cable
- d. 9/125 μm, 19 PS/(nm*km) fiber optic cable

* Single mode for EDS-508A and EDS-505A only.

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current (@ 24 V): 0.44A (EDS-516A), 0.51A (EDS-516A-MM), 0.26A/0.24A (EDS-508A/505A), 0.36A/0.35A (EDS-508A/505A-MM, EDS-508A/505A-SS)

Connection: Two removable 6-pin terminal blocks

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case

Dimensions (W x H x D):

EDS-516A series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in.)

EDS-508A/505A series: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in.)

Weight:

EDS-516A series: 1586 g

EDS-508A/505A series: 1040 g

Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

-40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (EDS-516A Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)

Maritime: DNV, GL

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: EN61000-4-2 (ESD), level 3 (EDS-508A/505A) / level 2 (EDS-516A)

EN61000-4-3 (RS), level 3

EN61000-4-4 (EFT), level 3 (EDS-508A/505A) / level 2 (EDS-516A)

EN61000-4-5 (Surge), level 3

EN61000-4-6 (CS), level 3

EN61000-4-8

EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

MTBF: EDS-516A series: 247,000 hrs

EDS-508A series: 339,000 hrs

EDS-505A series: 352,000 hrs

Database: Telcordia (Bellcore), GB

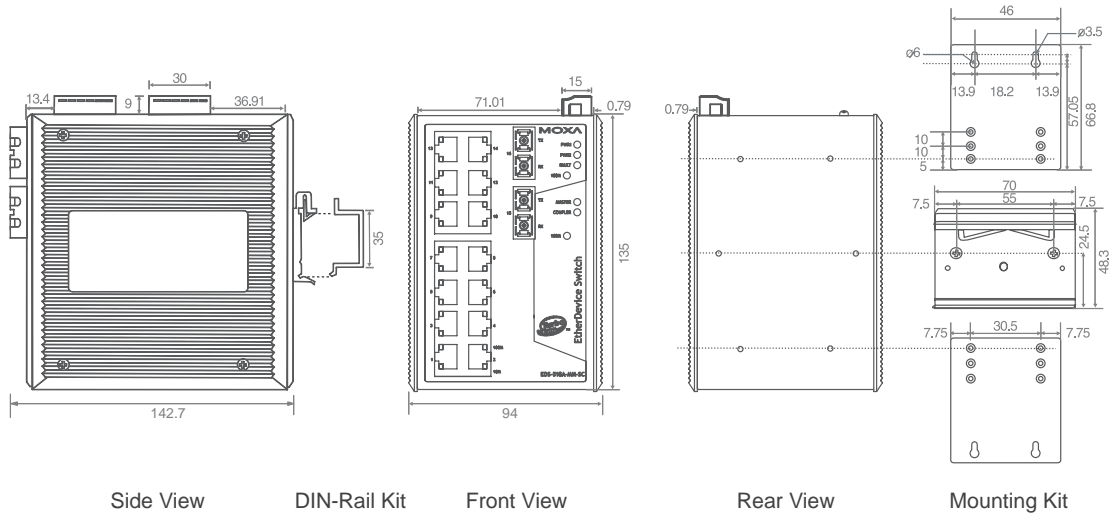
* Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

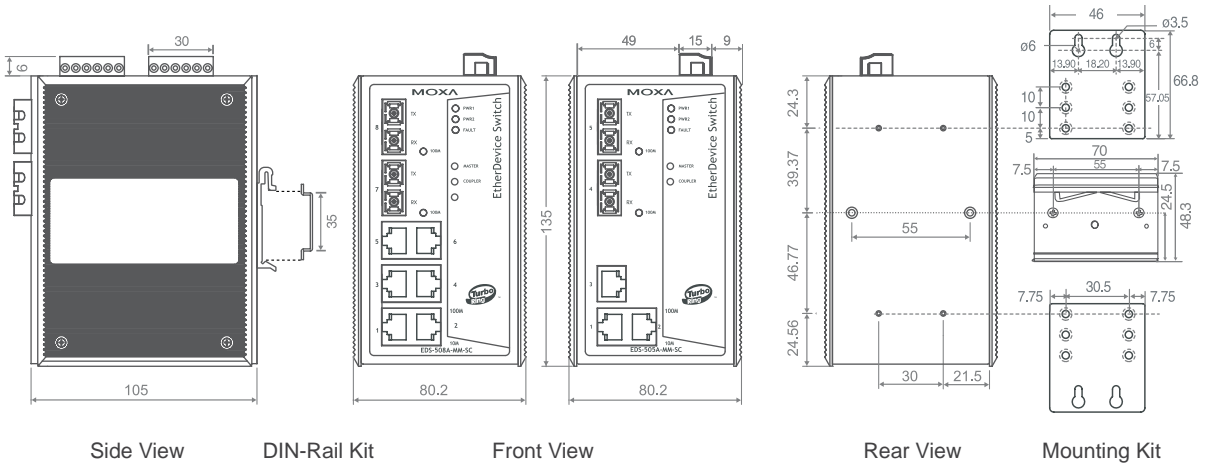
Dimensions (unit = mm)

