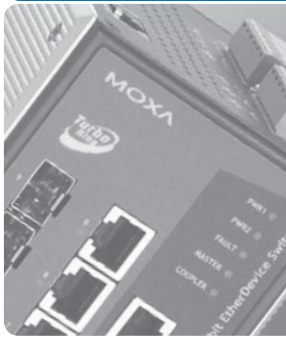
Industrial Ethernet Switches

3

Industrial Ethernet Switches



Managed Ethernet Switches

	Managed Rackmount Switches		Managed DIN-Rail Switches					
								
	IKS-6726	IKS-6726-PoE	EDS-828	EDS-728	EDS-608	EDS-G509	EDS-518A	EDS-510A
Supported Modules								
Gigabit Ethernet Modules	√	√	√	√	---	---	---	---
Fast Ethernet Modules	√	√	√	√	√	---	---	---
SFP Gigabit Ethernet Modules	√	√	√	√	---	√	√	√
SFP Fast Ethernet Modules	√	√	---	---	---	√	---	---
Number of Ports								
Max. Number of Ports	26	26	28	28	8	9	18	10
Gigabit Ethernet, 10/100/1000 Mbps	up to 2	up to 2	up to 4	up to 4	---	9	2	3
Fast Ethernet, 10/100 Mbps	up to 24	up to 24	up to 24	up to 24	8	---	16	7
Available Power Supplies								
3.3 VDC	---	---	---	---	---	---	---	---
24 VDC	√	√	√	√	---	---	√	√
24 VAC	---	---	---	---	---	---	---	---
48 VDC	√	√	---	---	---	---	---	---
12/24/48 VDC	---	---	---	---	√	√	---	---
88-300 VDC or 85-264 VAC, isolated	√	√	---	---	---	---	---	---
Installation Options								
DIN-Rail Mounting	---	---	√	√	√	√	√	√
Panel Mounting	---	---	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	√	√	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures								
0 to 60°C	---	---	√	√	√	√	√	√
-10 to 60°C	---	---	---	---	---	---	---	---
-40 to 75°C	√	√	---	---	√	√	√	√
Redundancy and Backup Options								
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	√	√	√	√
STP/RSTP	√	√	√	√	√	√	√	√
Automatic Backup Configurator (ABC-01)	√	√	√	√	√	√	√	√
Network Management and Control								
Layer 3 Switching	---	---	√	---	---	---	---	---
IPv6	√	√	---	√	√	√	√	√
DHCP Option 66/67/82	√	√	√	√	√	√	√	√
IEEE 1588 PTP	√	√	√	√	√	√	√	√
LLDP	√	√	√	√	√	√	√	√
Modbus/TCP	√	√	√	√	√	√	√	√
IGMP/GMRP	√	√	√	√	√	√	√	√
Port Trunking	√	√	√	√	√	√	√	√
IEEE 802.1X	√	√	√	√	√	√	√	√
Port Lock	√	√	√	√	√	√	√	√
SNMP/RMON	√	√	√	√	√	√	√	√
VLAN	√	√	√	√	√	√	√	√
QoS	√	√	√	√	√	√	√	√
Relay Warning	√	√	√	√	√	√	√	√
Regulatory Approvals								
CE/FCC	√	√	√	√	√	√	√	√
UL/cUL 60950-1	Pending	Pending	Pending	Pending	---	---	√	√
UL508	---	---	Pending	Pending	Pending	Pending	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	---	---	Pending	Pending	Pending	Pending	Pending	√
DNV/GL	Pending	Pending	Pending	Pending	Pending	Pending	√	√
NEMA TS2	√	√	---	---	---	---	---	---
EN50155/EN50121-4	√	√	---	---	---	---	---	---

Managed Ethernet Switches

	Managed DIN-Rail Switches						
							
	EDS-505A	EDS-508A	EDS-516A	EDS-405A	EDS-408A	EDS-P510	EOM-104
Supported Modules							
Gigabit Ethernet Modules	---	---	---	---	---	---	---
Fast Ethernet Modules	---	---	---	---	---	---	---
SFP Gigabit Ethernet Modules	---	---	---	---	---	√	---
SFP Fast Ethernet Modules	---	---	---	---	---	√	---
Number of Ports							
Max. Number of Ports	5	8	16	5	8	10	4
Gigabit Ethernet, 10/100/1000 Mbps	---	---	---	---	---	3	---
Fast Ethernet, 10/100 Mbps	5	8	16	5	8	7 (4 PoE)	4
Available Power Supplies							
3.3 VDC	---	---	---	---	---	---	√
24 VDC	√	√	√	√	√	---	---
24 VAC	---	---	---	---	---	---	---
48 VDC	---	---	---	---	---	√	---
12/24/48 VDC	---	---	---	---	---	---	---
88-300 VDC or 85-264 VAC, isolated	---	---	---	---	---	---	---
Installation Options							
DIN-Rail Mounting	√	√	√	√	√	√	---
Panel Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	---
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	---
Supported Operating Temperatures							
0 to 60°C	√	√	√	√	√	√	---
-10 to 60°C	---	---	---	---	---	---	---
-40 to 75°C	√	√	√	√	√	√	√
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	√	√	√
STP/RSTP	√	√	√	√	√	√	√
Automatic Backup Configurator (ABC-01)	√	√	√	√	√	√	---
Network Management and Control							
Layer 3 Switching	---	---	---	---	---	---	---
IPv6	√	√	√	√	√	√	---
DHCP Option 66/67/82	√	√	√	√	√	√	---
IEEE 1588 PTP	√	√	√	---	---	√	---
LLDP	√	√	√	√	√	√	---
Modbus/TCP	√	√	√	√	√	√	---
IGMP/GMRP	√	√	√	---	---	√	---
Port Trunking	√	√	√	---	---	√	---
IEEE 802.1X	√	√	√	---	---	√	---
Port Lock	√	√	√	---	---	√	---
SNMP/RMON	√	√	√	√	√	√	√
VLAN	√	√	√	√	√	√	---
QoS	√	√	√	√	√	√	---
Relay Warning	√	√	√	√	√	√	---
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL/cUL 60950-1	√	√	√	√	√	---	---
UL508	√	√	√	√	√	Pending	---
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	√	√	Pending	√	√	Pending	---
DNV/GL	√	√	√	√	√	Pending	---
NEMA TS2	---	---	---	---	---	---	---
EN50155/EN50121-4	---	---	---	---	---	---	---

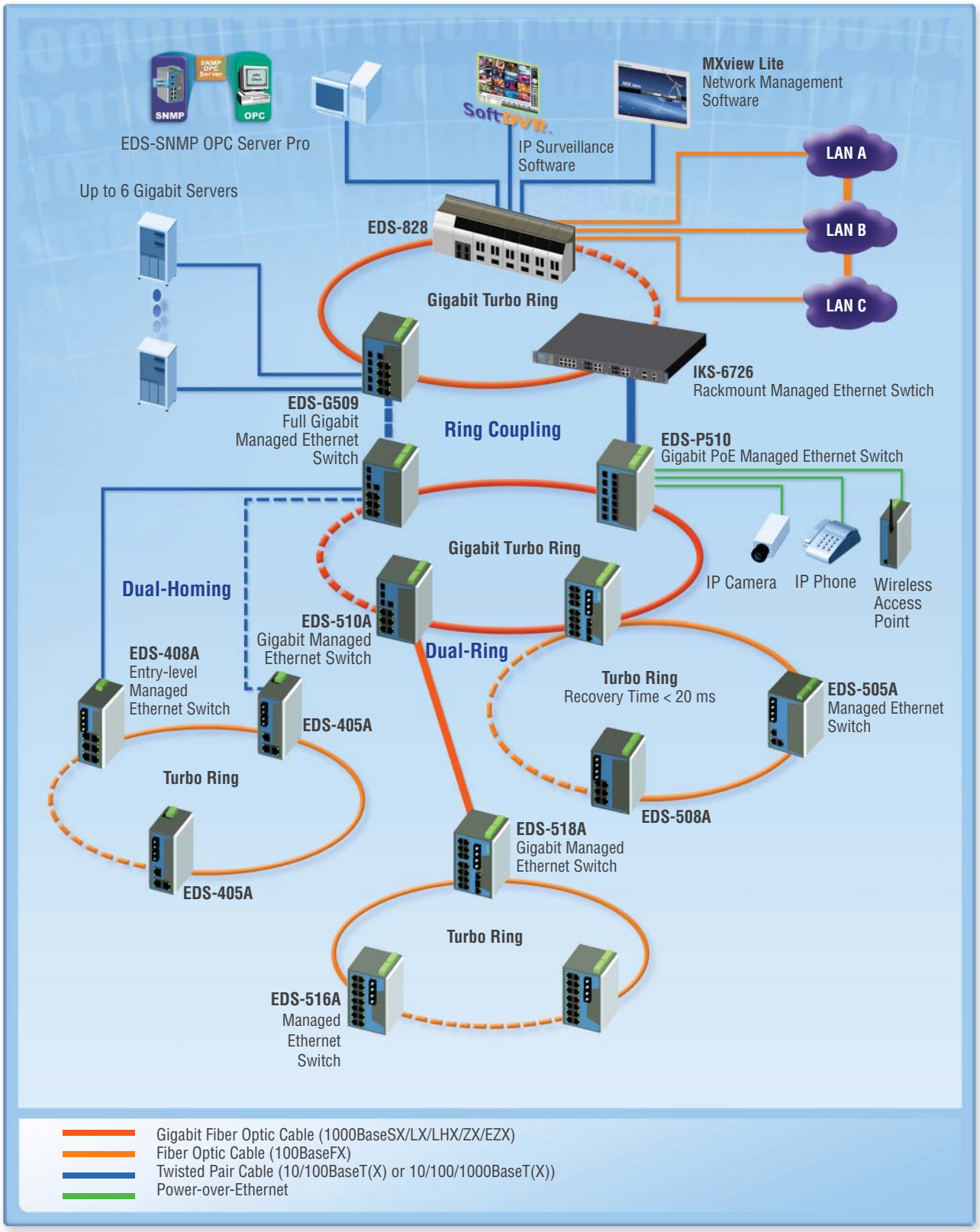
Unmanaged Ethernet Switches

	Unmanaged Rackmount Switches	Unmanaged DIN-Rail Switches					
							
	IKS-6324	EDS-G205	EDS-G308	EDS-305	EDS-308	EDS-309	EDS-316
Supported Modules							
Gigabit Ethernet Modules	√	---	---	---	---	---	---
Fast Ethernet Modules	√	---	---	---	---	---	---
SFP Gigabit Ethernet Modules	√	---	√	---	---	---	---
SFP Fast Ethernet Modules	---	---	√	---	---	---	---
Number of Ports							
Max. Number of Ports	24	5	8	5	8	9	16
Gigabit Ethernet, 10/100/1000 Mbps	Up to 2	5	8	---	---	---	---
Fast Ethernet, 10/100 Mbps	Up to 24	---	---	5	8	9	16
Available Power Supplies							
24 VDC	---	---	---	√	√	√	√
24 VAC	---	---	---	---	---	---	---
48 VDC	---	---	---	---	---	---	---
12/24/48 VDC	√	√	√	---	---	---	---
88-300 VDC or 85-264 VAC, isolated	√	---	---	---	---	---	---
Installation Options							
DIN-Rail Mounting	---	√	√	√	√	√	√
Panel Mounting	---	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Rack Mounting	√	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures							
0 to 60°C	---	√	√	√	√	√	√
-10 to 60°C	---	---	---	---	---	---	---
-40 to 75°C	√	√	√	√	√	√	√
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL/cUL 60950-1	Pending	---	---	√	√	√	√
UL508	---	Pending	Pending	√	√	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	---	Pending	Pending	√	√	√	Pending
DNV/GL	Pending	Pending	Pending	√	√	√	√
NEMA TS2	√	---	---	---	---	---	---
EN50155/EN50121-4	√	---	---	---	---	---	---

Unmanaged Ethernet Switches

	Unmanaged DIN-Rail Switches				
					
	EDS-205A	EDS-208A	EDS-205	EDS-208	EDS-P308
Supported Modules					
Gigabit Ethernet Modules	---	---	---	---	---
Fast Ethernet Modules	---	---	---	---	---
SFP Gigabit Ethernet Modules	---	---	---	---	---
SFP Fast Ethernet Modules	---	---	---	---	---
Number of Ports					
Max. Number of Ports	5	8	5	8	8
Gigabit Ethernet, 10/100/1000 Mbps	---	---	---	---	---
Fast Ethernet, 10/100 Mbps	5	8	5	8	8 (4 PoE)
Available Power Supplies					
24 VDC	---	---	√	√	---
24 VAC	√	√	√	√	---
48 VDC	---	---	---	---	√
12/24/48 VDC	√	√	---	---	---
88-300 VDC or 85-264 VAC, isolated	---	---	---	---	---
Installation Options					
DIN-Rail Mounting	√	√	√	√	√
Panel Mounting	w/ optional kit	w/ optional kit	---	---	w/ optional kit
Rack Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures					
0 to 60°C	---	---	---	---	√
-10 to 60°C	√	√	√	√	---
-40 to 75°C	√	√	---	---	√
Regulatory Approvals					
CE/FCC	√	√	√	√	√
UL/cUL 60950-1	---	---	---	√	---
UL508	√	√	√	√	√
UL/cUL Class I, Div. 2; ATEX Class I, Zone 2	Pending	Pending	---	---	Pending
DNV/GL	Pending	Pending	---	---	Pending
NEMA TS2	---	---	---	---	---
EN50155/EN50121-4	---	---	---	---	---

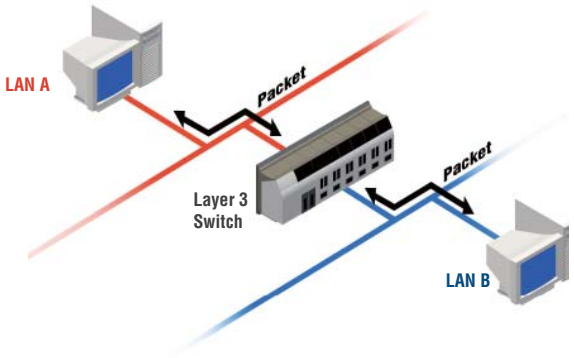
Introduction to Managed Ethernet Switches



Intelligent Layer 3 Network Control

What is a Layer 3 Switch?

Layer 3 switches use the IP address to make switching decisions, just like a router, but use hardware optimized to transmit data just as fast as Layer 2 switches. The 802.1Q VLAN of a Layer 2 switch allows network operators to configure and maintain their network more effectively, but cross VLAN communication still relies on traditional Layer 3 routers. Both routers and Layer 3 switches use a routing protocol and routing table to determine the best path. However, compared to routers, which are usually software-based, Layer 3 switches are relatively faster and less expensive. This is due to their built-in switching hardware with optimized chips and full-wire speed IP frame forwarding performance suitable for interconnecting VLANs. Moxa's Layer 3 switches can be used to partition a large-scale LAN into multiple subnets for better network performance.



Static Routing

Instead of using MAC tables in the way that Layer 2 Ethernet switches them, the EDS-828 has a built-in IP routing table to support the forwarding of IP frames. Network administrators need to configure and maintain this IP routing table manually, and if changes are made to the network topology, the network administrator will need to reconfigure the routing table.

Routing Information Protocol (RIP)

In addition to static routing, the EDS-828 has a built-in IP routing table that can be set up and updated dynamically by RIP (routing information protocol). RIP is an often used routing protocol that relies on the Bellman-Ford algorithm and "hop count" measurement to determine how packets should be routed from one network to another.

Open Shortest Path First (OSPF)

The EDS-828 also supports OSPF (open shortest path first), which uses "Link State" instead of "hop count" to determine the network route. OSPF is more complicated than RIP. However, compared to RIP, OSPF has faster network convergence and results in less network traffic. Both RIP and OSPF are usually referred to as Interior Gateway Protocols (IGP).

Distance Vector Multicast Routing Protocol (DVMRP)

The EDS-828 supports Distance Vector Multicast Routing Protocol (DVMRP), which is used to share information between routers to transport IP multicast packets between networks. DVMRP resembles RIP, but is extended for multicast delivery to forward packets. The router generates a routing table with the multicast group for which it knows the corresponding distances. When a multicast packet is received by a router, it is forwarded by the routing interfaces specified in the routing table.

Protocol Independent Multicast—Dense Mode (PIM-DM)

The EDS-828 supports the Protocol Independent Multicast—Dense Mode (PIM-DM), which is designed mainly for multicast LAN applications with high bandwidth. PIM-DM is optimized to guarantee delivery of multicast packets so as not to reduce overhead. The PIM-DM multicast routing protocol assumes that all downstream routers would like to receive multicast messages, and relies upon explicit pruning messages from downstream routers to remove branches from the multicast delivery tree that do not contain multicast group members. PIM-DM is an efficient protocol since most receivers are interested in the multicast data, but does not scale well across larger domains in which most receivers are not interested in the data.

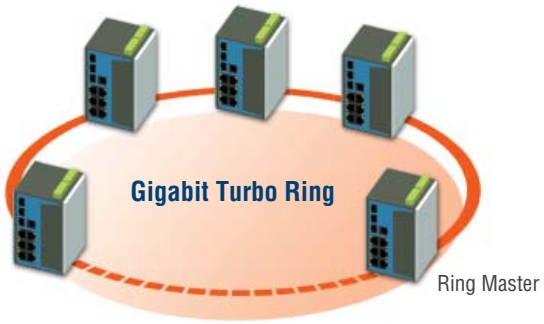
Static versus Dynamic

The EDS-828's built-in IP routing table can be updated and maintained both statically and dynamically. If the network is small and fixed, the network administrator may decide to configure the IP routing table manually. However, any change in the network topology will require the network administrator to reconfigure the settings manually. If the network is extended or the network topology is changed frequently, using dynamic routing provides an efficient way to enhance network stability and reduce the time it takes to effect network convergence. Dynamic routing protocol allows devices to detect and respond to network changes automatically. In this case, network administrators do not need to reconfigure the settings after the network changes.

Advanced Layer 2 Network Management

Gigabit Ethernet Redundant Ring

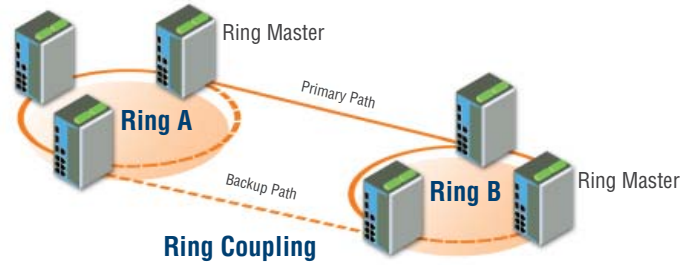
Ethernet is becoming the default data communication medium for industrial automation applications. In fact, it's not uncommon for video, voice, and high-rate industrial application data transfers to be integrated into one network. Moxa's EDS-G509, EDS-510A/518A, EDS-P510, and IKS-6726, which come equipped 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.

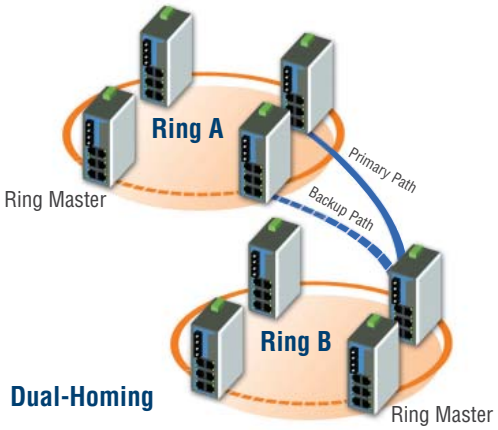


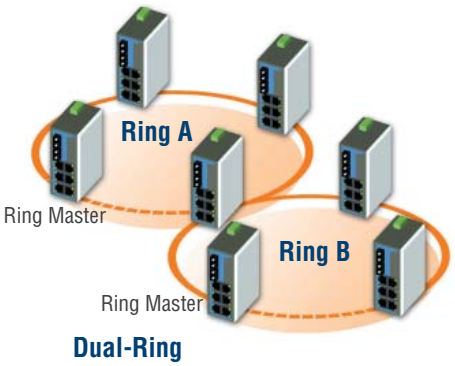
Coupling Several Turbo Rings for Distributed Applications

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 Moxa managed 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 Moxa managed Ethernet switch to connect two separate rings for applications that present cabling difficulties.

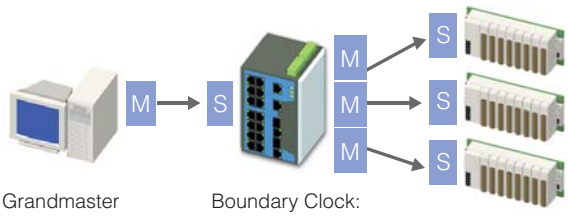






IEEE 1588 PTP Enhances Time Synchronization

IEEE 1588, also known as Precision Time Protocol (PTP), is designed to synchronize real-time clocks located at the nodes of a distributed system that communicates over a network. Moxa's managed Ethernet switches (not including the EDS-400A) are well suited for applications, such as motion control, that require distributed clocks to be synchronized with high accuracy.



Grandmaster Clock: Determines the time base for the system

Boundary Clock: Slave to the grandmaster clock and master to its slave

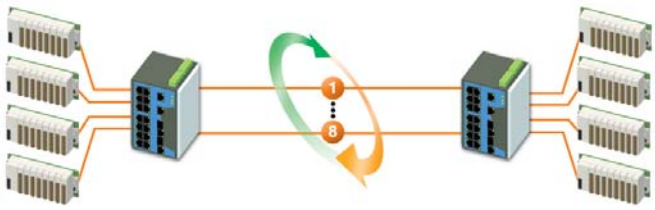
Ordinary Clock: Slave to its master

IPv6 for Next Generation Networking

IPv6 is the next generation protocol for Internet networking. Since IPv4 addresses will be completely used up in the near future, support for IPv6 (128-bit IP addresses) is important to secure the future of your network. Moxa's managed Ethernet switches support IPv6 to offer better addressing and security for large networks, and to protect your future investments.

Port Trunking for Flexible Network Connections

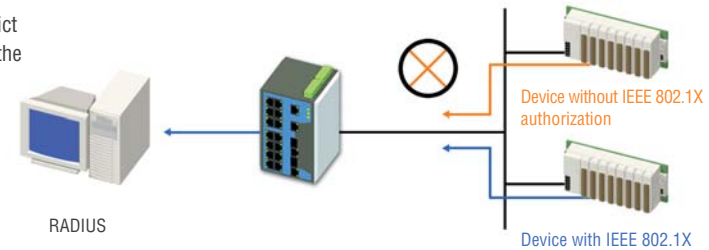
IEEE 802.3ad (LACP, Link Aggregation Control Protocol) provides flexible network connections and a redundant path for critical devices. For example, the EDS-G509 and EDS-500A allow users to set up a wider communication path by aggregating a trunk group. A maximum of eight ports can be assigned to one 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

Moxa's managed Ethernet switches (not including the EDS-400A) support 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.



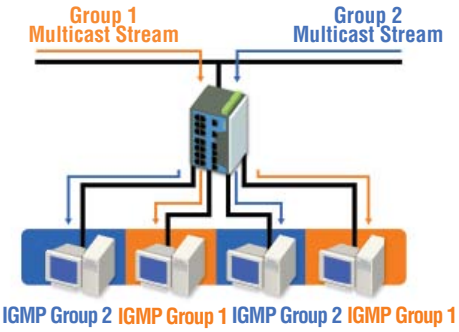
HTTPS and SSH Enhance Network Security

In order to protect data from being intercepted, Moxa's managed Ethernet switches (not including the EDS-400A) 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, be sure to use HTTPS and SSH to keep your data secure.

HTTPS/SSH

IGMP Snooping and GMRP for Filtering Multicast Traffic

Moxa's managed Ethernet switches (not including the EDS-400A) 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.

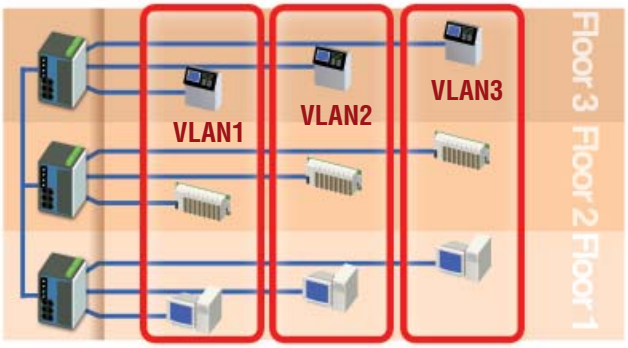


RMON for Efficient Network Monitoring and Proactive Capability

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.

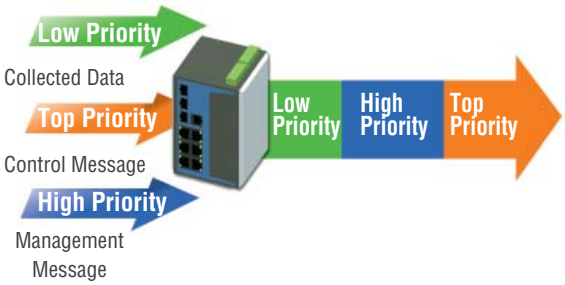
VLAN Eases Network Planning

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.



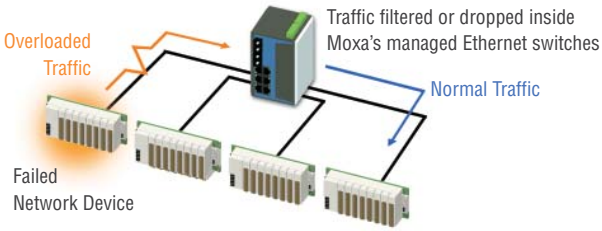
QoS Increases Determinism

Quality of Service (QoS) provides a traffic prioritization capability to ensure that important data is delievered 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.



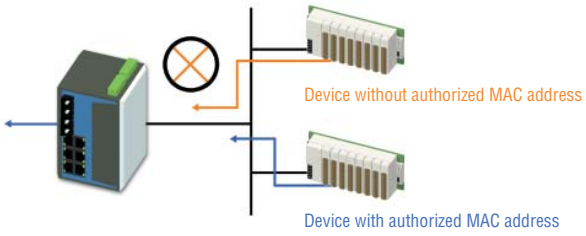
Bandwidth Management Prevents Unpredictable Network Status

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 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.



