

EtherDevice™ Switch EDS-510A Series

Industrial 7+3G-Port Gigabit Managed Redundant Ethernet Switch



Highlights

- 2 Gigabit Ethernet ports for Redundant Ring and 1 Gigabit Ethernet port for Uplink solution
- Gigabit Turbo Ring (Recovery time < 300 ms), RSTP/STP (IEEE802.1W/D) for Ethernet redundancy
- QoS, IGMP snooping/GMRP, VLAN, LACP, SNMP V1/V2c/V3, RMON supported
- Rate Limiting for bandwidth management, and broadcast storm protection
- IEEE802.1X and https/SSL to enhance network security



Features

Industrial Networking Capability

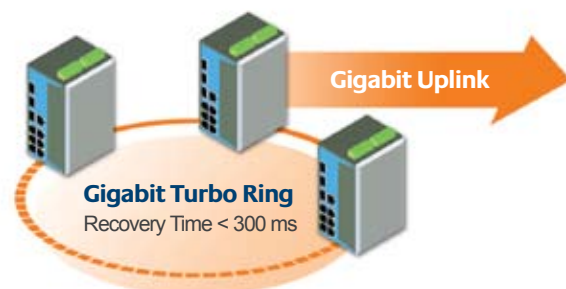
- 2 Gigabit Ethernet Ports for Redundant Gigabit Ethernet Ring (recovery time < 300 ms at full load) and RSTP/STP (IEEE802.1W/D), 1 Gigabit Ethernet Port for Uplink
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet Protocols
- Supports IEEE802.1Q VLAN and GVRP protocol to ease network planning
- Supports QoS-IEEE802.1p/1Q and TOS/DiffServ to increase determinism
- Supports 802.3ad, LACP for optimum bandwidth utilization
- Supports IEEE802.1X and https/SSL to enhance network security
- SNMP V1/V2c/V3 for different levels of network management
- RMON for efficient network monitoring and proactive capability

Designed for Industrial Applications

- Bandwidth management prevents unpredictable network status
- Supports ABC-01 (Automatic Backup Configurator) for system configuration back up
- Lock port for authorized only MAC address access
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery (Patented)
- Redundant, dual DC power inputs
- IP30, rugged high-strength case
- Long-haul transmit distance of 40 km or 80 km
- DIN-Rail or panel mounting capability
- Send ping commands to identify network segment integrity
- Redundant 12-45 VDC power inputs and over current protection

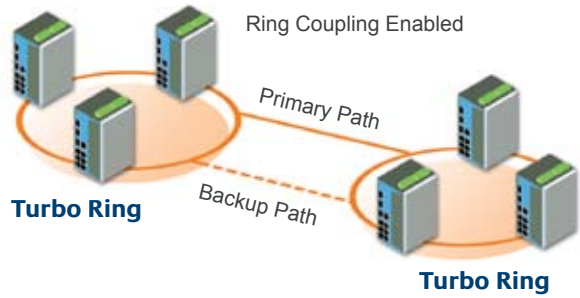
Gigabit Ethernet Redundant Ring (< 300 ms), plus 1-Gigabit Ethernet Port for Uplink

EDS-510A comes equipped with 3 gigabit Ethernet ports. 2 of them can be used for building a redundant Gigabit ring 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 under 300 ms. The 3rd Gigabit Ethernet port can be a uplink port, which can give 1000Mbps link capability for transmitting all the data to the control center. With this 3rd Gigabit Ethernet port's help, EDS-510A can help the user to build a completed Gigabit Ethernet backbone network.



Couple Several Turbo Rings for Distributed Applications

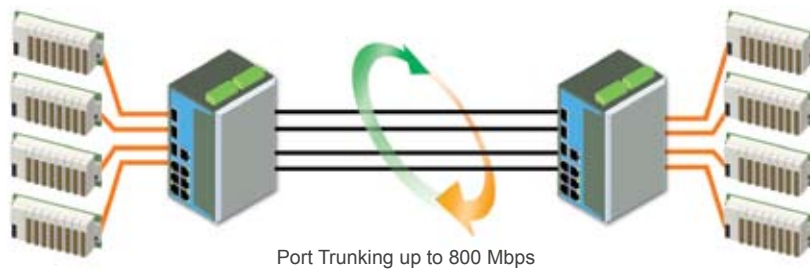
For some systems, it may not be convenient to connect all devices in the system to create one BIG redundant ring, since some devices could be located at a remote site. Turbo Ring's "Ring Coupling" function helps you separate those distributed devices into different smaller redundant rings, but in such a way that they can still communicate with each other.



