Master Catalog

2016-2017

Enabling Connectivity for the Industrial Internet of Things

• Edge Connectivity • Industrial Computing • Network Infrastructure

MOXA®

Reliable Networks ▲ Sincere Service

Moxa: Your Trusted Partner in Automation

As the Industrial Internet of Things (IoT) interconnects our world faster than ever, we rely more than ever on network infrastructures. Since its establishment in 1987, Moxa has had a proven track record of providing customers with the most reliable networks for a variety of industrial applications.

With over 25 years of industry experience, Moxa has connected more than 40 million devices worldwide. These devices have delivered highly reliable communications between people, systems, and processes to achieve all forms of automation and collaboration.

Promise for the Future

Reliable Networks, Sincere Service continues to be Moxa's promise to enable connectivity for the Industrial IoT. Moxa stays ahead of the curve with innovative Ethernet-core technology and solutions to help customers tap into the potential of the Industrial IoT market.

Reliable Networks

Network reliability is the cornerstone of Moxa's commitment to deliver the best value to our customers and partners. Moxa's many solutions share a common set of robust features designed to provide maximum network uptime, especially in harsh environments. Our cutting-edge product portfolio comprises quality and innovative technology to ensure nonstop productivity, operational efficiency, and robust security for complex industrial communications and automation applications.

Sincere Service

At Moxa, we listen carefully to learn more about our customers' expectations and needs before we develop a solution. With extensive experience and innovative technology, we provide premium customization, expert network consulting, and a broad range of technical support services. Through close collaboration with our worldwide partners, we help customers optimize their applications' performance, adapt to fast-changing technologies, and seize opportunities to achieve the best time-to-market results.

Product Offerings

Edge Connectivity

Moxa's edge connectivity products bridge various industrial devices to streamline the acquisition and transmission of data, voice, and video to backbone networks. Customers can enjoy seamless network integration for various cross-system collaborations.

- Serial connectivity
- Industrial Ethernet gateways
- RTU controllers and smart I/O devices
- Industrial IP cameras and video management software

Industrial Computing

Moxa provides RISC- and x86-based industrial computers to work in the most demanding conditions. The world's first wide-temperature-range 4G LTE computer is a perfect example of a device that delivers reliable 4G performance without requiring a fan or a heater.

- Mission-critical computers
- Displays and panel computers
- Compact and wireless computers
- Embedded CPU modules

Network Infrastructure

Moxa's network infrastructure solutions provide comprehensive building blocks to develop robust wired and wireless backbones for mission-critical applications with regard to device reliability, connection availability, cybersecurity, and easy management.

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular routers
- Industrial secure routers
- Ethernet media converters
- Network management software

Get Connected to Success and Opportunity

Worldwide, Moxa's expert sales team is ready to provide the best quality, support, and services to assist you in all aspects of your projects—from concept to completion—to empower your network operations and applications.

Global Service Coverage

Customer-Oriented Service

Moxa has established a global service network to be closer to our customers to better understand their needs and respond faster to their requirements. Leveraging Moxa's industrial experiences and technological intelligence, our service team provides professional solutions and consulting services, backed by our extensive global resources and solution capabilities.

Extended Teamwork

Through our annual MTSC (Moxa Technical Support Certification) training, Moxa provides the most up-to-date solutions and technologies to our global partners to ensure the best service to customers. Integrating the strengths of our worldwide industry and technology partners, we deliver sincere service and an extended range of innovative solutions to customers.

Total Quality Management

Our commitment to quality is at the heart of Moxa's promise of *Reliable Networks, Sincere Service.* Moxa employs a corporate-wide Total Quality Management System (TQMS) to achieve customer satisfaction and unbeatable results in the following categories:

Robust Technology

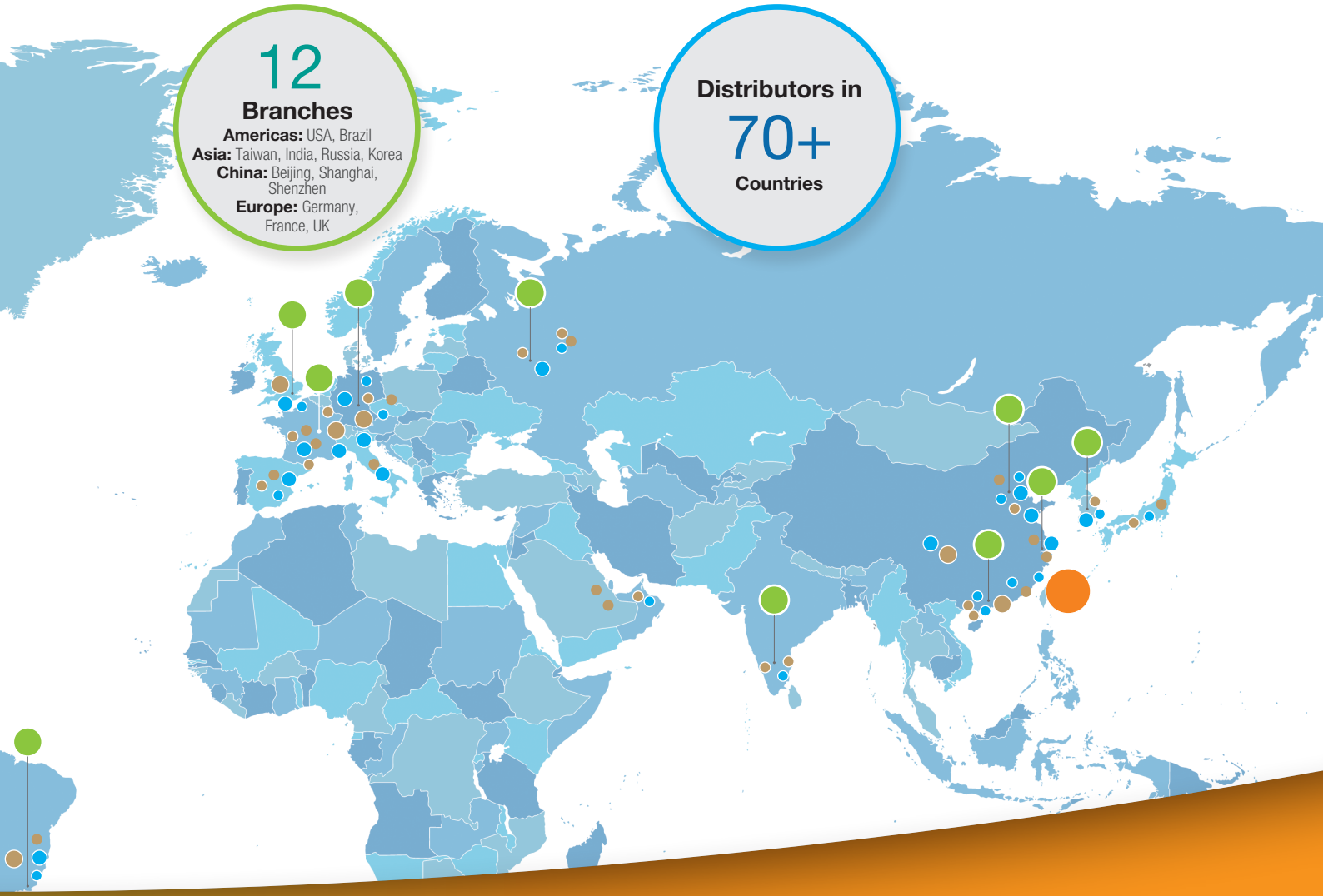
At Moxa, quality starts with concepts that benefit our partners and customers. Moxa attracts a broad spectrum of talent and encourages new ideas to nurture innovation at every level. Following the well-defined New Product Development Process (NPDP), all of Moxa's products must undergo strict tests, verifications, and validations to achieve tangible quality-related benchmarks for various industrial applications.

Project Life-Cycle Management

Moxa is IRIS-certified and implements a rigorous management process to ensure quality and optimal results for long-term projects. Specific RAMS and LCC management guidelines guarantee reliability, longevity, low life-cycle costs, and easy maintenance throughout a project's lifetime.

Continuous Improvement

Moxa motivates each employee to work smarter and find ways for continuous improvement. Our Quality Improvement Team (QIT) and Eight Disciplines Problem-Solving (8D) methodology for solving problems and preventing crises promote continuous progress in the quality of our products, service, and technology, to ensure customer satisfaction.



Technological Innovation

Moxa cultivates continuous technological innovation to meet the constantly changing requirements of industrial environments. To enable the most capable and reliable connectivity required for the Industrial IoT, Moxa strives to achieve application-driven innovations in the following aspects.

■ Performance
High-speed wired/wireless connectivity for future-proof networks

■ Reliability
Proven reliability for continuous productivity

■ Availability
Millisecond-level redundancy for nonstop operations

■ Security
Industrial cybersecurity for critical device protection and secure remote access

■ Manageability
Easy operations in deployment, monitoring, and diagnostics maintenance

■ Interoperability
Leading legacy and versatile fieldbus technologies for seamless automation communication

Industrial Ethernet

Industrial Wireless

Device Connectivity

Remote Automation

IP Surveillance

Industrial Computing

Enabling Connectivity for the Industrial Internet of Things

Moxa's industrial network and automation solutions are ready to take connectivity to new frontiers. With a forecast of more than 50 billion devices connected worldwide by 2020, Moxa focuses on connectivity enablement to expand communication and collaboration between various devices, technologies, and people.

Edge Connectivity

Serial/Fieldbus Connectivity

Serial or fieldbus connectivity bridges legacy, fieldbus, and Ethernet devices to reap the benefits of legacy-to-IP communications and operational efficiency.

I/O Connectivity

Industrial I/Os and controllers enable faster data transfer and SCADA response, as well as programming-free logic control.

Video Connectivity

Extreme weather IP cameras activate 360-degree HD surveillance for extreme applications.

Smart Value for Your Applications

Through our fully converged communication solutions, Moxa helps customers build remote control and monitoring networks suited for highly automated industrial operations and demanding public-safety applications.

Powering Productivity

Our cutting-edge product portfolio delivers superior performance thanks to high bandwidth, reliability, availability, and interoperability in mixed-protocol and legacy environments.

- High-speed transmission
- Maximum uptime and availability
- Video always-on networking
- Reliable mobile communications
- Industry-proven reliability
- Legacy compatibility
- Protocol interoperability

Optimizing Operational Efficiency

Moxa's extensive software solutions are the key to operational efficiency, including intuitive management software for operations that are faster and less error-prone, as well as an API platform for faster development and ease-of-use.

- Faster deployment
- Visualized management
- Easier troubleshooting
- Preventive maintenance
- APIs for easy application deployment
- Seamless integration with SCADA systems

Strengthening Security

A convergence of cybersecurity and physical security systems forge a reinforced network to ensure the full protection of control systems and staff safety in industrial applications.

- Device security with authentication, integrity, and firewall protection
- Secure remote access with IPSec, L2TP, or OpenVPN encryption
- IEC 62443 standard compliance *(Available in Q4, 2016)*
- Industrial-grade IP surveillance systems

Factory Automation

Moxa's factory automation solutions are designed to drive productivity and cost reduction through network convergence from the edge to the core. The solutions deliver optimized process integration and automation-friendly management to improve throughput and performance.

Industrial Computing

Industrial Computers

Embedded computers enable seamless data aggregation, analytics, and reporting from the extreme edge to the cloud/core.

Network Infrastructure

Industrial Ethernet

Industrial Wireless

Industrial Ethernet and WLAN solutions offer leading performance, availability, and reliability to achieve maximum uptime and efficiency for wired and wireless connectivity.

Industrial Routers

Industrial secure and cellular routers enable asset protection and secure access across public networks.

Management

IA-friendly device management and network management address easy deployment, supervision, troubleshooting, and seamless collaboration with SCADA and third-party platforms.

Railway Automation

Moxa's IRIS-certified railway solutions come with the top-notch service, quality, and commitment that industrial customers demand. Moxa's railway solutions deliver EN 50155-compliant control and communications between train, ground, and trackside to ensure safety and uninterrupted passenger services.

Power Automation

Moxa has delivered solutions in more than 300 successful substation networking and computing applications. Moxa's solutions ensure GOOSE compliance and zero-packet-loss performance in compliance with IEC 61850-3 and IEEE 1613 standards.

Oil and Gas Automation

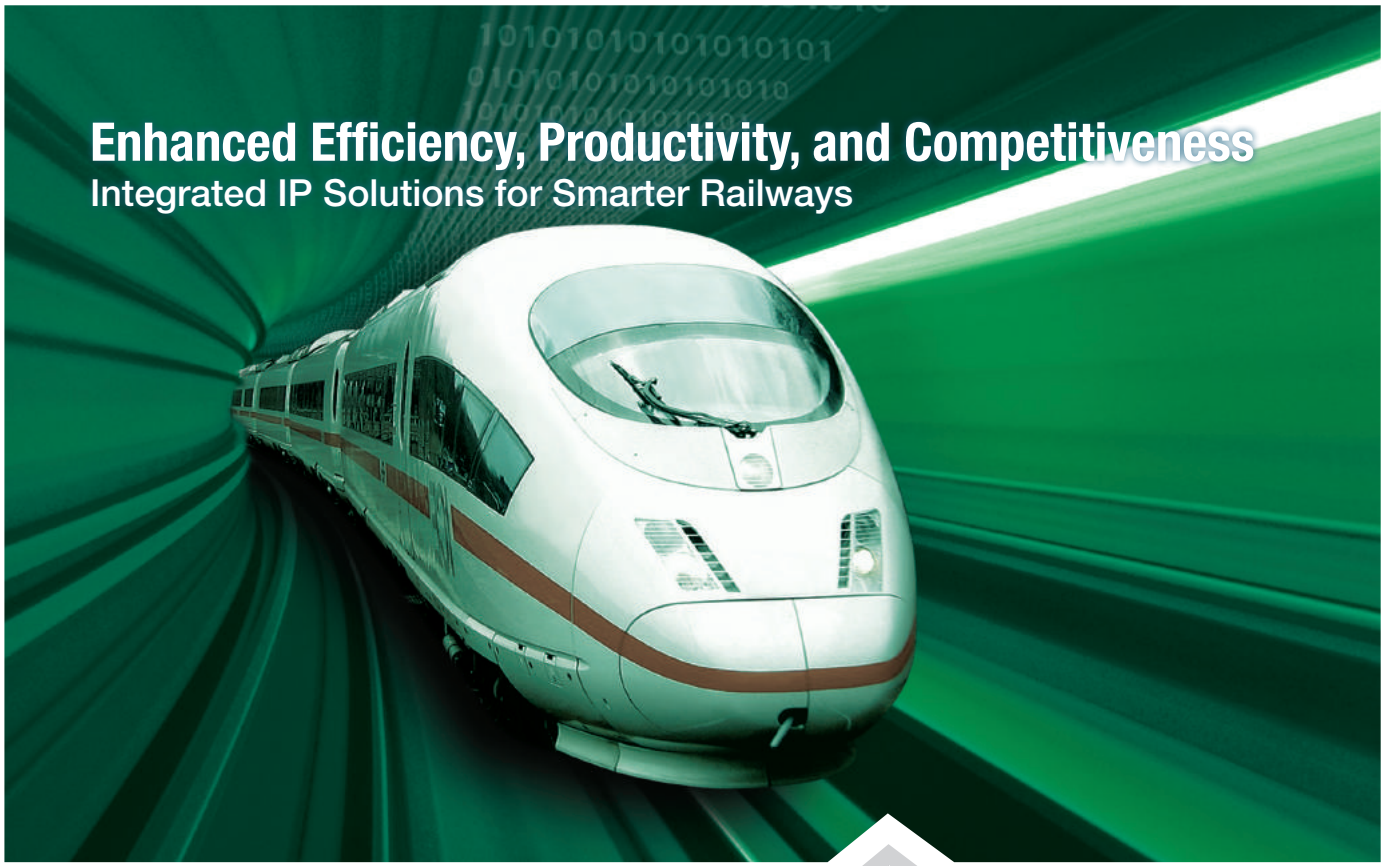
Moxa's oil and gas automation solutions comply with UL Class 1 Division 2, ATEX Zone 2, and IECEx standards, allowing customers to achieve maximum uptime and improved productivity with our oil and gas networking, monitoring, and computing solution portfolio.