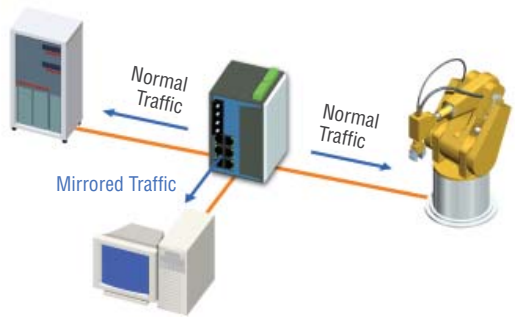
Port Lock Limits Access by MAC Address

Moxa's managed Ethernet switches (not including the EDS-400A) 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 Moxa's managed Ethernet switches helps ensure that the system behaves as expected.



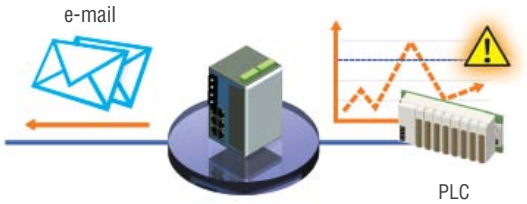
Automatic Warning by Event

Since industrial Ethernet devices are often located at remote parts of a network, it may be hard for system administrators to keep track of the status of such devices. The traditional method used to determine the status of devices 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 a number of important features, as described below.

Warning by e-mail

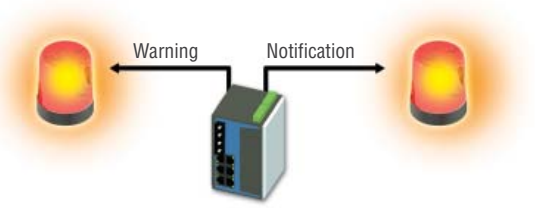
Moxa's managed Ethernet switches send out a warning e-mail when an exception is detected, providing system managers with real-time alarm messages.

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



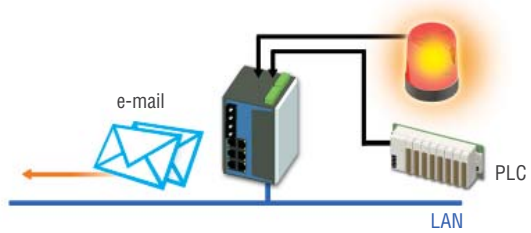
Warning by Relay Output

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

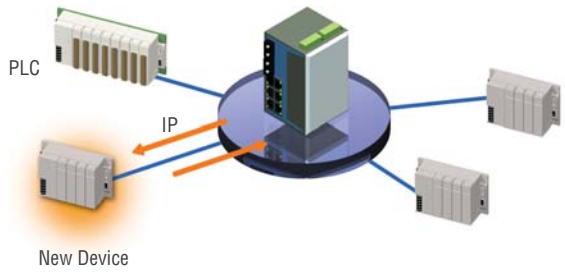
Moxa's managed Ethernet switches (not including the EDS-400A or IKS series switches) have two digital inputs for integrating sensors into the Ethernet switches' automatic alarm mechanism. This is done by redirecting warning messages to an IP network by e-mail notification.

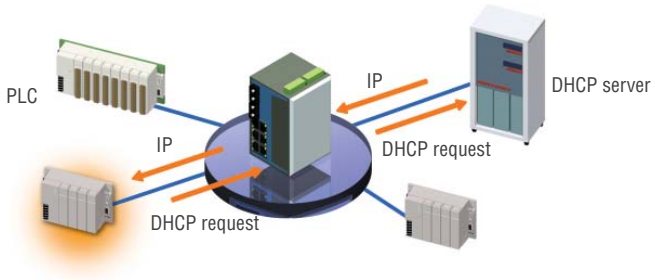


Replacing Faulty Devices

To reduce the effort required to configure IP addresses, Moxa's managed Ethernet switches support DHCP/BootP server and RARP protocols, which are used to automatically configure the IP addresses of Ethernet-enabled devices.

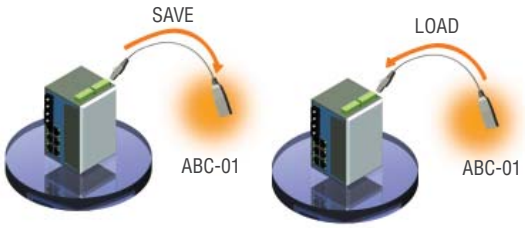
In addition, Moxa's managed Ethernet switches can also play the role of DHCP relay agent (with Option 82 support) to forward DHCP requests and provide information details (such as the slot ID, port number, and VLAN ID) for the authentication of DHCP servers.





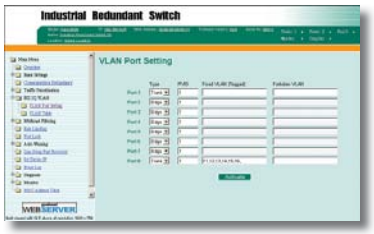
ABC-01 Provides a Seamless Backup Solution

Moxa's ABC-01 is designed to save and load the configuration of a Moxa 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's 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.

Modular Design, Maximum Flexibility

Innovative Modular Design

Scalable Gigabit Modular Solution

A bandwidth 100 Mbps is not enough to meet the requirements posed by industrial Ethernet applications that involve transmitting both voice and video. The EDS-728/828 and IKS-6726 Ethernet switches, which support Gigabit Ethernet ports and Gigabit Turbo Ring, can be used to create a reliable, high performance network backbone. Select Gigabit modules that meet your current needs, or to set up your system for future requirements.

Flexible Fast Ethernet Module

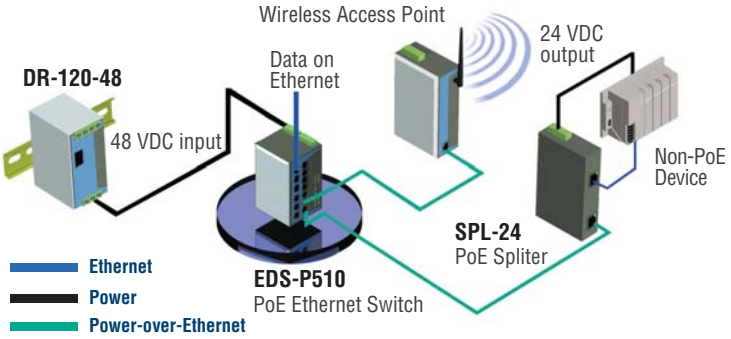
Up to 24 Fast Ethernet ports can be installed in the EDS-728/828 and IKS-6726 Ethernet switches. Select from a variety of Fast Ethernet interface modules wtih a combination of 10/100BaseT(X) (RJ45 connectors) and 100BaseFX (single/multi-mode, SC/ST connectors) ports. Long-haul single mode optical fiber can be used to provide 100 Mbps transmission over a distance of 40 km or 80 km.

Easy and Flexible Installation

Moxa's Ethernet switches are designed for DIN-Rail, wall mounting, and 19-inch rack mounting. The rugged, user-friendly DIN-Rail kit, which is easily installed with a flat-head screw driver, has passed stringent industrial vibration, freefall, and shock tests, and the wall mounting kit provides users with a handy option that meets the requirements of many different industrial applications. In addition, the 19-rack mounting kit can be used to securely mount non-rack DIN-Rail devices to a 19-inch rack cabinet.

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, the EDS-P510, 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.



Managed Ethernet Switch Comparison Chart

	Interface								Features									
Model	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	Turbo Ring DIP Switch	Layer 3 Switching	Turbo Ring	RSTP/STP	IGMP snooping/GMRP	Port-Trunking/LACP	IEEE 802.1X/HTTPS/SSH	SNMP/RMON	802.1Q VLAN	Port-based VLAN	QoS	ABC-01*
Rackmount Managed Ethernet Switches																		
IKS-6726	26	2	24	---	1	---	---	---	√	√	√	√	√	√	√	---	√	√
IKS-6726-PoE	26	2	8	16	1	---	---	---	√	√	√	√	√	√	√	---	√	√
DIN-Rail Managed Ethernet Switches																		
EDS-828	28	4	24	---	2	2	---	√	√	√	√	√	√	√	√	---	√	√
EDS-728	28	4	24	---	2	2	---	---	√	√	√	√	√	√	√	---	√	√
EDS-608	8	---	8	---	1	1	√	---	√	√	√	√	√	√	√	√	√	√
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	---	√	---	√	√	---	---	---	√	---	√	√	√
EDS-P510	10	3	3	4	2	2	√	---	√	√	√	√	√	√	√	√	√	√

* ABC-01 is an RS-232 RJ45-based automatic backup configurator for Moxa's managed Ethernet switches. See page 3-48 for detailed information.

IKS-6726 Series

24+2G-port Gigabit modular managed Ethernet switches

- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/GL certifications
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6726 series of industrial rackmount Ethernet switches are designed to meet the rigorous demands of mission critical applications for industry and business, such as traffic control systems (NEMA TS2) and maritime applications (DNV/GL). The IKS-6726's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the IKS-6726 also makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 24 fast Ethernet ports.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP 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 with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

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: IGMP v1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

Modular Rackmount Ethernet Switch System, IKS-6726

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

Fast Ethernet: Slots 1 and 2 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 3 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP slots

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 24 VDC (18 to 36 V), or 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 1.11 A @ 24 VDC
- Max. 0.56 A @ 48 VDC
- Max. 0.56/0.28 A @ 110/220 VDC
- Max. 0.56/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 4200 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C

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

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

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

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

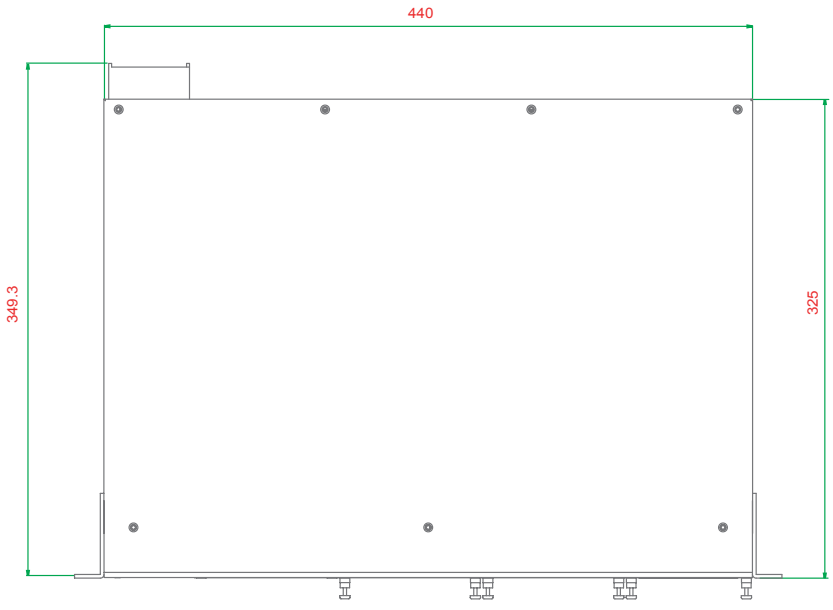
Warranty

Warranty Period: 5 years

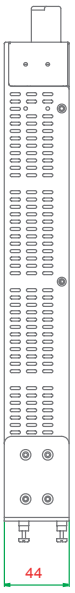
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

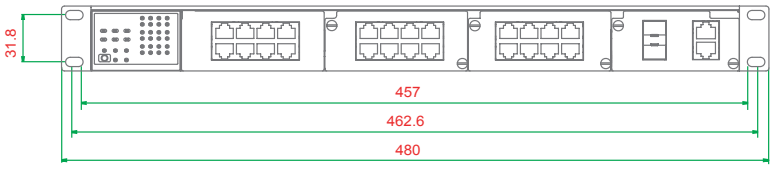
Rear View



Top View



Side View



Front View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6726 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The IKS-6726 Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726 Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch systems with 8 fixed 10/100BaseT(X) ports, 2 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. Supports up to 24+2G ports, -40 to 75°C operating temperature.

Available Models	Power Supply					
	Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-F-24-T	1	---	---	---	---	---
IKS-6726-F-24-24-T	1	---	---	1	---	---
IKS-6726-F-24-48-T	1	---	---	---	1	---
IKS-6726-F-24-HV-T	1	---	---	---	---	1
IKS-6726-F-48-T	---	1	---	---	---	---
IKS-6726-F-48-48-T	---	1	---	---	1	---
IKS-6726-F-48-HV-T	---	1	---	---	---	1
IKS-6726-F-HV-T	---	---	1	---	---	---
IKS-6726-F-HV-HV-T	---	---	1	---	---	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726

	Interface Module																							
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

IKS-6726-PoE Series

24+2G-port IEEE 802.3af PoE Gigabit modular managed Ethernet switches

- Provides 15.4 W (per port) to up to 16 PoE ports when 48 VDC power is applied
- Supports a total of 120 W for smart PoE power management when HV power is applied
- PoE and Ethernet combo module supported, IEEE 802.3af-compliant
- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/GL certifications
- Turbo Ring and RSTP/STP for Ethernet Redundancy
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6726-PoE series of industrial rackmount Ethernet switches are designed to meet the demands of mission critical applications for business and industry, such as traffic control systems (NEMA TS2), power automation, and critical facility surveillance. The IKS-6726-PoE comes standard with up to 16 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 2 combo Gigabit Ethernet ports. The IKS-6726-PoE Ethernet switches provide two kinds of power input source: 48 VDC and 110/220 VDC/VAC. The IKS-6726-PoE 48 VDC model supports up to 15.4 watts of power per PoE port, and allows power to be supplied to connected devices when AC power is not readily available or is cost-prohibitive to provide locally. The IKS-6726-PoE HV model supports a total of 120 W for smart PoE power management when HV power is applied. When supplied with 120 W of power, the IKS-6726-PoE HV model can supply power to up to 16 PoE ports. The switches support a variety of management functions, including Turbo Ring, RSTP/STP, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring, and are 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

- Advanced PoE management function
- IEEE 802.3af-compliant PoE and Ethernet combo ports
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D) supported
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP 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 to prevent unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

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 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

IKS-6726-PoE Modular Rackmount Ethernet Switch System

Protocols: IGMPv1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

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

Fast Ethernet: Slots 1 and 2 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/PoE/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 3 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP ports

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED, PoE on module

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage: 24 VDC (18 to 36 V), 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:

- Max. 5.8 A @ 48 VDC (supports up to 16 ports at 15.4 W per PoE port)
- Max. 1.85/0.94 A @ 110/220 VDC (120 W total for PoE ports)
- Max. 1.54/0.78 A @ 110/220 VAC (120 W total for PoE ports)

Overload Current Protection: Present

Connection: 10-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 4200 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F), cold start requires min. of 100 VAC at -40°C

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

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

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

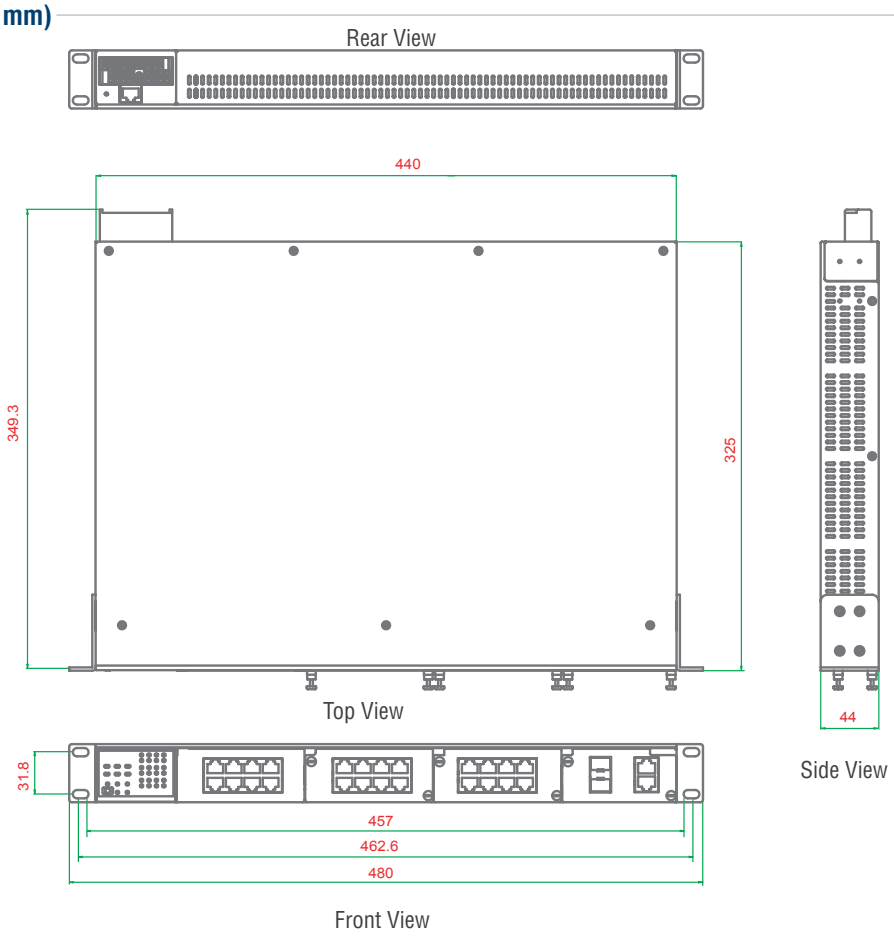
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

IKS-6726-PoE with power supply

Step 2: Select interface modules

PM-7200 series
(Gigabit or fast Ethernet)

Note: The IKS-6726-PoE Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6726-PoE Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch system with 8 10/100BaseT(X) ports, 2 slots for fast Ethernet modules (PoE), and 1 slot for Gigabit Ethernet modules. Supports up to 24+2G ports and up to 16 PoE ports, -40 to 75°C operating temperature

Available Models	Power Supply			
Front Cabling, Front Display	Isolated Power Supply 1		Isolated Power Supply 2	
	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
IKS-6726-PoE-F-48-T	1	---	---	---
IKS-6726-PoE-F-48-48-T	1	---	1	---
IKS-6726-PoE-F-48-HV-T	1	---	---	1
IKS-6726-PoE-F-HV-T	---	1	---	---
IKS-6726-PoE-F-HV-HV-T	---	1	---	1

Note: The HV power module supplies a total of 30 W to the system and 120 W for PoE power management.

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6726-PoE

	Interface Module																							
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Slot 3	---	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

EDS-828

24+4G-port Layer 3 Gigabit modular managed Ethernet switch

- Layer 3 routing interconnects multiple LAN segments
- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Gigabit Turbo Ring and 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 to enhance network security

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-828 is a high-performance Layer 3 Ethernet switch designed for network routing. The improved hardware technology built into the EDS-828 replaces the software logic used by traditional routers, offering better performance, and making the switch ideal for large-scale local area networks (LANs). In addition to Layer 3 features, the EDS-828 also supports Layer 2 management features, including QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON, IEEE 802.1X, HTTPS, and SSH. In order to meet the demands of any industrial application, the EDS-828 uses a modular design that allows users to install up to 4 Gigabit Ethernet ports and 24 fast Ethernet ports, providing a high degree of flexibility for network expansion.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Redundant Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocol 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 for integrating sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

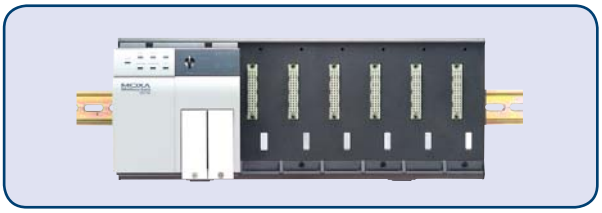
Technology

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/EZX
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, IEEE 1588 PTP, Modbus/TCP, SNMP Inform

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, DVMRP, PIM-DM, VRRP for router redundancy

Layer 3 Modular Managed Ethernet Switch System, EDS-82810G



MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 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

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot

Console Port: RS-232 (RJ45 connector)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER, T.RING

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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: 0.96 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 362.4 x 142.47 x 128 mm (14.27 x 5.61 x 5.04 in)

Weight: 1950 g

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

Environmental Limits

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

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

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

Regulatory Approvals

Safety: UL508 (Pending), UL60950-1, CSA C22.2 No. 60950-1, 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)

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 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 160,000 hrs

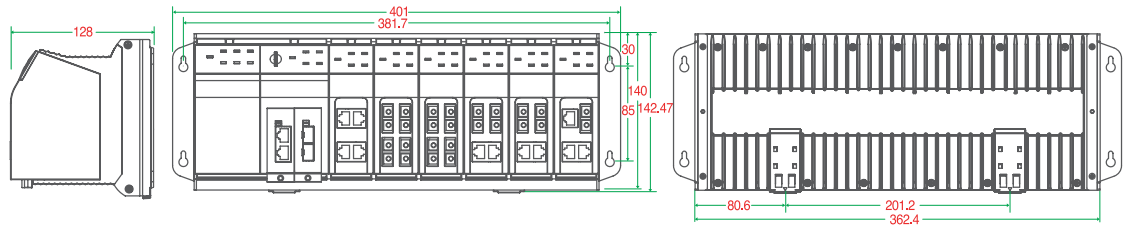
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View Front View Rear View

Ordering Information

Step 1: Select Ethernet switch system

EDS-82810G

Step 2: Select interface modules

IM series (Gigabit or fast Ethernet)

Note: The EDS-82810G switch system is delivered without interface modules. Please see page 3-26 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-82810G: Layer 3 modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-32: Wall mounting kit for the EDS-728/828 series

RK-4U: 4U-high 19" rack mounting kit

EDS-728

24+4G-port Gigabit modular managed Ethernet switch

- 4 Gigabit plus 24 fast Ethernet ports for copper and fiber
- Gigabit Turbo Ring and 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 to enhance network security
- ABC-01 Automatic Backup Configurator for system configuration backup (optional accessory)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-728 modular Gigabit Ethernet switch features a versatile modular design that allows different combinations of fiber and copper modules, creating a wide array of connection options ideal for any automation network. The modular design lets you install up to 4 Gigabit ports and 24 fast Ethernet ports. The EDS-728 is specially designed for redundant Gigabit network backbones and uses a modular configuration to provide a high degree of flexibility for network expansion. Top network performance, security, and reliability is assured through the EDS-728's advanced management features, including QoS, IGMP snooping/GMRP, VLAN, LACP, SNMPv1/v2c/v3, RMON, IEEE 802.1X, HTTPS, and SSH. The EDS-728 also features industrial-grade construction, a console port for automatic configuration backup, and an angled LED troubleshooting panel that can be conveniently viewed from both horizontal and vertical orientations.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Redundant Gigabit Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocol 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 for only authorized MAC address access
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs to integrate sensors and alarms with IP networks
- Redundant, dual DC power inputs
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

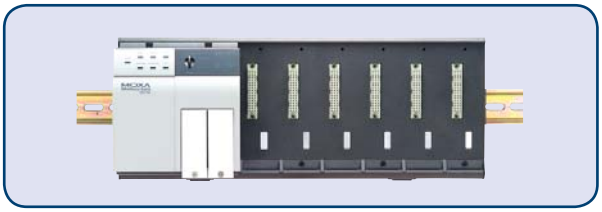
Specifications

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/EZX
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

Modular Managed Ethernet Switch System, EDS-72810G



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

Fast Ethernet: 6 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

Gigabit Ethernet: 2 slots for any combination of 2-port interface modules, 10/100/1000BaseT(X) or 1000BaseSFP slot

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER, T.RING

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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: 0.96 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 362.4 x 142.47 x 128 mm (14.27 x 5.61 x 5.04 in)

Weight: 1950 g

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

Environmental Limits

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

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

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

Regulatory Approvals

Safety: UL508 (Pending), UL60950-1, CSA C22.2 No. 60950-1, 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)

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 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 160,000 hrs

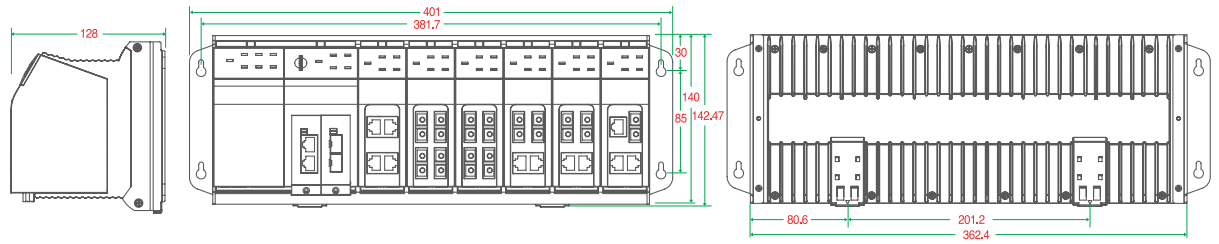
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View Front View Rear View

Ordering Information

Step 1: Select Ethernet switch system **Step 2: Select interface modules**

EDS-72810G → IM series (Gigabit or fast Ethernet)

Note: The EDS-72810G switch system is delivered without interface modules. Please see page 3-26 for product information related to the IM series Gigabit and fast Ethernet interface modules.

Available Models

EDS-72810G: Modular managed Ethernet switch system with 6 slots for 4-port fast Ethernet interface modules and 2 slots for 2-port Gigabit interface modules, for up to 24+4G ports

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-32: Wall mounting kit for the EDS-728/828 series

RK-4U: 4U-high 19" rack mounting kit

EDS-608 Series

Preliminary

8-port compact modular managed Ethernet switches

- Modular design lets you choose from a variety of media combinations
- Turbo Ring and 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 to enhance network security
- -40 to 75°C operating temperature (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The versatile modular design of the compact EDS-608 Ethernet switch allows users to combine fiber and copper modules to create switch solutions suitable for any automation network. The EDS-608's modular design lets you install up to 8 fast Ethernet ports, and the advanced Turbo Ring (recovery time < 20 ms) technology and RSTP/STP (IEEE 802.1w/D) helps 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. The EDS-608 supports 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 Ethernet switches suitable for any harsh industrial environment.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- 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 802.3x 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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6

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

Fast Ethernet: 2 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX

System LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: 10/100M for TP port, 100M for Fiber port

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

Digital Inputs: 1 input 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, redundant dual inputs

Overload Current Protection: Present

Connection: 1 removable 5-contact and 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 124.9 x 151 x 157.2 mm (4.92 x 5.95 x 6.19 in)

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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)

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 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

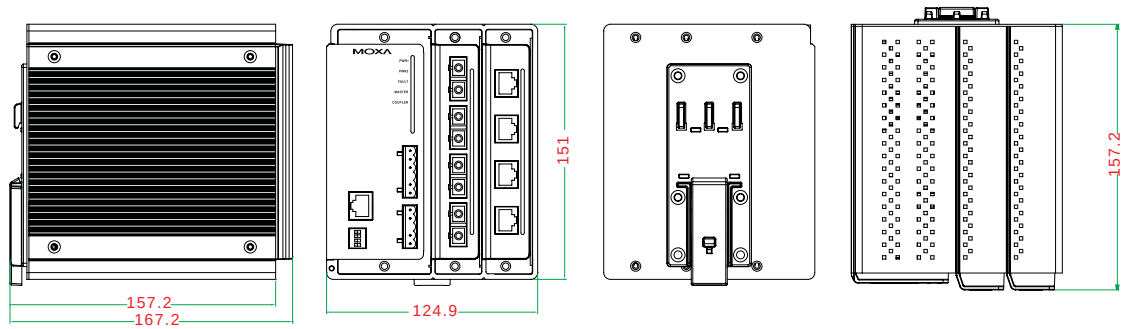
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | Top View

Ordering Information

Step 1: Select Ethernet switch system

EDS-608

Step 2: Select interface modules

CM Series

Note: The EDS-608 switch system is delivered without interface modules. Please see page 3-28 for product information related to the CM series fast Ethernet interface modules.