Port Trunking for Flexible Network Connections

Port Trunking allows devices to communicate by aggregating up to four links in parallel with a maximum of 8 ports for each link. That means users could connect one EDS to another EDS by

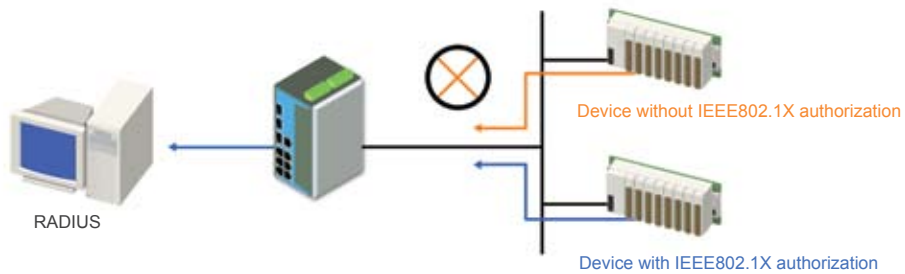
port trunking to double, triple, or quadruple the bandwidth of the connection.



IEEE802.1X Enhances User Authentication

EDS-510A supports IEEE802.1X (Port-Based Network Access Control) to enhance user authentication. Only authorized users

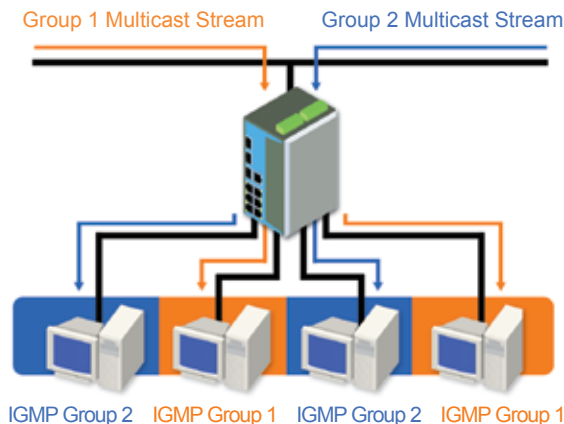
can access the port. Authentication is done using the local user database or an external RADIUS server.



IGMP Snooping and GMRP for Filtering Multicast Traffic

EDS-510A supports IEEE802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP Snooping provides the ability to prune multicast traffic so that it travels only to those end

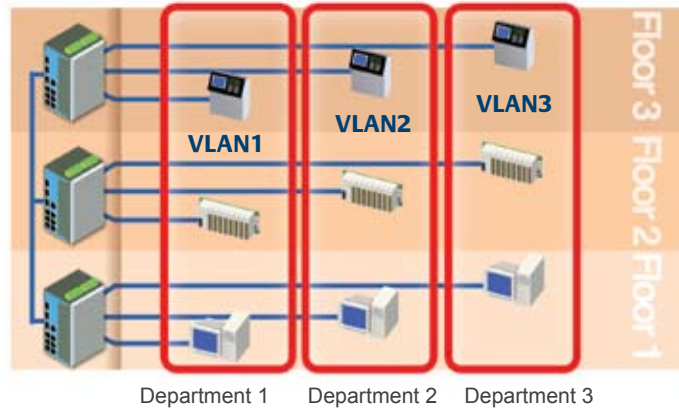
destinations that require this kind of traffic, reducing the amount of traffic on the Ethernet LAN.



VLAN Eases Network Planning

VLANs can be used to segment your network without being restricted by physical connections, a limitation imposed by traditional network design. If devices belong to different VLANs, they cannot communicate with each other, providing extra

security and protection from unwanted invasion or traffic. EDS-510A supports the IEEE802.1Q standard and GVRP protocol, which 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. EDS-510A Series can inspect IEEE802.1p/1Q layer 2 CoS tags, and even layer 3 TOS information, to provide a

consistent classification of the entire network. EDS-510A Series' QoS capability improves your industrial network's performance and determinism for mission critical applications.