Marine Automation

Moxa's marine solutions, compliant with all major maritime certifications, offer a wide range of marine-grade industrial Ethernet and computer products that ensure long-lasting and reliable operations in the challenging environments experienced by ship, offshore oil and gas, and windmill applications.

Intelligent Transportation Systems

Moxa's ITS solutions combine high-bandwidth networks and HD IP video solutions to ensure fast information convergence and nonstop operational continuity, allowing traffic control managers to make decisions quickly in the event of road traffic emergencies.



IRIS-Certified Rail Solutions Verified for Maximum Quality

Moxa is an IRIS-certified global leader in a wide range of IP-based communications solutions. Now, Moxa is contributing its networking expertise to the railway industry through membership in IEC railway committees. Railway operators world-wide have discovered new operational efficiencies by deploying Moxa's unique time and cost-saving railway technologies. By designing for a long MTBF, owning all the core component IPs, and building long-term partnerships, Moxa helps railway integrators create sustainable solutions with low life-cycle costs for passenger comfort and railway operation networks.

Application Focus

- Passenger-oriented service (e.g., onboard Wi-Fi, passenger information systems)
- Railway CCTV
- CBTC (Communication-Based Train Control)
- Wayside data communications systems

Leading Technologies

- Turbo Ring and Turbo Chain: Advanced Ethernet redundancy solutions
- Turbo Roaming: Fast and secure train-to-ground wireless communications
- ACC: Intelligent wireless inter-carriage links
- FLI: Flexible, location-based, intelligent industrial-grade auto-configuration technology

IRIS Certification

Visit www.moxa.com/rail

ACC Auto Carriage Connection · FLI Industrial Auto Configuration · EN 50155 · EN 50121

ToughNet, EDS Series
Industrial Ethernet Switches
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TAP, AWK-RCC/RTG Series
Industrial Wireless AP/Bridge/Client
▶Page 8-4

NPort 5000AI-M12 Series
RS-232/422/485 Serial Device Servers
▶Page 10-18

TC-6000, V2000 Series
Industrial Embedded Computers
▶Page 22-4/22-11

VPort Series
Industrial IP Cameras
▶Page 19-19

ioPAC Series
Industrial RTU Controllers
▶Page 15-4

ioLogik E1500 Series
Remote I/Os
▶Page 17-17

Connect to the Smart Grid Today

End-to-End Networking and Computing Solutions for the Power Industry

Many Successful Deployments in Power Projects Worldwide

Create rock-solid and future-proof power networks by partnering with Moxa. Moxa is a Collective Member of CIGRE and has delivered solutions in over 500 successful substation transmission and distribution networking and computing applications around the world. Moxa is now the leading solar energy monitoring supplier in North America with many diverse projects in advanced metering infrastructures worldwide. You can rely on our expertise of more than 25 years in proven solutions in the following industry applications.

Application Focus

- Solar power
- Wind power
- IEC 61850 transmission and distribution substation
- Advanced metering infrastructure

Leading Technologies

- Industry's first IEC 61850 switch with MMS data modeling: SNMP/MMS management with integrated network monitoring solutions for power substation SCADA
- Industry's first integrated PRP/HSR redundancy box for zero recovery time
- Turbo Chain: Different redundant networks can be extended without any ring coupling effort
- Patented computing platform for heat dissipation with wide temperature tolerance
- ThingsPro: Asset management for solar energy monitoring

Visit www.moxa.com/SmartGrid

Turbo Chain | PRP HSR | IEC 61850 IEEE 1613 | ThingsPro

PT-7528 Series
IEC 61850 28-port IEEE 1613 Class 2 Managed Ethernet Switches
▶Page 2-44

PT-7728-PTP Series
IEC 61850 14-port IEEE 1588v2 Managed PRP/HSR Switches
▶Page 2-40

PT-G503-PHR-PTP Series
IEC 61850 3-port Full Gigabit Managed PRP/HSR Redundancy Boxes
▶Page 2-63

DA-820 Series
x86 IEC 61850-3 Certified i7 Rackmount Computers
▶Page 21-4

NPort S8000 Series
Combo Switches / Serial Device Servers
▶Page 10-14

UC-8100 Series
RISC Energy Monitoring Computers
▶Page 21-36

ioLogik E1200 Series
Compact Ethernet Remote I/O
▶Page 17-6

DCU-8620-T Series
Data Concentration Units
▶Available by request

Proven Solutions for the Harshest Oil & Gas Environments

Integrated Networking, Monitoring, and Computing Systems

Your Trusted Partner in Oil & Gas Automation

Moxa is a leading provider of industrial automation solutions and has proven experience in providing networking equipment and service suitable for the harshest oil & gas environments. Moxa's industrial-grade products and well respected technology enable efficient remote monitoring and easy asset management, delivering business value to customers all over the world. To assure the highest level of safety, the computing, networking, and automation products Moxa develops especially for use in oil & gas facilities meet important global certifications, including ATEX Zone 2, Class 1 Division 2, and IECEx.

Application Focus

- Offshore oil drilling control systems
- Onshore drilling / wellhead monitoring
- Pump stations and pipeline monitoring
- Oil refining and gas station operations

Leading Technologies

- Turbo Ring and Turbo Chain: Unrivaled network redundancy solutions with 20 ms recovery
- Dual-Radio and Turbo Roaming: Zero packet loss and millisecond-level wireless roaming
- ISA99/IEC 62443 compliant for industrial security: Layered cybersecurity solution with innovative PacketGuard™ for Modbus TCP deep packet inspection
- World-leading panel computer design: 1000-nit LCD, glove-friendly multi-touch, system bootup within 3 minutes, -40 to 70°C operating temperature without heater
- MXview, MXview ToGo, QuickLink, MX-AOPC UA Server: Efficient network management by smart visualization, automated configuration, and seamless integration with SCADA systems

Visit www.moxa.com/Solutions/Oil_and_gas

EDS/IKS/ICS Series

Edge-to-Core Ethernet Switches

▶Page 1-12

EDR Series

VPN/Firewall Secure Routers

▶Page 5-2

AWK Series

IEEE 802.11a/b/g/n Wireless AP/Bridge/Client

▶Page 6-6

MGate and NPort Series

Industrial Gateways and Device Servers

▶Page 4-5; 10-43

ICF Series

Industrial Serial/PROFIBUS-to Fiber Converters

▶Page 14-32

ioLogik 2500 Series and ioLogik E1200 Series

Smart Remote I/O and Ethernet Remote I/O

▶Page 16-4; 17-6

VPort Series

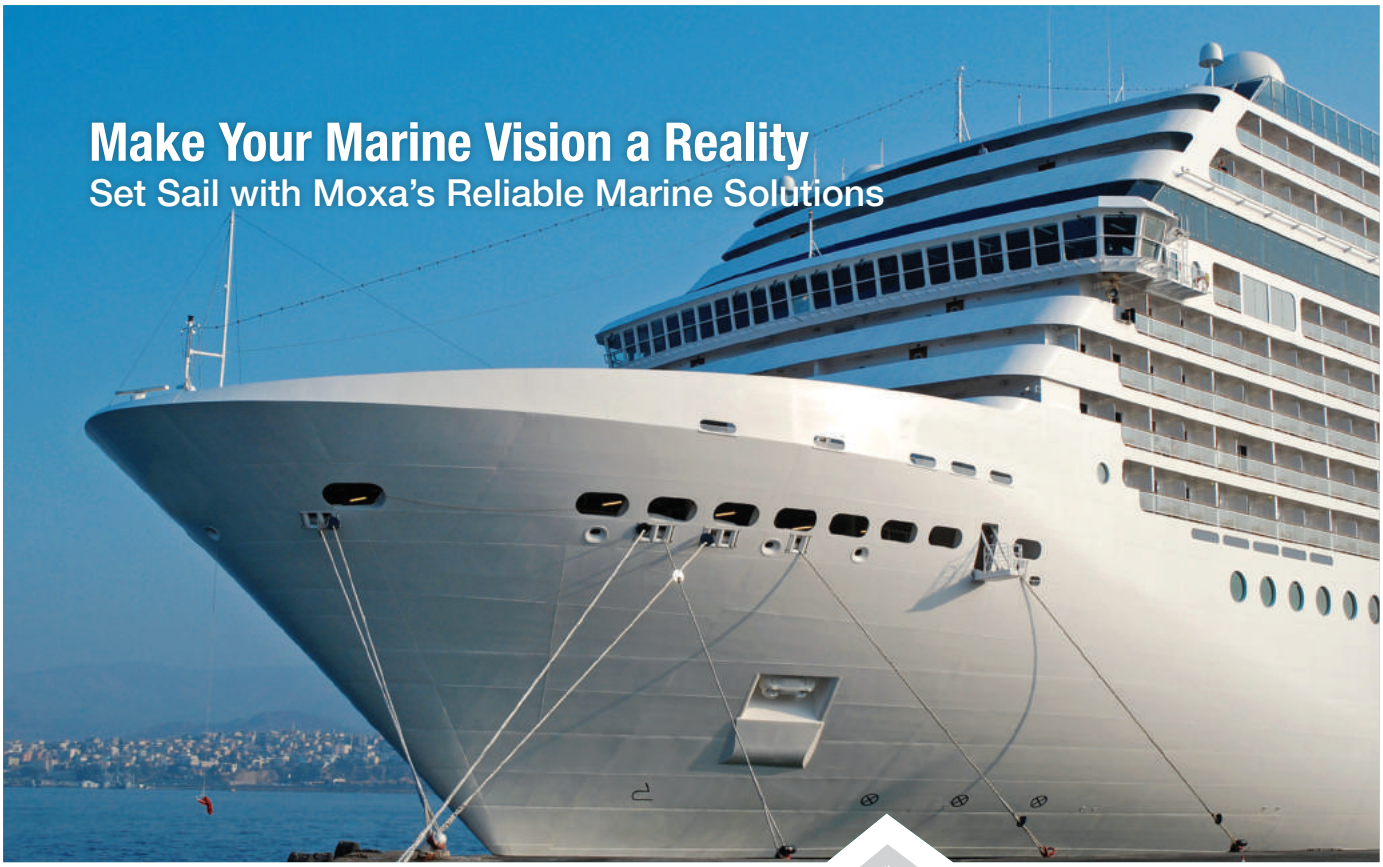
HD IP Cameras

▶Page 19-14

EXPC-1519 Series

Zone 2 Panel Computers

▶Page 25-12



Make Your Marine Vision a Reality

Set Sail with Moxa's Reliable Marine Solutions

Successful Deployment of Integrated Marine Bridge Solutions Worldwide

Moxa provides maritime professionals with industrial-grade marine computers, panel PCs, displays, and Ethernet switches that use leading technologies and reliable designs perfect for applications on docks, marine bridges, open decks, and in control rooms.

Moxa's marine solutions pass strict tests and follow critical industrial standards to ensure compliance with international marine standards, including DNV, ABS, GL, LR, IEC 60945, IEC 61174, IEC 61162, and IACS E10, making Moxa's marine solutions the best option for marine applications.

Application Focus

- Electronic Chart Display and Information System (ECDIS)
- Radar System
- Integrated Navigation System (INS)
- Integrated Platform Management System (IPMS)

Leading Technologies

- Advanced ECDIS color calibration technology: more consistent color rendering for a longer period of use
- Customer initiated smart OSD design: Off-Screen-Display control allows users to easily control the monitor in low light environments
- High performance computing power in a fanless design enhances computers' reliability and reduces customers' maintenance costs

Visit www.moxa.com/marine

MPC-2150/2190/2240/2260 Series
Marine Panel Computers
▶Page 24-9

MD-219/224/226 Series
Marine Displays
▶Page 24-3

MC-7200 Series
Marine ECDIS Computers
▶Page 23-3

MGate 5101-PBM-MN Series
PROFIBUS-to-Modbus TCP Gateways
▶Page 4-18

ioLogik E1200H Series
Ethernet Remote I/O
▶Page 17-13

EDS-408A Series
Managed Ethernet Switches
▶Page 1-46

Your Trusted Partner for Factory Automation

To help manufacturers maximize the benefits of integrating network and automation technology, Moxa has focused on the factory automation market for over 26 years. Moxa provides leading solutions for industrial communications, including wired and wireless infrastructures, industrial computing, remote monitoring, and video surveillance.

Application Focus

- SCADA
- Control system networks
- Wireless infrastructures and machine-to-machine communication
- Packaging equipment
- Cybersecurity
- Industrial video surveillance
- Material handling

Main Benefits

Reliability

- Industry leading communication redundancy for < 20 ms recovery time
- Unique thermal design that supports fanless wide temperature operation (-40 to 75°C)
- High level EMI/EMC shielding
- Redundant power supply with isolation protection
- Continual improvement of total quality management
- ISO 9001 quality management standard recognized

Ease of Integration

- User-friendly network and device management software
- Serial, Ethernet, I/O, and wireless solutions integrated into a single network
- Quick mass configuration tool for 90% time savings (with up to 100 switches)
- OPC server for cost-effective SCADA integration

Global Support

- Access to products and support in over 70 countries
- Customization service

VPort Series
Industrial IP Cameras
▶Page 19-1

EDS Series
Industrial Ethernet Switches
▶Page 1-27

MGate Series
Industrial Ethernet Gateways
▶Page 4-1

NPort Series
Serial-to-Ethernet Device Servers
▶Page 10-1

ioLogik 2500-WL1 Series
Smart Wireless I/O
▶Page 16-4

EDR-810 Series
Industrial 8+2G Multiport Secure Routers
▶Page 5-7

AWK-A Series
Industrial Wireless AP/Bridge/Client
▶Page 6-6

Integrated Network Solutions for Intelligent Transportation

Real-Time Convergence for Non-Stop Safety

Today more than ever before, roadway safety and efficiency depend on real-time information and communication. To increase traffic flow, reduce congestion, and improve incident response times, Moxa's industrial Ethernet solutions facilitate real-time convergence of various sensor data, voice, and video by providing high-speed throughputs and a wide range of network devices. All of these devices emphasize extreme reliability, smart redundancy, easy manageability, and a lower total cost of ownership.