Available Models

EDS-608: Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, up to 8 ports, 0 to 60°C operating temperature

EDS-608-T: Compact managed Ethernet switch system with 2 slots for 4-port fast Ethernet interface modules, up to 8 ports, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

RK-4U: 4U-high 19" rack mounting kit

IM Series

2-port Gigabit Ethernet and 4-port fast Ethernet interface modules for EDS-728/828 series Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-2G Series


IM-2GTX


IM-2GSFP

Interface

Fiber Ports: 1000BaseSFP slot

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed and auto MDI/MDI-X connection

LED Indicators: Port status

Note: Please see page 3-45 for product information related to the SFP-1G series of Gigabit Ethernet SFP modules.

Power Requirements

Power Consumption:
IM-2GTX: 2.96 W
IM-2GSFP: 3.04 W

Physical Characteristics

Dimensions: 24 x 65.9 x 101.1 mm (0.94 x 2.59 x 3.98 in)

Weight:
IM-2GTX: 150 g
IM-2GSFP: 148 g

Fast Ethernet Interface Modules, IM Series


IM-4TX


IM-2MSC/2TX
IM-2SSC/2TX


IM-2MST/2TX


IM-1LSC/3TX


IM-4MSC
IM-4SSC


IM-4MST

Interface

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

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

LED Indicators: PWR, P1, P2, P3, P4 port status

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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Power Consumption:
IM-4TX: 1.52 W
IM-2MSC/2TX: 2.43 W
IM-2MST/2TX: 2.43 W
IM-2SSC/2TX: 2.43 W
IM-1LSC/3TX: 2.5 W
IM-4MSC: 6.6 W
IM-4MST: 6.6 W
IM-4SSC: 6.6 W

Physical Characteristics

Housing: IP30 protection

Dimensions: 40 x 127.8 x 100 mm (1.57 x 5.03 x 3.94 in)

Weight:
IM-4TX: 215 g
IM-2MSC/2TX: 245 g
IM-2MST/2TX: 250 g
IM-2SSC/2TX: 245 g
IM-1LSC/3TX: 235 g
IM-4MSC: 250 g
IM-4MST: 270 g
IM-4SSC: 270 g

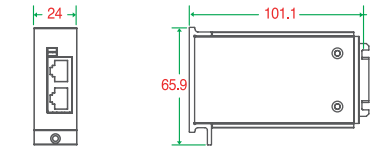
MTBF (meantime between failures)

Time: 620,000 hrs

Database: MIL-HDBK-217F, GB 25°C

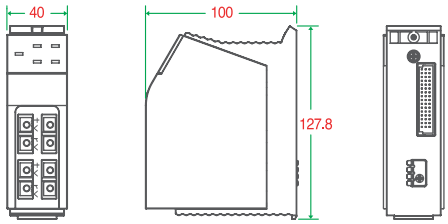
Dimensions (unit = mm)

Gigabit Ethernet Interface Modules



Front View Side View

Fast Ethernet Interface Modules



Front View Side View Rear View

Ordering Information

Available Models	Port Interface						
	Gigabit Ethernet		Fast Ethernet				
				100BaseFX			
	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
IM-2G Series							
IM-2GTX	2	---	---	---	---	---	---
IM-2GSFP	---	2	---	---	---	---	---
IM Series							
IM-4TX	---	---	4	---	---	---	---
IM-4MSC	---	---	---	4	---	---	---
IM-4MST	---	---	---	---	4	---	---
IM-2MSC/2TX	---	---	2	2	---	---	---
IM-2MST/2TX	---	---	2	---	2	---	---
IM-4SSC	---	---	---	---	---	4	---
IM-2SSC/2TX	---	---	2	---	---	2	---
IM-1LSC/3TX	---	---	3	---	---	---	1

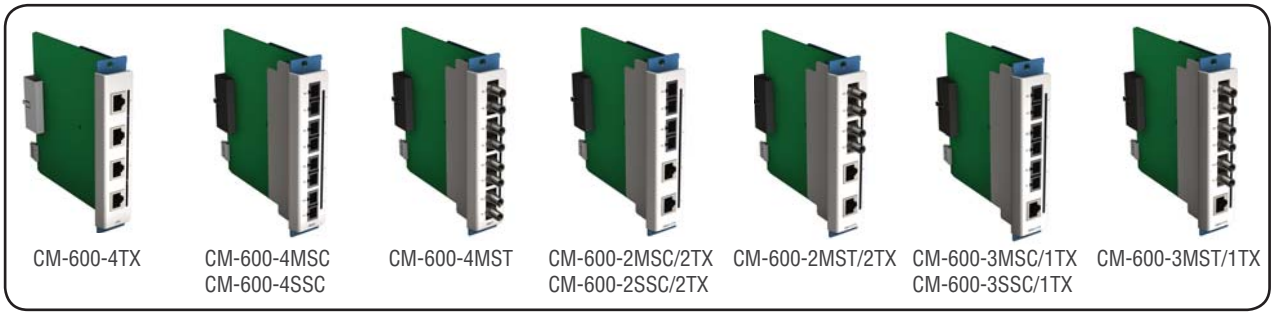
* Please see page 3-45 for product information related to the SFP-1G series Gigabit Ethernet SFP modules.

CM-600 Series Preliminary

4-port fast Ethernet interface modules for EDS-608 series Ethernet switches

Specifications

Fast Ethernet Interface Modules, CM-600 Series



CM-600-4TX | CM-600-4MSC, CM-600-4SSC | CM-600-4MST | CM-600-2MSC/2TX, CM-600-2SSC/2TX | CM-600-2MST/2TX | CM-600-3MSC/1TX, CM-600-3SSC/1TX | CM-600-3MST/1TX

Interface

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

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

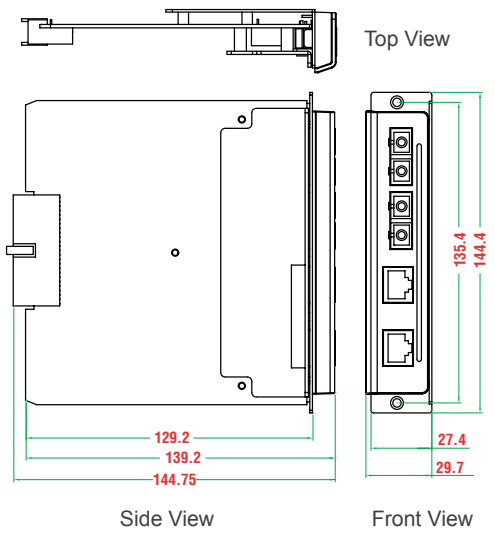
LED Indicators: 10/100 for TP port, 100M for fiber port

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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Dimensions (unit = mm)



Physical Characteristics

Housing: IP30 protection

Dimensions: 29.7 x 144.4 x 144.75 mm (1.17 x 5.69 x 5.7 in)

Ordering Information

Available Models	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
CM-600-4TX	4	---	---	---
CM-600-4MSC	---	4	---	---
CM-600-4MST	---	---	4	---
CM-600-4SSC	---	---	---	4
CM-600-2MSC/2TX	2	2	---	---
CM-600-2MST/2TX	2	---	2	---
CM-600-2SSC/2TX	2	---	---	2
CM-600-3MSC/1TX	1	3	---	---
CM-600-3MST/1TX	1	---	3	---
CM-600-3SSC/1TX	1	---	---	3

EDS-G509 Series

9G-port full Gigabit managed Ethernet switches

- 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 improving 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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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 speed 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. 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

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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
- 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 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

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

Fiber Ports: 100/1000BaseSFP slot

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

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

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

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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 redundant dual inputs

Input Current: 0.81 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)

Weight: 1510 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -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

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex 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 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

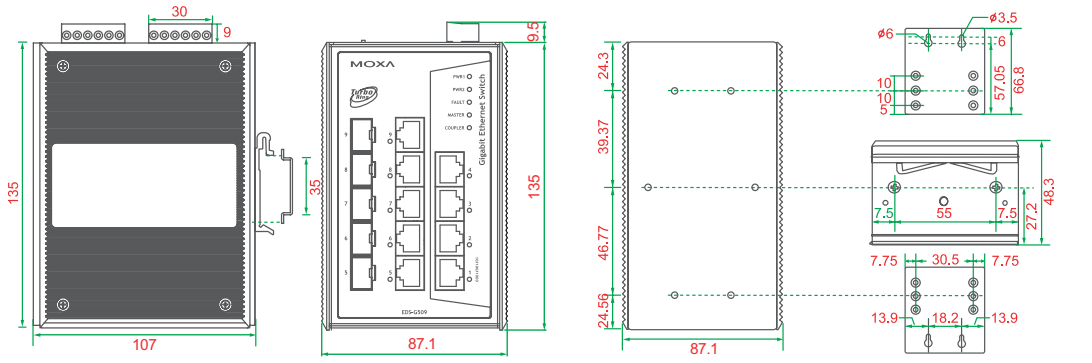
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models

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 operating temperature

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 operating temperature

Note: The EDS-G509 series switches support up to 5 100/1000BaseSFP slots. See page 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-518A Series

16+2G-port Gigabit managed Ethernet switches

- 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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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 fiber 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

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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

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/EZX
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

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

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

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

Console Port: RS-232 (RJ45 connector)

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

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

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

Input Current:
EDS-518A: 0.51 A @ 24 V
EDS-518A-MM/SS: 0.61 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 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 (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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)

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

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 240,000 hrs

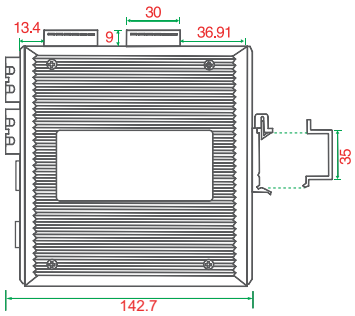
Database: Telcordia (Bellcore), GB

Warranty

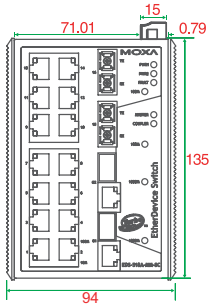
Warranty Period: 5 years

Details: See www.moxa.com/warranty

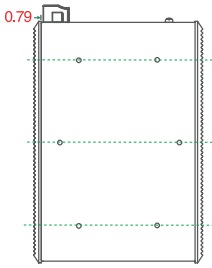
Dimensions (unit = mm)



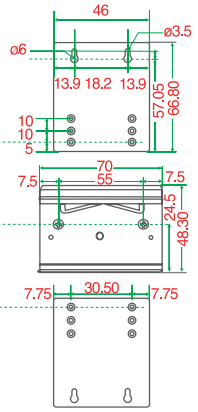
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface					
		Gigabit Ethernet	Fast Ethernet				
				100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*	10/100BaseT(X)	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

Note: The EDS-518A series supports 2 1000BaseSFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-510A Series

7+3G-port Gigabit managed Ethernet switches

- 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 to enhance network security
- ABC-01 (Automatic Backup Configurator) for system configuration backup

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

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

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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

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/EZX
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

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

Fiber Ports: 1000BaseSFP slot

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

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

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

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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:
EDS-510A-3GT: 0.65 A @ 24 V
EDS-510A-1GT2SFP: 0.44 A @ 24 V
EDS-510A-3SFP: 0.46 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 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 (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 204,000 hrs

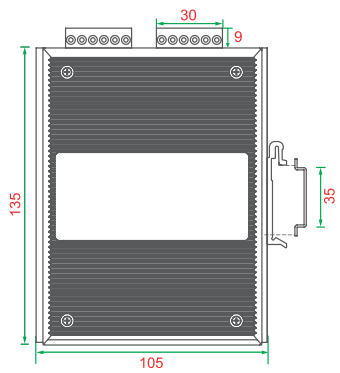
Database: MIL-HDBK-217J, GB 25°C

Warranty

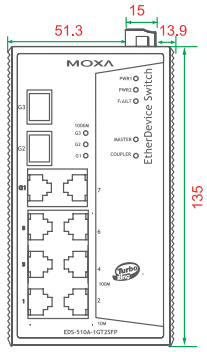
Warranty Period: 5 years

Details: See www.moxa.com/warranty

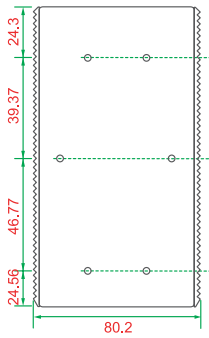
Dimensions (unit = mm)



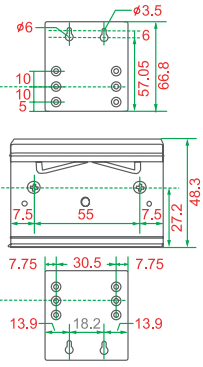
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet		Fast Ethernet
Standard Temperature (0 to 60°C)	Wide 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

Note: The EDS-510A series supports up to 3 1000BaseSFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-505A/508A/516A Series

5, 8, and 16-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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

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

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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 to prevent 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

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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, GMRP, LACP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, SNMP Inform, Modbus/TCP, LLDP, IEEE 1588 PTP, IPv6

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

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

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

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve (EDS-505A/508A series only)

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

Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

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

Input Current:
EDS-516A: 0.41 A @ 24 V
EDS-516A-MM: 0.51 A @ 24 V
EDS-505A: 0.24 A @ 24 V
EDS-508A: 0.26A @ 24 V
EDS-505A-MM/SS: 0.35 A @ 24 V
EDS-508A-MM/SS: 0.36 A @ 24 V

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-505A/508A Series: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
EDS-516A Series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)

Weight:
EDS-505A/508A Series: 1040 g
EDS-516A Series: 1586 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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 Series Pending); ATEX Class I, Zone 2, Ex nC IIC (EDS-516A Series Pending)

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

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

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time:
EDS-505A Series: 352,000 hrs
EDS-508A Series: 339,000 hrs
EDS-516A Series: 247,000 hrs

Database: Telcordia (Bellcore), GB

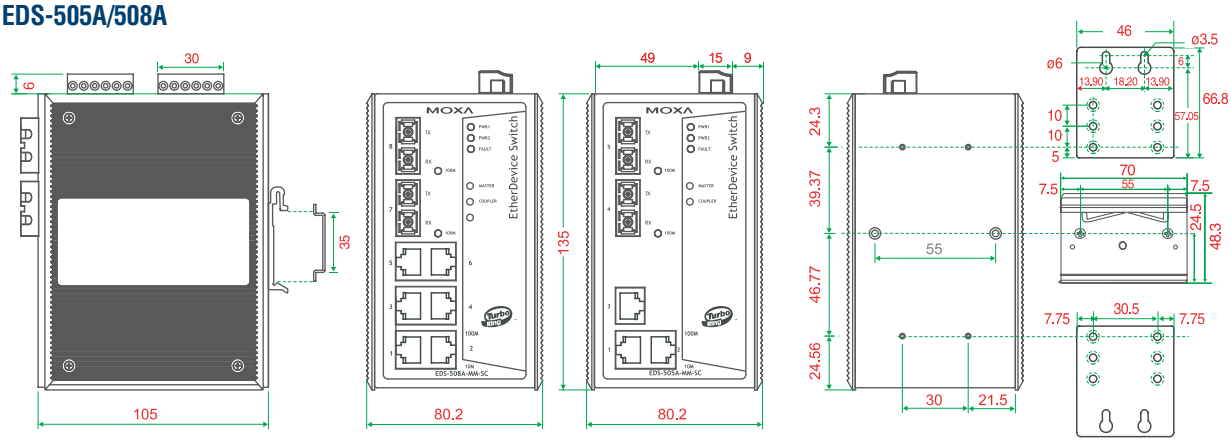
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)

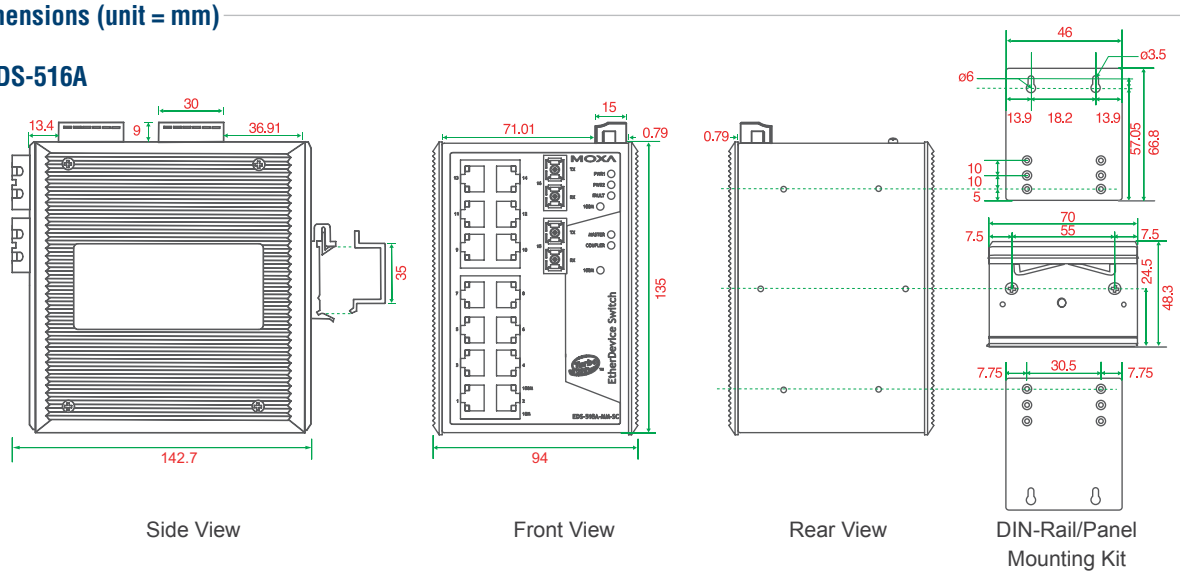
EDS-505A/508A



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Dimensions (unit = mm)

EDS-516A



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
			100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-505A/508A Series						
EDS-505A/508A	EDS-505A/508A-T	5/8	---	---	---	---
EDS-505A/508A-MM-SC	EDS-505A/508A-MM-SC-T	3/6	2	---	---	---
EDS-505A/508A-MM-ST	EDS-505A/508A-MM-ST-T	3/6	---	2	---	---
EDS-505A/508A-SS-SC	EDS-505A/508A-SS-SC-T	3/6	---	---	2	---
EDS-505A/508A-SS-SC-80*	EDS-508A-SS-SC-80-T	3/6	---	---	---	2
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	---	---

Note: The EDS-505A-SS-SC-80 is only available as a standard temperature model.

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-405A/408A Series

5 and 8-port entry-level managed Ethernet switches

- Plug-n-Play Turbo Ring with fast recovery time (under 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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

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

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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 to prevent unpredictable network status
- Port mirroring for online debugging

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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, LLDP, Modbus/TCP, IPv6

MIB: MIB-II, Ethernet-Like MIB, P-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

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

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

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

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

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

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 single-mode fiber optic cable

Power Requirements

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

Input Current:
EDS-405A: 0.24 A @ 24 V
EDS-408A: 0.26 A @ 24 V
EDS-405A-MM/SS: 0.32 A @ 24 V
EDS-408A-MM/SS: 0.35 A @ 24 V
EDS-408A-3M/3S/2M1S/1M2S: 0.32 A @ 24 V

Overload Current Protection: Present

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 x 135 x 105 mm (3.17 x 5.31 x 4.13 in)

Weight:
EDS-405A, EDS-405A-MM-SC/ST, EDS-405A-SS-SC: 650 g
EDS-408A, EDS-408A-MM-SC/ST, EDS-408A-SS-SC: 650 g
EDS-408A-3M/3S/2M1S/1M2S: 890 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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 (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*)

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 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending*), GL (Pending*)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

* All models in this series except for the 3 fiber models have already received this regulatory approval. Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

Time:
EDS-405A Series: 392,000 hrs
EDS-408A Series: 363,000 hrs

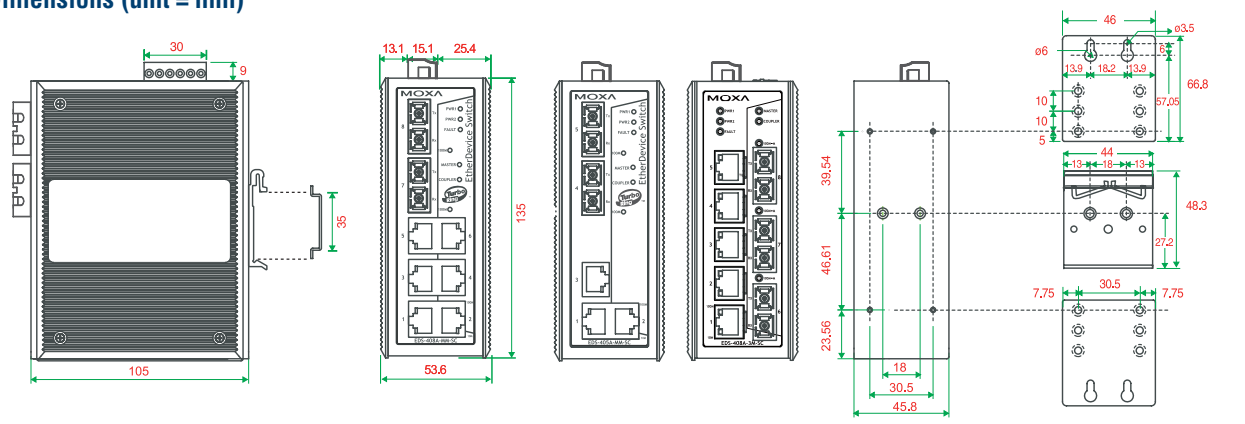
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-405A/408A	EDS-405A/408A-T	5/8	---	---	---
EDS-405A/408A-MM-SC	EDS-405A/408A-MM-SC-T	3/6	2	---	---
EDS-405A/408A-MM-ST	EDS-405A/408A-MM-ST-T	3/6	---	2	---
EDS-408A/405A-SS-SC	EDS-408A/405A-SS-SC-T	3/6	---	---	2
EDS-405A/408A-SS-SC	EDS-405A/408A-SS-SC-T	3/6	---	---	2
EDS-408A-3M-ST	EDS-408A-3M-ST-T	5	---	3	---
EDS-408A-3S-SC	EDS-408A-3S-SC-T	5	---	---	3
EDS-408A-2M1S-SC	EDS-408A-2M1S-SC-T	5	2	---	1
EDS-408A-1M2S-SC	EDS-408A-1M2S-SC-T	5	1	---	2

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-P510 Series

7+3G-port Gigabit PoE managed Ethernet switches

- 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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-P510 series includes 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 EDS-P510 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 is cost-prohibitive to provide locally. The EDS-P510 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 EDS-P510 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

- Advanced PoE management function
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- 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 to prevent 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

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 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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6

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

Fiber Ports: 100/1000BaseSFP slot

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

Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve

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

Alarm Contact: 2 relay outputs with current carrying capacity of 0.5 A @ 48 VDC

Digital Inputs: 2 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: 48 (46 to 50V) VDC, redundant dual inputs

Input Current: Max. 1.62 A @ 48 VDC (supports up to 4 ports at 15.4 W per PoE port)

Overload Current Protection: Present

Connection: 2 removable 6-contact terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 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 (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508 (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)

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 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2 (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

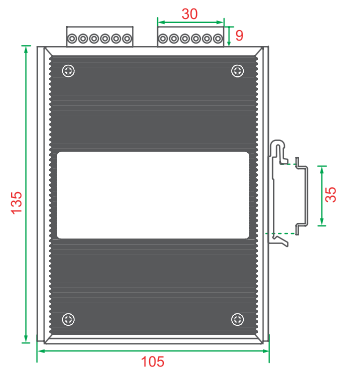
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

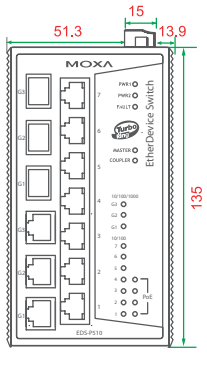
Warranty Period: 5 years

Details: See www.moxa.com/warranty

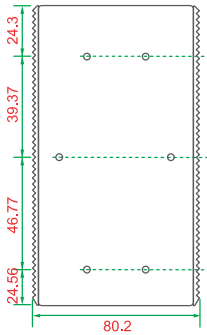
Dimensions (unit = mm)



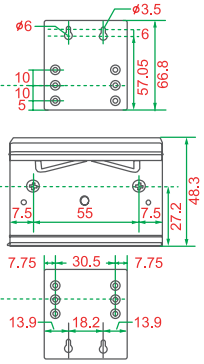
Side View



Front View



Rear View



DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface		
		Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE, 10/100BaseT(X)	10/100BaseT(X)
EDS-P510	EDS-P510-T	3	4	3

Note: The EDS-P510 series supports up to 3 100/1000BaseSFP slots. See page 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature

SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

DR-75-48/120-48: 75/120 W DIN-Rail 48 VDC power supplies

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

SPL-24 Series

IEEE 802.3af PoE splitters

- IEEE 802.3af compliant; splits power and data from PoE equipment
- Supports output power up to 12.95 W at 24 VDC
- Short circuit protection for power output
- Auto disconnection if power input voltage is too high
- -40 to 75°C operating temperature range (T models)
- DIN-Rail mounting ability

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3af for Power-over-Ethernet

Interface

RJ45 Ports: 10/100BaseT(X) for PoE IN and DATA OUT

LED Indicators: Power

Power Requirements

Input Voltage: 44 to 75 VDC

Output Voltage: 24 VDC

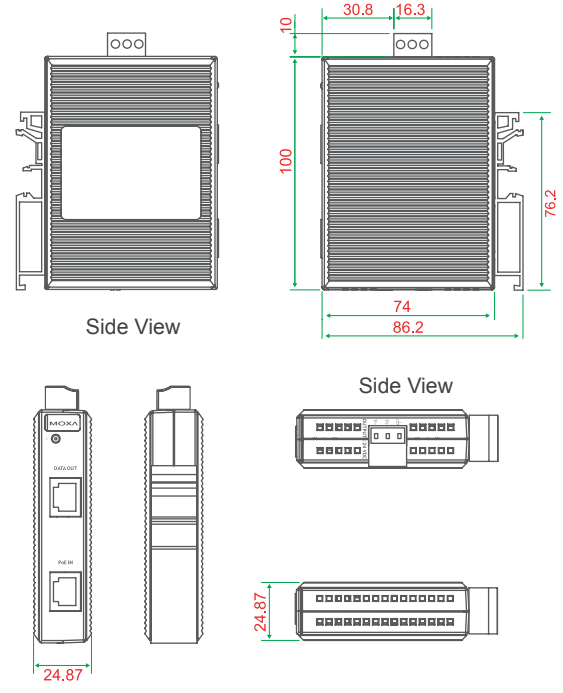
Overload Current Protection: 400 mA @ 48 VDC input

Connection: 1 removable 3-contact terminal block for output

Output Power: 12.95 W (0.54 A @ 24 VDC)

Efficiency: 85% (at 25°C, fully loaded)

Dimensions (unit = mm)



Physical Characteristics

Housing: Plastic, IP30 protection

Dimensions: 24.87 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)

Weight: 95 g

Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508 (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)

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 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

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

MTBF (meantime between failures)

Time: 5,100,000 hrs

Database: MIL-HDBK-217F, GB 25°C

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature

SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature

EOM-104

4-port embedded managed Ethernet switch module

- 10/100 Mbps Ethernet Interface
- Turbo Ring, RSTP/STP for Ethernet Redundancy
- SNMP and e-mail alerts for event trapping and notification
- Two-thirds the size of a business card
- Low power consumption
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EOM-104 Ethernet switch module is designed for device manufacturers who would like to embed an Ethernet switch module in their products to enhance performance and reliability.