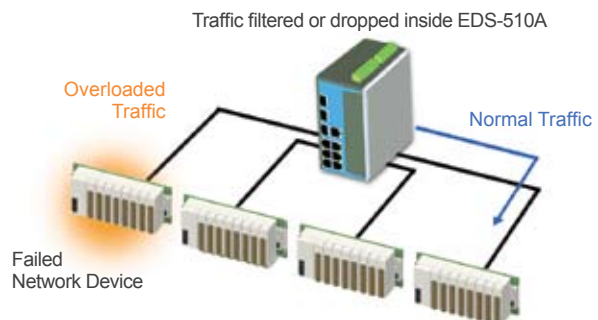
RMON for Efficient Network Monitoring and Proactive Capability

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. It 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.

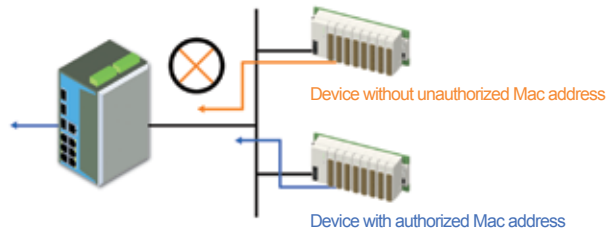
Bandwidth Management Prevents Unpredictable Network Status

The EDS-510A series not only prevents broadcast storms, but also configures the ingress/egress rate of unicast/multicast/broadcast packets, and in this way gives administrators full control of limited bandwidth to prevent unpredictable faults.



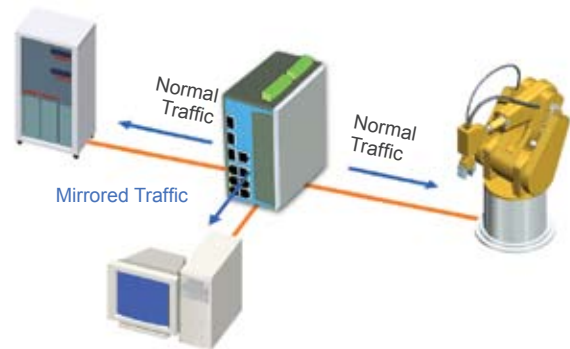
Port Lock to Allow Authorized Access by Specific MAC Addresses

The EDS-510A series can assign protected static MAC addresses to specific ports. By using the Port Lock function, locked ports will not be able to learn other addresses but only allow the traffic that comes from the preset static MAC address, helping to 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 communications level. 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. EDS-510A Series' mirroring port function helps to ensure that the system behaves as expected.



Automatic Warning by Event

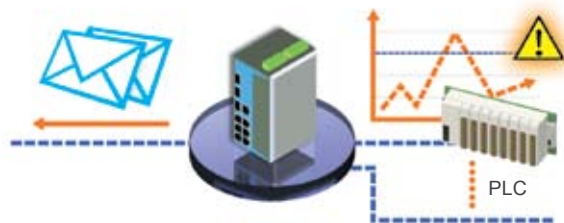
Since industrial Ethernet devices are often located at the endpoints of a system, such devices cannot always know what's happening elsewhere on the network. This means that industrial Ethernet switches that connect these devices must take responsibility for providing system maintainers with real-time alarm messages. Even when control engineers are out of the control room for an extended period of time, they can still be

informed of the status of devices almost instantaneously when exceptions occur. The traditional way of determining device status is to poll devices periodically, but this is not "real-time" enough, and is not very efficient. Warning messages must be actively triggered by events. To take care of these requirements, industrial Ethernet Switches need features such as:

Warning by e-mail

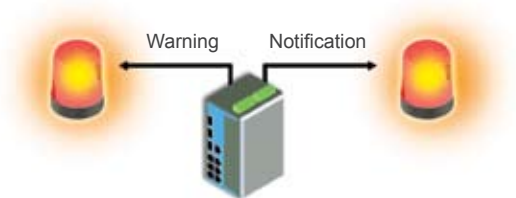
The EDS-510A Series can send out a warning e-mail when an exception is detected, providing system managers with real-time alarm messages.