[EDS-516A series]



Dimensions (unit = mm)

[EDS-508A/505A series]



Ordering Information

Product Model		Port Interface				
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX			Single Mode, SC Connector, 80 km
			Multi Mode, SC Connector	Multi Mode, ST Connector	Single Mode, SC Connector	
EDS-516A Series						
EDS-516A	EDS-516A	16				
EDS-516A-MM-SC	EDS-516A-MM-SC-T	14	2			
EDS-516A-MM-ST	EDS-516A-MM-ST-T	14		2		
EDS-508A/505A Series						
EDS-508A/505A	EDS-508A/505A-T	8/5				
EDS-508A/505A-MM-SC	EDS-508A/505A-MM-SC-T	6/3	2			
EDS-508A/505A-MM-ST	EDS-508A/505A-MM-ST-T	6/3		2		
EDS-508A/505A-SS-SC	EDS-508A/505A-SS-SC-T	6/3			2	
EDS-508A/505A-SS-SC-80*	EDS-508A-SS-SC-80-T	6/3				2

* EDS-505A-SS-SC-80 only supports a standard temperature model.

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-4524:** 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-75-24:** 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-120-24:** 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high, 19" rack mounting kit

EDS-408A/405A Series

8- and 5-port entry-level managed Ethernet switches



- > Plug-n-Play Turbo Ring with fast recovery time within 20 ms
- > QoS, port-based VLAN, SNMPv1/v2c/v3, RMON supported
- > Automatic warning by exception through e-mail, relay output
- > User-friendly web-based configuration and management
- > ABC-01 (Automatic Backup Configurator) for system configuration backup



Introduction

The EDS-408A/405A series Ethernet switches are entry-level 8 and 5-port managed Ethernet switches designed especially for industrial applications. The Ethernet switches support a variety of useful management functions, such as Turbo Ring, ring coupling, port-based VLAN, QoS, RMON, bandwidth management, port mirroring, and

Features and Benefits

- Plug-n-Play Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D) capability
- Port-based VLAN to ease network planning
- QoS-IEEE 802.1p and TOS/DiffServ to increase determinism
- RMON for efficient network monitoring and proactive capability
- SNMPv1/v2c/v3 for different levels of network management security
- Bandwidth management prevents unpredictable network status
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards: IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3x for Flow Control, IEEE 802.1D for Spanning Tree Protocol, IEEE 802.1w for Rapid STP, IEEE 802.1p for Class of Service

Protocols: SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, Telnet, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX ports (SC/ST connector)

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER, 10/100M

DIP Switch: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: One relay output with current carrying capacity of 1A @ 24 VDC

warning by email or relay. The ready-to-use Turbo Ring can be set up easily using the web-based management interface, or with the DIP switches on the Ethernet switch's top panel.

Optical Fiber

	100BaseFX	
	Multi Mode	Single Mode
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km ^a 4 km ^b	40 km ^c
Saturation	-6 dBm	-3 dBm

- a. 50/125 μm, 800 MHz*km fiber optic cable
- b. 62.5/125 μm, 500 MHz*km fiber optic cable
- c. 9/125 μm, 3.5 PS/(nm*km) fiber optic cable

Power Requirements

Input Voltage: 24 VDC (12 to 45 VDC), redundant dual inputs

Input Current (@ 24 V): 0.26A/0.24A (EDS-408A/405A), 0.35A/0.32A (EDS-408A/405A-MM, -SS)

Connection: One removable 6-pin terminal block

Overload Current Protection: Present

Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case

Dimensions (W x H x D): 53.6 x 135 x 105 mm (3.17 x 5.31 x 4.13 in.)