The EOM-104 module provides an easy and cost-effective integrated solution for adding an Ethernet switch module to an existing product.

The module supports 10/100 Mbps Fast Ethernet, and comes with Turbo Ring's fast recovery time of under 20 ms built in. The EOM-104 also provides a rich set of peripherals, such as Turbo Ring Enable and GPIO programming pins, and is an ideal solution for embedded Ethernet applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
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 Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog

MIB: MIB-II, Ethernet-Like MIB, P-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

Ethernet Ports: 4, 10/100BaseT(X), auto MDI/MDI-X

Connectors: 1 connector with 2 x 20 pins and 2 connectors with 1 x 9 pins

Console Port: RS-232 (TxD, RxD, DTR, DSR)

GPIO: 4 programmable I/O pins

Power Requirements

Input Voltage: 3.3 V

Input Current: 0.59 A @ 3.3 V

Physical Characteristics

Dimensions: 54 x 60 x 8.25 mm (2.13 x 2.36 x 0.32 in)

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

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

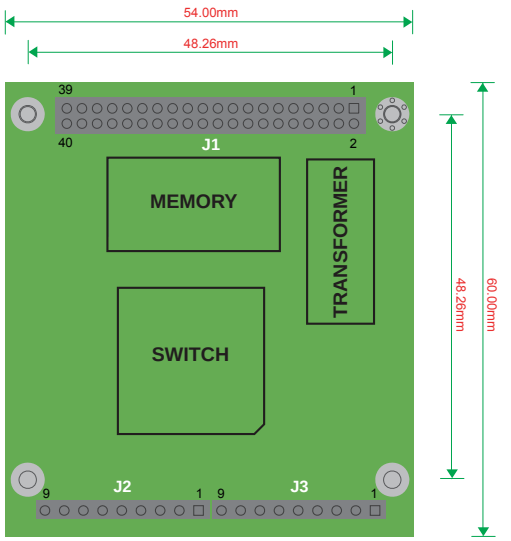
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Pin Assignment

J1 (2 x 20 connector pin assignment)

PIN	1	3	5	7	9	11	13	15	17	19
SIGNAL	TX4 -	RX4	NC	RX3 +	TX3 +	NC	GND	3.3V	GND	DTR

PIN	2	4	6	8	10	12	14	15	18	20
SIGNAL	TX4 +	RX4 +	NC	RX3	TX3	NC	GND	3.3V	GND	DSR

PIN	21	23	25	27	29	31	33	35	37	39
SIGNAL	TXD	GPIO3	GPIO1	MASTER ENABLE	MASTER LED	PORT 3 LED	PORT 1 LED	MANUAL RESET	3.3V	GND

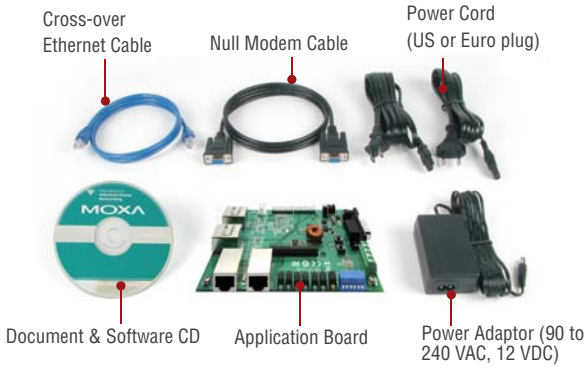
PIN	22	24	26	28	30	32	34	36	38	40
SIGNAL	RXD	GPIO2	NC GPIO0	TURBO RING ENABLE	TURBO RING LED	RESET DEFAULT	PORT 2 LED	PORT 4 LED	3.3V	GND

J2 and J3 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX +	TX	3.3V	3.3V	FXSD	RX -	RX +	GND

EOM-104 Evaluation Kit

The EOM Evaluation Kit includes an evaluation board, power adaptor, software CD, and serial and Ethernet cables to allow quick and easy evaluation of all embedded Ethernet switch functions. The evaluation board is equipped with an Ethernet port, console port, and Turbo Ring DIP switch to help you test your modules and applications.



Ordering Information

Available Models

EOM-104: 4-port embedded managed Ethernet switch module, -40 to 75°C operating temperature

SFP-1G Series

1G-port Gigabit Ethernet SFP modules

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

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1GXXALC and SFP-1GXXBLC)

Optical Fiber

	Gigabit Ethernet											
	SFP-SX	SFP-LSX	SFP-LX	SFP-LHX	SFP-ZX	SFP-EZX	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wave-length	850 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 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	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	1 dBm	5 dBm	5 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-4 dBm	0 dBm	0 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-24 dBm	-24 dBm	-30 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	20 dB	24 dB	30 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m [a]	2 km [b]	10 km [c]	40 km [c]	80 km [c]	110 km [c]	10 km [c]		20 km [c]		40 km [c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz * km or 62.5/125 µm, 500 MHz * km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz * km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Operating Temp. Models: -40 to 85°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

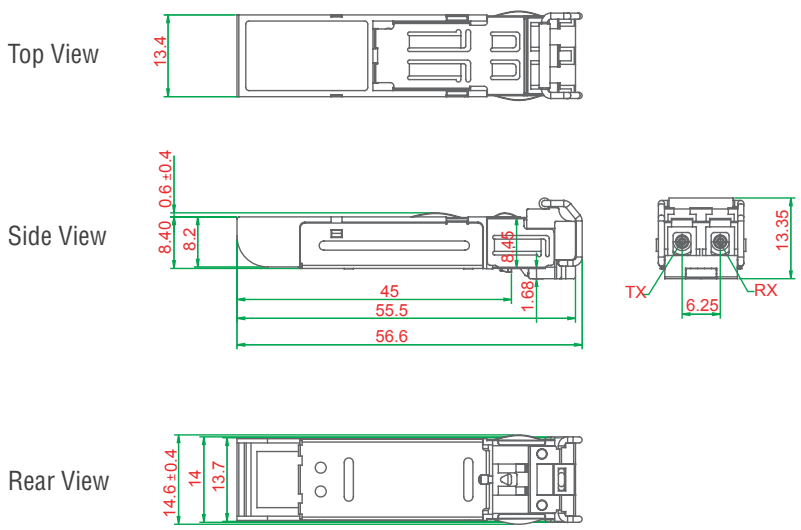
Safety: UL, TÜV

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

SFP Modules

Available Models		Port Interface					
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	---	---	---	---	---
SFP-1GLSXLC	SFP-1GLSXLC-T	---	1	---	---	---	---
SFP-1GLXLC	SFP-1GLXLC-T	---	---	1	---	---	---
SFP-1GLHXLC	SFP-1GLHXLC-T	---	---	---	1	---	---
SFP-1GZXLC	SFP-1GZXLC-T	---	---	---	---	1	---
SFP-1GEZXLC	---	---	---	---	---	---	1

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

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60°C)	Wide 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

The SFP-1G series modules can be used with the following products

EDS-728/828 series: IM-2GSFP series Gigabit Ethernet interface modules
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
EDS-P510 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

SFP-1FE Series

1-port fast Ethernet SFP modules

- Single + 3.3 V power Supply
- Small From Factor Pluggable MSA Compliant
- PECL Differential Inputs and Output
- TTL Signal Detect Indicator
- Compliant with SONET / SDH Standard
- LC Duplex Connector
- EEPROM with serial ID functionality
- Class 1 Laser International Safety Standard IEC 825 Compliant

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

EN : 60825

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-18 dBm	0 dBm	0 dBm
Min. TX	-8 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km [a]	40 km [b]	80 km [b]
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 µm or 62.5/125 µm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
b. 9/125 µm single-mode fiber optic cable

Environmental Limits

Operating Temperature: -40 to 85°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

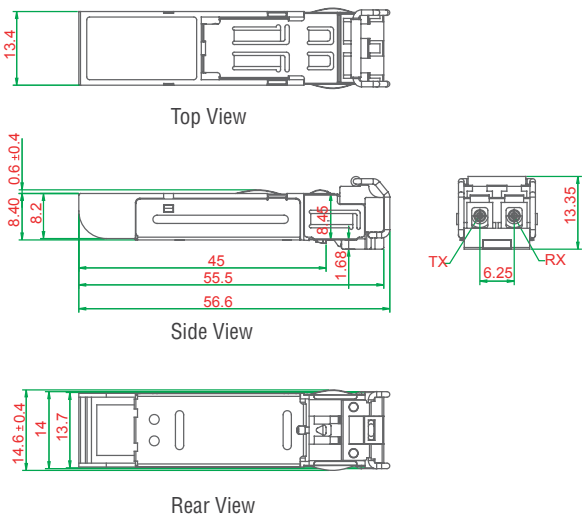
Safety: UL, TÜV

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T	1	---	---
SFP-1FESLC-T	---	1	---
SFP-1FELLC-T	---	---	1

The SFP-1FE series modules can be used with the following products

EDS-G509 series: 9G-port full Gigabit managed Ethernet switches

EDS-G308 series: 8G-port full Gigabit unmanaged Ethernet switches

EDS-P510 series: 7+3G-port Gigabit PoE managed Ethernet switches

PT and IKS series: PM-7200-8SFP Fast Ethernet interface module

ABC-01

Configuration backup and restoration tool for managed switches

- Reduce system downtime, without an additional power input
- Plug-n-Play system backup and restoration
- Front label for writing identification information
- Compact, rugged, reliable design
- Supports Moxa's managed Ethernet switches

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Features

- RS-232 RJ45 console port connection
- Store the complete configuration of one switch
- Load the system configuration automatically after system reboot
- Manually load and save the system configuration through the web console
- Portable low-power design requires no power supply
- CE and FCC approval

Introduction

The ABC-01 configuration backup and restoration tool can be used to save and load the configuration of Moxa's managed Ethernet switches through the switches' RS-232 console port. This simple yet powerful tool makes it much easier to back up a switch's system parameters, or even replace an existing switch with a new switch. With the ABC-01, you can quickly re-install a substitute switch (of the same model) or recover the entire system configuration, including IP address, if a switch failure occurs.

Specifications

Basic Operation

Connector: RS-232 RJ45 port

Configuration: Use the web console of Moxa's managed switches

Power Requirements

Input Voltage: 3 to 5 VDC (through the RS-232 port's RTS signal)

Physical Characteristics

Housing: PVC molding, IP40 protection

Weight: 50 g

Dimensions: 32.5 x 97 x 12 mm (8.07 x 3.82 x 0.47 in)

On-switch Installation: M4 screw (< 4 mm)

Cable Length: 35 cm (including connector)

Environmental Limits

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

Storage Temperature: -20 to 70°C (-4 to 158°F)

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

Regulatory Approvals

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 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Ordering Information

Available Models

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

MXview Lite

Easy browser-based network management software

- Auto device discovery
- User defined topology map
- Network troubleshooting with comprehensive event logs
- Remotely accessible through user friendly web browser
- Batch deployment of configuration and firmware for Moxa network devices

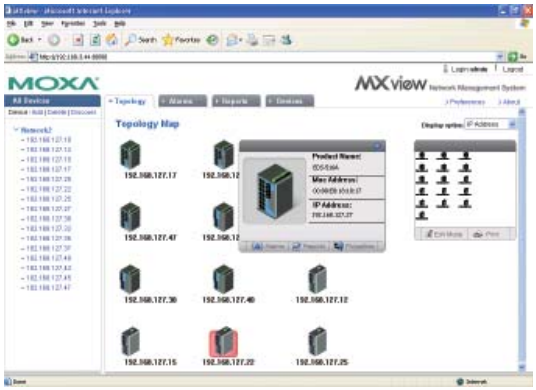
Introduction

Moxa's MXview Lite network management software is designed for configuring, monitoring, and troubleshooting Moxa network components connected to industrial Ethernet networks. MXview Lite provides an integrated management platform that can discover Moxa network components installed on multiple subnets. All selected network components can be managed graphically by web browser from both local and remote sites—anytime and anywhere.

Topology Visualization

After devices are discovered, a built-in editing tool can be used to manually draw a topology map of Moxa's managed Ethernet switches. The topology map ensures easy management and troubleshooting of your industrial Ethernet networks. Device information, such as device status and settings, will also be included on the topology map.

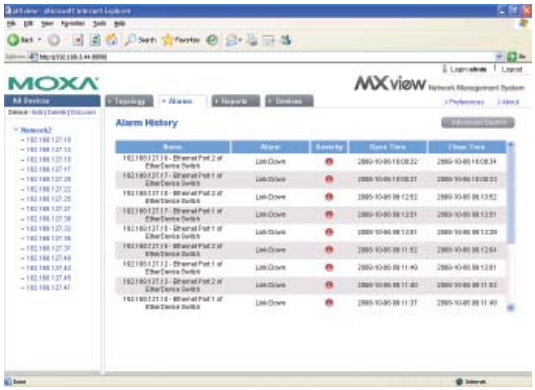
- Automatic discovery (supports searching multiple subnets)
- Manually add or delete a single Ethernet switch
- Editable topology map
- Popup menu on device thumbnail for easily configuring devices or getting device information rapidly
- Color-coded icons on the topology map indicate the status of abnormal devices



Event Management

Administrators can set up event threshold definitions. MXview Lite will use the definitions to display warning messages on a monitor, or the messages will be sent to network administrators via email. The alarm information is recorded in a database, which users can check to keep the network running smoothly.

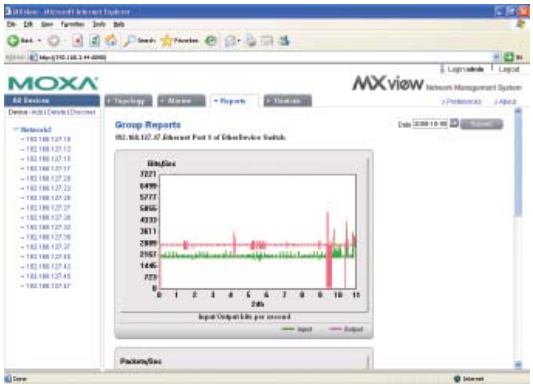
- Notification based on an event, including SNMP failure, link down, bandwidth utilization, packet error rate, and collision rate
- Notification can be sent via email
- Event threshold can be defined by the administrator
- Alarm history list and advance search function of the event log
- Color-coded icons for real-time status



Traffic Monitoring

MXview Lite generates port-based traffic statistics for selected ports on the network components. The statistics can be viewed graphically in a chart, and the statistics for two different ports can be displayed on the same page for easy network analysis.

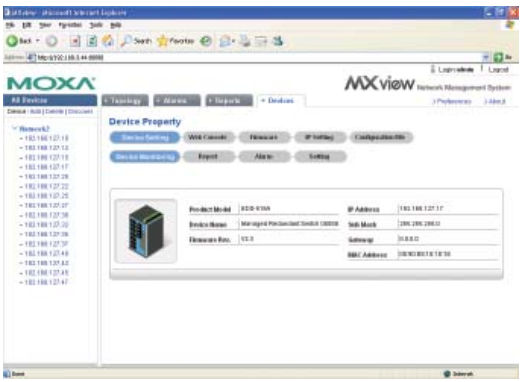
- Network traffic statistics for Moxa's managed Ethernet switches
- Multiple statistics charts can be displayed on a single page



Device Configurations

MXview Lite is an integrated tool that can manage a group of Moxa Ethernet switches over industrial Ethernet networks. Updating firmware for a group of Ethernet switches using a single tool is now possible using MXview Lite. The individual configuration file for each Ethernet switch can be stored and deployed when the Moxa Ethernet switch is replaced during maintenance, reducing system downtime.

- 100% configuration of Moxa switches by web console
- Centralized firmware deployment for Moxa's managed Ethernet switches
- Restore and deploy configuration files over the network



System Requirements

Software Requirements	
CPU	Intel Core 2 Duo 2.4 GHz or above
RAM	1G or above
Hard Disk Space	1G or above
Hardware Requirements	
Operating System	Windows XP Professional/2000/2003
Browser	IE 6.0 or higher
Language Support	
User interface and user's manual	English

Ordering Information

Available Models

MXview Lite: Browser-based network management software that supports monitoring 32 units of Moxa's managed Ethernet switches

Note: Registered users of Moxa's managed Ethernet switches can download MXview Lite for free from from Moxa's website.

EDS-SNMP OPC Server Pro

OPC server for integrating SNMP devices into HMI/SCADA systems

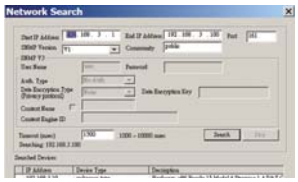
Seamlessly integrate EDS-SNMP OPC Server Pro with the leading HMI/SCADA software to create a comprehensive Ethernet network management solution for SNMP devices.

Introduction

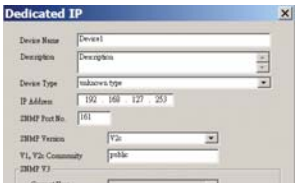
Moxa's EDS-SNMP OPC Server Pro provides a user-editable Tag file for any SNMP device. Use the default MIB file, or create and edit a standard or private MIB to generate a dedicated Tag file. This powerful function lets operators use an existing HMI software environment to create a customized and real 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

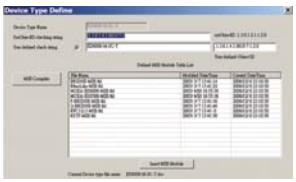
- "Broadcast Search" the network for Moxa's managed Ethernet switches and any SNMP device



- 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

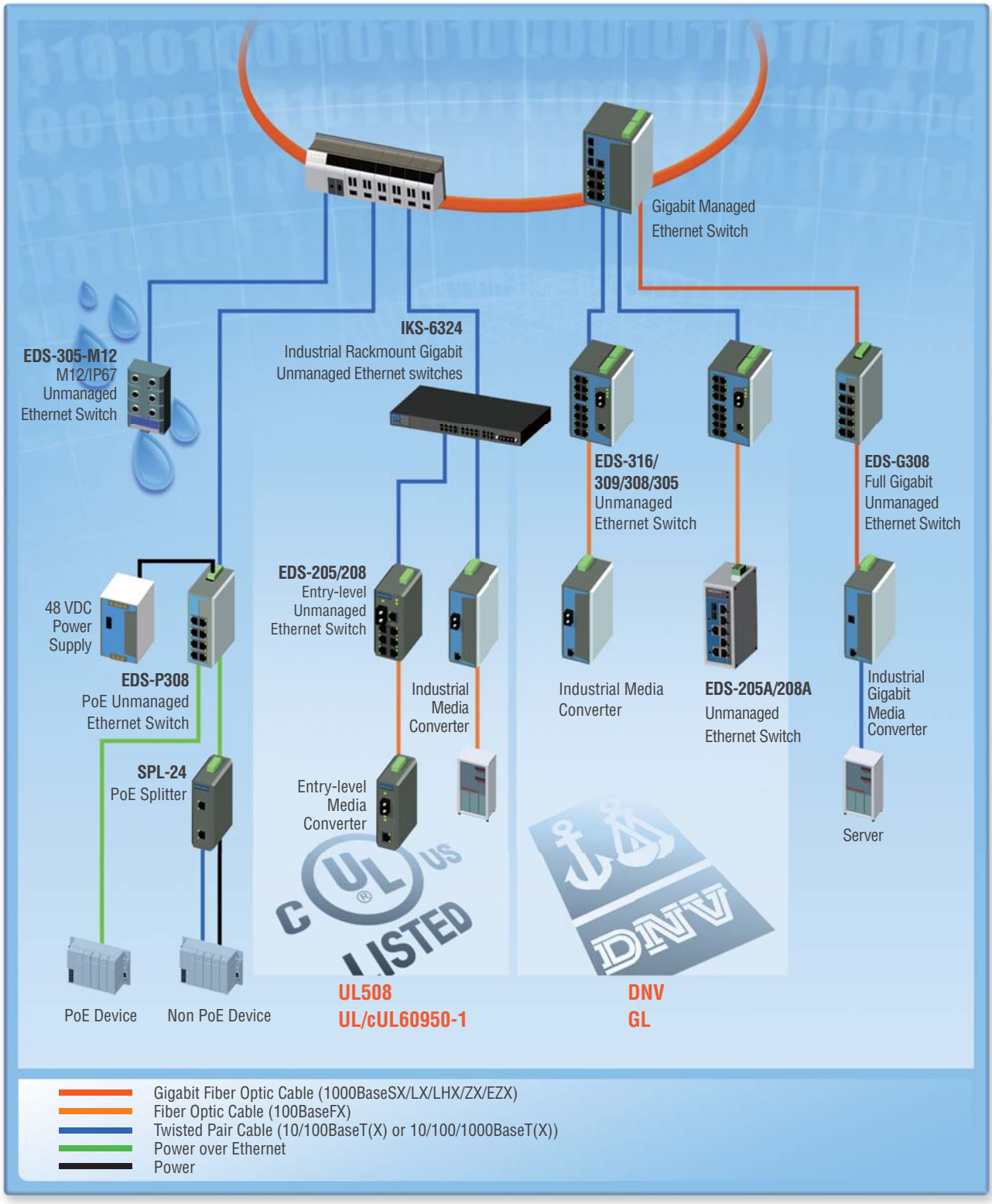
Ordering Information

Available Models

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

Introduction to Unmanaged Ethernet Switches

Adapted for Any Tough Environment

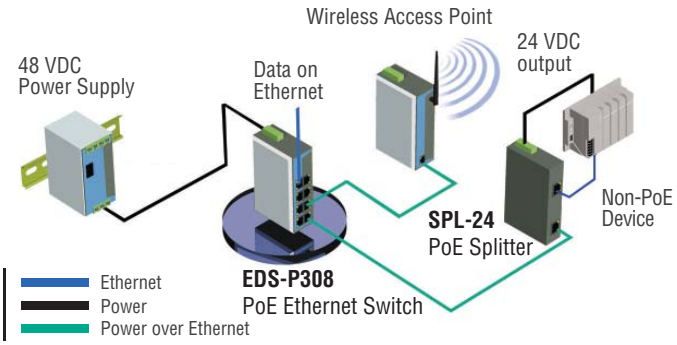


Certified to Meet Industrial Reliability Standards

Industrial environments often involve unknown, hazardous factors that can influence the operation of Ethernet devices. In fact, some of the factors could cause serious disasters or the loss of life and property. Many of Moxa's industrial products have received UL508 and UL60950-1 certifications, which were developed to indicate which industrial control and information technology equipment is suitable for hazardous locations such as maritime environments, mines, oil refineries, and other industrial settings. In addition, UL/cUL Class I Division 2, ATEX C1Z2, and DNV and GL maritime type approvals have strict standards for testing and determining which devices can be used safely and reliably in these critical environments.

Power-over-Ethernet Solutions

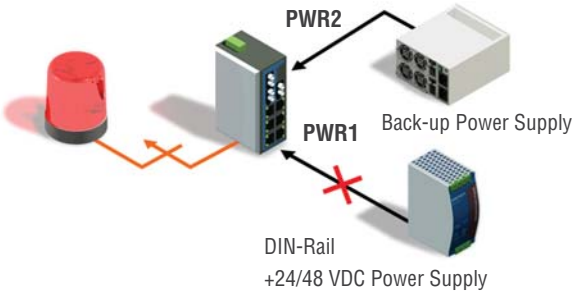
Moxa provides solutions for any IEEE 802.3af PoE compliant unit and Ethernet-enabled device. The EDS-P308 series of unmanaged Ethernet switches and the SPL-24 PoE splitter can be used to simplify wiring in the field and provide a more versatile environment for installing devices. The devices can be placed up to 328 feet (100 m) from a PSE.



Advanced Features for Enhanced Reliability and Operation

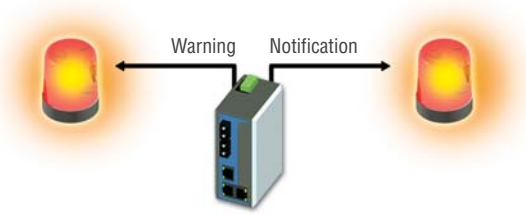
Redundant Power Inputs

The IKS-6324, EDS-200A, EDS-305, EDS-308, EDS-309, EDS-316, EDS-G205, EDS-G308, and EDS-P308 unmanaged Ethernet switches provide two power inputs that can be connected simultaneously to live DC power sources. If one of the power inputs fails, the other live source acts as a backup to provide the Ethernet switch's power needs automatically.