Application Focus

- Advanced Transportation Management Systems
- Tunnels
- Intelligent E-Bus
- Electronic Toll Collection (ETC)

Leading Technologies

High Bandwidth

- 1GbE/10GbE switching and routing
- Up to 500 Mbps router throughput
- Up to 300 Mbps wireless transmission
- Up to 150 Mbps VPN traffic

Extreme Reliability

- Turbo Ring and Turbo Chain self-recovery (< 20 ms @ 250 switches)
- V-ON network redundancy under 50 ms for mission-critical IP surveillance
- Turbo Roaming with millisecond-level handoff times for seamless mobility

Efficient Management

- MXstudio network management suite for installation, operation, maintenance, and diagnostics
- OnCell Central Manager for remote cellular device management
- IP surveillance software solutions for easy SCADA surveillance

Visit www.moxa.com/ITS

ICS Series
Industrial 10GbE Ethernet Switches
▶Page 1-12

AWK-A Series
Industrial 802.11n AP/Bridge/Client
▶Page 6-6

EDS-G512E-8PoE
8-port PoE+ Full Gigabit Managed Switch
▶Page 1-64

VPort Series
Industrial HD IP Cameras
▶Page 19-7

IEX-408E-2VDSL2 Series
Copper Extender Switches
▶Page 3-26

NPort IA5000A Series
2-Port Industrial Serial Device Servers
▶Page 10-43

MXstudio
Industrial Network Management Suite
▶Page 5-11

Industrial Ethernet Switches

Rackmount Ethernet Switches

	Managed Rackmount Switches							
								
	ICS-G7852A	ICS-G7850A	ICS-G7848A	ICS-G7752A	ICS-G7750A	ICS-G7748A	ICS-G7828A	ICS-G7826A
Supported Modules								
Gigabit Media Modules	✓	✓	✓	✓	✓	✓	–	–
Fast Media Modules	–	–	–	–	–	–	–	–
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	✓	✓	–	✓	✓
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	✓	✓	✓
Number of Ports								
Max. Number of Ports	52	50	48	52	50	48	28	26
10 Gigabit Ethernet	4	2	–	4	2	–	4	2
Gigabit Ethernet, 10/100/1000 Mbps	up to 48	up to 48	up to 48	up to 48	up to 48	up to 48	24	24
Fast Ethernet, 10/100 Mbps	–	–	–	–	–	–	–	–
Available Power Input								
24 VDC	–	–	–	–	–	–	–	–
24 VAC	–	–	–	–	–	–	–	–
48 VDC	–	–	–	–	–	–	–	–
12/24/48 VDC	–	–	–	–	–	–	–	–
85 to 264 VAC	✓	✓	✓	✓	✓	✓	✓	✓
88 to 300 VDC or 85 to 264 VAC, isolated	–	–	–	–	–	–	–	–
Installation Options								
DIN-Rail Mounting	–	–	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures								
-10 to 60°C (14 to 140°F)	✓	✓	✓	✓	✓	✓	✓	✓
-40 to 75°C (-40 to 167°F)	–	–	–	–	–	–	–	–
Redundancy and Backup Options								
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	✓	✓	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	✓	✓	✓	✓	✓	✓	✓	✓
Network Management and Control								
Layer 3 Switching	✓	✓	✓	–	–	–	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	✓	✓	✓	–	–	–	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓	✓
IPv6	–	–	–	✓	✓	✓	–	–
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓	✓	✓
UL 508	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	–	–	–	–	–
ABS/LR/NK	–	–	–	–	–	–	–	–
NEMA TS2	–	–	–	–	–	–	–	–
EN 50121-4	✓	✓	✓	✓	✓	✓	✓	✓
Page	1-12	1-12	1-12	1-12	1-12	1-12	1-16	1-16

Rackmount Ethernet Switches

	Managed Rackmount Switches					
						
	ICS-G7528A	ICS-G7526A	IKS-G6824A	IKS-G6524A	IKS-6728A	IKS-6726A
Supported Modules						
Gigabit Media Modules	–	–	–	–	–	–
Fast Media Modules	–	–	–	–	✓	✓
SFP+ 10 Gigabit Ethernet Modules	✓	✓	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	✓	✓
SFP Fast Ethernet Modules	✓	✓	✓	✓	✓	✓
Number of Ports						
Max. Number of Ports	28	26	24	24	28	26
10 Gigabit Ethernet	4	2	–	–	–	–
Gigabit Ethernet, 10/100/1000 Mbps	24	24	24	24	4	2
Fast Ethernet, 10/100 Mbps	–	–	–	–	up to 24	up to 24
Available Power Input						
24 VDC	–	–	–	–	✓	✓
24 VAC	–	–	–	–	–	–
48 VDC	–	–	–	–	✓	✓
12/24/48 VDC	–	–	–	–	–	–
85 to 264 VAC	✓	✓	✓	✓	✓	✓
88 to 300 VDC or 85 to 264 VAC, isolated	–	–	–	–	–	–
Installation Options						
DIN-Rail Mounting	–	–	–	–	–	–
Panel Mounting	–	–	–	–	–	–
Rack Mounting	✓	✓	✓	✓	✓	✓
Supported Operating Temperatures						
-10 to 60°C (14 to 140°F)	✓	✓	✓	✓	–	–
-40 to 75°C (-40 to 167°F)	–	–	✓	✓	✓	✓
Redundancy and Backup Options						
Turbo Ring	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓
V-ON	✓	✓	✓	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	✓	✓	✓	✓	✓	✓
Network Management and Control						
Layer 3 Switching	–	–	✓	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓
IGMP/GMRP	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	–	–	✓	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓
IPv6	✓	✓	–	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓
Standards and Certifications						
CE/FCC	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓
UL 508	–	–	–	–	–	–
DNV/GL	–	–	–	–	✓	✓
ABS/LR/NK	–	–	–	–	✓	✓
NEMA TS2	–	–	–	–	–	–
EN 50121-4	✓	✓	✓	✓	✓	✓
Page	1-16	1-16	1-19	1-19	1-22	1-22

DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches								
									
	EDS-828	EDS-728	EDS-619	EDS-616	EDS-611	EDS-608	EDS-G516E	EDS-G512E	EDS-G508E
Supported Modules									
Gigabit Media Modules	✓	✓	–	–	–	–	–	–	–
Fast Media Modules	✓	✓	✓	✓	✓	✓	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	–	✓	–	✓	✓	–
SFP Fast Ethernet Modules	–	–	✓	–	✓	–	✓	✓	–
Number of Ports									
Max. Number of Ports	28	28	19	16	11	8	16	12	8
Gigabit Ethernet, 10/100/1000 Mbps	up to 4	up to 4	3	–	3	–	16	12	8
Fast Ethernet, 10/100 Mbps	up to 24	up to 24	up to 16	up to 16	up to 8	up to 8	–	–	–
Available Power Input									
24 VDC	✓	✓	–	–	–	–	–	–	–
12/24/48 VDC	–	–	✓	✓	✓	✓	–	–	–
12/24/48/-48 VDC	–	–	–	–	–	–	✓	✓	✓
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	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	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures									
0 to 60°C (32 to 140°F)	✓	✓	✓	✓	✓	✓	–	–	–
-10 to 60°C (14 to 140°F)	–	–	–	–	–	–	✓	✓	✓
-40 to 75°C (-40 to 167°F)	–	–	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options									
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	–	–	–	–	–	–	✓	✓	✓
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
MSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-01)	✓	✓	✓	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-02)	–	–	–	–	–	–	✓	✓	✓
Network Management and Control									
Layer 3 Switching	✓	–	–	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet/IP	✓	✓	✓	✓	✓	✓	✓	✓	✓
PROFINET	–	–	–	–	–	–	✓	✓	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	–	–	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	✓	–	–	–	–	–	✓	✓	✓
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port Lock	✓	✓	✓	✓	✓	✓	✓	✓	✓
IPv6	–	✓	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications									
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	✓	✓	✓	✓	✓	–	–	–
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–
EN 60950-1	✓	✓	✓	✓	✓	✓	–	–	–
UL/cUL Class 1 Div. 2	–	–	✓	✓	✓	✓	✓	✓	✓
ATEX Zone 2	–	–	✓	✓	✓	✓	✓	✓	✓
DNV/GL	✓	✓	✓	✓	✓	✓	✓	✓	✓
ABS/LR/NK	✓	✓	✓	✓	✓	✓	✓	✓	✓
NEMA TS2	–	–	✓	✓	✓	✓	✓	✓	✓
EN 50121-4	–	–	✓	✓	✓	✓	✓	✓	✓
IEEE 1613	–	–	–	–	–	–	✓	✓	✓
IEC 61850-3	–	–	–	–	–	–	✓	✓	✓
Page	1-27	1-27	1-31	1-31	1-31	1-31	1-35	1-35	1-35

DIN-Rail Ethernet Switches

	Managed DIN-Rail Switches								
									
	EDS-G509	EDS-518E	EDS-510E	EDS-516A	EDS-508A	EDS-505A	EDS-408A	EDS-405A	EDS-405A-PTP
Supported Modules									
Gigabit Media Modules	–	–	–	–	–	–	–	–	–
Fast Media Modules	–	–	–	–	–	–	–	–	✓
SFP Gigabit Ethernet Modules	✓	✓	✓	–	–	–	–	–	–
SFP Fast Ethernet Modules	✓	✓	✓	–	–	–	–	–	–
Number of Ports									
Max. Number of Ports	9	18	10	16	8	5	8	5	5
Gigabit Ethernet, 10/100/1000 Mbps	9	4	3	–	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	–	14	7	16	8	5	8	5	5
Available Power Input									
24 VDC	–	–	–	✓	✓	✓	✓	✓	–
12/24/48 VDC	✓	–	–	–	–	–	–	–	✓
12/24/48/-48 VDC	–	✓	✓	–	–	–	–	–	–
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	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	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures									
0 to 60°C (32 to 140°F)	✓	–	–	✓	✓	✓	✓	✓	–
-10 to 60°C (14 to 140°F)	–	✓	✓	–	–	–	–	–	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options									
Turbo Ring	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turbo Chain	✓	✓	✓	✓	✓	✓	✓	✓	✓
V-ON	–	✓	✓	–	–	–	–	–	–
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
MSTP	✓	✓	✓	✓	✓	✓	–	–	✓
Automatic Backup Configurator (ABC-01)	✓	-	–	✓	✓	✓	✓	✓	✓
Automatic Backup Configurator (ABC-02)	–	✓	✓	–	–	–	–	–	–
Network Management and Control									
Layer 3 Switching	–	-	–	–	–	–	–	–	–
Port Trunking	✓	✓	✓	✓	✓	✓	–	–	–
Modbus/TCP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet/IP	✓	✓	✓	✓	✓	✓	✓	✓	✓
PROFINET	–	✓	✓	–	–	–	EDS-408A-PN series only	EDS-405A-PN series only	✓
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	✓	✓
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1Q VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Port-based VLAN	✓	✓	✓	✓	✓	✓	✓	✓	✓
Access Control Lists (ACL)	–	–	–	–	–	–	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓	–	–	✓
Port Lock	✓	✓	✓	✓	✓	✓	–	–	✓
IPv6	✓	✓	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications									
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	–	–	–	✓	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–
EN 60950-1	✓	–	–	✓	✓	✓	–	–	–
UL/cUL Class 1 Div. 2	–	✓	✓	✓	✓	✓	✓	✓	✓
ATEX Zone 2	–	✓	✓	✓	✓	✓	✓	✓	✓
DNV/GL	✓	–	–	✓	✓	✓	✓	✓	✓
ABS/LR/NK	✓	–	–	–	–	–	EDS-408A 3 Fiber series only	–	–
NEMA TS2	–	✓	✓	–	–	–	✓	✓	✓
EN 50121-4	✓	✓	✓	–	–	–	✓	–	–
IEEE 1613	–	✓	✓	–	–	–	–	–	–
IEC 61850-3	–	✓	–	–	–	–	–	–	–
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DIN-Rail Ethernet Switches

	Unmanaged DIN-Rail Switches										
											
	EDS-G308	EDS-G205	EDS-316	EDS-309	EDS-308	EDS-305	EDS-210A	EDS-208A	EDS-205A	EDS-208	EDS-205
Supported Modules											
SFP Gigabit Ethernet Modules	✓	✓	–	–	–	–	✓	–	–	–	–
SFP Fast Ethernet Modules	✓	✓	–	–	–	–	✓	–	–	–	–
Number of Ports											
Max. Number of Ports	8	5	16	9	8	5	10	8	5	8	5
Gigabit Ethernet, 10/100/1000 Mbps	8	5	–	–	–	–	up to 2	–	–	–	–
Fast Ethernet, 10/100 Mbps	–	–	16	9	8	5	up to 9	8	5	8	5
Available Power Input											
24 VDC	–	–	–	✓	✓	✓	–	–	–	✓	✓
24 VAC	–	–	–	–	–	–	–	✓	✓	✓	✓
12/24/48 VDC	✓	✓	✓	–	–	–	✓	✓	✓	–	–
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	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	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit	w/ optional kit
Supported Operating Temperatures											
0 to 60°C (32 to 140°F)	–	–	✓	✓	✓	✓	–	–	–	–	–
-10 to 60°C (14 to 140°F)	✓	✓	–	–	–	–	✓	✓	✓	✓	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Standards and Certifications											
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	–	–	✓	✓	✓	✓	–	–	–	–	–
UL 508	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–	–	–	–
EN 60950-1	–	✓	✓	✓	✓	–	–	–	✓	✓	✓
UL/cUL Class 1 Div. 2	✓	✓	✓	✓	✓	✓	–	✓	✓	–	–
ATEX Zone 2	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	–
DNV/GL	–	–	✓	✓	✓	✓	–	✓	✓	–	–
ABS/LR/NK	–	–	–	–	–	–	–	✓	✓	–	–
NEMA TS2	–	–	–	–	–	–	–	✓	✓	–	–
EN 50121-4	✓	✓	–	–	–	–	–	✓	✓	–	–
IEC 61850-3	–	–	–	–	–	–	–	–	–	–	–
Page	1-50	1-50	1-52	1-52	1-52	1-52	1-55	1-57	1-57	1-59	1-59

PoE Switches

	Managed Rackmount PoE Switches		Managed DIN-Rail PoE Switches			Unmanaged DIN-Rail PoE Switches		
								