Weight: 650 g

Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
-40 to 75°C (-40 to 167°F) for T models

Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

Hazardous Location:

UL/cUL Class I, Division 2, Groups A, B, C, and D;
ATEX Class I, Zone 2, Ex nC IIC (Pending)

Maritime: DNV, GL

EMI: FCC Part 15, CISPR (EN55022) class A

EMS: EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3 (EDS-405A) / level 2 (EDS-408A)

EN61000-4-4 (EFT), level 3 (EDS-405A) / level 2 (EDS-408A)
EN61000-4-5 (Surge), level 3 (EDS-405A) / level 2 (EDS-408A)
EN61000-4-6 (CS), level 3 (EDS-405A) / level 2 (EDS-408A)
EN61000-4-8
EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

MTBF: EDS-408A series: 363,000 hrs

EDS-405A series: 392,000 hrs

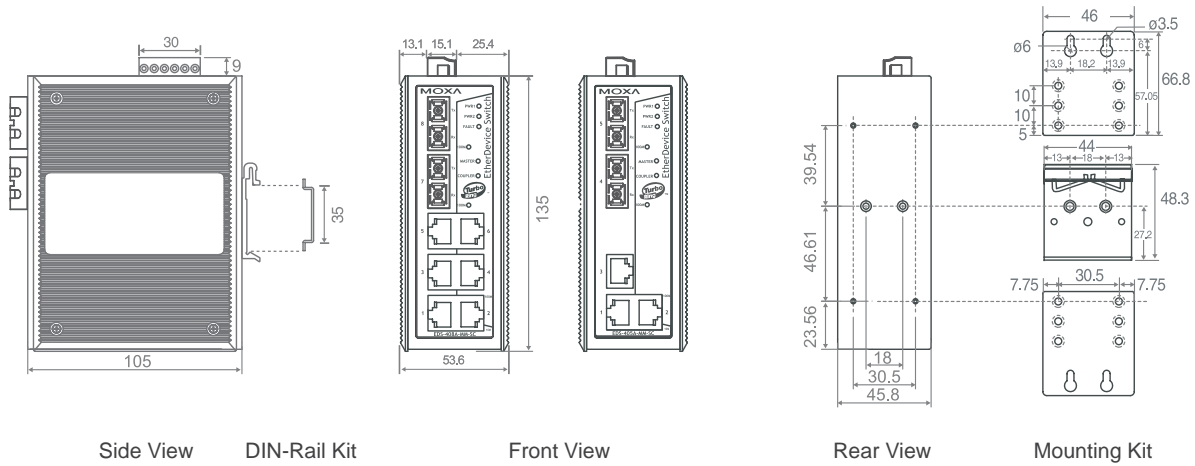
Database: Telcordia (Bellcore), GB

*Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

Dimensions (unit = mm)



Ordering Information

Product Model		Port Interface			
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi Mode, SC Connector	Multi Mode, ST Connector	Single Mode, SC Connector
EDS-408A/405A	EDS-408A/405A-T	8/5			
EDS-408A/405A-MM-SC	EDS-408A/405A-MM-SC-T	6/3	2		
EDS-408A/405A-MM-ST	EDS-408A/405A-MM-ST-T	6/3		2	
EDS-408A/405A-SS-SC	EDS-408A/405A-SS-SC-T	6/3			2

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-4524:** 45W/2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-75-24:** 75W/3.2A DIN-Rail 24 VDC power supply, 85 to 264 VAC input
- **DR-120-24:** 120W/5A DIN-Rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high, 19" rack mounting kit

PX-1510 Series

Preliminary

7+3G-port Gigabit PoE managed Ethernet switch



- > 4 IEEE 802.3af-compliant PoE and Ethernet combo ports
- > Provides up to 15.4 watts at 48 VDC per PoE port
- > Intelligent power consumption detection, classification, and PoE scheduling function
- > 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
- > Turbo Ring (recovery time < 20 ms), RSTP/STP (IEEE 802.1w/D) for Ethernet redundancy
- > QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON, IEEE 802.1X, HTTPS, and SSH supported



Introduction

The PX-1510 series Ethernet switches are Gigabit managed redundant Ethernet switches that come standard with 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports. The PX-1510 Ethernet switches provide up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or cost-prohibitive to provide locally. The PX-1510 Ethernet switches are highly versatile, and their

SFP fiber port can transmit data up to 80 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including Turbo Ring, RSTP/STP, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The PX-1510 series is designed especially for security automation applications such as IP surveillance, and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