Relay Output Alarm for Port Breaks, Power Failure

The EDS-305, EDS-308, EDS-309, EDS-316, EDS-G205, EDS-G308, and EDS-P308 unmanaged Ethernet switches provide relay contact outputs to warn technicians on the shop floor when the power fails or a port link breaks, so that they can respond quickly with appropriate emergency operation procedures.



Broadcast Storm Protection

Moxa's unmanaged Ethernet switches are protected from receiving too many broadcast packets. During normal use, broadcast packets will be forwarded to all ports except the source port. However, unmanaged Ethernet switches will discard broadcast or multicast packets if the number of those packets exceeds a threshold in a preset period of time. When the preset time period expires, the switch will then resume receiving broadcast or multicast packets until the threshold is reached again.

VLAN Tag Packets Transmitted Transparently

The IEEE 802.1Q standard defines a VLAN tag that includes TPID control (information) with an additional 4 bytes inserted into an untagged Ethernet frame. Moxa's unmanaged Ethernet switches can transmit and receive these data packets without modifying the packets in any way.

AC or DC Power Input Options

The EDS-200A/200 unmanaged Ethernet switches allow users to use either a 24 VDC or 24 VAC power input. The 24 VAC power input is specially designed for applications in the building automation field where the power input source is often restricted. The EDS-200A/200 Ethernet switches are low-cost, versatile solutions suitable for all industrial applications.

Comparison Chart for Unmanaged Ethernet Switches

	Port Interface				Features				Approvals			
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Alarm Contact	Power Redundancy	-40 to 75°C	UL/cUL 60950-1	UL508	EN50155/EN50121-4	UL/cUL Class I, Div. 2/ ATEX Class I, Zone 2	DNV/GL
Rackmount Unmanaged Ethernet Switches												
IKS-6324	24	2	24	---	---	√	√	P	---	√	---	P
DIN-Rail Unmanaged Ethernet Switches												
EDS-G308	8	8	---	---	√	√	√	---	P	---	P	P
EDS-G205	5	5	---	---	√	√	√	---	P	---	P	P
EDS-P308	8	---	4	4	√	√	√	---	√	---	P	P
EDS-316	16	---	16	---	√	√	√	√	√	---	P	√
EDS-309	9	---	9	---	√	√	√	√	√	---	√	√
EDS-308	8	---	8	---	√	√	√	√	√	---	√	√
EDS-305	5	---	5	---	√	√	√	√	√	---	√	√
EDS-208A	8	---	8	---	---	√	√	---	√	---	P	P
EDS-205A	5	---	5	---	---	√	√	---	√	---	P	P
EDS-208	8	---	8	---	---	---	---	√	√	---	---	---
EDS-205	5	---	5	---	---	---	---	---	√	---	---	---

√ = Available, P = Pending, Note: Please check Moxa's website for the most up-to-date certification status.

IKS-6324 Series

22+2G-port Gigabit unmanaged Ethernet switches

- Meets UL 60950-1, NEMA TS2, EN50155/EN50121-4, and DNV/ GL certifications
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- Redundant dual 12/24/48 VDC power inputs
- -40 to 75°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The IKS-6324 industrial rackmount Ethernet switches are designed to meet the demands of industrial application networks such as traffic control systems (NEMA TS2), and maritime applications (DNV/GL). The IKS-6324 is a 24-port industrial 19" rackmount Ethernet switch series that provides a rugged and economical solution for your industrial Ethernet connections. Up to two fast Ethernet fiber optic ports and combo Gigabit Ethernet TP or fiber optic ports can be chosen to make the construction of a reliable Ethernet network easy. A universal power supply range of 24/48 VDC or 110/220 VDC/VAC give users greater flexibility in choosing power inputs. The Ethernet switches comply with UL standards and support a wide operating temperature range of -40 to 75°C. All models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications.

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

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

Interface

Fiber Ports: 100BaseFX (SC/ST connector) or 1000BaseSFP slots

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: STAT, PWR1, PWR2, FAULT, LNK/ACT, FDX/HDX, SPEED

Note: Slot 1 is for a 2-port PM-7200 Gigabit Ethernet combo module, or 1 or 2-port PM-7200 fast Ethernet module. See page 4-31 for details.

Power Requirements

Input Voltage: 12/24/48 VDC (9 to 60 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 0.68 A @ 24 VDC
- Max. 0.35 A @ 48 VDC
- Max. 0.17/0.11 A @ 110/220 VDC
- Max. 0.33/0.23 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-contact terminal block

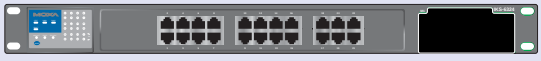
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)

Unmanaged Rackmount Ethernet Switch System, IKS-6324



Weight: 4300 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

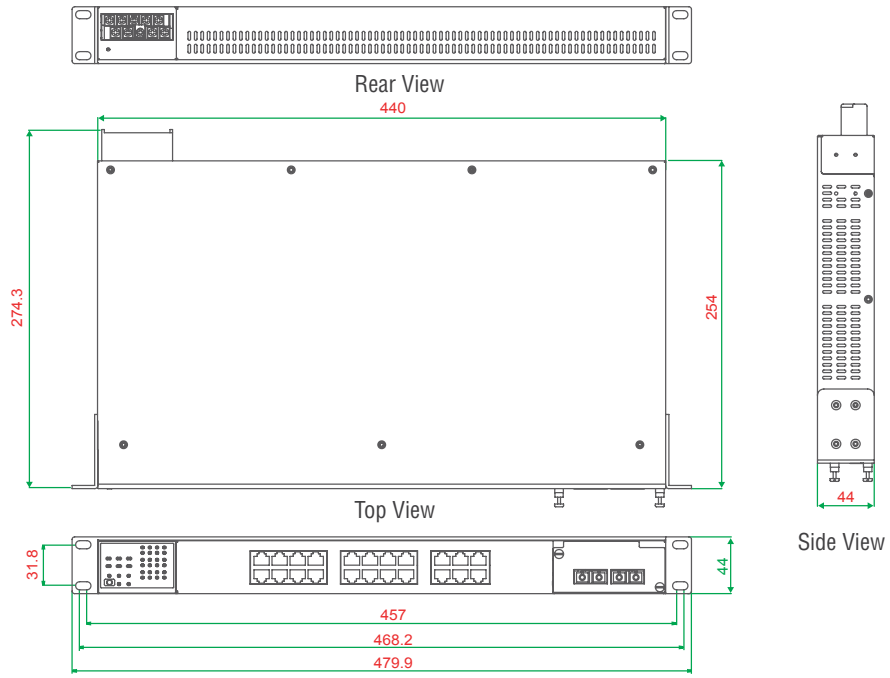
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

IKS-6324 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The IKS-6324 Ethernet switch system is delivered without interface modules. Please see page 4-31 to determine which PM-7200 interface modules are suitable for your application.

IKS-6324 Unmanaged Rackmount Ethernet Switch System

The IKS-6324 switch system consists of 2 unmanaged rackmount Ethernet switch systems with 22 10/100BaseT(X) ports, and 1 slot for fast Ethernet or Gigabit Ethernet modules. A total of up to 24 or 22+2G ports can be installed, and the switch can be used in a temperature range from -40 to 75°C.

Product Model	Power Supply	
Front Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
IKS-6324-F-LV-T	1	---
IKS-6324-F-HV-T	---	1

Gigabit/Fast Ethernet Module Compatibility Chart for the IKS-6324

	Interface Module						
	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-1SSC	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC
Slot 1	√	√	√	√	√	√	√

EDS-G205/G308 Series

5G and 8G-port full Gigabit unmanaged Ethernet switches

- Fiber optic options for extending distance and electrical noise immunity (EDS-G308 series)
- Redundant dual 12/24/48 VDC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-G205 and EDS-G308 switches are equipped with 5 and 8 Gigabit Ethernet ports, respectively, and up to 2 fiber optic ports, making them ideal for applications that demand high bandwidth. The EDS-G205/G308 switches provide an economical solution for your industrial Gigabit Ethernet connections, and the built-in relay warning function alerts network managers when power failures or port breaks occur. Two models are available in this series. One model has an operating temperature range of 0 to 60°C, and the other model has an extended operating temperature range of -40 to 75°C. Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-G205/G308 switches can be installed easily on a DIN-Rail or in distribution boxes.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

Fiber Ports: 100/1000BaseSFP slot (EDS-G308 series only)

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: One for port break alarm, one for Enable/Disable broadcast storm protection

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

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

Power Requirements

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

Input Current:
EDS-G205: 0.20 A @ 24 V
EDS-G308: 0.32 A @ 24 V
EDS-G308-2SFP: 0.34 A @ 24 V

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-G205: 35 x 130 x 105 mm (1.37 x 5.12 x 4.13 in)
EDS-G308: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)

Weight:
EDS-G205: 290 g
EDS-G308: 630 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508 (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)

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 3
EN61000-4-6 (CS), level 3

Maritime: DNV (Pending), GL (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (meantime between failures)

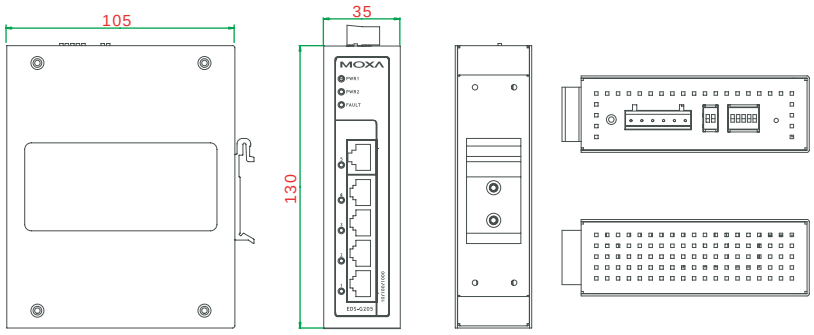
Time: 325,000 hrs (EDS-G308 series)
Database: Telcordia (Bellcore), GB (EDS-G308 series)

Warranty

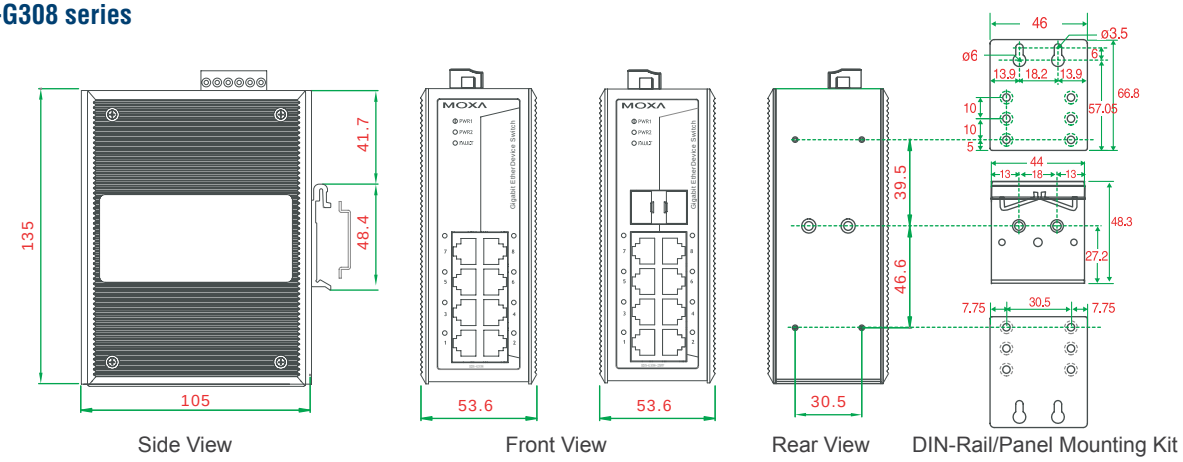
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

EDS-G205



EDS-G308 series



Ordering Information

Product Model		Port Interface	
		Gigabit Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	Combo port, 10/100/1000BaseT(X) or 100/1000BaseSFP*
EDS-G205	EDS-G205-T	5	---
EDS-G308	EDS-G308-T	8	---
EDS-G308-2SFP	EDS-G308-2SFP-T	6	2

Note: The EDS-G308-2SFP and EDS-G308-2SFP-T support up to 2 100/1000BaseSFP slots. See pages 3-45 and 3-47 for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-46: Wall mounting kit (EDS-G308 series only)
WK-30: Wall mounting kit (EDS-G205 series only)
RK-4U: 4U-high 19" rack mounting kit

EDS-305/308/309/316 Series

5, 8, 9, and 16-port unmanaged Ethernet switches

- Redundant dual 24 VDC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Transparent transmission of VLAN tagged packets
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-305/308/309/316 are 5, 8, 9, and 16-port Ethernet switches that provide an economical solution for your industrial Ethernet connections. The built-in relay warning function alerts network engineers when power failures or port breaks occur, and the switches are designed for harsh industrial environments, such as in hazardous locations (Class I, Div. 2/ATEX). The switches comply with FCC, TÜV, UL, and CE standards, and come in two model types. Standard operating temperature range models (0 to 60°C) and wide operating temperature range models (-40 to 75°C). Both models undergo a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. The EDS-305/308/309/316 switches can be installed easily on a DIN-Rail or in a distribution box.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

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

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

DIP Switches: Port break alarm mask

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

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

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, 2 km (EDS-316-T)[a]	40 km [c]	80 km [d]
	4 km, 2 km (EDS-316-T)[b]		
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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Power Requirements

Input Voltage:
EDS-305/308: 24 VDC (12 to 48 VDC), redundant inputs
EDS-309/316: 24 VDC (12 to 45 VDC), redundant inputs

Input Current:
EDS-305: 0.13 A @ 24 V
EDS-305-M/S: 0.17 A @ 24 V
EDS-308: 0.13 A @ 24 V
EDS-308-M/S: 0.21 A @ 24 V
EDS-308-MM/SS: 0.26 A @ 24 V
EDS-309-3M: 0.31 A @ 24 V
EDS-316: 0.27 A @ 24 V
EDS-316-M/S/MM/SS/MS: 0.44 A @ 24 V

Overload Current Protection:
EDS-305, EDS-305-M, EDS-305-S, EDS-308: 1.1 A
EDS-308-M/S/MM/SS, EDS-309 series, EDS-316 series: 1.6 A

Connection: 1 removable 6-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions:
EDS-305/308/309 Series:
53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
EDS-316 Series:
80.5 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)

Weight:
EDS-305/308/309 Series: 630 g
EDS-316 Series: 1140 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety:
EDS-305/308/309 Series: UL508, UL60950-1, CSA C22.2 No. 60950-1, EN60950-1
EDS-316 series: UL508, UL60950-1, EN60950-1

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (EDS-316 Series Pending); ATEX Class I, Zone 2, Ex nC IIC (EDS-316 Series 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 3
EN61000-4-6 (CS), EDS-305/308: level 2; EDS-309/316: level 3

Maritime: DNV, GL

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time:
EDS-305 series: 422,000 hrs
EDS-308 series: 255,000 hrs
EDS-309 series: 396,000 hrs
EDS-316 series: 257,000 hrs

Database: MIL-HDBK-217F, GB 25°C

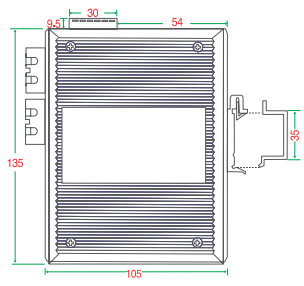
Warranty

Warranty Period: 5 years

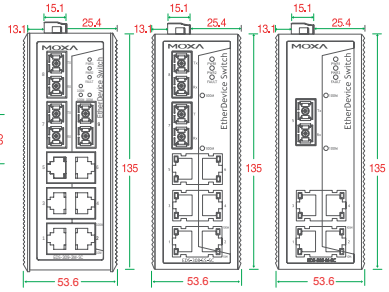
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

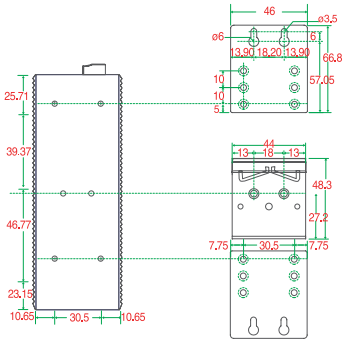
EDS-305/308/309 Series



Side View



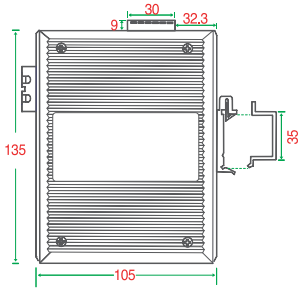
Front View



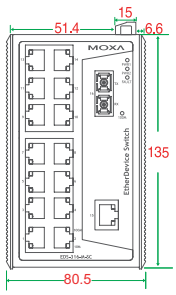
Rear View

DIN-Rail/Panel Mounting Kit

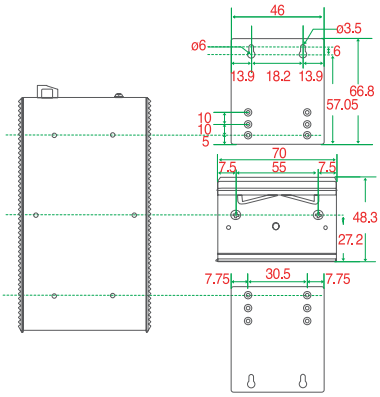
EDS-316 Series



Side View



Front View



Rear View

DIN-Rail/Panel Mounting Kit

Ordering Information

Available Models		Port Interface				
			100BaseFX			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km
EDS-305 Series						
EDS-305	EDS-305-T	5	---	---	---	---
EDS-305-M-SC	EDS-305-M-SC-T	4	1	---	---	---
EDS-305-M-ST	EDS-305-M-ST-T	4	---	1	---	---
EDS-305-S-SC	EDS-305-S-SC-T	4	---	---	1	---
EDS-305-S-SC-80	---	4	---	---	---	1
EDS-308 Series						
EDS-308	EDS-308-T	8	---	---	---	---
EDS-308-M-SC	EDS-308-M-SC-T	7	1	---	---	---
EDS-308-MM-SC	EDS-308-MM-SC-T	6	2	---	---	---
EDS-308-MM-ST	EDS-308-MM-ST-T	6	---	2	---	---
EDS-308-S-SC	EDS-308-S-SC-T	7	---	---	1	---
EDS-308-SS-SC	EDS-308-SS-SC-T	6	---	---	2	---
EDS-308-S-SC-80	EDS-308-S-SC-80-T	7	---	---	---	1
EDS-308-SS-SC-80	EDS-308-SS-SC-80-T	6	---	---	---	2
EDS-309 Series						
EDS-309-3M-SC	EDS-309-3M-SC-T	6	3	---	---	---
EDS-309-3M-ST	EDS-309-3M-ST-T	6	---	3	---	---
EDS-316	EDS-316-T	16	---	---	---	---
EDS-316-M-SC	EDS-316-M-SC-T	15	1			---
EDS-316-M-ST	EDS-316-M-ST-T	15	---	1	---	---
EDS-316-MM-SC	EDS-316-MM-SC-T	14	2	---	---	---
EDS-316-MM-ST	EDS-316-MM-ST-T	14	---	2	---	---
EDS-316-MS-SC	EDS-316-MS-SC-T	14	1	---	1	---
EDS-316-S-SC	EDS-316-S-SC-T	15	---	---	1	---
EDS-316-SS-SC	EDS-316-SS-SC-T	14	---	---	2	---
EDS-316-MS-SC-80	---	14	1	---	---	1
EDS-316-S-SC-80	---	15	---	---	---	1
EDS-316-SS-SC-80	---	14	---	---	---	2
EDS-316-SS-SC-40/80	---	14	---	---	1	1

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit

RK-4U: 4U-high 19" rack mounting kit

EDS-205A/208A Series

5 and 8-port unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi/single-mode, SC or ST connector)
- Redundant dual 12/24/48 VDC, 18 to 30 VAC power inputs
- IP30 aluminum housing
- Rugged hardware design well suited for hazardous locations (Class I Div. 2 /ATEX) and maritime environments (DNV/GL)
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-205A/208A series are 5 and 8-port industrial Ethernet switches that support IEEE 802.3 and IEEE 802.3u/x with 10/100M full/half-duplex, MDI/MDI-X auto-sensing. The EDS-205A/208A switches provide 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC redundant power inputs that can be connected simultaneously to live AC/DC power sources. These switches have been designed for harsh industrial environments, such as in maritime (DNV/GL) or hazardous locations (Class I Div. 2/ATEX) that comply with FCC, TUV, UL, and CE standards.

The EDS-205A/208A switches are available with a standard operating temperature range from -10 to 60°C, or with a wide operating temperature range from -40 to 75°C. All models are subjected to a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control applications. In addition, the EDS-205A/208A switches have DIP switches for enabling or disabling broadcast storm protection, providing another level of flexibility for industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode, single-mode)

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

DIP Switches: Enable/Disable broadcast storm protection

LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

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 single-mode fiber optic cable

Power Requirements

Input Voltage: 12/24/48 VDC (9.6 to 60 VDC), 18 to 30 VAC (47 to 63 Hz), redundant dual inputs

Input Current:
EDS-205A: 0.091 A @ 24 V
EDS-208A: 0.13 A @ 24 V
EDS-208A-M: 0.17 A @ 24 V
EDS-208A-MM/SS: 0.22 A @ 24 V

Overload Current Protection: 1.1 A

Connection: 1 removable 4-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum, IP30 protection

Dimensions:
EDS-205A: 30 x 115 x 70 mm (1.18 x 4.52 x 2.76 in)
EDS-208A: 50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)

Weight:
EDS-205A: 175 g
EDS-208A: 275 g

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

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D (Pending); ATEX Class I, Zone 2, Ex 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 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11

Maritime: DNV (Pending), GL (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 425,000 hrs

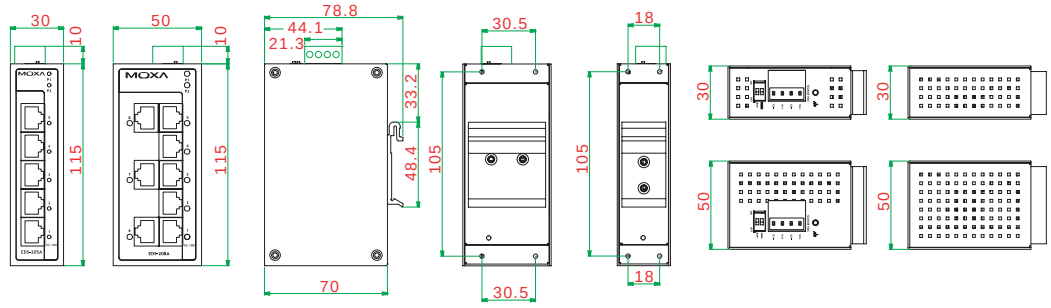
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Front Views | Side View | Rear Views | Top & Bottom Views

Ordering Information

Available Models		Port Interface			
			100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector
EDS-205A	EDS-205A-T	5	---	---	---
EDS-208A	EDS-208A-T	8	---	---	---
EDS-208A-M-SC	EDS-208A-M-SC-T	7	1	---	---
EDS-208A-M-ST	EDS-208A-M-ST-T	7	---	1	---
EDS-208A-MM-SC	EDS-208A-MM-SC-T	6	2	---	---
EDS-208A-MM-ST	EDS-208A-MM-ST-T	6	---	2	---
EDS-208A-S-SC	EDS-208A-S-SC-T	7	---	---	1
EDS-208A-SS-SC	EDS-208A-SS-SC-T	6	---	---	2

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature

WK-46: Wall mounting kit (EDS-208A series only)

WK-30: Wall mounting kit (EDS-205A series only)

RK-4U: 4U-high 19" rack mounting kit

EDS-205/208 Series

5 and 8-port entry-level unmanaged Ethernet switches

- 10/100BaseT(X) (RJ45 connector), 100BaseFX (multi-mode, SC/ST connectors)
- IEEE802.3/802.3u/802.3x support
- Broadcast storm protection
- DIN-Rail mounting ability
- -10 to 60°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-205/208 series of industrial Ethernet switches are entry-level industrial 5 and 8-port Ethernet switches that support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDIX auto-sensing RJ45 ports. The EDS-205/208 switches are rated to operate at temperatures ranging from -10 to 60°C, and are rugged enough for any harsh industrial environment. The switches can be easily installed on a DIN-Rail as well as in distribution boxes. The DIN-Rail mounting capability, wide operating temperature, and the the IP30 housing with LED indicators make the plug-and-play EDS-205/208 switches easy to use and reliable.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode)

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

LED Indicators: Power, 10/100M (TP port), 100M (fiber port)

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 single-mode fiber optic cable

Power Requirements

Input Voltage:
EDS-205: 12 to 48 VDC, 18 to 30 VAC (47 to 63 Hz)
EDS-208 series: 12 to 45 VDC, 18 to 30 VAC (47 to 63 Hz)

Input Current:
EDS-205: 0.12 A @ 24 V
EDS-208: 0.14 A @ 24 V
EDS-208-M: 0.23 A @ 24 V

Overload Current Protection: 1.1 A

Connection: 1 removable 3-contact terminal block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP30 protection

Dimensions:
EDS-205: 25 x 100 x 74 mm (0.98 x 3.94 x 2.91 in)
EDS-208: 40 x 100 x 74 mm (1.57 x 3.94 x 2.91 in)

Weight:
EDS-205: 135 g
EDS-208: 170 g

Installation: DIN-Rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

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

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

Regulatory Approvals

Safety:
EDS-205: UL508
EDS-208: UL508, UL60950-1

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 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), EDS-205: level 3; EDS-208: level 2
EN61000-4-8
EN61000-4-11

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time:
EDS-205: 323,000 hrs
EDS-208: 368,000 hrs

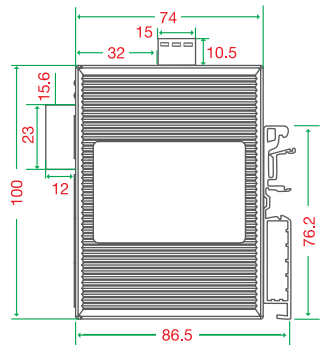
Database:
EDS-205: Telcordia (Bellcore), GB
EDS-208: MIL-HDBK-217F, GB 25°C