	IKS-6728A-8PoE	EDS-G512E-8PoE	EDS-P510A-8PoE	EDS-P510	EDS-P506A-4PoE	EDS-G205A-4PoE	EDS-P206A-4PoE	EDS-P308
Supported Modules								
Gigabit Media Modules	–	–	–	–	–	–	–	–
Fast Media Modules	✓	✓	–	–	–	–	–	–
SFP Gigabit Ethernet Modules	✓	✓	✓	✓	–	✓	–	–
SFP Fast Ethernet Modules	✓	✓	✓	✓	–	✓	–	–
Number of Ports								
Max. Number of Ports	28	12	10	10	6	5	6	8
Gigabit Ethernet, 10/100/1000 Mbps	up to 4	12	2	3	–	5	–	–
PoE, Gigabit Ethernet, 10/100/1000 Mbps	–	8 (PoE+)	–	–	–	4 (PoE+)	–	–
Fast Ethernet, 10/100 Mbps	up to 24	–	8	7	6	–	6	8
PoE, Fast Ethernet, 10/100 Mbps	up to 24 (PoE+)	–	8 (PoE+)	4	4 (PoE+)	–	4 (PoE+)	4
Available Power Input								
24 VDC	–	–	–	–	✓	–	✓	–
48 VDC	✓	✓	✓	✓	✓	–	✓	✓
12/24/48 VDC	–	–	–	–	–	✓	–	–
85-264 VAC	✓	–	–	–	–	–	–	–
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	w/ optional kit
Rack Mounting	✓	w/ optional kit	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 (32 to 140°F)	–	–	–	✓	✓	✓	✓	✓
-10 to 60°C (14 to 140°F)	–	✓	✓	–	–	–	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options								
Turbo Ring	✓	✓	✓	✓	✓	–	–	–
Turbo Chain	✓	✓	✓	✓	✓	–	–	–
V-ON	✓	✓	✓	✓	–	–	–	–
STP/RSTP	✓	✓	✓	✓	✓	–	–	–
MSTP	✓	✓	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-01)	–	–	✓	✓	✓	–	–	–
Automatic Backup Configurator (ABC-02)	✓	✓	–	–	–	–	–	–
Network Management and Control								
Port Trunking	✓	✓	✓	✓	✓	–	–	–
Modbus/TCP	✓	✓	✓	✓	✓	–	–	–
Ethernet/IP	✓	✓	✓	✓	✓	–	–	–
IEEE 1588 PTP	✓	✓	✓	✓	✓	–	–	–
SNMP/RMON	✓	✓	✓	✓	✓	–	–	–
LLDP	✓	✓	✓	✓	✓	–	–	–
DHCP Option 66/67/82	✓	✓	✓	✓	✓	–	–	–
IGMP Snooping/GMRP	✓	✓	✓	✓	✓	–	–	–
QoS	✓	✓	✓	✓	✓	–	–	–
VLAN	✓	✓	✓	✓	✓	–	–	–
IEEE 802.1X	✓	✓	✓	✓	✓	–	–	–
Port Lock	✓	✓	✓	✓	✓	–	–	–
IPv6	✓	✓	✓	✓	✓	–	–	–
Relay Warning	✓	✓	✓	✓	✓	–	–	–
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL 60950-1	✓	–	–	–	–	–	–	–
UL 508	–	✓	✓	✓	✓	✓	✓	✓
UL 61010-2-201	–	–	–	–	–	–	–	–
EN 60950-1	✓	✓	–	✓	✓	✓	✓	✓
UL/cUL Class 1 Div. 2	–	–	✓	–	–	–	–	–
ATEX Zone 2	–	–	–	–	–	–	–	–
DNV/GL	–	–	–	✓	–	–	–	✓
ABS/LR/NK	–	–	–	✓	–	–	–	✓
NEMA TS2	–	–	✓	–	–	–	–	–
EN 50121-4	–	✓	✓	–	✓	✓	–	–
IEC 61850-3	–	–	–	–	–	–	–	–
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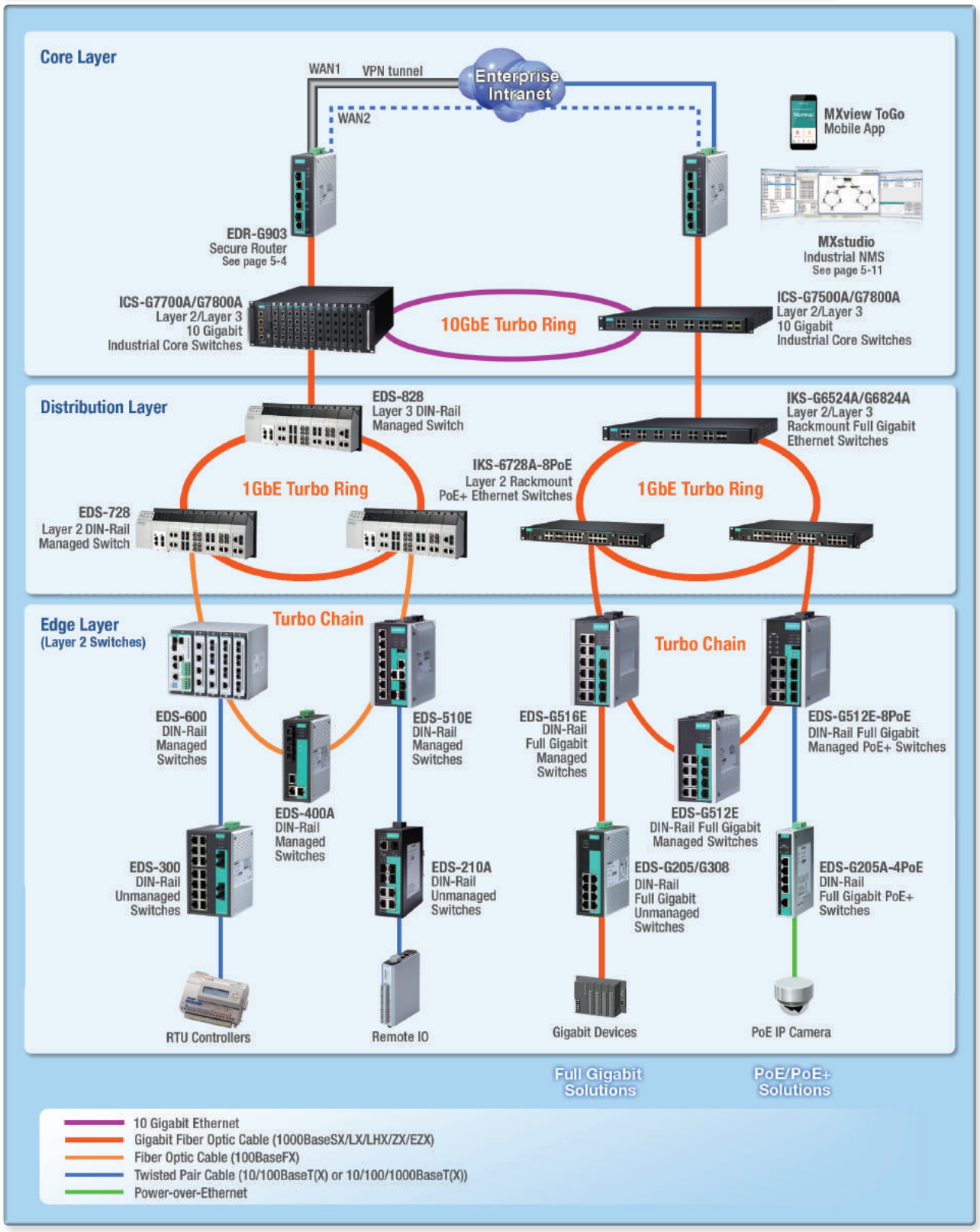
Introduction to Edge-to-Core Industrial Ethernet Solutions

A Comprehensive Portfolio of Edge-to-Core Ethernet Switches



Embrace Edge-to-Core Industrial Ethernet Infrastructure

Moxa delivers a tailored edge-to-core industrial Ethernet infrastructure for industrial automation applications, providing a reliable, scalable, and flexible network foundation for today and tomorrow. Moxa's one-stop shop of Ethernet solutions includes:

Core Layer

High Bandwidth 10GbE Industrial Core Switches

- Full Gigabit Layer 2/Layer 3
- Up to 4 10GbE ports
- Up to 24 or 48 1GbE connection
- Rugged, fanless design
- Absolutely non-stop operations
- Designed for large-scale applications

Edge Layer

Compact, Standalone/Modular DIN-Rail Switches

- Widest selection of switches: from 5 to 19 ports, Fast Ethernet to Full Gigabit Ethernet, managed to unmanaged, PoE to PoE+
- Best price-to-performance ratio
- Advanced Layer 2 networking capability
- Supports EtherNet/IP, PROFINET, and Modbus/TCP for industrial protocols interoperability
- Turbo Ring and Turbo Chain for highly resilient networks

Distribution Layer

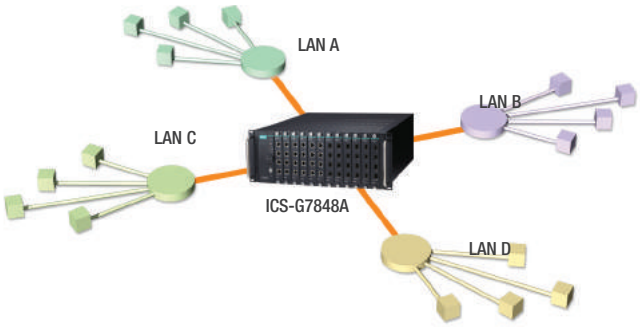
Industrial Modular DIN-Rail and Rackmount Switches

- Full Gigabit Layer 2/Layer 3
- Up to 24 1GbE connections
- Up to 24 PoE+ ports
- High port density (> 19 ports)
- Flexibility with modular design
- Gigabit Turbo Ring & Turbo Chain
- Ideal for control room and outdoor cabinet operations

High-performance Layer 3 Switching Capability

Optimum Network Efficiency through LAN Segmentation

Layer 3 switches use the IP address to make switching decisions, as routers do, but are 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 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 now offers high-performance Layer 3 switches that use state-of-the-art routing technology to partition a large-scale LAN into multiple subnets for improved network performance.



Future-Proof Performance

Moxa's rackmount switches include high-density fixed and modular 10GbE and full-Gigabit platforms with copper, fiber, or SFP/SFP+ port combinations to fulfill highly dynamic backbone requirements.

- Up to 4 10GbE and 48 GbE uplinks
- Flexible density with 4-port slot and single-port 10GbE/GbE modularity
- Tiny 10GbE/GbE SFP transceiver modules allow transmission up to 120 km

Versatile Layer 2 Industrial Network Management

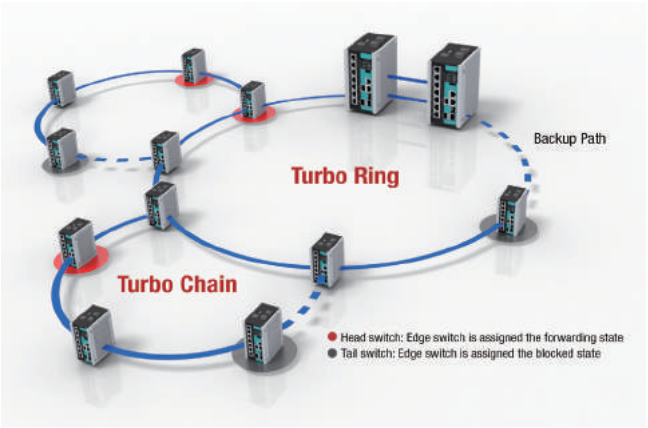
Optimized Network Designs for High Availability

Network reliability is essential for industrial Ethernet infrastructures. To maximize system reliability and uptime during network failures, Moxa offers Turbo Ring and Turbo Chain Ethernet network redundancy technologies throughout a wide range of industrial managed switch solutions that are designed from the very start for high availability. Turbo Ring is a proprietary self-healing protocol that supports three topology options, including ring-coupling, dual ring, and dual homing, to enable fast fault recovery in less than 20 ms (tested at a full load of 250 switches). Turbo Chain, a highly flexible self-healing Ethernet redundancy technology, is designed to go beyond the current limitations of redundant ring technology by easily connecting and extending existing redundant networks. Turbo Chain technology also supports IEEE 802.1w/802.1D-2004 RSTP and STP protocols. Moxa's industrial Ethernet solutions can simplify and optimize network designs with superior availability, reliability, flexibility to deliver large savings on deployment time and cost.

Real-world testing of Turbo Chain with 250 EDS switches

Turbo Ring: Enabling Ring and Media Redundancy

- Fast fault recovery < 20 ms
- Flexible ring topology
- Lower total cost of ownership



Turbo Chain: Build Complex Redundant Networks Quickly and Easily

- Fast fault recovery < 20 ms
- Unlimited redundant network expansions
- Live node expansion without network interruptions
- Tremendous savings on cabling cost

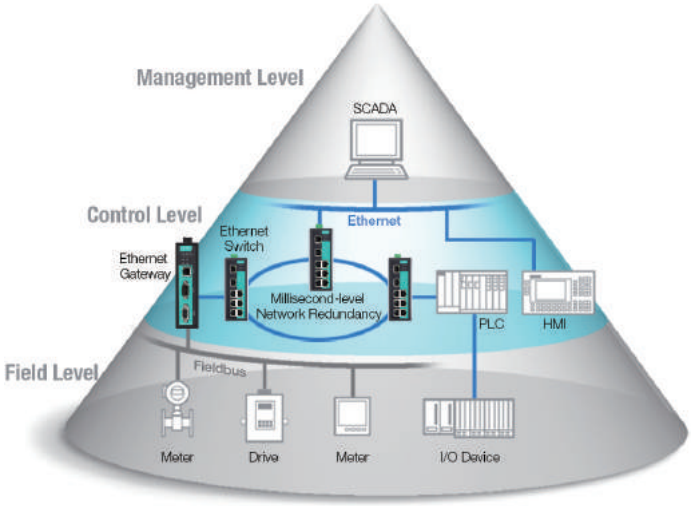
V-ON: Ensure Always-on Video on L2/L3 Networks

Combining proprietary technologies to achieve millisecond recovery, V-ON™ ensures a nonstop industrial network for data, voice, and video communication in mission-critical environments. This unique V-ON™ technology is setting a new standard in fast recovery on Layer 2 (less than 50 ms) and Layer 3 (less than 300 ms) recovery by integrating these technologies:

- Path redundancy: Turbo Ring and Turbo Chain.
- Router redundancy: Fast VRRP for millisecond redundancy
- Protocol optimization: Layer 2 Multicast fast forwarding and Layer 3 Multicast local route

Easy Network Management

Moxa's managed Ethernet switches are certified to be compliant with PROFINET, Modbus/TCP, and EtherNet/IP industrial Ethernet protocols to allow effortless integration with industrial SCADA/HMI/PLC systems. Moxa's managed switches ensure seamless interoperability with major industrial Ethernet automation networks without the need for additional switch configuration/modification.



Rugged Industrial Design for Outstanding Reliability

Many mission-critical applications in industrial automation require highly-available network transmissions to provide real-time monitoring and control, prevent production losses from system downtime, and ensure onsite personnel safety. Robustness of industrial Ethernet switch is one of the critical factors to achieve highly reliable networks. Moxa's rugged industrial-grade Ethernet switch solutions are ideal for operation in harsh industrial environments, such as traffic control, oil and gas, marine, and wayside applications, which can demand the following requirements:

- Immunity from electromagnetic interference
- Ability to withstand vibration, impacts, dust, humidity, and corrosive environments
- Ability to withstand exposure to extreme temperatures
- Versatile power input for maximum network uptime
- Compliant with industry certifications and standards

Reliable Network Connections in Harsh Environmental Conditions

Moxa's industrial Ethernet switches are designed with excellent electromagnetic immunity, high anti-vibration capability, and advanced thermal dissipation to excel in harsh environmental conditions. Moxa's advanced Ethernet switches are compliant with IEEE 1613* standards with EMS Level 4 protection against extreme ESD, EFT/Burst, and surge to provide a higher level of reliability for industrial networks. These advanced switches also conform to the IEC 60068-2 standard and the high strength DIN-rail mounting kit is tested at over 5g* of acceleration to resist severe vibration to deliver uninterrupted data transmission. Optimized thermal fin design efficiently dissipates heat and significantly reduces operating temperature to prolong device lifetime.