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



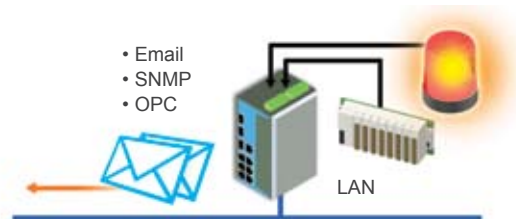
Warning by Relay Output

The EDS-510A Series provides two relay outputs that can be set up to indicate events with different importance to notify or warn engineers in the field, so the engineer can use the appropriate emergency maintenance procedures to respond quickly to higher priority messages.



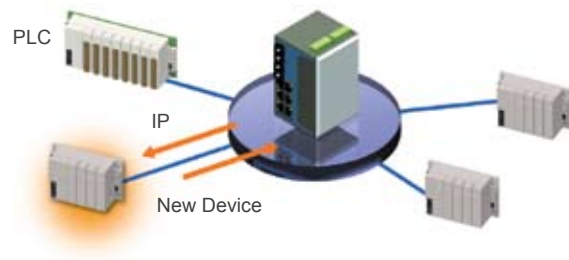
DI to Integrate Other Important Sensors

With two digital inputs, the EDS-510A series can integrate sensors into its automatic alarm mechanism, by redirecting warning messages to an IP network by e-mail, SNMP trap, or OPC.



Replace Faulty Devices

To reduce the effort required to configure IP addresses repeatedly, the EDS-510A series comes equipped with DHCP/BootP server and RARP protocol to set up IP addresses of Ethernet-enabled devices automatically.



Easy Browser-based Configuration

The EDS-510A series is easily configured over the network by web browser, Telnet console, or a Moxa provided Windows utility. In addition, Moxa's Batch Configurator can also be used to store and copy configuration parameters to multiple EDS-510A units simultaneously.

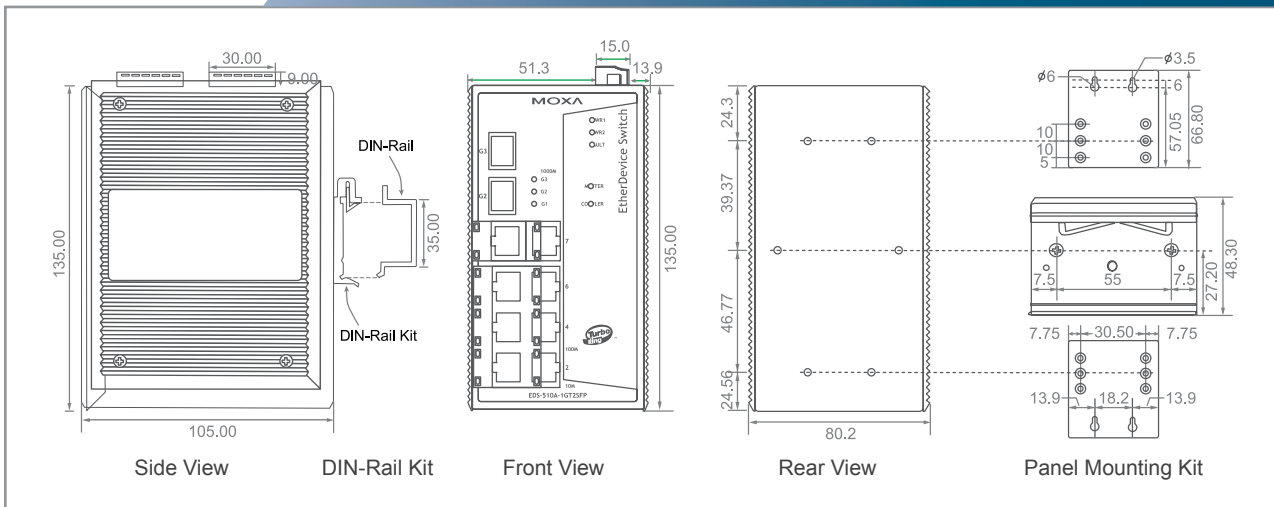


Network Management with EDS-SNMP OPC Server Pro

The SNMP OPC Server Pro software package can convert SNMP into OPC format. The vertical integration of SNMPPmanagement 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.