Features and Benefits

- IEEE 802.3af Power-over-Ethernet Technology
- Turbo Ring (recovery time < 20 ms at full load) and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks

Specifications

Technology

Standards: IEEE 802.3af for Power-over-Ethernet, IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3ab for 1000Base(X), IEEE 802.3z for 1000BaseSX/LX/LHX/ZX, IEEE 802.3x for Flow Control, IEEE 802.1D for Spanning Tree Protocol, IEEE 802.1w for Rapid STP, IEEE 802.1Q for VLAN Tagging, IEEE 802.1p for Class of Service, IEEE 802.1X for Authentication, IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed

Fiber Ports: 100/1000BaseSFP slot

Console: RS-232 (RJ45)

LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MASTER, COUPLER, PoE

DIP Switch: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: Two relay outputs with current carrying capacity of 0.5A @ 48 VDC

Digital Inputs: Two inputs with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state “1”
- -30 to +3V for state “0”
- Max. input current: 8 mA

PoE (per port)

Max. Output Power: 15.4W
Output Voltage: 44 to 48.5 VDC
Max. Output Current: 350 mA
Max. Overload Protection: 400 mA

Power Requirements

Input Voltage: 48 (46 to 50V) VDC, redundant dual inputs
Connection: Two removable 6-pin terminal blocks
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Casing: IP30 protection, metal case
Dimensions (W x H x D): 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in.)
Weight: 1170 g
Installation: DIN-Rail mounting, wall mounting (optional kit)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
 -40 to 75°C (-40 to 167°F) for T models
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

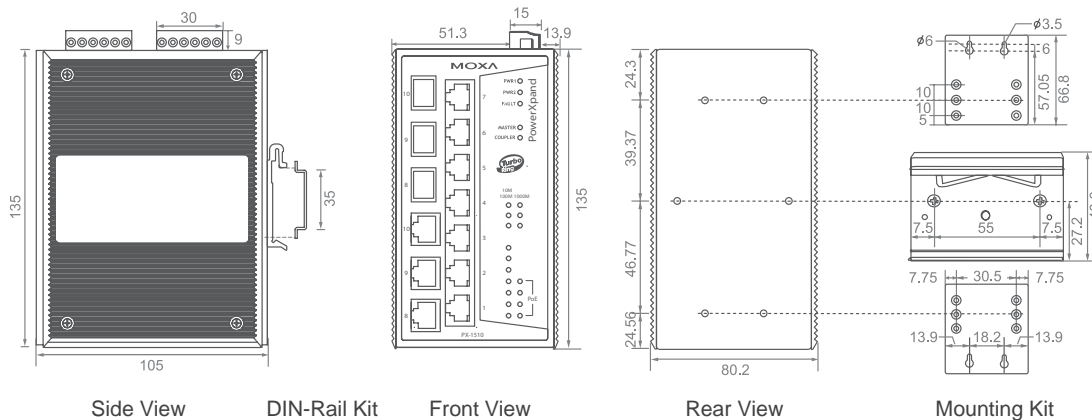
Regulatory Approvals

Safety: UL508 (Pending), EN60950-1 (Pending)
Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)
Maritime: DNV (Pending), GL (Pending)
Traffic Control: NEMA TS2 (Pending)
EMI: FCC Part 15, CISPR (EN55022) class A
EMS: EN61000-4-2 (ESD), level 3
 EN61000-4-3 (RS), level 3
 EN61000-4-4 (EFT), level 3
 EN61000-4-5 (Surge), level 2
 EN61000-4-6 (CS), level 3
 EN61000-4-8
 EN61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
 *Please check Moxa's website for the most up-to-date certification status.

Warranty

5 years (see www.moxa.com/warranty for details)

Dimensions (unit = mm)



Ordering Information

Product Model		Port Interface			
		Gigabit Ethernet		Fast Ethernet	
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 10/1000BaseSFP*		PoE, 10/100BaseT(X)	10/100BaseT(X)
PX-1510-3GT	PX-1510-3GT-T	3		4	3

* PX-1510 series supports up to 3 100/1000BaseSFP slots. Please see page 2-23 for the product information of SFP-1G series Gigabit Ethernet SFP modules.

Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **SPL-24:** PoE splitter, maximum output of 12.95W at 24 VDC, 0 to 60°C
- **SPL-24-T:** PoE splitter, maximum output of 12.95W at 24 VDC, -40 to 75°C
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual
- **DR-120-48:** 120W/2.5A DIN-Rail 48 VDC power supply with 88 to 132 VAC/176 to 264 VAC input by switch
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high, 19" rack mounting kit

Moxa NMS

Preliminary

Network management software for monitoring industrial networks



Moxa NMS's remote management capability provides an integrated environment for managing your industrial Ethernet infrastructure.

Introduction

Configuration Management

Moxa NMS provides comprehensive, easy-to-use tools for network operators to configure Moxa's managed Ethernet switches. You will find the configuration file management, firmware management, and topology recognition tools particularly useful. The user-friendly web UI, with firmware upgrade, auto-discovery topology, and more, makes it particularly easy to deploy your industrial Ethernet infrastructure.

Performance Management

Network operators are able to monitor and analyze network traffic reports for each network device with Moxa NMS. Moxa NMS generates various trending graphs to monitor network performance, and with the full support of both standard and Moxa proprietary MIBs, Moxa NMS provides a complete data source for network performance analysis.

Fault Management

Faults impair normal operation, and users expect to be kept informed of network status. Through Moxa NMS's fault management system, an organized event list provides the operational status of the whole network. Color-coded icons on the topology map notify network operators the first time a network anomaly is detected.



Features and Benefits

- Auto-Discovery to create topology map
- Various trending graphs to generate performance reports
- Fault management system to monitor network anomalies
- Remotely accessible through user-friendly web UI

System Requirements

- Processor:** x86 compatible CPU, min. 1 GHz
- RAM:** 1 GB
- Hard disk space:** 500 MB free

0

Overview

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Modular Ethernet Switches

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Managed Ethernet Switches

3

Unmanaged Ethernet Switches

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Backmount Ethernet Switches

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Wireless Ethernet

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Active Ethernet I/O

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Peer-to-Peer I/O

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Modular Remote I/O

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Video Networking Products

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Media Converters

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Accessories

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Ordering Information

EDS-SNMP OPC Server Pro

OPC server for integrating SNMP devices into HMI/SCADA systems



Seamlessly integrate EDS-SNMP OPC Server Pro with the leading HMI/SCADA software to create a comprehensive Ethernet network management solution for SNMP devices.

2

Managed Ethernet Switches

EDS-SNMP OPC Server Pro

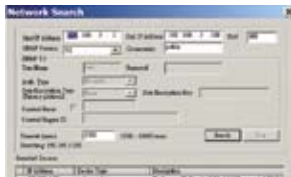
Introduction

Moxa's EDS-SNMP OPC Server Pro provides a user-editable Tag file for any SNMP device. Use the default MIB file, or create and edit a standard or private MIB to generate a dedicated Tag file. This powerful function lets operators use an existing HMI software environment to create a customized and real time view of the integrity of all Ethernet network devices, the overall Ethernet network traffic volume, and overall Ethernet network status. Moxa's managed Ethernet switches are ideally suited for connecting Ethernet-enabled industrial devices

in your mission critical applications. Combined with EDS-SNMP OPC Server Pro software, your HMI (Human Machine Interface) packages and SCADA (Supervisory Control And Data Acquisition) software will be turned into a complete remote network traffic and status monitoring tool. This solution gives control engineers the power to monitor the network from a central location with existing and familiar visualization and control applications.

Features and Benefits

- "Broadcast Search" the network for Moxa's managed Ethernet switches and any SNMP device



- Easy to create and edit the configuration of connected devices in advance



- Easy to create and edit the MIB Template for dedicated tag file of any SNMP device



- User-definable tag file meets the requirements of many different applications



System Requirements

Windows NT/2000/XP, Administrator Privileges, Ethernet Card

Ordering Information

EDS-SNMP OPC Server Pro: CD with EDS-SNMP OPC Server Pro software and manual

SFP-1G Series

1G-port Gigabit Ethernet SFP modules



- > Compliant with IEEE 802.3z
- > Differential LVPECL inputs and outputs
- > Single power supply 3.3V
- > TTL signal detect indicator
- > Hot Pluggable
- > Class 1 laser product, complies with EN60825-1



Specifications

Interface

Gigabit Port: 1 port

Connector: Duplex LC Connector or

Simplex LC Connector* (WDM-type only)

* WDM-type SFP modules must be used in pairs (e.g., SFP-1GXALC and SFP-1GXXBLC)