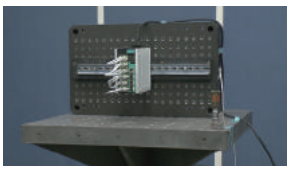
*EDS E series only

ESD Test

Surge Test

EFT/Burst Test

Vibration Test



Designed to Withstand Extreme Temperatures

Industrial environments require network devices that operate reliably when subjected to wide temperature fluctuations. Tested beyond industry standards to ensure Moxa's Ethernet switches were tested beyond industry standards to ensure reliable operation in a -40 to 75°C operating temperature range. Moxa's Ethernet switches are all held to strict minimal packet loss requirements, and use passive cooling to ensure reliability in extreme temperatures.

SmartPoE Solution for Simple and Flexible Connections

Moxa provides a complete range of solutions for any IEEE 802.3af/at PoE/PoE+ compliant units that are ideal for hard-to-reach outdoor or harsh environments where a power installation is not readily available or is cost-prohibitive. With Moxa's SmartPoE enables intelligent PoE power links, diagnostics, and monitoring to simplify PD (powered device) configuration and management. The built-in feature reduces the time and costs required for troubleshooting and maintenance.

Superior PoE/PoE+ Capability

- Up to 48 Gigabit PoE+ links
- 15.4/30/36/60 W PoE/PoE+ high power PoE output selection
- Smart Powering provides various PoE port output modes for non-standard PD and legacy PD

Easy Management

- Smart suggestion for PD configuration
- Smart monitoring for real-time output monitoring and PD failure checking and rebooting

Outdoor Reliability

- 3 kV LAN surge protection
- -40 to 75°C operating temperature range
- Supports Turbo Ring, Turbo Chain, and MSTP/RSTP/STP redundancy technologies

See Page 1-63

SmartPoE

Moxa's SmartPoE enables intelligent PoE power links, diagnostics, and monitoring to simplify PD (powered device) configuration and management. This built-in feature reduces the time and costs required for troubleshooting and maintenance.

Smart Diagnostics

- Auto PD detection of power class, status, and error
- Smart suggestion for PD configuration

Smart Powering

- High power mode supports non-standard PDs
- Force mode supports legacy PD

Smart Monitoring

- Real-time PoE output monitoring
- PoE power output threshold cutoff and active event warning

ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A Series

48G/48G+2 10GbE/48G+4 10GbE-port Layer 2/Layer 3 full Gigabit modular managed Ethernet switches

- Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- Up to 52 optical fiber connections (SFP slots)
- Up to 48 PoE+ ports with external power supply (with IM-G7000A-4PoE module)
- Fanless, -10 to 60°C operating temperature range
- Modular design for maximum flexibility and hassle-free future expansion
- Hot swap interface and power modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports. The ICS-G7848A/G7850A/G7852A series also supports Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (ICS-G7800A series)
- Advanced PoE management functions: PoE output setting, PD failure check, PoE scheduling, and PoE diagnostics (with IM-G7000A-4PoE module)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- 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
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (ICS-G7800A series)
- 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 AC power inputs

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
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3af/at for PoE/PoE+ output
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (ICS-G7800A series only)
Unicast Routing: Static Routing, RIPV1/V2, OSPF (ICS-G7800A series)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (ICS-G7800A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (ICS-G7800A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules
• 10/100/1000BaseT(X), or
• PoE+ 10/100/1000BaseT(X), or
• 100/1000BaseSFP slots
Note: See the IM-G7000A datasheet for Gigabit Ethernet module product information.
10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7750A/G7850A and ICS-G7752A/G7852A only)
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC
Operating Voltage: 85 to 264 VAC
Input Current: ICS-G7748A/G7848A: Max. 0.87/0.6 A @ 110/220 VAC
ICS-G7750A/G7850A: Max. 0.94/0.64 A @ 110/220 VAC
ICS-G7752A/G7852A: Max. 1.01/0.68 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 176 x 523.8 mm (17.32 x 6.93 x 20.62 in)
Weight: 12.9 kg (28.5 lb)
Installation: 19-inch rack 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)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

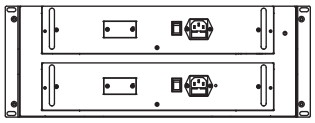
Time:
ICS-G7748A/G7848A: 314,973 hrs
ICS-G7750A/G7850A: 282,329 hrs
ICS-G7752A/G7852A: 274,488 hrs
Standard: Telcordia (Bellcore), GB

Warranty

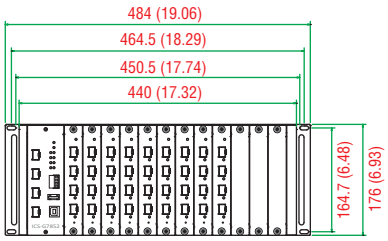
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

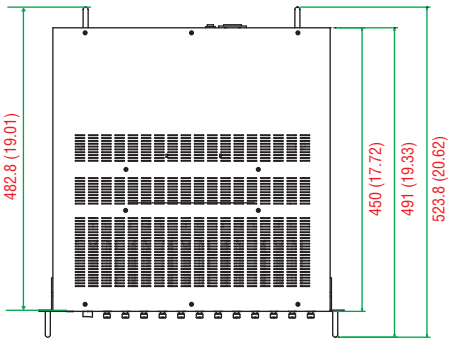
Unit: mm (inch)



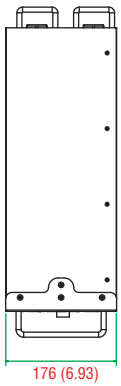
Rear View



Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A with power supply

Step 2: Select interface modules

IM-G7000A (Gigabit Ethernet)

Note: The ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A Ethernet switch system is delivered without interface modules. See the IM-G7000A datasheet to determine which interface modules are suitable for your application. See the SFP-10G, SFP-1G, and SFP-1FE datasheets for SFP module product information.

Available Models

Available Models	Port Interface			Power Supply	
Standard Temperature (-10 to 60°C)	Gigabit Ethernet		10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7748A/G7750A/G7752A Series Layer 2 Switches					
ICS-G7748A-HV-HV	up to 48	up to 48	–	1	1
ICS-G7750A-2XG-HV-HV	up to 48	up to 48	2	1	1
ICS-G7752A-4XG-HV-HV	up to 48	up to 48	4	1	1
ICS-G7848A/G7850A/G7852A Series Layer 3 Switches					
ICS-G7848A-HV-HV	up to 48	up to 48	–	1	1
ICS-G7850A-2XG-HV-HV	up to 48	up to 48	2	1	1
ICS-G7852A-4XG-HV-HV	up to 48	up to 48	4	1	1

Note: The ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A series supports 10GbE SFP+ and 100/1000BaseSFP slots. See the SFP-10G, SFP-1G, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

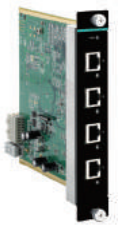
- ICS-G7748A/G7750A/G7752A/G7848A/G7850A/G7852A switch
- 12 interface cover plates
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-G7000A Series

4G-port Gigabit Ethernet interface modules for ICS-G7748A/G7750A/G7752A/ G7848A/G7850A/G7852A series modular managed Ethernet switches

Specifications

Gigabit Ethernet Interface Modules, IM-G7000A Series



IM-G7000A-4GTX

IM-G7000A-4GSFP

IM-G7000A-4PoE

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100/1000BaseSFP slot
LED Indicators: STAT, 10/100/1000 for TP port, 100/1000 for fiber port
Hot Swap Button: Push this button prior to swapping IM-G7000A modules
PoE+ Ports: 10/100/1000BaseT(X) auto negotiation speed, compliant with IEEE 802.3af/at high power mode up to 36 W

Power Requirements

Power Consumption:
IM-G7000A-4GTX: 3.47 W
IM-G7000A-4GSFP: 1.32 W
IM-G7000A-4PoE: 5.14 W (without PD power consumption)
Note: A 48 VDC external power supply is required to provide power to PoE devices.

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 28.8 x 174.7 x 166.8 mm (1.13 x 6.88 x 6.57 in)
Weight: 220 g (0.49 lb)

MTBF (mean time between failures)

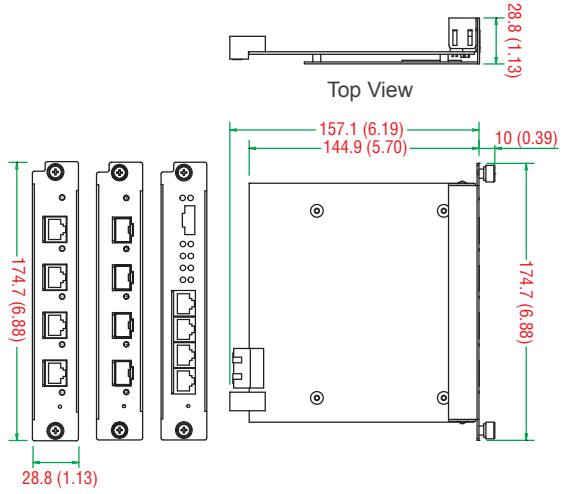
Time:
IM-G7000A-4GTX: 1,569,520 hrs
IM-G7000A-4GSFP: 1,544,084 hrs
IM-G7000A-4PoE: 394,348 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IM-G7000A-4GTX: Gigabit Ethernet interface module with 4 10/100/1000BaseT(X) ports, -10 to 60°C operating temperature
IM-G7000A-4GSFP: Gigabit Ethernet interface module with 4 100/1000BaseSFP slots, -10 to 60°C operating temperature
IM-G7000A-4PoE: Gigabit Ethernet PoE+ interface module with 4 10/100/1000BaseT(X) ports, -10 to 60°C operating temperature
Note: See the SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Package Checklist

- IM-G7000A interface module
- Warranty card

ICS-G7526A/G7528A/G7826A/G7828A Series

24G+2 10GbE/24G+4 10GbE-port Layer 2/Layer 3 full Gigabit managed Ethernet switches

- 24 Gigabit Ethernet ports plus up to 4 10G Ethernet ports
- Up to 28 optical fiber connections (SFP slots)
- Fanless, -10 to 60°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7526A/G7528A/G7826A/G7828A series full Gigabit backbone switches are equipped with 24 Gigabit Ethernet ports plus up to 4 10 Gigabit Ethernet ports, and the ICS-G7826A/G7828A support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The ICS-G7526A/G7528A/G7826A/G7828A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (ICS-G7800A series)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- 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
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (ICS-G7800A series)
- 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 AC power inputs

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
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (ICS-G7800A series only)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (ICS-G7800A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (ICS-G7800A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
10 Gigabit Ethernet: 10GbE SFP+ slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110 to 220 VAC
Operating Voltage: 85 to 264 VAC
Input Current:
ICS-G7526A/G7826A: Max. 0.83/0.47 A @ 110/220 VAC
ICS-G7528A/G7828A: Max. 0.99/0.65 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Weight:
ICS-G7526A/G7826A: 5.3 kg (11.69 lb)
ICS-G7528A/G7828A: 5.5 kg (12.14 lb)
Installation: 19-inch rack 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)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

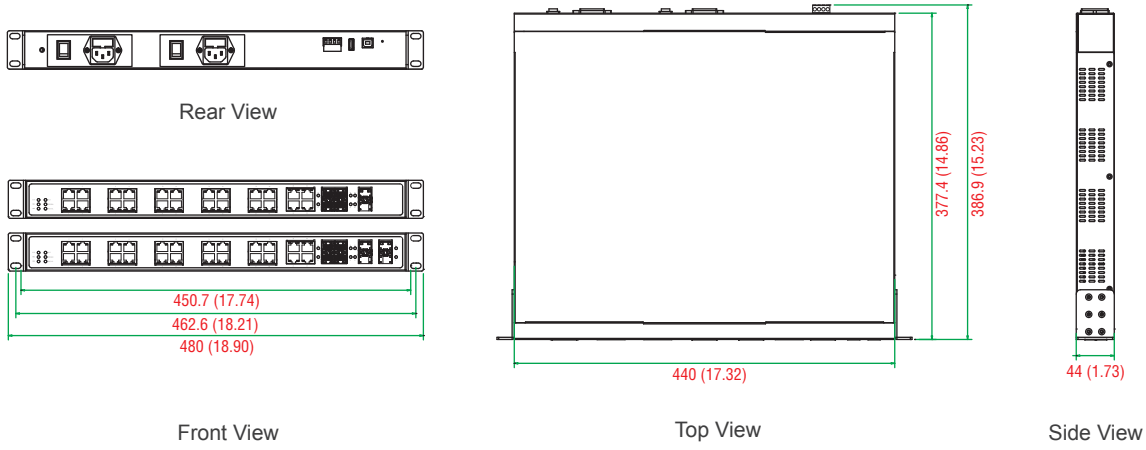
Time:
ICS-G7526A: 419,734 hrs
ICS-G7528A: 403,574 hrs
ICS-G7826A: 428,165 hrs
ICS-G7828A: 411,819 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface				Power Supply	
Standard Temperature (-10 to 60°C)	Gigabit Ethernet			10 Gigabit Ethernet	Isolated Power Supply 1	Isolated Power Supply 2
	10/100/1000BaseT(X)	100/1000BaseSFP*	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	10GbE SFP+*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
ICS-G7526A/G7528A Series Layer 2 Switches						
ICS-G7526A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7526A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7526A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7528A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7528A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7528A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1
ICS-G7826A/G7828A Series Layer 3 Switches						
ICS-G7826A-4GTXSFP-2XG-HV-HV	20	–	4	2	1	1
ICS-G7826A-8GSFP-4GTXSFP-2XG-HV-HV	12	8	4	2	1	1
ICS-G7826A-20GSFP-4GTXSFP-2XG-HV-HV	–	20	4	2	1	1
ICS-G7828A-4GTXSFP-4XG-HV-HV	20	–	4	4	1	1
ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV	12	8	4	4	1	1
ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV	–	20	4	4	1	1

Note: The ICS-G7526A/G7528A/G7826A/G7828A series supports 10GbE SFP+ and 100/1000BaseSFP slots. See the SFP-10G, SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- ICS-G7526A, ICS-G7528A, ICS-G7826A, or ICS-G7828A switch
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-G6524A/G6824A Series

24G-port Layer 2 / Layer 3 full Gigabit managed Ethernet switches

- Layer 3 routing interconnects multiple LAN segments (IKS-G6824A series)
- 24 Gigabit Ethernet ports
- Up to 24 optical fiber connections (SFP slots)
- Fanless, -40 to 75°C operating temperature range (T models)
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The IKS-G6524A/G6824A series full Gigabit backbone switches are equipped with 24 Gigabit Ethernet ports, and support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large scale industrial networks. The IKS-G6524A/G6824A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks (IKS-G6824A series)
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- 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
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management (IKS-G6824A series)
- 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 AC power inputs