Warranty

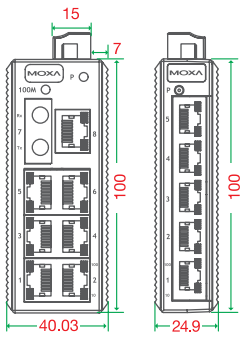
Warranty Period: 5 years

Details: See www.moxa.com/warranty

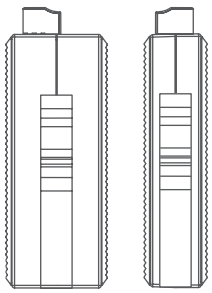
Dimensions (unit = mm)

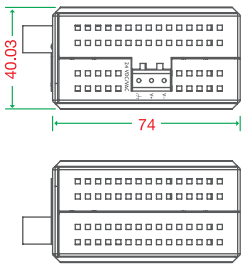


Side View



Front View


Rear View



Top & Bottom Views

Ordering Information

Available Models	Port Interface			Housing Material	Power Range
Standard Temperature (-10 to 60°C)	10/100BaseT(X)	100BaseFX			
		Multi-mode, SC Connector	Multi-mode, ST Connector		
EDS-205	5	---	---	Plastic	12 to 48 VDC
EDS-208	8	---	---	Plastic	12 to 45 VDC
EDS-208-M-SC	7	1	---	Plastic	12 to 45 VDC
EDS-208-M-ST	7	---	1	Plastic	12 to 45 VDC

Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies

RK-4U: 4U-high 19" rack mounting kit

EDS-P308 Series

8-port IEEE 802.3af PoE unmanaged Ethernet switches

- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Up to 15.4 watts at 48 VDC per PoE port
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P308 switches are smart, 8-port, unmanaged Ethernet switches supporting PoE (Power-over-Ethernet) on ports 1 to 4. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-P308 switches enable centralization of the power supply and provide up to 15.4 watts of power per port. The switches can be used to power IEEE 802.3af compliant powered devices (PD), eliminating the need for additional wiring, and support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical solution for your industrial Ethernet network. In addition, the built-in relay warning function alerts network engineers when power failures or port breaks occur.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet

Processing Type: Store and Forward

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

DIP Switches: Port break alarm mask

LED Indicators: PWR1, PWR2, FAULT, 10/100M, PoE

Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC

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 single-mode fiber optic cable

Power Requirements

Input Voltage: 48 (46 to 50 V) VDC, redundant inputs

Input Current: 1.6 A @ 48 V

Overload Current Protection: 2.5 A @ 48 VDC

Connection: 1 removable 6-contact terminal block

Reverse Polarity Protection: Present

PoE (per port)

Max. Output Power: 15.4 W

Output Voltage: 44 to 48.5 VDC

Max. Output Current: 350 mA

Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal, IP30 protection

Dimensions: 53.6 × 135 × 105 mm (2.11 x 5.31 x 4.13 in)

Weight: 840 g

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

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508

Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex 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 4
EN61000-4-5 (Surge), level 4
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
Maritime: DNV (Pending), GL (Pending)
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

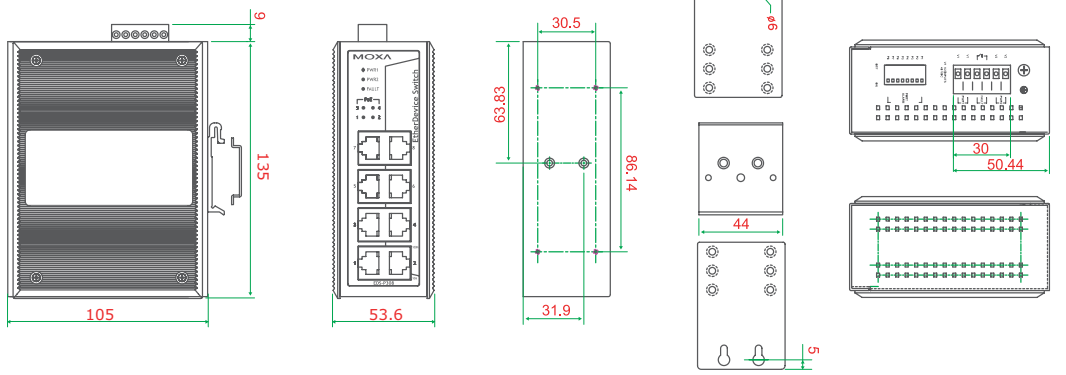
MTBF (meantime between failures)

Time: 360,000 hrs
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit | Top and Bottom Views

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	PoE, 10/100BaseT(X)	100BaseFX	
				Mulit-mode, SC Connector	Single-mode, SC Connector
EDS-P308	EDS-P308-T	4	4	---	---
EDS-P308-M-SC	EDS-P308-M-SC-T	3	4	1	---
EDS-P308-S-SC	EDS-P308-S-SC-T	3	4	---	1
EDS-P308-MM-SC	EDS-P308-MM-SC-T	2	4	2	---
EDS-P308-SS-SC	EDS-P308-SS-SC-T	2	4	---	2

Optional Accessories (can be purchased separately)

SPL-24: PoE splitter, maximum output of 12.95 W at 24 VDC, 0 to 60°C operating temperature (see page 3-42 for details)
SPL-24-T: PoE splitter, maximum output of 12.95 W at 24 VDC, -40 to 75°C operating temperature (see page 3-42 for details)
DR-75-48/120-48: 75W/120W DIN-Rail 48 VDC power supplies
WK-46: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

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Industry-specific Ethernet Switches

M12 Ethernet Switches







	TN-5508 Series	TN-5510 Series	TN-5516 Series	TN-5518 Series	TN-5308 Series	TN-5308-PoE Series	EDS-305-M12 Series
Number of Ports							
Max. Number of Ports	8	10	16	18	8	8	5
Gigabit Ethernet, 10/100/1000 Mbps	---	2	---	2	---	---	---
Fast Ethernet, 10/100 Mbps	8	8	16	16	8	8 (4 PoE)	5
Power Supply							
12/24/36/48 VDC	√	√	√	√	√ (LV Model)	---	---
72/96/110 VDC	√	√	√	√	√ (MV Model)	---	---
80-300 VDC, 85-264 VAC	√	√	√	√	---	---	---
24 VDC	---	---	---	---	---	---	√
48 VDC	---	---	---	---	---	√	---
24 VAC	---	---	---	---	---	---	√
Installation Options							
DIN-Rail Mounting	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Panel Mounting	√	√	√	√	√	√	√
Operating Temperature							
0 to 60°C	√	√	√	√	√	√	√
-40 to 75°C	√	√	√	√	√	√	√
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	√	√	√	√	---	---	---
STP/RSTP	√	√	√	√	---	---	---
Network Management and Control							
IPv6	√	√	√	√	---	---	---
DHCP Option 66/67/82	√	√	√	√	---	---	---
IEEE 1588 PTP	√	√	√	√	---	---	---
LLDP	√	√	√	√	---	---	---
Modbus/TCP	√	√	√	√	---	---	---
IGMP/GMRP	√	√	√	√	---	---	---
Port Trunking	√	√	√	√	---	---	---
IEEE 802.1X	√	√	√	√	---	---	---
Port Lock	√	√	√	√	---	---	---
SNMP/RMON	√	√	√	√	---	---	---
VLAN	√	√	√	√	---	---	---
QoS	√	√	√	√	---	---	---
Relay Warning	√	√	√	√	---	---	---
Regulatory Approvals							
CE/FCC	√	√	√	√	√	√	√
UL508	Pending	Pending	Pending	Pending	Pending	Pending	√
Traffic Control Systems: NEMA TS2 e1	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 Pending Pending	 --- ---
Railway Applications: EN50155 EN50121-3-2 EN50121-4	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 Pending Pending Pending	 √ Pending Pending
DNV/GL	---	---	---	---	---	---	Pending

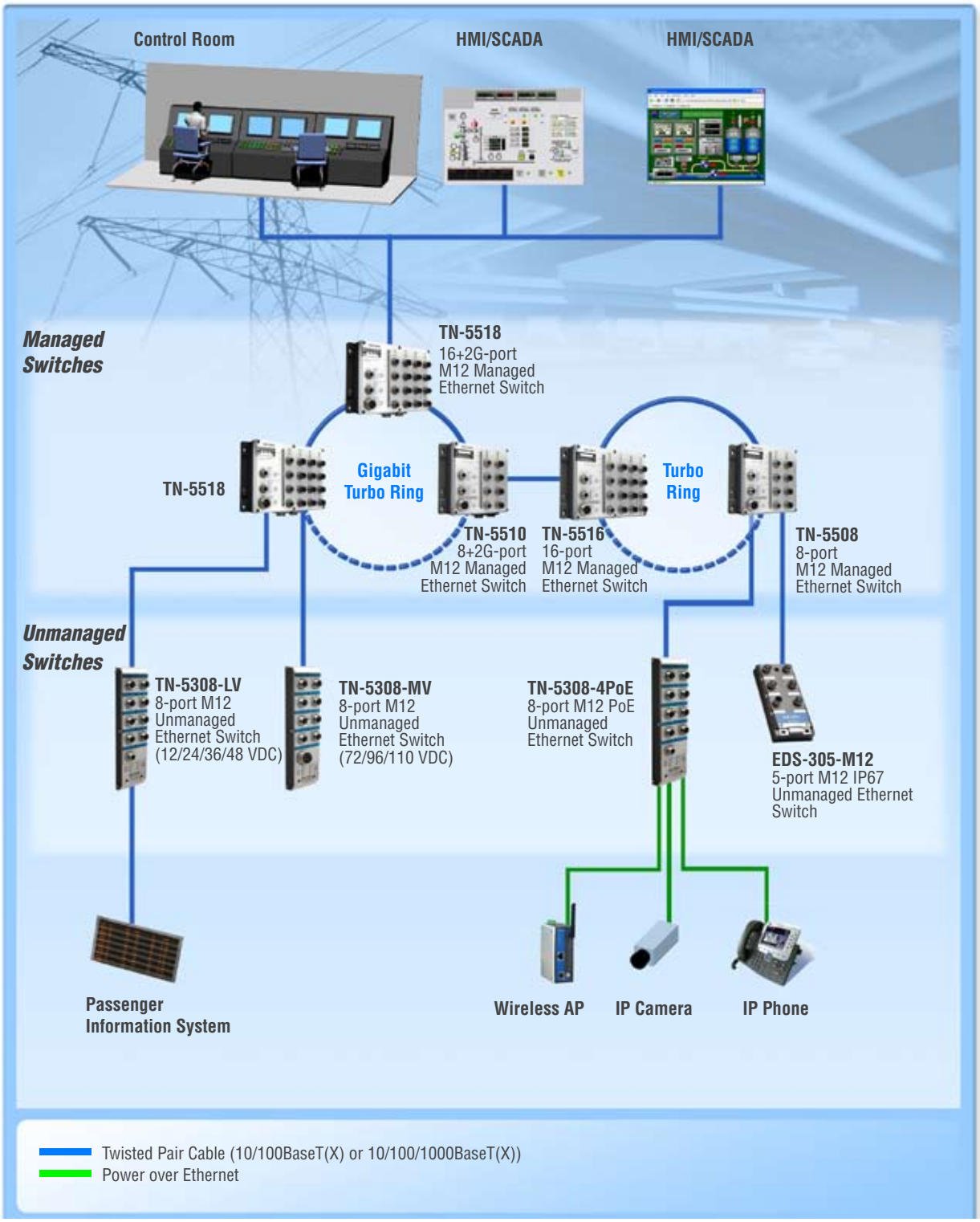
IEC 61850-3 Rackmount Ethernet Switches




	PT-7828	PT-7728	PT-7710	PT-7324
Supported Modules				
Gigabit Ethernet Modules	√	√	√	√
Fast Ethernet Modules	√	√	√	√
SFP Gigabit Ethernet Modules	√	√	√	√
SFP Fast Ethernet Modules	√	√	√	---
Number of Ports				
Max. Number of Ports	28	28	10	24
Gigabit Ethernet, 10/100/1000 Mbps	Up to 4	Up to 4	Up to 2	Up to 2
Fast Ethernet, 10/100 Mbps	Up to 24	Up to 24	Up to 10	Up to 24
Power Supply				
24 VDC, isolated	√	√	---	---
48 VDC, isolated	√	√	---	---
12/24/48 VDC	---	---	√	√
88-300 VDC or 85-264 VAC, isolated	√	√	√	√
Installation Options				
Rack Mounting	√	√	√	√
Panel Mounting	---	---	√	---
Operating Temperature				
-40 to 85°C	√	√	√	√
Redundancy and Backup Options				
Turbo Ring (Recovery Time < 20 ms)	√	√	√	---
STP/RSTP	√	√	√	---
Automatic Backup Configurator (ABC-01)	√	√	√	---
Network Management and Control				
Layer 3 Switching	√	---	---	---
IPv6	---	√	√	---
DHCP Option 66/67/82	√	√	√	---
IEEE 1588 PTP	√	√	√	---
LLDP	√	√	√	---
Modbus/TCP	√	√	√	---
IGMP/GMRP	√	√	√	---
Port Trunking	√	√	√	---
IEEE 802.1X	√	√	√	---
Port Lock	√	√	√	---
SNMP/RMON	√	√	√	---
VLAN	√	√	√	√
QoS	√	√	√	√
Relay Warning	√	√	√	√
Regulatory Approvals				
CE/FCC	√	√	√	√
UL/cUL 60950-1	Pending	Pending	Pending	Pending
IEC 61850-3 (Power Substation)	√	√	√	√
IEEE 1613 (Power Substation)	√	√	√	√
NEMA TS2 (Traffic Control System)	√	√	√	√
EN50155/EN50121-4 (Railway Applications)	√	√	√	√
DNV/GL	Pending	Pending	Pending	Pending

Introduction to M12 Shielded Ethernet Switches

Building Tough Networks for any Harsh Industrial Environment



Robust M12 Solution for Industry-specific Applications

Ethernet devices used in harsh industrial environments must be able to withstand extreme environmental conditions and provide robust data communication. Industrial settings are often subject to vibration, shock, dust, fluid, and extreme temperatures. Moxa's ToughNet TN series of M12 Ethernet switches can be used to ensure stable and tough network connections. With ToughNet switches, you can rest assured that your network will meet the stringent design requirements needed for applications in factories, trains, buses, ships, and other moving vehicles.

M12 Connectors | M23 Connector | Circular RJ45 Connector

M12 and Circular Connectors

Moxa's ToughNet series of Ethernet switches use tight M12 connectors and other types of circular connectors to ensure robust connections and reliable operation when subjected to environmental disturbances such as vibration and shock. The M12 4-pin connector with D-coding has already been defined as an Industrial Ethernet standard according to IEC 61067-2-101 Amendment 1. The ToughNet switches support fast Ethernet twisted-pair cables with M12 connectors or Gigabit Ethernet twisted-pair cables with circular RJ45 connectors.

Rugged Metal Housing

Moxa's ToughNet series of Ethernet switches have a metal housing that can sustain mechanical stress and protects the switches against electromagnetic disturbances.

Fanless Operation in a Wide (-40 to 75°C) Temperature Range

The wide temperature (T) models of the TN series of M12 Ethernet switches are guaranteed to operate reliably in extreme temperatures ranging from -40 to 75°C, and the switches' fanless design is suitable for harsh environments.

Suitable for Diverse Requirements

Reliable Gigabit Ethernet Bypasses Device Failure

The TN-5510/5518 series of M12 Ethernet switches provide 2 Gigabit Ethernet ports with relay bypass function. The bypass function ensures reliable data communication even if the device fails to work due to a power failure. This avoids SPOF (single point of failure) to assure continuous system operation. The Gigabit ports are suitable for the Ethernet backbone of an industrial network, and the large bandwidth allows applications such as video surveillance and VoIP (Voice-over-Internet-Protocol).

Large Choice of Power Input Ranges

To satisfy global power requirements for various industrial applications, the TN-5500 series managed switches provide isolated dual redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range. For example, the TN-5516-LV-MV switches support the wide power input range of 12/24/36/48/72/96/110 VDC that fit most railway applications. In addition, the TN-5308-LV switches provide a 7 to 60 VDC power supply range that allows stable operations, even when using a 12 VDC battery. The TN-5308-MV switches provide a 72/96/110 VDC (50.4 to 154 VDC) power supply range that is suitable for different applications.

Robust M12 Power-over-Ethernet Solution

The TN-5308-4PoE switches have M12 IEEE 802.3af compliant PoE ports that make the devices act as power source equipment (PSE), which means that the switches can transmit data and power through the same cable to IEEE 802.3af compliant powered devices (PD), such as IP cameras and wireless access points, making it easier to wire your applications.

Hardware-based IP Address Configuration for Faulty Device Replacement

The rapid replacement of faulty devices is critical for systems that must continue operating around the clock. One way to achieve this is to make it much easier to configure the new device that replaces the faulty one. The TN-5500 series switches, for example, have rotary switches for configuring the IP address built right into the switch's housing, allowing you to recover your network communication in no time.

Moxa's Products are Certified to Meet Industrial Standards

Railway Application Standards

EN50155

EN50155 addresses the conditions of operation, design, construction, and testing of electronic equipment used on rail vehicles (rolling stock) in railway applications. The ToughNet series of M12 Ethernet switches are compliant with both the performance tests and environmental tests dictated by EN50155. Reliable performance can be assured under different power supply conditions, such as voltage variations, power interruption, supply change over, and other conditions. The switches can also withstand environmental disturbances such as vibration, shock, and temperature variations.

EN50121-3-2

EN50121-3-2 defines the electromagnetic compatibility (EMC) of an apparatus installed on rolling stock in railway applications. The TN series switches are compliant with this standard.

EN50121-4

EN50121-4 defines the emission and immunity standards for a signaling and telecommunications apparatus. The TN series switches are EN50121-4 compliant.

Road Traffic Control System Standards

NEMA TS2

The National Electrical Manufacturers Association (NEMA) established the TS1 standard to define technically adequate and safe traffic control equipment. The TS2 standard was later introduced to overcome the limitations of TS1. Section 2 contains the environmental and testing requirements, including guidelines for temperature, humidity, voltage, vibration, and shock. The TN series switches are compliant with the NEMA TS2 traffic control system standards.

e1

Compliance with the EU's Automotive EMC Directive (95/54/EC) is indicated by the "e" mark, which is fitted to a vehicle's sub-assembly. Moxa's TN series switches meet the EMC requirements of this directive.

M12 Ethernet Switches Comparison Chart

	Port Interfaces					Features													Certifications			
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	Isolated Redundant Power	IPv6	IEEE 1588 PTP	DHCP Option 82	Turbo Ring and RSTP/STP	IGMP Snooping/GMRP	VLAN/GVRP	QoS	Port Trunking/LACP	IEEE 802.1X/HTTPS/SSH	SNMP/RMON	Port Lock	IP67	UL508	EN50155/EN50121-3-2/EN50121-4	NEMA TS2	e1
TN-5508	8	---	8	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5510	10	2	8	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5516	16	---	16	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5518	18	2	16	---	√	√	√	√	√	√	√	√	√	√	√	√	---	P	P	P	P
TN-5308-LV	8	---	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
TN-5308-MV	8	---	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
TN-5308-4PoE	8	---	4	4	---	---	---	---	---	---	---	---	---	---	---	---	---	P	P	P	P
EDS-305-M12	5	---	5	---	---	---	---	---	---	---	---	---	---	---	---	---	√	P	√	P	P

√ = Available P = Pending

Coming Soon

TN-5508/5510/5516/5518 Series

Preliminary

8, 8+2G, 16, 16+2G-port M12 managed Ethernet switches

- M12 connectors for robust links
- Wide power input range from 12 to 110 VDC (LV-MV model)
- Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
- 2-port flexibility of Gigabit Ethernet ports with relay bypass function
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5500 series M12 managed Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to use only one model in global applications. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of your communications and saves on cabling/wiring costs. The TN-5500 switches provide up to 8 or 16 fast Ethernet M12 ports, and TN-5510/5518 switches provide 2 ports on the down side to provide the Gigabit Ethernet RJ45 interface with a relay bypass function. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series Ethernet switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Relay bypass function on the 2 Gigabit Ethernet RJ45 ports to ensure data communication even if the device fails to work due to a power failure
- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE802.1w/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
- IEEE 802.3ad, LACP 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 allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, and Windows utility
- Panel mounting or DIN-Rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP, Modbus/TCP, IPv6

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

Switch Properties

Priority Queues: 4

Max. Number of Available VLANs: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Gigabit Ethernet: Down cabling, circular field connector (RJ45 inside), 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with relay bypass function

Console Port: M12 A-coding 5-pin male connector

System LED Indicators: PWR1, PWR2, FAULT, MASTER, COUPLER

Port LED Indicators: 10/100M (fast Ethernet port), 10/100/1000M (Gigabit Ethernet port)

Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
- 12/24/36/48 VDC (8.4 to 60 VDC)
- 72/96/110 VDC (50.4 to 154 VDC)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Overload Current Protection: Present

Connection: M23 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection

Dimensions:
TN-5508 Series: 185 x 170 x 69.8 mm (7.28 x 6.69 x 2.75 in)
TN-5510 Series: 185 x 183 x 69.8 mm (7.28 x 7.20 x 2.75 in)
TN-5516 Series: 250 x 170 x 69.8 mm (9.84 x 6.69 x 2.75 in)
TN-5518 Series: 250 x 183 x 69.8 mm (9.84 x 7.20 x 2.75 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

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

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

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

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

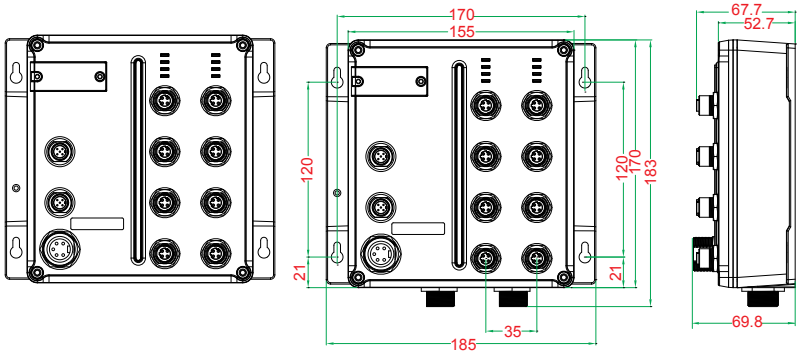
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

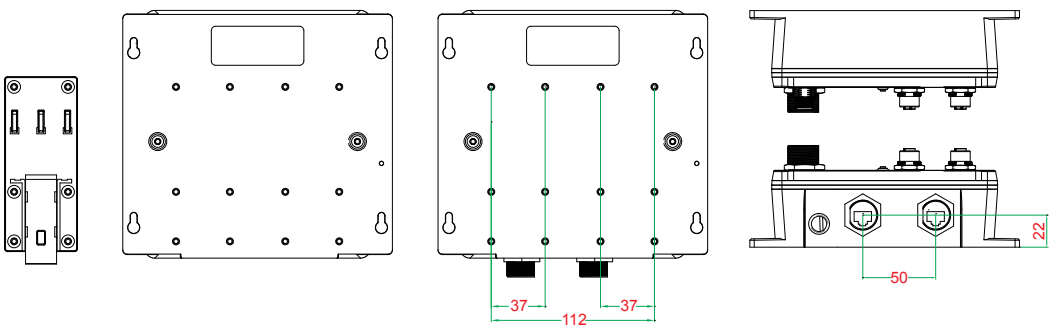
Dimensions (unit = mm)

TN-5508/5510 Series



Front View

Side View



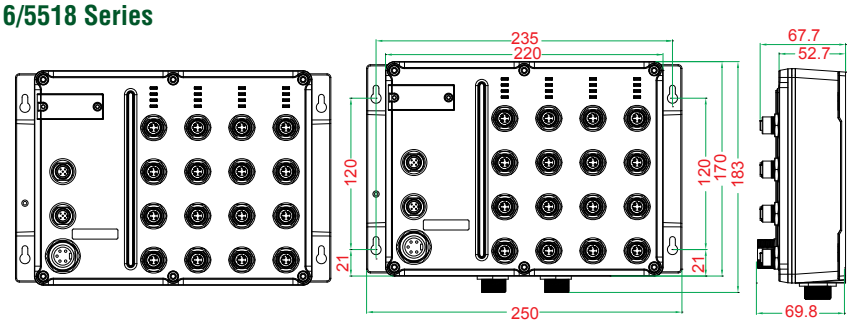
DIN-Rail Mounting Kit

Rear View

Top & Bottom Views

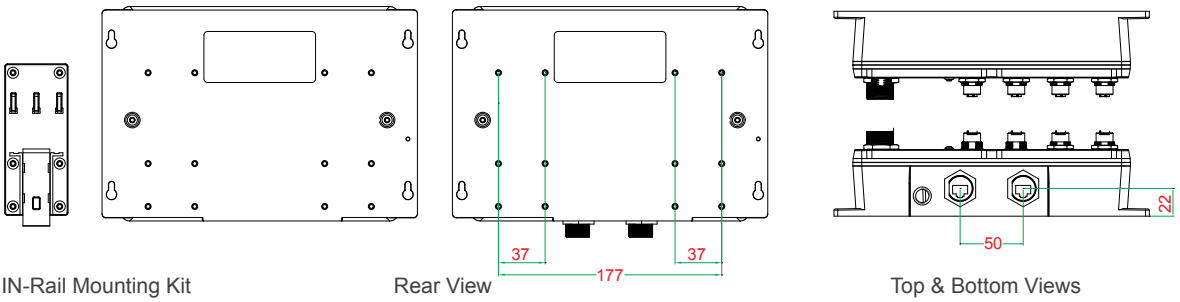
Dimensions (unit = mm)