Dimensions (unit = mm)



Specifications

Technology

Standards: IEEE802.3, 802.3u, 802.3x, 802.1D, 802.1W, 802.1Q, 802.1p, 802.1X, 802.3ad, 802.3z

Protocols: IGMP V1/ V2/ V3 device, GMRP, GVRP, SNMP V1/V2c/V3, DHCP Server/Client, BootP, TFTP, SNMP, SMTP, RARP, RMON and EDS-SNMP OPC Server Pro (Optional)

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: IEEE802.3x flow control, back pressure flow control

Interface

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

Fiber Ports: Optional 1000BaseSX/LX/LHX/ZX (LC connector)

Console: RS-232 (RJ45)

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

1000BaseSX/LX/LHX/ZX

Multi mode:

- 1000BaseSX: 0 to 500 m, 850 nm (50/125 μm, 400 MHz*km)
0 to 275 m, 850 nm (62.5/125 μm, 200 MHz*km)
- 1000BaseLX: 0 to 1100 m, 1310 nm (50/125 μm, 800 MHz*km)
0 to 550 m, 1310 nm (62.5.125 μm, 500 MHz*km)

Single mode:

- 1000BaseLX: 0 to 10 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km))
- 1000BaseLHX: 0 to 40 km, 1310 nm ((9/125 μm, 3.5 PS/(nm*km)))
- 1000BaseZX: 0 to 80 km, 1550 nm ((9/125 μm, 19 PS/(nm*km))

Power

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

Connection: Two removable 6-pin terminal blocks

Overload Current Protection: Present

Reverse Polarity Protection: Present

Mechanical

Casing: IP30 protection

Dimensions (W x H x D): 80.5 x 135 x 105 mm
3.17 x 5.31 x 4.13 in.

Weight: 1170g

Installation: DIN-Rail, Wall Mounting (optional kit)

Environmental

Operating Temperature: 0 to 60°C (32 to 140°F)
-40 to 75°C (-40 to 185°F)

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

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

Regulatory Approvals

Safety: UL60950, UL 508, CSA C22.2 No. 60950, EN60950(Pending)

Hazardous location: UL/cUL Class I, Division 2, Groups A, B, C and D
ATEX Class I, Zone 2, EEx nC IIC (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 2
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Shock: IEC60068-2-27

Freefall: IEC60068-2-32

Vibration: IEC60068-2-6

Warranty

5 years

*Preliminary Specifications are subject to change without notice.

Ordering Information

EDS-510A-**ABBBCDDD-E**

Ordering Code Definition	Number of Gigabit Ports	Copper/ Fiber ports	Number of Rest Gigabit Ports	Fiber ports	Operating Temperature
	3: Three ports 1: One port	GT: 10/100/1000BaseT(X) port SFP: SFP (mini-GBIC) ports, LC Connector	2: Two Ports	SFP: SFP (mini-GBIC) ports, LC Connector	T: Operating Temp. -40 to 75°C *Standard Models: 0 to 60°C
Available Models	Standard: • EDS-510A-3GT • EDS-510A-1GT2SFP • EDS-510A-3SFP				Wide Temperature: • EDS-510A-3GT-T • EDS-510A-1GT2SFP-T • EDS-510A-3SFP-T

Gigabit Ethernet Modules for EDS-510A, SFP-1G Series

SFP-**AGBBBCC-D**

Ordering Code Definition	Number of Gigabit Ports	Fiber ports	FO Connector	Operating Temperature
	1: One Fiber port	SX: 1000BaseSX port, 0.5 km LX: 1000BaseLX port, 10 km LHX: 1000BaseLHX port, 40 km ZX: 1000BaseZX port, 80 km	LC: LC Connector	T: Operating Temp. -40 to 75°C *Standard Models: 0 to 60°C
Available Models	Standard: • SFP-1GSXLC • SFP-1GLXLC	Long-Haul (40 km): • SFP-1GLHXLC	Long-Haul (80 km): • SFP-1GZXLC	Wide Temperature: • SFP-1GSXLC-T • SFP-1GLXLC-T • SFP-1GLHXLC-T