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
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (IKS-G6824A only)
Multicast Routing: DVMRP, PIM-DM, PIM-SM, PIM-SSM (IKS-G6824A series)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Routing Redundancy: VRRP (IKS-G6824A series)

Switch Properties

Priority Queues: 8
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 4096
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jumbo Frame Size: 9.6 KB

Interface

Gigabit Ethernet: 10/100/1000BaseT(X) or 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +1 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110 to 220 VAC
Operating Voltage: 85 to 264 VAC
Input Current: Max. 0.67/0.38 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in)
Weight: 5.1 kg (11.25 lb)
Installation: 19-inch rack mounting

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)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

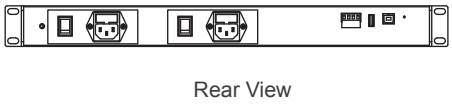
Time:
IKS-G6524A: 460,854 hrs
IKS-G6824A: 471,418 hrs
Standard: Telcordia (Bellcore), GB

Warranty

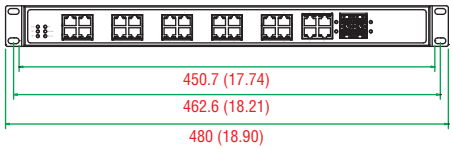
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

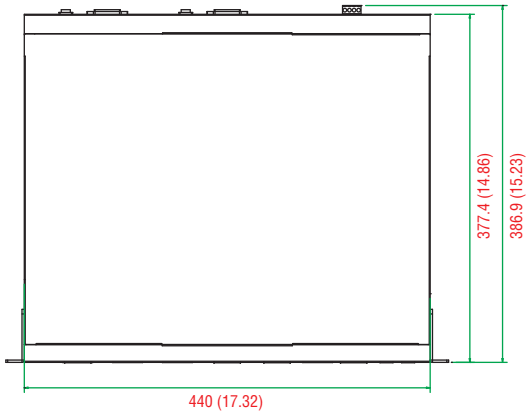
Unit: mm (inch)



Rear View



Front View



Top View

Side View

Ordering Information

Available Models		Port Interface			Power Supply	
		Gigabit Ethernet			Isolated Power Supply 1	Isolated Power Supply 2
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000 BaseT(X)	100/1000 BaseSFP*	Combo Port, 10/100/1000 BaseT(X) or 100/1000 BaseSFP*	HV: 85 to 264 VAC	HV: 85 to 264 VAC
IKS-G6524A Series Layer 2 Switches						
IKS-G6524A-4GTXSFP-HV-HV	IKS-G6524A-4GTXSFP-HV-HV-T	20	–	4	1	1
IKS-G6524A-8GSFP-4GTXSFP-HV-HV	IKS-G6524A-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6524A-20GSFP-4GTXSFP-HV-HV	IKS-G6524A-20GSFP-4GTXSFP-HV-HV-T	–	20	4	1	1
IKS-G6824A Series Layer 3 Switches						
IKS-G6824A-4GTXSFP-HV-HV	IKS-G6824A-4GTXSFP-HV-HV-T	20	–	4	1	1
IKS-G6824A-8GSFP-4GTXSFP-HV-HV	IKS-G6824A-8GSFP-4GTXSFP-HV-HV-T	12	8	4	1	1
IKS-G6824A-20GSFP-4GTXSFP-HV-HV	IKS-G6824A-20GSFP-4GTXSFP-HV-HV-T	–	20	4	1	1

*The IKS-G6524A/G6824A series supports 100/1000BaseSFP slots. See SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-G6524A or IKS-G6824A switch
- USB cable (Type A male to Type B male)
- 2 power cords (US type x 1, EU type x 1)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IKS-6726A/6728A Series

24+2G/24+4G-port modular managed Ethernet switches

- 2/4 Gigabit plus 24 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VAC power supply
- Modular design lets you choose from a variety of media combinations
- -40 to 75°C operating temperature range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The IKS-6726A/6728A 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 and maritime applications. The IKS-6726A/6728A's Gigabit and fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 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-6726A/6728A also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, IEEE 802.1X, SNMPv3, 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, CLI, Windows utility, and ABC-02-USB automatic backup configurator

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Modular Rackmount Ethernet Switch System, IKS-6726A/6728A

IKS-6726A-2GTXSFP

IKS-6728A-4GTXSFP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
Jumbo Frame Size: 9.6 KB

Interface

Fast Ethernet: 8-port 10/100Base T(X) and 2 modular slots for any 8-port or 6-port Interface Modules with 10/100BaseT(X), 100BaseFX (SC/ST connector), or 100Base SFP
Note: See the IM-6700A datasheet for Fast Ethernet module product information.
Gigabit Ethernet: 2- or 4-port 10/100/1000BaseT(X) or 100/1000Base SFP
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
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 models: 24 VDC
• 48 VDC models: 48 VDC
• HV models: 110/220 VAC
Operating Voltage:
• 24 VDC models: 18 to 36 VDC
• 48 VDC models: 36 to 72 VDC
• HV models: 85 to 264 VAC
Input Current: (without IM-6700A modules installed)
• Max. 0.36 A @ 24 VDC
• Max. 0.19 A @ 48 VDC
• Max. 0.28/0.14 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 280 mm (17.32 x 1.37 x 11.02 in)
Weight: 4100 g (9.05 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

Time:
IKS-6726A: 149,151 hrs
IKS-6728A: 148,687 hrs
Standard: Telcordia (Bellcore), GB

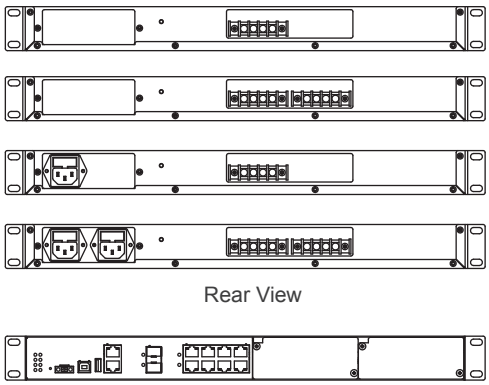
Warranty

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

Dimensions

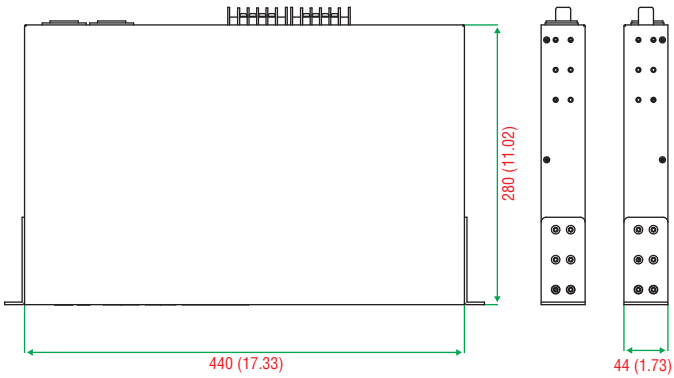
Unit: mm (inch)

IKS-6726A-2GTXSFP Series



Rear View

Front View



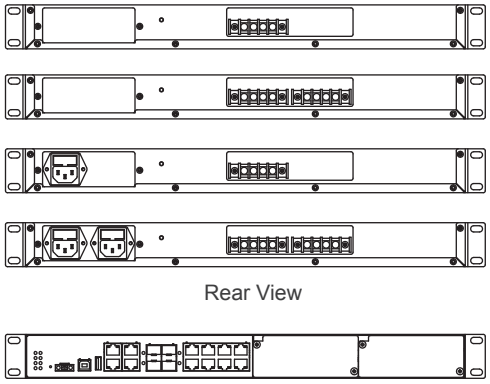
Top View

Side View

Dimensions

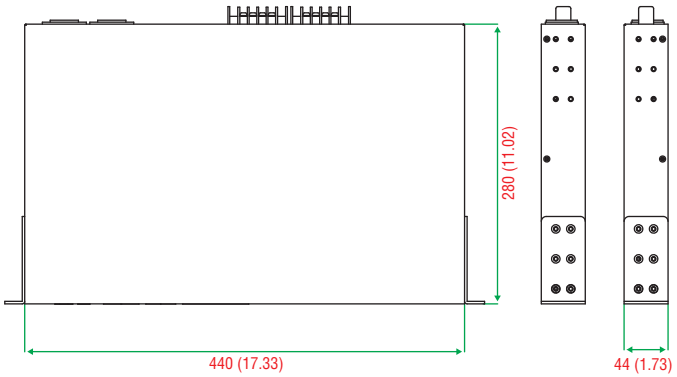
Unit: mm (inch)

IKS-6728A-4GTXSFP Series



Rear View

Front View



Top View

Side View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6726A/6728A with power supply

Step 2: Select interface modules

IM-6700A modules (Fast Ethernet)

Note: The IKS-6726A/6728A Ethernet switch system is delivered without interface modules. See the IM-6700A datasheet to determine which interface modules are suitable for your application.

IKS-6726A/6728A Modular Rackmount Ethernet Switch System

Modular managed rackmount Ethernet switch with 8 fixed 10/100BaseT(X) ports, 2 or 4 Gigabit Copper/SFP combo ports, and 2 slots for Fast Ethernet modules. Support up to 24+4G ports, -40 to 75°C operating temperature.

Available Models	Port Interface				Power Supply					
	Gigabit Ethernet	Fast Ethernet			Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Wide Temperature (-40 to 75 °C)	10/100/1000 BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)	100BaseFX	100BaseSFP*	HV (85 to 264 VAC)	48 VDC	24 VDC	HV (85 to 264 VAC)	48 VDC	24 VDC
IKS-6726A Series										
IKS-6726A-2GTXSFP-HV-T	2	Up to 24	Up to 12	Up to 18	1	–	–	–	–	–
IKS-6726A-2GTXSFP-HV-HV-T	2	Up to 24	Up to 12	Up to 18	1	–	–	1	–	–
IKS-6726A-2GTXSFP-24-T	2	Up to 24	Up to 12	Up to 18	–	–	1	–	–	–
IKS-6726A-2GTXSFP-24-24-T	2	Up to 24	Up to 12	Up to 18	–	–	1	–	–	1
IKS-6726A-2GTXSFP-48-T	2	Up to 24	Up to 12	Up to 18	–	1	–	–	–	–
IKS-6726A-2GTXSFP-48-48-T	2	Up to 24	Up to 12	Up to 18	–	1	–	–	1	–
IKS-6728A Series										
IKS-6728A-4GTXSFP-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	–	–	–
IKS-6728A-4GTXSFP-HV-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	1	–	–
IKS-6728A-4GTXSFP-24-T	4	Up to 24	Up to 12	Up to 20	–	–	1	–	–	–
IKS-6728A-4GTXSFP-24-24-T	4	Up to 24	Up to 12	Up to 20	–	–	1	–	–	1
IKS-6728A-4GTXSFP-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–	–	–
IKS-6728A-4GTXSFP-48-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–	1	–

Note: The IKS-6726A/6728A series supports 100BaseSFP and 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-6726A or IKS-6728A switch
- AC power cord (HV model only)
- Protective caps for unused ports
- 2 rackmount ears
- USB cable (Type A male to Type B male)
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-6700A Series

Fast Ethernet modules for IKS-6726A-2GTXSFP/IKS-6728A-4GTXSFP/ IKS-6728A-8PoE-4GTXSFP series switches

Specifications

Fast Ethernet Interface Modules, IM-6700A series


IM-6700A-8TX


IM-6700A-8SFP*


IM-6700A-6SSC
IM-6700A-6MSC


IM-6700A-6MST


IM-6700A-2MSC4TX
IM-6700A-2SSC4TX


IM-6700A-2MST4TX


IM-6700A-4MSC2TX
IM-6700A-4SSC2TX


IM-6700A-4MST2TX


IM-6700A-8PoE**

*See the SFP-1FE datasheet for Fast Ethernet module product information.
**IM-6700A-8PoE is supported by the IKS-6728A-8PoE series

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST or SFP LC connector)
PoE Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection, IEEE 802.3af/at standards, Mode A

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption:
IM-6700A-8TX: 1.21 W
IM-6700A-8PoE: 1.21 W (w/o PoE output)
IM-6700A-8SFP: 0.92 W
IM-6700A-6MSC/6MST/6SSC: 7.57 W
IM-6700A-4MSC2TX/4MST2TX/4SSC2TX: 5.28 W
IM-6700A-2MSC4TX/2MST4TX/2SSC4TX: 3.19 W

Physical Characteristics

Weight:
IM-6700A-8TX: 225 g (0.50 lb)
IM-6700A-8PoE: 260 g (0.58 lb)
IM-6700A-8SFP: 295 g (0.65 lb)
IM-6700A-6MSC-6MSC/6MST/6SSC: 390 g (0.86 lb)
IM-6700A-4MSC2TX-4MSC2TX/4MST2TX/4SSC2TX: 270 g (0.60 lb)
IM-6700A-2MSC4TX-2MSC4TX/2MST4TX/2SSC4TX: 270 g (0.60 lb)

Reliability

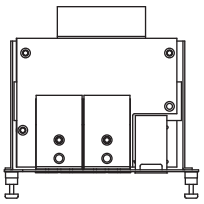
MTBF (mean time between failures):
IM-6700A-8TX: 10,412,400 hrs
IM-6700A-8SFP: 3,510,110 hrs
IM-6700A-6MSC: 366,119 hrs
IM-6700A-6MST: 365,741 hrs
IM-6700A-6SSC: 365,741 hrs
IM-6700A-4MSC2TX: 530,268 hrs
IM-6700A-4MST2TX: 537,942 hrs
IM-6700A-2MSC4TX: 1,031,180 hrs
IM-6700A-2MST4TX: 1,031,180 hrs
IM-6700A-2SSC4TX: 1,031,180 hrs
IM-6700A-8PoE: 338,800 hrs
Database: Telcordia (Bellcore), GB

Warranty

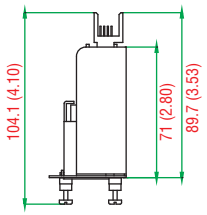
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

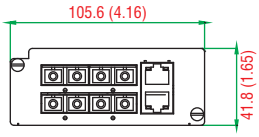
Unit: mm (inch)



Top View



Side View



Front View

Ordering Information

Compatible Rackmount Ethernet Switch Systems

Modular Rackmount Ethernet Switch System:

IKS-6726A-2GTXSFP

IKS-6728A-4GTXSFP

IKS-6728A-8PoE

Fast Ethernet Modules, IM-6700A Series

Available Models	Port Interface				
	10/100BaseT(X)	100BaseFX			100BaseSFP*
		Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector	
IM-6700A-8TX	8	–	–	–	–
IM-6700A-8SFP	–	–	–	–	8
IM-6700A-6MSC	–	6	–	–	–
IM-6700A-6MST	–	–	6	–	–
IM-6700A-6SSC	–	–	–	6	–
IM-6700A-4MSC2TX	2	4	–	–	–
IM-6700A-4MST2TX	2	–	4	–	–
IM-6700A-4SSC2TX	2	–	–	4	–
IM-6700A-2MSC4TX	4	2	–	–	–
IM-6700A-2MST4TX	4	–	2	–	–
IM-6700A-2SSC4TX	4	–	–	2	–
IM-6700A-8PoE	8 (PoE+ ports)	–	–	–	–

Package Checklist

- IM-6700A series interface module
- Warranty card

EDS-728/828

Award-winning Product

24+4G-port Layer 2/Layer 3 Gigabit modular managed Ethernet switches

- 4 Gigabit plus 24 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Layer 3 routing interconnects multiple LAN segments (EDS-828)
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-728/828 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-728/828 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-728/828's advanced management and security features. The EDS-728/828 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. In addition to Layer 2 features, 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.