TN-5516/5518 Series



Front View

Side View



DIN-Rail Mounting Kit

Rear View

Top & Bottom Views

Ordering Information

Available Models		Port Interface		Power Supply					
		Front Cabling	Down Cabling	Power Supply 1			Power Supply 2		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X) M12 connector	10/100/1000 BaseT(X) Circular RJ45 connector Relay bypass function	LV 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV 72/96/110 VDC (50.4 to 54 V), isolated	HV 88 to 300 VDC and 85 to 264 VAC, isolated	LV 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV 72/96/110 VDC (50.4 to 154 V), isolated	HV 88 to 300 VDC and 85 to 264 VAC, isolated
TN-5508 Series									
TN-5508-LV-LV	TN-5508-LV-LV-T	8	---	1	---	---	1	---	---
TN-5508-LV-MV	TN-5508-LV-MV-T	8	---	1	---	---	---	1	---
TN-5508-LV-HV	TN-5508-LV-HV-T	8	---	1	---	---	---	---	1
TN-5510 Series									
TN-5510-2GTX-LV-LV	TN-5510-2GTX-LV-LV-T	8	2	1	---	---	1	---	---
TN-5510-2GTX-LV-MV	TN-5510-2GTX-LV-MV-T	8	2	1	---	---	---	1	---
TN-5510-2GTX-LV-HV	TN-5510-2GTX-LV-HV-T	8	2	1	---	---	---	---	1
TN-5516 Series									
TN-5516-LV-LV	TN-5516-LV-LV-T	16	---	1	---	---	1	---	---
TN-5516-LV-MV	TN-5516-LV-MV-T	16	---	1	---	---	---	1	---
TN-5516-LV-HV	TN-5516-LV-HV-T	16	---	1	---	---	---	---	1
TN-5516-MV-MV	TN-5516-MV-MV-T	16	---	---	1	---	---	1	---
TN-5516-MV-HV	TN-5516-MV-HV-T	16	---	---	1	---	---	---	1
TN-5516-HV-HV	TN-5516-HV-HV-T	16	---	---	---	1	---	---	1
TN-5518 Series									
TN-5518-2GTX-LV-LV	TN-5518-2GTX-LV-LV-T	16	2	1	---	---	1	---	---
TN-5518-2GTX-LV-MV	TN-5518-2GTX-LV-MV-T	16	2	1	---	---	---	1	---
TN-5518-2GTX-LV-HV	TN-5518-2GTX-LV-HV-T	16	2	1	---	---	---	---	1
TN-5518-2GTX-MV-MV	TN-5518-2GTX-MV-MV-T	16	2	---	1	---	---	1	---
TN-5518-2GTX-MV-HV	TN-5518-2GTX-MV-HV-T	16	2	---	1	---	---	---	1
TN-5518-2GTX-HV-HV	TN-5518-2GTX-HV-HV-T	16	2	---	---	1	---	---	1

Optional Accessories (must be purchased separately)

DK-DC50131: DIN-Rail mounting kit, 50 x 131 mm

M-type Connectors and Patch Cords:

- M12 connectors and patch cords
- M23 connectors and patch cords

Circular-type Connectors and Patch Cords:

- Circular RJ45 connectors and patch cords

Coming Soon

TN-5308 Series

Preliminary

8-port M12 unmanaged Ethernet switches

- Universal 12/24/36/48 or 72/96/110 VDC power supply range
- M12 connectors and IP40 metal housing
- Supports IEEE 802.3/802.3u/802.3x
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5308 series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5308 series Ethernet switches provide 8 fast Ethernet M12 ports, support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308 series Ethernet switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: PWR, LNK/ACT

Power Requirements

Input Voltage:
• TN-5308-LV: 12/24/36/48 VDC (7 to 60 VDC)
• TN-5308-MV: 72/96/110 VDC (50.4 to 154 VDC)

Overload Current Protection: Present

Connection:
• TN-5308-LV: M12 A-coding, 5-pin male connector
• TN-5308-MV: M23 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP40 protection

Dimensions:
TN-5308-LV: 60 x 216.6 x 36.1 mm (2.36 x 8.53 x 1.42 in)
TN-5308-MV: 60 x 216.6 x 53.7 mm (2.36 x 8.53 x 2.11 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

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

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

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

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

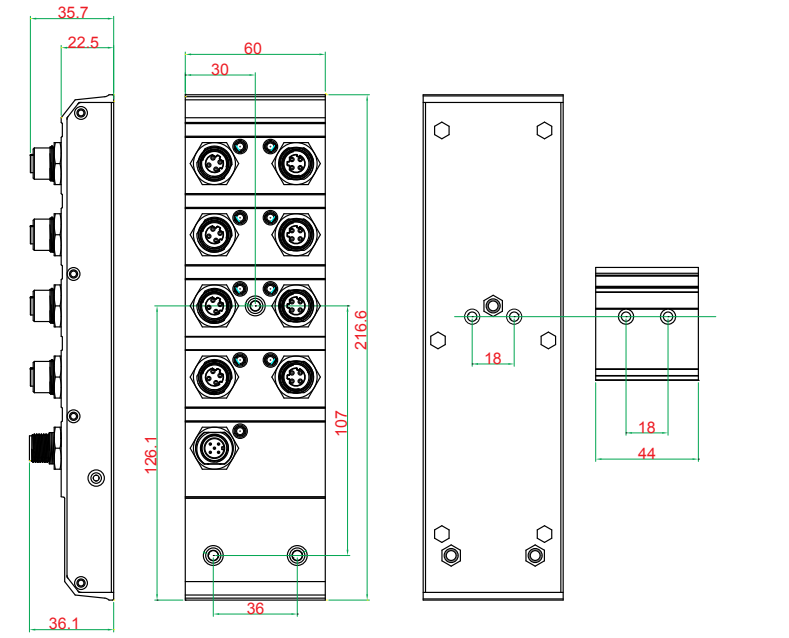
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

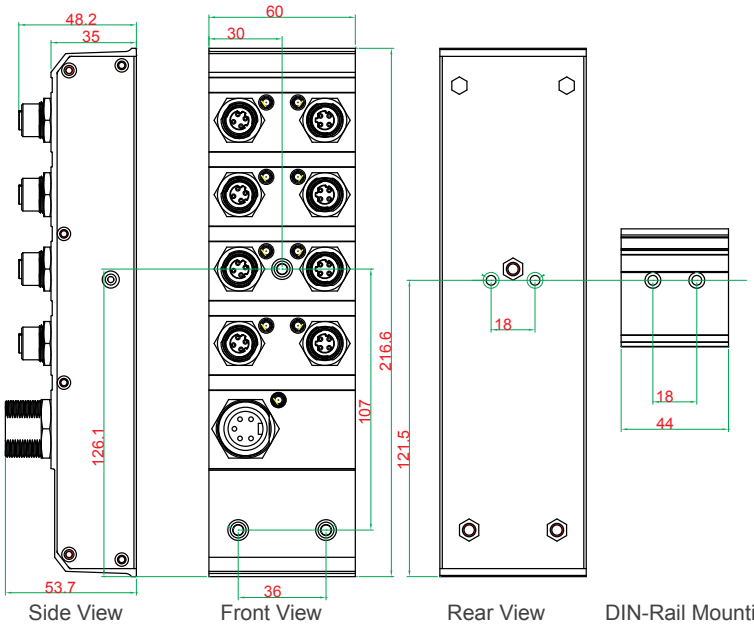
Dimensions (unit = mm)

TN-5308-LV Series



Side View Front View Rear View DIN-Rail Mounting Kit

TN-5308-MV Series



Side View Front View Rear View DIN-Rail Mounting Kit

Ordering Information

Available Models		Power Supply	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	LV	MV
		12/24/36/48 VDC (7 to 60 V)	72/96/110 VDC (50.4 to 154V)
TN-5308-LV	TN-5308-LV-T	√	---
TN-5308-MV	TN-5308-MV-T	---	√

Optional Accessories (must be purchased separately)

DK-44: DIN-Rail mounting kit, 44 x 48.3 mm

Connectors and Patch Cords: M12-type and M23-type

Coming Soon

TN-5308-4PoE Series

Preliminary

8-port M12 IEEE 802.3af PoE unmanaged Ethernet switches

- M12 connectors and IP40 metal housing
- 4 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- EN50155/50121-3-2/50121-4, NEMA TS2, and e1 compliant
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The ToughNet TN-5308-4PoE series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The M12 connectors ensure tight, robust connections, and guarantee reliable operation, even for applications that are subject to high vibration and shock. The TN-5308-4PoE series Ethernet switches provide 8 fast Ethernet M12 ports with 4 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port.

The TN-5308-4PoE switches can be used to power IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The switches support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5308-4PoE switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e1 (vehicles) requirements, making them suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.3af for Power-over-Ethernet

Processing Type: Store and Forward

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

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

LED Indicators: PWR, LNK/ACT, PoE

Power Requirements

Input Voltage: 48 VDC (46 to 50 V)

Overload Current Protection: Present

Connection: M12 A-coding, 5-pin male connector

Reverse Polarity Protection: Present

PoE (per port)

Max. Output Power: 15.4 W

Output Voltage: 44 to 48.5 VDC

Max. Output Current: 350 mA

Max. Overload Protection: 400 mA

Physical Characteristics

Housing: Metal, IP40 protection

Dimensions: 60 x 216.6 x 48.6 mm (2.36 x 8.53 x 1.91 in)

Installation: Panal mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)

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

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

Traffic Control: NEMA TS2 (Pending), e1 (Pending)

Rail Traffic: EN50155 (Environmental, Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)

Shock: IEC61373

Freefall: IEC60068-2-32

Vibration: IEC61373

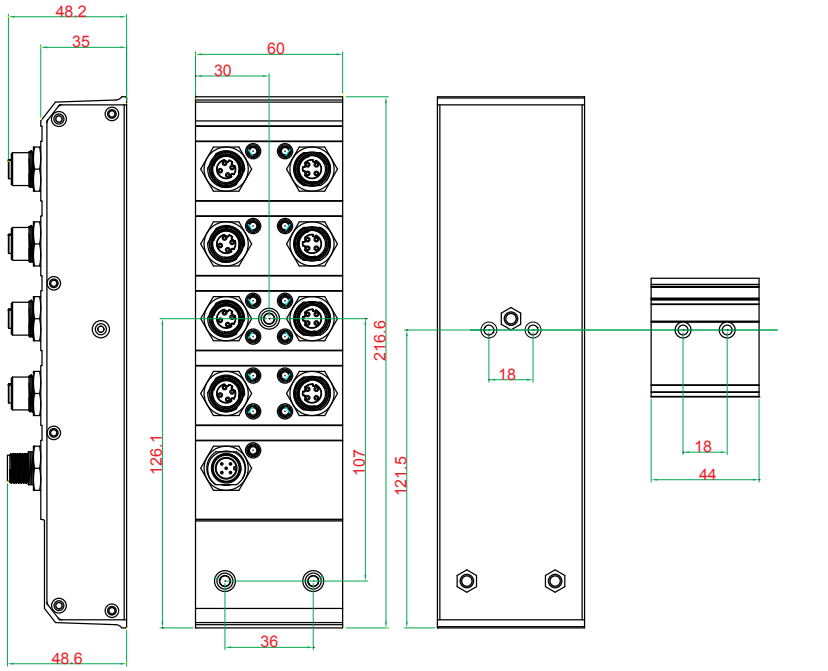
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Available Models		Port Interface	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X)	10/100BaseT(X)
TN-5308-4PoE	TN-5308-4PoE-T	4	4

Optional Accessories (must be purchased separately)

DK-44: DIN-Rail mounting kit, 44 x 48.3 mm
DR-75-48/DR-120-48: 75/120 W DIN-Rail 48 VDC power supplies
Connectors and Patch Cords: M12-type

EDS-305-M12 Series

5-port M12/IP67 unmanaged Ethernet switches

- M12 connectors and IP67 rated case
- 10/100BaseT(X), 4-pin M12 (D-coding), F/H duplex mode, and auto MDI/MDI-X connection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- -40 to 75°C operating temperature range (T models)

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The EDS-305-M12 series Ethernet switches are IP67 rated for the toughest industrial applications, which means that the rugged housing and connectors guard against dust, water, and oil. By using M12 connectors, you can rest assured that Ethernet cables will connect tightly to the switch, and will be robust enough to protect your applications from external disturbances, such as the vibration and shock encountered in the transportation industry. The space-saving EDS-305-M12 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the extremest of conditions.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control

Processing Type: Store and Forward

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

Interface

M12 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

LED Indicators: Power, LNK/ACT

Power Requirements

Input Voltage:
• 12 to 45 VDC
• 18 to 30 VAC (47 to 63 Hz)

Input Current:
• 0.12A @ 24 VDC
• 0.28A @ 24 VAC

Overload Current Protection: 1.1 A (Limited Current)

Connection: 1 M12 socket (A-coding), single power input

Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic, IP67 protection

Dimensions: 60 x 125 x 29.6 mm (2.36 x 4.92 x 1.17 in)

Weight: 250 g

Installation: Field-style mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

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

Regulatory Approvals

Safety: UL508

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

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

Maritime: DNV (Pending), GL (Pending)

Rail Traffic: EN50155 (Environmental), EN50121-4 (Pending), EN50121-3-2 (Pending)

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

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

MTBF (meantime between failures)

Time: 636,000 hrs

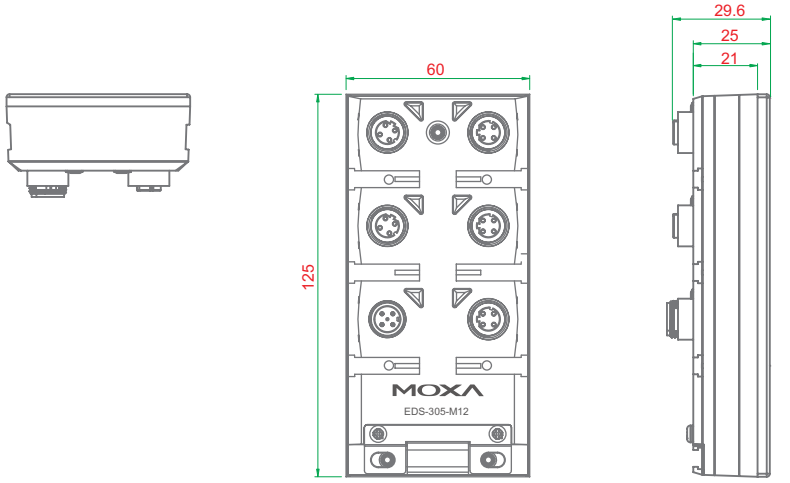
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Top View | Front View | Side View

Ordering Information

Available Models

EDS-305-M12: Industrial M12/IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, 0 to 60°C operating temperature
EDS-305-M12-T: Industrial M12/IP67 unmanaged Ethernet switch with 5 10/100BaseT(X) ports, -40 to 75°C operating temperature

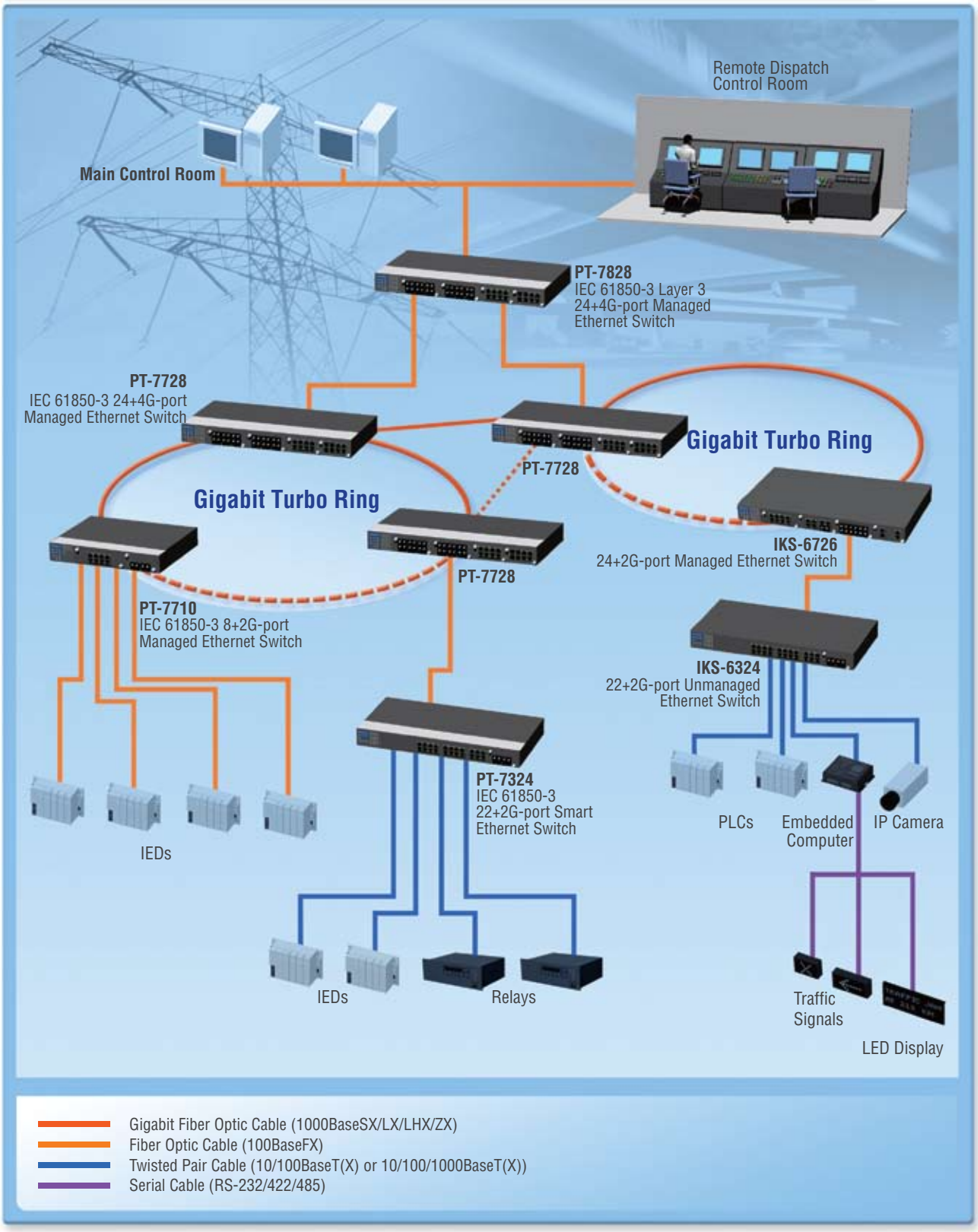
Optional Accessories (can be purchased separately)

DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
DK-M12-305: DIN-Rail mounting kit for the EDS-305-M12 series
M12 Patch Cords and Sensor Connectors:

M12 Patch Cords		
	**CBL-M12D(MM4P)/RJ45-100 IP67**	1-meter M12-to-RJ45 Cat-5E UTP Ethernet cable with waterproof 4-pin D-coded M12 connector
	**CBL-M12(FF5P)/OPEN-100 IP67**	1-meter M12-to-5-pin power cable with waterproof 5-pin A-coded M12 connector
Sensor Connectors		
	**M12D-4P-IP68**	Field-installable D-coded screw-in sensor connector, male
	**M12A-5P-IP68**	Field-installable A-coded screw-in sensor connector, female

Introduction to IEC 61850-3 Rackmount Ethernet Switches

Suitable for All Demanding Power Utility Applications



Tailor-made Rackmount Solutions Fit for a Variety of Applications

Ethernet has already penetrated into the industrial environment, and is now used widely in control rooms, and for connecting controllers and devices on the shop floor. Industrial Ethernet is not only being used in a wide range of vertical markets, but is also finding uses in different facets of each market. For example, IEC 61850-3 industrial Ethernet networks are applied as the physical medium for power substation automation, which means that a host of legacy field buses must be connected to the Ethernet network. The bottom line is that Industrial Ethernet is now the future trend for automation communication systems.

Different vertical markets require different solutions, which is why Moxa developed two distinct rackmount Ethernet switch product lines. The new PowerTrans PT series of IEC 61850-3 rackmount Ethernet switches and the IKS industrial rackmount Ethernet switch series were developed to meet the needs of a variety of applications (see the table at the right).

Two Product Lines for Diverse Applications		
Applications	IEC 61850-3 Substation Rail traffic Road traffic	Power automation Traffic control center Marine & offshore
Certifications Required	IEC 61850-3/IEEE 1613 NEMA TS2 EN50121-4 /EN50155 DNV/GL	NEMA TS2 EN50121-4/EN50155 DNV/GL
Moxa's Solutions	PowerTrans PT series IEC 61850-3 rackmount Ethernet switches	IKS series industrial rack-mount Ethernet switch*

* See Chapter 3 for detailed information about Moxa's IKS series of rackmount Ethernet switches.

Scalable Network Infrastructure Capability

Substation and transportation automation networks can be extremely large and cover expansive territories. Moxa's rackmount Ethernet switches satisfy the scalable network requirements with long-haul fiber solutions from Layer 3 to Layer 2 Ethernet switches.

- The PT-7828 Layer 3 Ethernet switch can divide a large network into hierarchical sub-nets. Controlling network traffic on separate subnets can improve the performance of the entire network.
- The PT-7710, PT-7728, and IKS-6727 are Layer 2 modular managed Ethernet switches that support advanced network management and control functions, including VLAN, QOS, IGMP snooping, LACP, and GMRP to optimize and prioritize network communications.
- The Layer 2 PoE modular managed Ethernet switch IKS-6726-PoE, which supports max. 16 PoE (Power-over-Ethernet) ports. The PoE Ethernet switch provides up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices when AC power is not readily available or cost-prohibitive to provide locally.
- The PT-7324 is a smart Layer 2 Ethernet switch that offers web-smart functions, such as port-based VLAN and QoS, to make network management easier.
- The IKS-6324 series of unmanaged Layer 2 Ethernet switches are reliable plug-and-play Ethernet communication solutions that give users an easy and economical way to connect with end devices.

Note: Please check the "Comparison Chart for Rackmount Ethernet Switches" on page 4-19 for details of features that each product model supports.

Redundancy for Higher Network Availability

Moxa's rackmount Ethernet switches provide multiple levels of redundant features:

Media Redundancy

Managed rackmount Ethernet switches come with the world's fastest Turbo Ring redundancy (20 ms @ 250 switches), and standard STP or RSTP redundant protocol. In addition to a single ring redundancy structure, Turbo Ring also provides multiple ring-coupling functions, such as "Ring Coupling," "Dual Homing," and "Dual Ring."

Power Input Redundancy

Non-stop operation is the key criterion for mission-critical applications. The PT-7728/7828 and IKS-6726 support dual, isolated, redundant power supplies with different power sources (24/48 VDC or 110/220 VAC/VDC input voltage). For example, you can choose 110/200 VAC/VDC as your main power source, and 48 VDC from a battery as your back up power source.

Configuration Redundancy

The ABC-01 backup configuration tool can both save and load configurations automatically when connected to a Moxa managed Ethernet switch. This novel management tool helps reduce downtime, and can be used for fast configuration duplication of large-scale networks.

Rugged Design Suitable for Harsh Environments

The rugged design of the PowerTrans PT and IKS series Ethernet switches make them well-qualified for a diverse number of mission-critical communication applications in the power utility and transportation automation markets.

- 19-inch rack-mountable design to meet the installation needs of substation and traffic control rooms.
- To perform flawlessly in the uncontrolled climates found in utility substations and industrial environments, these rackmount Ethernet switches are designed for fan-less operation in a wide temperature range:
  - All PT series Ethernet switches are designed for use in a -40 to 85°C wide operating temperature range.
  - All IKS series Ethernet switches are designed for use in a -40 to 75°C wide operating temperature range.

Future-proof Flexibility

Up to 4 Gigabit Ports for Backbone and Uplink

As industry adopts bandwidth-hungry applications such as video surveillance, there is a greater need for high bandwidth and fault-tolerant solutions with Gigabit Ethernet equipment. Demand is growing for applications in industrial networks that comprise multiple, interconnected Gigabit backbones among different network centers. Moxa offers a range of Gigabit managed Ethernet solutions that can be used to form a Gigabit backbone that connects to control centers, video-over-IP servers, Ethernet-enabled devices, or other Ethernet switches. These Gigabit Ethernet switches support fault-tolerant rings with fiber-optic ports, allowing operation in the toughest industrial environments.

Gigabit Ethernet is the trend, and we can already see a lot of work stations, HMI/SCADA equipment, and video monitoring panels in control rooms that come standard with a Gigabit Ethernet interface.

Moxa's modular rackmount Ethernet switches come with up to 4 Gigabit combo ports for the PT-7728/7828 series. Other modular Ethernet switches include the managed PT-7710 Ethernet switch, the IKS-6726 Ethernet switch, the smart PT-7324 Ethernet switch, and the unmanaged IKS-6324 Ethernet switch, all of which support 2 Gigabit combo ports. Any combination of twisted pair and fiber optic ports can be chosen to form a redundant Gigabit Turbo Ring or connected to a Gigabit HMI/SCADA in the control room.

Media Configuration Flexibility

The PT and IKS series of modular Ethernet switches supports different numbers of Gigabit and fast Ethernet interface modules, which allow users to choose from a variety of copper/fiber media combinations.

The modular design benefits users in three ways:

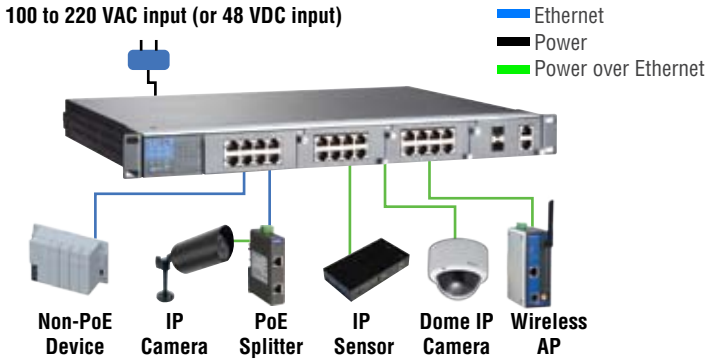
- Higher flexibility for system design and fast network changes
- Easy maintenance and lower cost of spare parts
- Reduced cost of future upgrade

Cabling Flexibility

Moxa's rackmount Ethernet switches provide two options of cabling direction. Front cabling is ideal for maintenance, whereas rear cabling is neater and results in an arrangement that is safer in the event that a cable gets disconnected.

Power-Over-Ethernet Solutions for Rackmount Applications

The IKS-6726-PoE switch comes standard with up to 16 10/100BaseT(X) PoE ports and 2 Gigabit Ethernet ports, making it suitable for applications such as power facility security, where up to 16 IP cameras or IO sensors can be connected to a single IKS-6726-PoE rackmount switch. Gigabit Ethernet and fiber optic ports are supported to secure remote, high bandwidth transmission to the control center. The unique combination of dual redundant power supplies, -40 to 75°C operating temperature range, and Moxa Turbo Ring redundancy ensures high network availability if a link or device fails.