Optical Fiber

	Gigabit Ethernet			
	SFP-SX	SFP-LX	SFP-LHX	SFP-ZX
Wavelength	850 nm	1310 nm	1310 nm	1550 nm
Max. TX	-4 dBm	-3 dBm	1 dBm	5 dBm
Min. TX	-9.5 dBm	-9.5 dBm	-4 dBm	0 dBm
RX Sensitivity	-18 dBm	-20 dBm	-24 dBm	24 dBm
Link Budget	8.5 dB	10.5 dB	20 dB	24 dB
Typical Distance	550 m ^a 275 m ^b	1100 m ^c 550 m ^d 10 km ^e	40 km ^e	80 km ^f
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm

	Gigabit Ethernet					
	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wave-length	TX 1310 nm, RX 1550 nm		TX 1550 nm, RX 1310 nm		TX 1310 nm, RX 1550 nm	
Max. TX	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-21 dBm		-23 dBm		-23 dBm	
Link Budget	12 dB		15 dB		20 dB	
Typical Distance	10 km ^{ef}		20 km ^{ef}		40 km ^{ef}	
Saturation	-1 dBm		-1 dBm		-1 dBm	

- a. 50/125 μm, 400 MHz*km fiber optic cable
- b. 62.5/125 μm, 200 MHz*km fiber optic cable
- c. 50/125 μm, 800 MHz*km fiber optic cable
- d. 62.5/125 μm, 500 MHz*km fiber optic cable
- e. 9/125 μm, 3.5 PS/(nm*km) fiber optic cable
- f. 9/125 μm, 19 PS/(nm*km) fiber optic cable

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

-40 to 85°C (-40 to 185°F) for T models

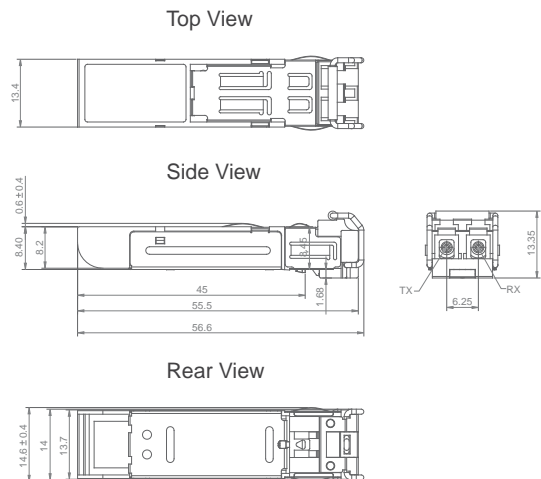
Storage Temperature: -40 to 85°C (-40 to 185°F)

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

Regulatory Approvals

Safety: UL, TÜV, EN60825-1

Dimensions (unit = mm)



Ordering Information

SFP Modules

Product Model		Port Interface			
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 85°C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLX, LC Connector, 10 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km
SFP-1GSXLC	SFP-1GSXLC-T*	1			
SFP-1GLXLC	SFP-1GLXLC-T		1		
SFP-1GLHXL	SFP-1GLHXL-T			1	
SFP-1GZXL	SFP-1GZXL-T				1

* SFP-1GSXLC-T: -20 to 75°C operating temperature

WDM-type (BiDi) SFP Modules

Product Model		Port Interface					
Standard Temperature (0 to 60°C)	Extended Temperature (-40 to 85°C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1					
SFP-1G10BLC	SFP-1G10BLC-T		1				
SFP-1G20ALC	SFP-1G20ALC-T			1			
SFP-1G20BLC	SFP-1G20BLC-T				1		
SFP-1G40ALC	SFP-1G40ALC-T					1	
SFP-1G40BLC	SFP-1G40BLC-T						1

Matched Products

- **EDS-828/728 series:** IM-2GSFP series Gigabit Ethernet interface module
- **EDS-G509 series:** 9G-port full Gigabit managed Ethernet switches
- **EDS-518A series:** 16+2G-port Gigabit managed Ethernet switches
- **EDS-510A series:** 7+3G-port Gigabit managed Ethernet switches
- **PX-1510 series:** 7+3G-port Gigabit PoE managed Ethernet switches
- **PT and IKS series:** PM-7200-2G/4G series Gigabit Ethernet interface modules
- **EDS-G308 series:** 8G-port full Gigabit unmanaged Ethernet switches
- **IMC-101G series:** Industrial Gigabit media converters