Features and Benefits

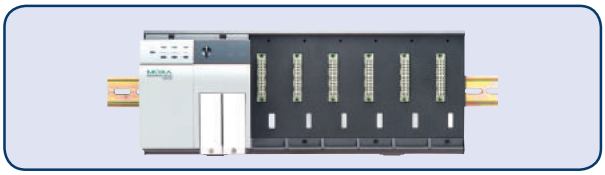
- Layer 3 switching functionality to move data and information across networks (EDS-828)
- Command Line Interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- 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
- Access Control Lists (ACL) increase the flexibility and security of network management (EDS-828)
- TACACS+, SNMPv3, 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, CLI, Windows utility, and ABC-01 automatic backup configurator

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Layer 2/Layer 3 Modular Managed Ethernet Switch System, EDS-72810G/82810G



Software Features

Management: IPv4, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control

Filter: 802.1Q VLAN, VLAN Unaware, Q-in-Q VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, VRRP (EDS-828 only)
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock, Access Control Lists (EDS-828 only)
Multicast Routing: DVMRP, PIM-DM (EDS-828)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 32 MB

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, MSTR/HEAD, CPLR/TAIL, T.RING
Mode 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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: 0.82 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 362.4 x 142.5 x 128 mm (14.27 x 5.61 x 5.04 in)
Weight: 1950 g (4.30 lb)
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)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

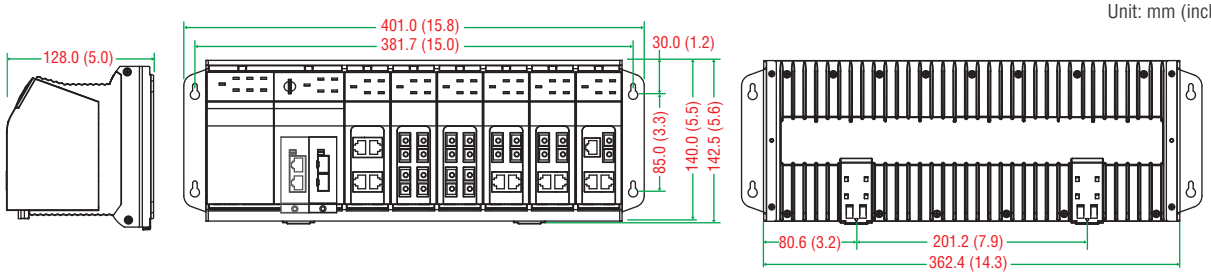
Time: 191,203 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Side View Front View Rear View

Ordering Information

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

EDS-72810G/82810G → **IM series (Gigabit or Fast Ethernet)**

Note: The EDS-72810G/82810G switch system is delivered without interface modules. See the IM series and SFP-1G datasheets for Gigabit and Fast Ethernet interface module product information.

Available Models

EDS-72810G/82810G: Layer 2/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)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-inch rack-mounting kit
WK-32: Wall-mounting kit for the EDS-728/828 series

Package Checklist

- EDS-728/828 switch
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

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: See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Power Requirements

Power Consumption (@ 24 V):
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 (0.33 lb)
IM-2GSFP: 148 g (0.33 lb)

MTBF (mean time between failures)

Time:
IM-2GTX: 417,521 hrs
IM-2GSFP: 424,955 hrs
Database: Telcordia (Bellcore), GB

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, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: PWR, P1, P2, P3, P4 port status

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption (@ 24 V):
IM-4TX: 1.29 W
IM-2MSC/2TX: 2.06 W
IM-2MST/2TX: 2.06 W
IM-2SSC/2TX: 2.06 W
IM-1LSC/3TX: 2.12 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 (0.48 lb)
IM-2MSC/2TX: 245 g (0.54 lb)
IM-2MST/2TX: 250 g (0.56 lb)
IM-2SSC/2TX: 245 g (0.54 lb)
IM-1LSC/3TX: 235 g (0.52 lb)
IM-4MSC: 250 g (0.56 lb)
IM-4MST: 270 g (0.60 lb)
IM-4SSC: 270 g (0.60 lb)

MTBF (mean time between failures)

Time:
IM-4TX: 4,403,579 hrs
IM-2MSC/2TX, IM-2MST/2TX, IM-2SSC/2TX: 1,011,453 hrs
IM-1LSC/3TX: 3,924,924 hrs
IM-4MSC, IM-4MST, IM-4SSC: 696,138 hrs
Standard: Telcordia (Bellcore), GB

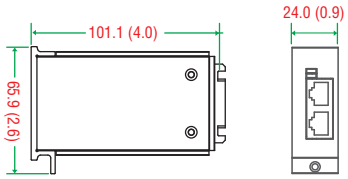
Warranty

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

Dimensions

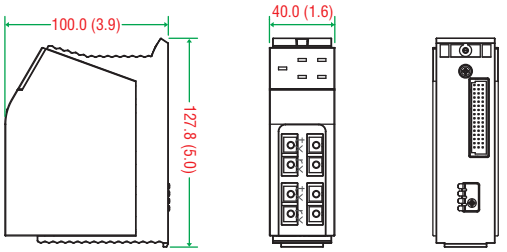
Unit: mm (inch)

Gigabit Ethernet Interface Modules



Side View Front View

Fast Ethernet Interface Modules



Side View Front View Rear View

Ordering Information

Available Models (0 to 60°C)	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

*See the SFP-1G datasheet for Gigabit Ethernet SFP module product information.

Package Checklist

- IM series interface modules
- Warranty card

EDS-608/611/616/619 Series

8, 8+3G, 16, 16+3G-port compact modular managed Ethernet switches

- Up to 19 optical fiber connections in a compact switch (EDS-619)
- Modular design with 4-port copper/fiber combinations
- Hot swap media modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The versatile modular design of the compact EDS-600 series Ethernet switch allows users to combine fiber and copper modules to create switch solutions suitable for any automation network. The EDS-600's modular design lets you install up to 3 Gigabit Ethernet ports and 16 Fast Ethernet ports, and the advanced Turbo Ring and Turbo Chain (recovery time < 20 ms) technology, RSTP/STP, and MSTP 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-600 series supports several reliable and intelligent functions, including IEEE 1588 PTPv2, EtherNet/IP, Modbus/TCP, LLDP, DHCP Option 82, SNMP Inform, QoS, IGMP snooping, VLAN, TACACS+, IEEE 802.1X, HTTPS, SSH, SNMPv3, and more, making the Ethernet switches suitable for any harsh industrial environment.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Hot swap media modules for continuous operation
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- SNMP Inform for ensuring reliable event management
- LLDP for automated topology discovery
- DHCP Option 82 for IP address assignment with different policies
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- 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
- TACACS+, SNMPv3, 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 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

Fast Ethernet: 2 or 4 slots for any combination of 4-port interface modules, 10/100BaseT(X) or 100BaseFX
Gigabit Ethernet: 3 10/100/1000BaseT(X) with 100/1000BaseSFP combo slots (EDS-611 and EDS-619 only)
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, G1/G2/G3 (EDS-611 and EDS-619 only)
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 +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: (without CM-600 modules installed)
EDS-608: 0.16 A @ 24 V
EDS-611: 0.31 A @ 24 V
EDS-616: 0.25 A @ 24 V
EDS-619: 0.31 A @ 24 V
Overload Current Protection: Present
Connection: 1 removable 5-contact and 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions:
EDS-608/611 Series: 124.9 x 151 x 157.2 mm (4.92 x 5.95 x 6.19 in)
EDS-616/619 Series: 185 x 151 x 157.2 mm (7.28 x 5.95 x 6.19 in)
Weight:
EDS-608: 2080 g (4.59 lb)
EDS-611: 2260 g (4.99 lb)
EDS-616: 2780 g (6.13 lb)
EDS-619: 2950 g (6.51 lb)
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)

Standards and Certifications

Safety: UL 508, UL 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24, EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

Time:
EDS-608: 596,219 hrs
EDS-611: 483,344 hrs
EDS-616: 546,937 hrs
EDS-619: 475,816 hrs
Standard: Telcordia (Bellcore), GB

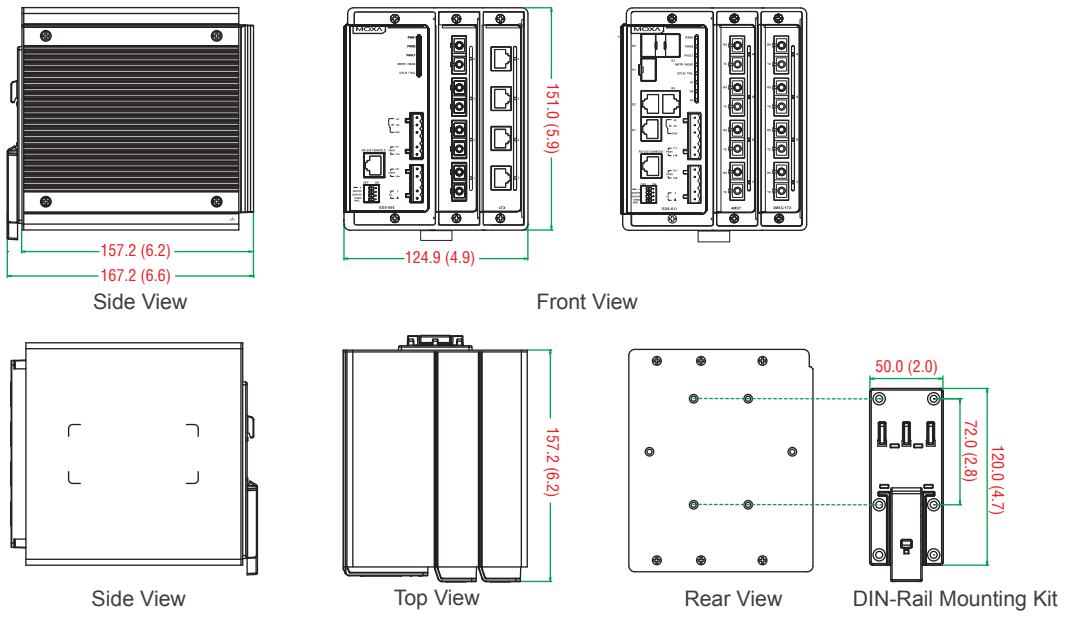
Warranty

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

Dimensions

Unit: mm (inch)

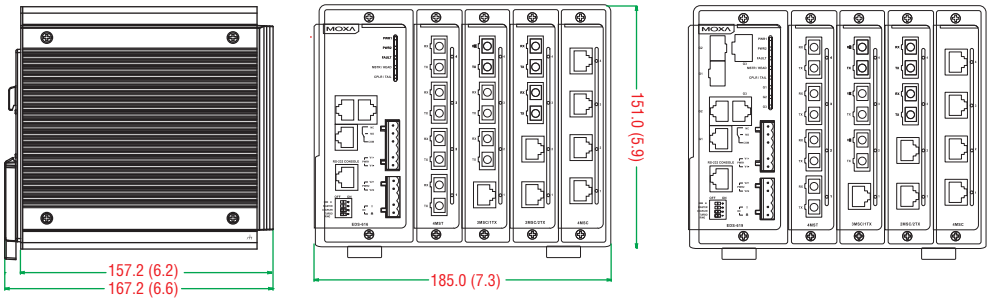
EDS-608/611 Series



Dimensions

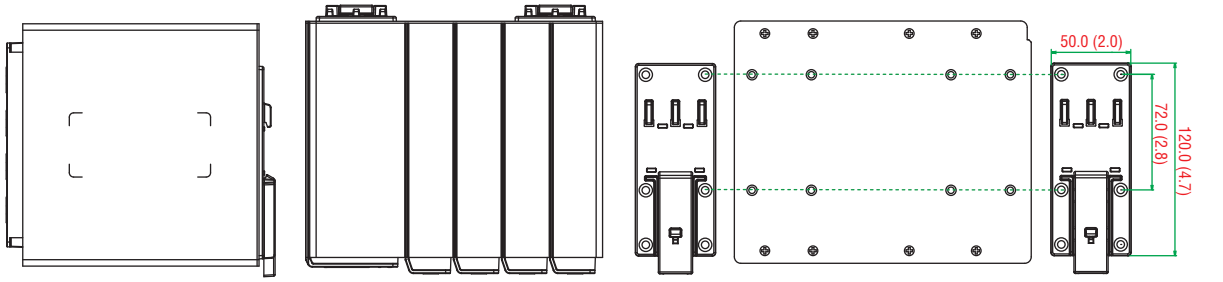
Unit: mm (inch)

EDS-616/619 Series



Side View

Front View



Side View

Top View

Rear View

DIN-Rail Mounting Kit

Ordering Information

Step 1: Select Ethernet switch system

EDS-608/611/616/619

Step 2: Select interface modules

CM-600 Series (Fast Ethernet)

Note: The EDS-600 switch system is delivered without interface modules. See the CM-600 datasheet for Fast Ethernet interface module product information.