Certifications to Ensure Reliable Operation

Power Substation Certifications

IEC 61850-3

IEC 61850-3 specifically addresses immunity from certain environmental conditions and electromagnetic interference (EMI) for communication networks and systems in substations. The EMI immunity requirements are based on IEC 61000-6-5, which establishes performance criteria for key functions within the substation. To be compliant with the standard, critical functions, such as protection relay

and control functions, on-line processing and regulation, as well as metering and network communication, must experience no delays or data loss when exposed to various EMI phenomena.

IEEE 1613

IEEE 1613 is another industry standard that establishes EMI immunity requirements for networking devices in electric power substations. Included in this standard are ratings, environmental performance requirements, and testing requirements for compliant communication devices.

According to the IEEE 1613 standard, compliant devices may not experience permanent damage under EMI stress. Two different classes of devices are defined in the standard according to how EMI stress affects performance.

Class 1

Compliant devices in this class may experience some data errors, losses, or delays under EMI stress conditions.

Class 2

Compliant devices in this class must not experience any data errors, delays, or losses under EMI stress conditions.

The PowerTrans PT series is compliant with IEC 61850-3 and IEEE 1613 certifications specifying a high level of EMC, shock, and vibration in power substations.

Road Traffic Control System Standard

NEMA TS2

The National Electrical Manufacturers Association (NEMA) established the TS1 standard to define technically adequate and safe traffic control equipment. The TS2 standard was later introduced to address some drawbacks of the original guidelines. NEMA TS2 defines controllers, cabinets, and systems more completely than TS1, promotes better interchangeability, and allows for future expansion. Section 2 contains the environmental and testing requirements, including guidelines for temperature, humidity, voltage, vibration, and shock. PT series and IKS series switches are compliant with the NEMA TS2 traffic control system standard.

Test	NEMA TS2
Temperature	-34 to 74°C
Humidity	18% to 90% RH, non-condensing
Voltage	120 to 135 VAC @ 57 to 63 Hz
Vibration	0.5 g @ 5 to 30 Hz
Shock	10 g's for 11 ms

Railway Control System Standards

EN50121-4

EN50121-4 defines emission and immunity standards for signaling and telecommunication apparatus.

EN50155

The complete PT and IKS series are certified according to the EN50155 ensuring safe deployment for railway applications.

Comparison Chart for Rackmount Ethernet Switches

	Port Interfaces				Certifications				Features											
Model	Total Number of Ports	Gigabit Ethernet (10/100/1000 Mbps)	Fast Ethernet (10/100 Mbps)	PoE, Fast Ethernet (10/100 Mbps)	IEC 61850-3, IEEE 1613	NEMA TS2	EN50155/EN50121-4	DNV/GL	Layer 3 Switching	Turbo Ring and RSTP/STP	IGMP snooping/GMRP	Port Trunking	IEEE 802.1X/HTTPS/SSH	Port Lock	SNMP/RMON	802.1Q VLAN	Port-based VLAN	QoS	Isolated Redundant Power	ABC-01*
PT-7828	28	4	24	---	√	√	√	P	√	√	√	√	√	√	√	√	---	√	√	√
PT-7728	28	4	24	---	√	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
PT-7710	10	2	8	---	√	√	√	P	---	√	√	√	√	√	√	√	√	√	---	√
PT-7324	24	2	22	---	√	√	√	P	---	---	---	---	---	---	---	---	√	√	---	---
IKS-6726	26	2	24	---	---	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
IKS-6726-PoE	26	2	8	16	---	√	√	P	---	√	√	√	√	√	√	√	---	√	√	√
IKS-6324	24	2	22	---	---	√	√	P	---	---	---	---	---	---	---	---	---	---	---	---

√ = Available P = Pending Note: Please check Moxa's website for the most up-to-date certification status.

(All products listed support a wide operating temperature range: -40 to 85°C for the PT series, and -40 to 75°C for the IKS series.)
*ABC-01 is an RS-232 RJ45-based automatic backup configurator for managed Ethernet Switches. See page 3-48 for details.

PT-7828 Series

IEC 61850-3 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches

- Layer 3 routing interconnects multiple LAN segments
- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Modular design for various media options: RJ45, fiber optic, M12, and SFP ports
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7828 switches are high performance Layer 3 Ethernet switches that support Layer 3 routing functionality to facilitate the deployment of applications across networks. The PT-7828 switches are also designed to meet the strict demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4).

The PT-7828's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the PT-7828 makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Optional front or rear wiring makes the PT-7828 switches suitable for a variety of applications.

Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP 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 to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, RIP V1/V2, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, DVMRP, PIM-DM, VRRP for router redundancy

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 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

Fast Ethernet: Slots 1, 2, and 3 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 24 VDC (18 to 36 V)
- 48 VDC (36 to 72 V)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 2.58 A @ 24 VDC
- Max. 1.21 A @ 48 VDC
- Max. 0.64/0.33 A @ 110/220 VDC
- Max. 0.53/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 5900 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C

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

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

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

Shock: IEC 60068-2-27

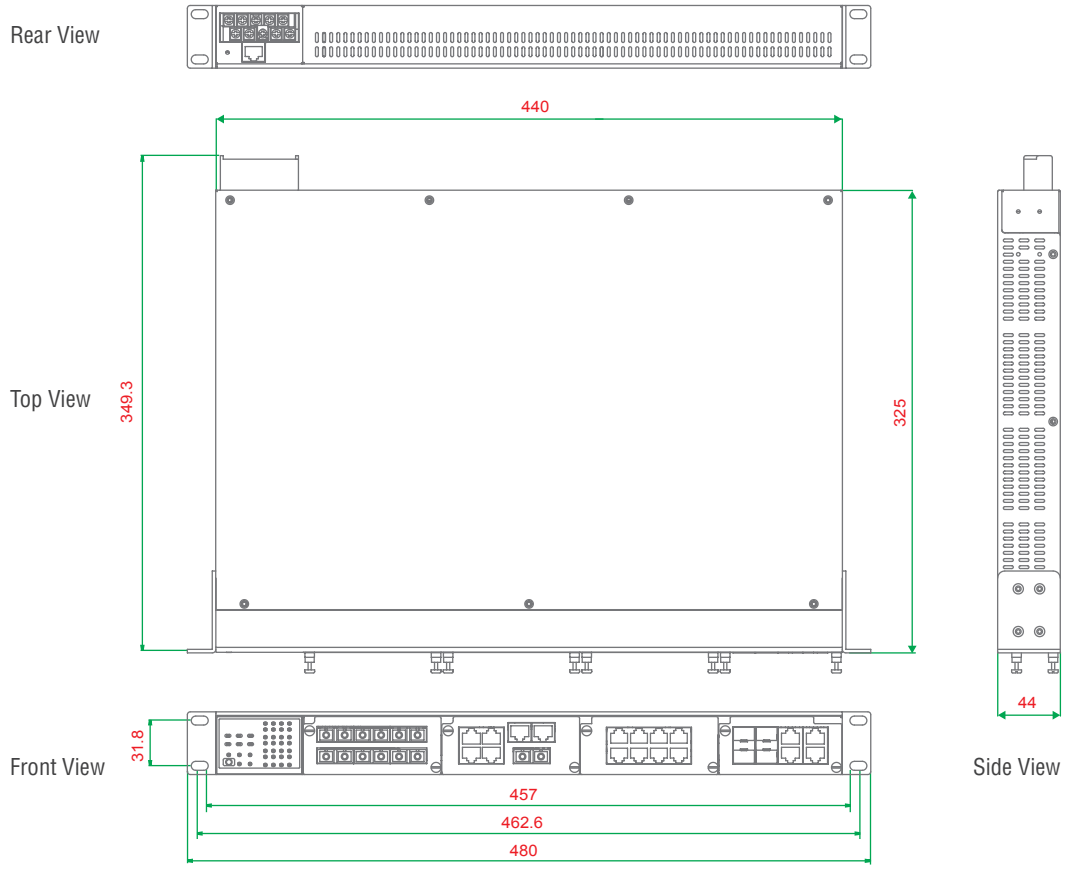
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system → **PT-7828 with power supply**

Step 2: Select interface modules → **PM-7200 module (Gigabit or fast Ethernet)**

Note: The PT-7828 Ethernet switch system is delivered without interface modules. See page 4-31 to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 18 Layer 3 modular managed rackmount Ethernet switch systems, each with 3 slots for fast Ethernet modules and 1 slot for a Gigabit Ethernet module. A total of 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7828-F-24	PT-7828-R-24	1	---	---	---	---	---
PT-7828-F-24-24	PT-7828-R-24-24	1	---	---	1	---	---
PT-7828-F-24-48	PT-7828-R-24-48	1	---	---	---	1	---
PT-7828-F-24-HV	PT-7828-R-24-HV	1	---	---	---	---	1
PT-7828-F-48	PT-7828-R-48	---	1	---	---	---	---
PT-7828-F-48-48	PT-7828-R-48-48	---	1	---	---	1	---
PT-7828-F-48-HV	PT-7828-R-48-HV	---	1	---	---	---	1
PT-7828-F-HV	PT-7828-R-HV	---	---	1	---	---	---
PT-7828-F-HV-HV	PT-7828-R-HV-HV	---	---	1	---	---	1

Note: The PT-7828 Layer 3 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface module and 3 slots for fast Ethernet interface modules. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules for your own application.

PT-7828-F series
(Front Cabling, Front Display)

PT-7828-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7828

	Interface Module																							
Product Model	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 4	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7728 Series

IEC 61850-3 24+4G-port Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet Redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- Modular design lets you choose from a variety of media combinations
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7728's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP 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 limits access to authorized MAC addresses only
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01 automatic backup configurator

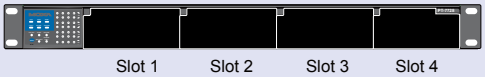
Specifications

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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6

Modular Rackmount Ethernet Switch System, PT-7728



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

Fast Ethernet: Slots 1, 2, and 3 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 24 VDC (18 to 36 V)
- 48 VDC (36 to 72 V)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 2.58 A @ 24 VDC
- Max. 1.21 A @ 48 VDC
- Max. 0.64/0.33 A @ 110/220 VDC
- Max. 0.53/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 5900 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C

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

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

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

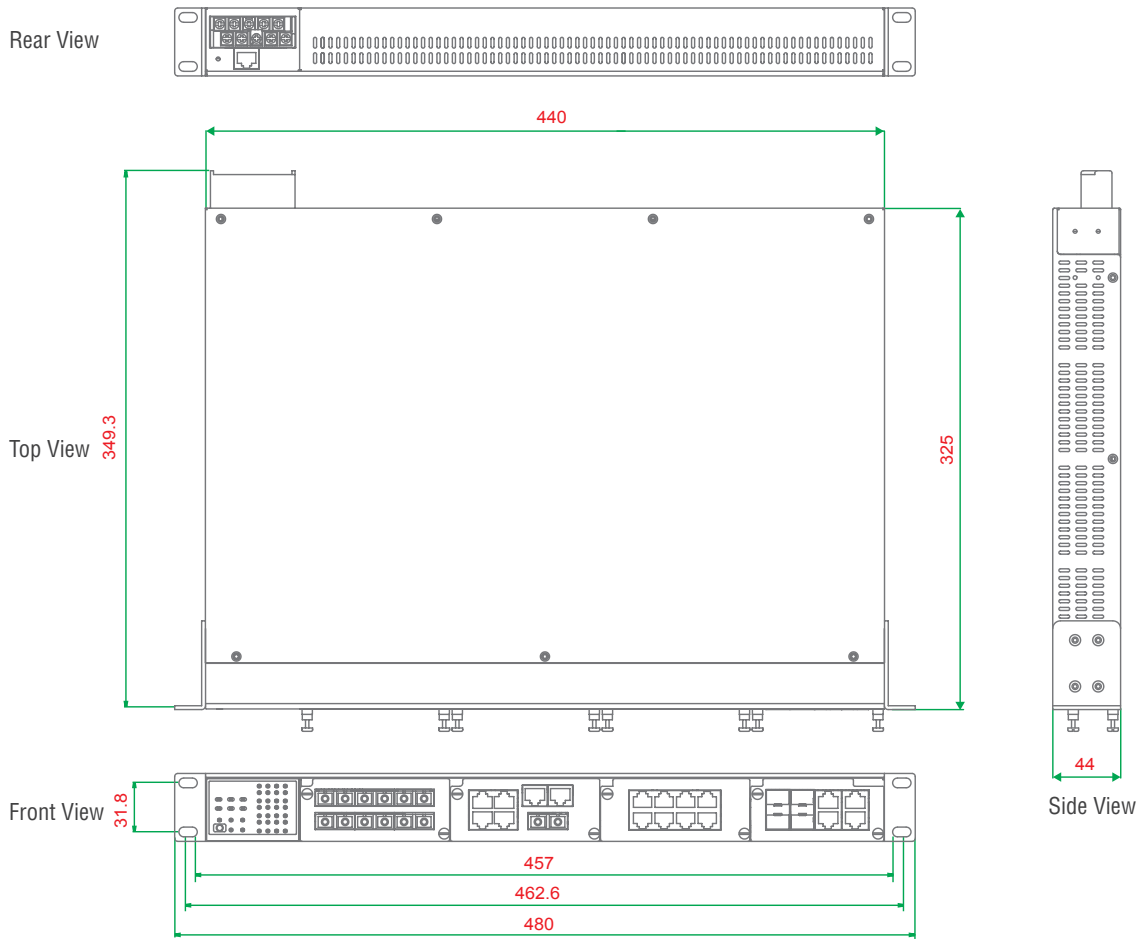
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 18 modular managed rackmount Ethernet switch systems with 3 slots for fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7728-F-24	PT-7728-R-24	1	---	---	---	---	---
PT-7728-F-24-24	PT-7728-R-24-24	1	---	---	1	---	---
PT-7728-F-24-48	PT-7728-R-24-48	1	---	---	---	1	---
PT-7728-F-24-HV	PT-7728-R-24-HV	1	---	---	---	---	1
PT-7728-F-48	PT-7728-R-48	---	1	---	---	---	---
PT-7728-F-48-48	PT-7728-R-48-48	---	1	---	---	1	---
PT-7728-F-48-HV	PT-7728-R-48-HV	---	1	---	---	---	1
PT-7728-F-HV	PT-7728-R-HV	---	---	1	---	---	---
PT-7728-F-HV-HV	PT-7728-R-HV-HV	---	---	1	---	---	1

Note: The PT-7728 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface modules and 3 slots for fast Ethernet interface modules. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7728-F series
(Front Cabling, Front Display)

PT-7728-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7728

Product Model	Interface Module																								
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 3	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 4	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7710 Series

IEC 61850-3 8+2G-port Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Turbo Ring and RSTP/STP for Ethernet redundancy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- Modular design lets you choose from a variety of media combinations
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7710's Gigabit and fast Ethernet backbone, redundant ring, and 12/24/48 VDC dual redundant power supplies or 110/220 VDC/VAC power supplies increase the reliability of the communications and reduce cabling and wiring costs. The modular design of the PT-7710 makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 8 fast Ethernet ports, or 10 fast Ethernet ports.

Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP 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 to limit access to authorized MAC addresses only
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

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 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6

Modular Rackmount Ethernet Switch System, PT-7710

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

Fast Ethernet: Slot 1 for any combination of 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST connector), or 100BaseSFP; Slot 2 for 1 or 2-port interface modules with 100BaseFX (SC/ST connector)

Gigabit Ethernet: Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module with 10/100/1000BaseT(X) or 1000BaseSFP slots

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

Module LED Indicators: LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
- 12/24/48 VDC (9 to 60 V)
- 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
- Max. 0.81 A @ 24 VDC
- Max. 0.42 A @ 48 VDC
- Max. 0.17/0.10 A @ 110/220 VDC
- Max. 0.20/0.12 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 266.7 x 44 x 195 mm (10.5 x 1.73 x 7.68 in)

Weight: 2200 g

Installation: 19'' rack mounting

Environmental Limits

Operating Temperature: -40 to 85°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: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

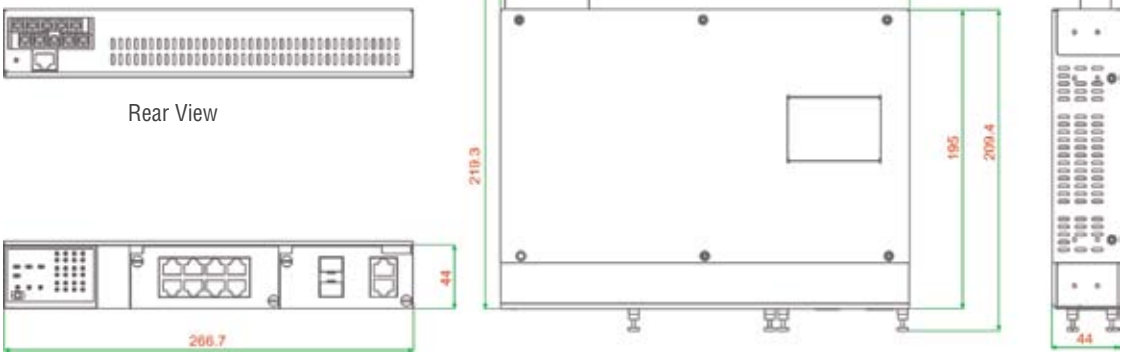
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Rear View | Front View | Top View | Side View

Ordering Information

Step 1: Select Ethernet switch system → **Step 2: Select interface modules**

PT-7710 with power supply → **PM-7200 modules (Gigabit or fast Ethernet)**

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount Ethernet switch systems with 1 slot for a fast Ethernet module, and 1 slot for a fast Ethernet or Gigabit Ethernet module. A total of 10 or 8+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply	
Rackmounting, Front Cabling, Front Display	Wall mounting, Down Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7710-F-LV	PT-7710-D-LV	1	---
PT-7710-F-HV	PT-7710-D-HV	---	1

Note: The PT-7710 Ethernet switch systems provide 1 slot for a Gigabit Ethernet interface module and 1 slot for a fast Ethernet interface module. See page 4-31 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rackmounting, Front Cabling, Front Display)

PT-7710-D series
(Wall mounting, Down Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7710

	Interface Module																							
Product Model	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	---	---	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
Slot 2	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PT-7324 Series

IEC 61850-3 22+2G-port Gigabit smart rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- Port-based VLAN to enhance security/network performance
- 802.1p priority queues, port-based QoS
- Smart web-based management makes configuration easy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- -40 to 85°C operating temperature range

The certification logos shown here apply to some or all of the products in this section. For details, see "Regulatory Approvals" under "Specifications" below.

Introduction

The PowerTrans PT-7324 smart Ethernet switch is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7324 is also equipped with smart "Class of Service" features suitable for multimedia applications, and port-based VLAN features that can be used to segment your network without being restricted by physical connections. If you do not want to receive too many broadcast packets, the broadcast storm filtering feature will discard broadcast packets if the number of such packets exceeds a threshold in a preset period of time.

Features and Benefits

- Port-based VLAN to ease network planning
- 802.1p priority queues and port-based QoS to increase determinism
- Broadcast storm filtering

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 802.1p for Class of Service

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

Switch Properties

Priority Queues: 2

Max. Number of Available VLANs: 24

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX (SC/ST connector) or 1000BaseSFP slots

LED Indicators: STAT, PWR1, PWR2, FAULT, LNK/ACT, FDX/HDX, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Note: Slot 1 for a 2-port PM-7200 Gigabit Ethernet combo module, or 1 or 2-port PM-7200 fast Ethernet module.

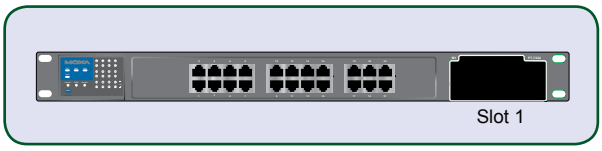
Power Requirements

Input Voltage:
• 12/24/48 VDC (9 to 60 V)
• 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

Input Current: (all ports are equipped with fiber)
• Max. 0.68 A @ 24 VDC
• Max. 0.35 A @ 48 VDC
• Max. 0.17/0.11 A @ 110/220 VDC
• Max. 0.33/0.23 A @ 110/220 VAC

Overload Current Protection: Present

Smart Rackmount Ethernet Switch System, PT-7324



Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)

Weight: 3300 g

Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°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: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1 (Pending)

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

Power Automation: IEC 61850-3, IEEE 1613

Maritime: DNV (Pending), GL (Pending)

Traffic Control: NEMA TS2

Rail Traffic: EN50155/EN50121-4

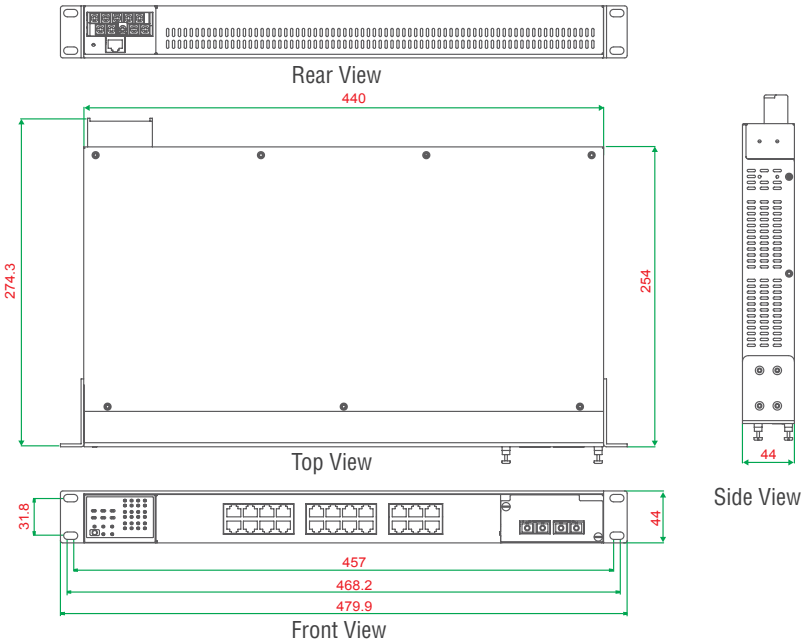
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions (unit = mm)



Ordering Information

Step 1: Select Ethernet switch system **Step 2: Select interface modules**

PT-7324 with power supply → **PM-7200 modules (Gigabit or fast Ethernet)**

Note: The PT-7324 Ethernet switch system is delivered without interface module. See page 4-31 to choose PM-7200 interface modules.

PT-7324 Smart Rackmount Ethernet Switch System

The PT-7324 switch system consists of 4 smart rackmount Ethernet switch systems with 22 10/100BaseT(X) ports, and 1 slot for a fast Ethernet or Gigabit Ethernet module. A total of 24 or 22+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply	
Front Cabling, Front Display	Rear Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7324-F-LV	PT-7324-R-LV	1	---
PT-7324-F-HV	PT-7324-R-HV	---	1

Note: The PT-7324 Ethernet switch systems provide 1 slot for a Gigabit Ethernet or fast Ethernet interface module. See page 4-31 to select the PM-7200 series Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7324-F series
(Front Cabling, Front Display)

PT-7324-R series
(Rear Cabling, Front Display)

Gigabit/Fast Ethernet Modules for the PT-7324

	Interface Modules						
	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-1SSC	PM-7200-2MSC	PM-7200-2MST	PM-7200-2SSC
Slot 1	√	√	√	√	√	√	√

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

Specifications

Gigabit Ethernet Interface Modules, PM-7200-2G/4G series


PM-7200-4GTXSFP


PM-7200-2GTXSFP

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 3-45 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series


PM-7200-8TX


PM-7200-6MSC
PM-7200-6SSC


PM-7200-6MST


PM-7200-4MSC2TX
PM-7200-4SSC2TX


PM-7200-4MST2TX


PM-7200-2MSC4TX
PM-7200-2SSC4TX


PM-7200-2MST4TX


PM-7200-1LSC6TX


PM-7200-2MSC
PM-7200-2SSC


PM-7200-2MST


PM-7200-1MSC
PM-7200-1SSC


PM-7200-1MST


PM-7200-1MST6TX


PM-7200-1MSC6TX
PM-7200-1SSC6TX

NEW


PM-7200-8PoE

NEW


PM-7200-8SFP

NEW


PM-7200-4M12

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 or SFP LC connector)

PoE Ports: IEEE 802.3af Power-over-Ethernet Technology, provide up to 15.4 watts per port

M12 ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

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 single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Product Model	Interface Modules																							
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1MSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1LSC6TX	PM-7200-8PoE	PM-7200-8SFP*	PM-7200-4M12
PT-7828	√	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7728	√	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7710	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
PT-7324	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
IKS-6726	---	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	---	√	√
IKS-6726-PoE	---	√	---	---	---	---	---	---	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
IKS-6324	---	√	√	√	√	√	√	√	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* If you are using an SFP-1FELLC module, the operating temperature is limited to -40 to 75°C (-40 to 167°F).

Gigabit Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4

*The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 3-45 for SFP-1G series Gigabit Ethernet SFP module information.

Fast Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200 Series

Available Models	Port Interface							
	10/100BaseT(X)			100BaseFX				100BaseSFP
	TP	PoE	M12	Multi-mode, SC Connector	Multi-mode, ST Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km	
PM-7200-8TX	8	---	---	---	---	---	---	---
PM-7200-6MSC	---	---	---	6	---	---	---	---
PM-7200-6MST	---	---	---	---	6	---	---	---
PM-7200-6SSC	---	---	---	---	---	6	---	---
PM-7200-4MSC2TX	2	---	---	4	---	---	---	---
PM-7200-4MST2TX	2	---	---	---	4	---	---	---
PM-7200-4SSC2TX	2	---	---	---	---	4	---	---
PM-7200-2MSC4TX	4	---	---	2	---	---	---	---
PM-7200-2MST4TX	4	---	---	---	2	---	---	---
PM-7200-2SSC4TX	4	---	---	---	---	2	---	---
PM-7200-1LSC6TX	6	---	---	---	---	---	1	---
PM-7200-2MSC	---	---	---	2	---	---	---	---
PM-7200-2MST	---	---	---	---	2	---	---	---
PM-7200-2SSC	---	---	---	---	---	2	---	---
PM-7200-1MSC	---	---	---	1	---	---	---	---
PM-7200-1MST	---	---	---	---	1	---	---	---
PM-7200-1SSC	---	---	---	---	---	1	---	---
PM-7200-1MSC6TX	6	---	---	1	---	---	---	---
PM-7200-1MST6TX	6	---	---	---	1	---	---	---
PM-7200-1SSC6TX	6	---	---	---	---	1	---	---
PM-7200-8PoE	---	8	---	---	---	---	---	---
PM-7200-8SFP	---	---	---	---	---	---	---	8
PM-7200-4M12	---	---	4	---	---	---	---	---