Available Models		Total No. of Ports	Port Interface		
			Gigabit Ethernet	Fast Ethernet	
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)		10/100/1000BaseT(X) or 100/1000BaseSFP*	Slots	10/100BaseT(X) and/or 100BaseFX
EDS-608	EDS-608-T	8	–	2	up to 8
EDS-611	EDS-611-T	11	3	2	up to 8
EDS-616	EDS-616-T	16	–	4	up to 16
EDS-619	EDS-619-T	19	3	4	up to 16

*The EDS-611/619 series supports 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500,1000, or 2000 nodes
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-75: Wall-mounting kit, 2 plates with 8 screws
AVK-17: Anti-vibration wiring Kit

Package Checklist

- EDS-608 or EDS-611 or EDS-616 or EDS-619 switch
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

CM-600 Series

4-port Fast Ethernet interface modules for EDS-600 series Ethernet switches

Specifications

Fast Ethernet Interface Modules, CM-600 Series


CM-600-4TX
CM-600-4TX-BP
CM-600-4TX-PTP


CM-600-4MSC
CM-600-4SSC


CM-600-4MST


CM-600-3MSC/1TX
CM-600-3SSC/1TX


CM-600-3MST/1TX


CM-600-2MSC/2TX
CM-600-2SSC/2TX


CM-600-2MST/2TX

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Power Consumption:
CM-600-4TX: 0.61 W
CM-600-4TX-BP: 2.38 W
CM-600-4TX-PTP: 3.46 W
CM-600-4MSC/4MST/4SSC: 2.44 W
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 2 W
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 1.56 W

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 29.7 x 144.4 x 144.8 mm (1.17 x 5.69 x 5.7 in)
Weight:
CM-600-4TX: 190 g (0.42 lb)
CM-600-4TX-BP: 240 g (0.53 lb)
CM-600-4TX-PTP: 185 g (0.41 lb)
CM-600-4MSC, -4MST, -4SSC: 240 g (0.53 lb)
CM-600-3MSC/1TX, -3MST/1TX, -3SSC/1TX: 230 g (0.51 lb)
CM-600-2MSC/2TX, -2MST/2TX, -2SSC/2TX: 230 g (0.51 lb)

MTBF (mean time between failures)

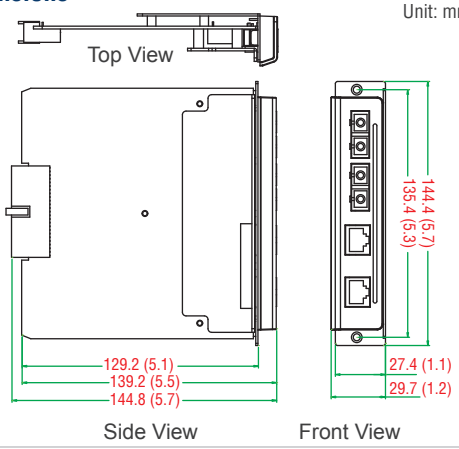
Time: 740,661 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models (-40 to 75°C)	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
CM-600-4TX	4	–	–	–
CM-600-4TX-BP*	4	–	–	–
CM-600-4TX-PTP*	4	–	–	–
CM-600-4MSC	–	4	–	–
CM-600-4MST	–	–	4	–
CM-600-4SSC	–	–	–	4
CM-600-3MSC/1TX	1	3	–	–
CM-600-3MST/1TX	1	–	3	–
CM-600-3SSC/1TX	1	–	–	3
CM-600-2MSC/2TX	2	2	–	–
CM-600-2MST/2TX	2	–	2	–
CM-600-2SSC/2TX	2	–	–	2

*The CM-600-4TX-BP supports the bypass relay function on each port; the CM-600-4TX-PTP supports the IEEE 1588 PTPv2 protocol on each port.

Package Checklist

- CM-600 interface module
- Warranty card

EDS-G508E/G512E/G516E Series

8G/12G/16G-port full Gigabit managed Ethernet switches

- Up to 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports (EDS-G516E)
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-G500E series is equipped with 8/12/16 Gigabit Ethernet ports and up to 4 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 triple-play services across a network quickly. Redundant Ethernet Turbo Ring, Turbo Chain, RSTP/STP, and MSTP increase system reliability and the availability of your network backbone. The EDS-G500E series is designed especially for communication demanding applications, such as video and process monitoring, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, SNMPv3, 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-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade.

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Input Current:
EDS-G516E: 0.39 A @ 24 VDC
EDS-G512E: 0.34 A @ 24 VDC
EDS-G508E: 0.28 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)
Weight: 1440 g (3.18 lb)
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)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

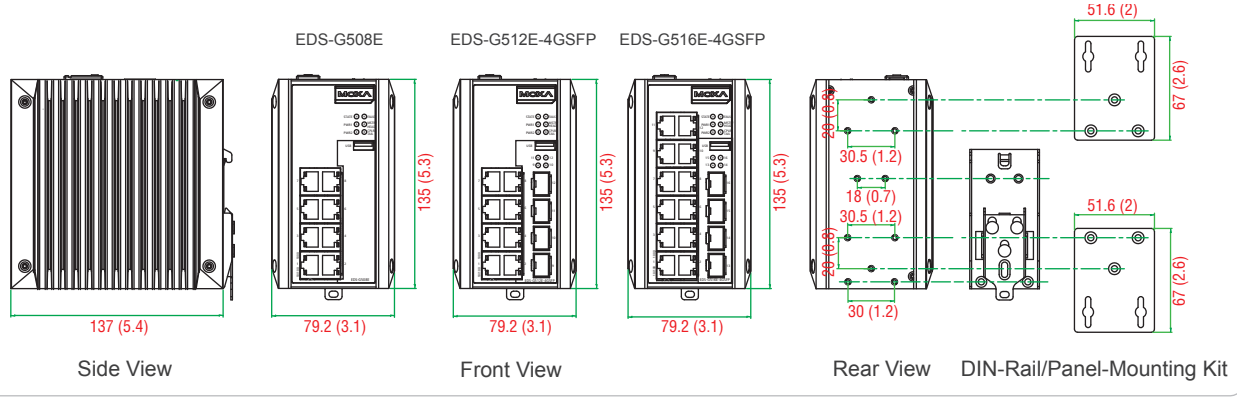
Time: EDS-G508E Series: 808,970 hrs
EDS-G512E-4GSFP Series: 816,823 hrs
EDS-G516E-4GSFP Series: 805,491 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Gigabit Ethernet Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	100/1000BaseSFP*
EDS-G508E	EDS-G508E-T	8	–
EDS-G512E-4GSFP	EDS-G512E-4GSFP-T	8	4
EDS-G516E-4GSFP	EDS-G516E-4GSFP-T	12	4

*The EDS-G500E series supports up to 4 100/1000BaseSFP slots. See the SFP-1G, SFP-1G Copper, and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: 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-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-G500E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

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 and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

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, Turbo Chain, RSTP/STP, and MSTP 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

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, SNMPv3, 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 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
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 +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 69 VDC
Input Current: 0.69 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)
Weight: 1510 g (3.33 lb)
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)

Standards and Certifications

Safety: UL 508, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

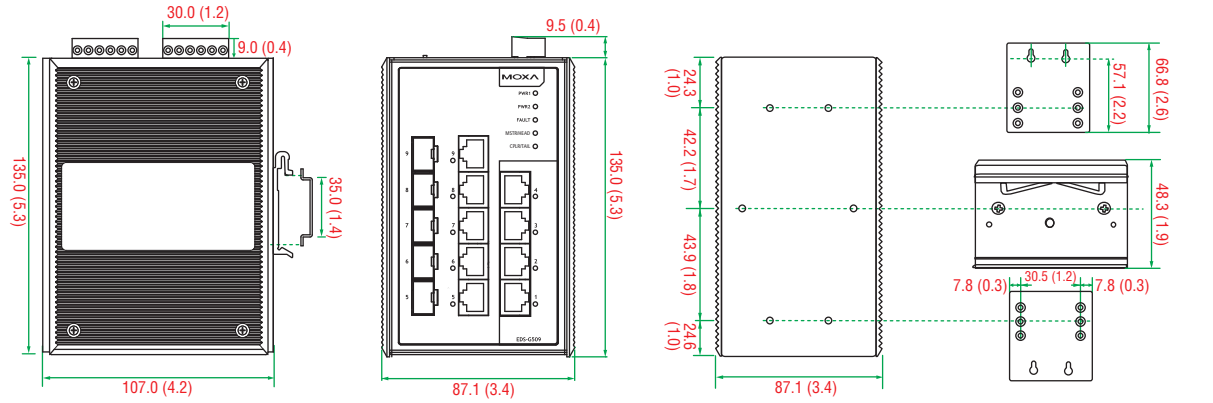
Time: 598,659 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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 5 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-G509 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-518E Series

14+4G-port Gigabit managed Ethernet switches

- 4 Gigabit plus 14 Fast Ethernet ports for copper and fiber
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFITNET, and Modbus/TCP protocols supported for device management and monitoring
- Fiber Check™--comprehensive fiber status monitoring and warning on MST/MSC/SSC/SFP fiber ports
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

EN 50121

Introduction

The EDS-518E series is a standalone, compact-size 18-port managed Ethernet switch that provides 4 combo Gigabit ports with built-in RJ45 or SFP slots for Gigabit fiber optic communication. The14 fast Ethernet ports with a variety of copper and fiber port combinations gives the EDS-518E series greater flexibility for designing your network and application. The Ethernet redundant Turbo Ring, Turbo Chain , RSTP/STP, and MSTP increase the system reliability and availability of your network backbone. The EDS-518E also supports advanced management and security features.

In addition, the EDS-518E series is designed especially for harsh industrial environments with limited installation space and high protection level requirements, such as maritime, rail wayside, oil and gas, factory automation and process automation.

Features and Benefits

- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- 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
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Fiber Check™ provides s comprehensive fiber Digital Diagnostic Monitoring (DDM) function and event warning on MST/MSC/SSC/SFP fiber ports
- 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-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade.

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, Fiber Check, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 16 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100BaseFX (SC/ST connector) and 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage port (Type A connector)
LED Indicators: PWR1, PWR2, STATE, FAULT, 10/100M (TP port), 100M (fiber port), 100/1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL
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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Input Current:
EDS-518E-4GTXSFP: 0.75 A @ 24 V
EDS-518E-MM-ST/SC-4GTXSFP: 0.61 A @ 24 V
EDS-518E-SS-SC-4GTXSFP: 0.61 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 94 x 135 x 137 mm (3.7 x 5.31 x 5.39 in)
Weight: 1,518 g (3.35 lb)
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)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
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 (mean time between failures)

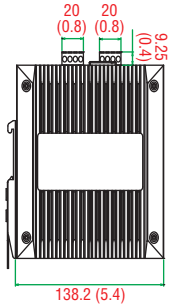
Time: 723,953 hrs
Standard: Telcordia (Bellcore), GB

Warranty

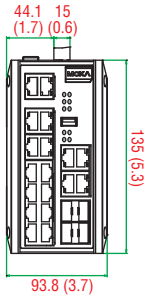
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

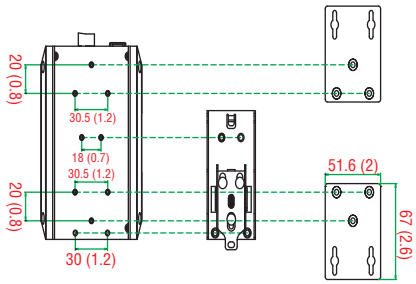
Unit: mm (inch)



Side View



Front View



Rear View

DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Total No. of Ports	Port Interface				
			Gigabit Combo Port	Fast Ethernet			
					100BaseFX		
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)		10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)	Multi-Mode, SC Connector	Multi-Mode, ST Connector	Single-Mode, SC Connector
EDS-518E-4GTXSFP	EDS-518E-4GTXSFP-T	18	4	14	–	–	–
EDS-518E-MM-SC-4GTXSFP	EDS-518E-MM-SC-4GTXSFP-T	18	4	12	2	–	–
EDS-518E-MM-ST-4GTXSFP	EDS-518E-MM-ST-4GTXSFP-T	18	4	12	–	2	–
EDS-518E-SS-SC-4GTXSFP	EDS-518E-SS-SC-4GTXSFP-T	18	4	12	–	–	2

*The EDS-518E series supports 4 1000BaseSFP slots. See the SFP section for Gigabit Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB-T: Configuration backup and restoration tool for managed Ethernet switches, -40 to 75°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-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-518E switch
- USB-IF certified cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-510E Series

7+3G-port Gigabit managed Ethernet switches

- 3 Gigabit Ethernet ports for redundant ring or uplink solutions
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- RADIUS, TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-510E Gigabit managed Ethernet switch is designed to meet rigorous mission critical applications, such as factory automation, ITS and process control. The 3 Gigabit Ethernet ports allows great flexibility to build up a Gigabit redundant Turbo Ring and a Gigabit uplink. The switch adopts USB interfaces for switch configuration, system file backup, and firmware upgrade, making it easier to manage.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- RADIUS, TACACS+, SNMPv3, 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
- Automatic warning by exception through e-mail, relay output
- Configurable by web browser, Telnet/USB console, CLI, MXconfig, and ABC-02 automatic backup configurator

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
DIP Switches: Turbo Ring, Master, Coupler, Reserve

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

Button: Reset button

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: 0.58 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 116 mm (3.12 x 5.31 x 4.57 in)
Weight: 1690 g (3.73 lb)
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)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

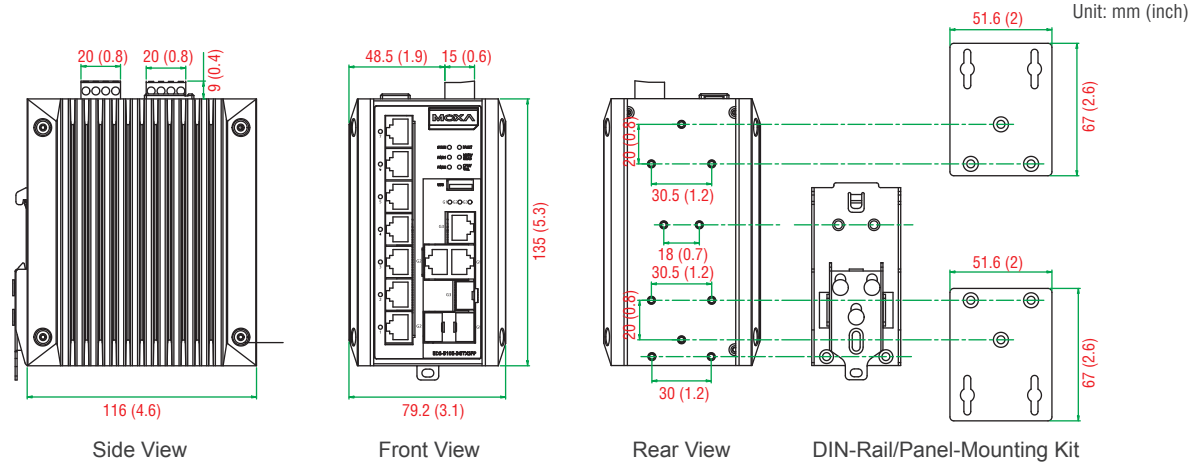
Time: 723,532 hours
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)
EDS-510E-3GTXSFP	EDS-510E-3GTXSFP-T	3	7

*The EDS-510E series supports up to 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit / Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: 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-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-510E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

EDS-505A/508A/516A Series

5, 8, and 16-port managed Ethernet switches

- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-505A/508A/516A are standalone 5, 8, and 16-port managed Ethernet switches. With their advanced Turbo Ring and Turbo Chain technology (recovery time < 20 ms), RSTP/STP, and MSTP support 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 advanced management and security features, making the EDS-505A/508A/516A switches suitable for any harsh industrial environment.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, SNMPv3, 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
- Automatic warning by exception through e-mail, relay output

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-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection (EDS-516A only)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit (EDS-505A/508A), 2 Mbit (EDS-516A)

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)

DIP Switches: Turbo Ring, Master, Coupler, Reserve (EDS-505A/508A series only)
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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Optical Fiber

		100BaseFX			
		Multi-Mode		Single-Mode (40 km)	Single-Mode (80 km)
Fiber Cable Type		OM1	50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		4 km	5 km	40 km	80 km
Wave-length	Typical (nm)	1300		1310	1550
	TX Range (nm)	1260 to 1360		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1600		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	12		29	29
	Dispersion Penalty (dB)	3		1	1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: EDS-505A: 0.21 A @ 24 V
EDS-505A-MM/SS: 0.3 A @ 24 V
EDS-508A: 0.22A @ 24 V
EDS-508A-MM/SS: 0.31 A @ 24 V
EDS-516A: 0.35 A @ 24 V
EDS-516A-MM: 0.44 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: 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 (2.30 lb)
EDS-516A Series: 1586 g (3.50 lb)
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)

Standards and Certifications

Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS: IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Marine: 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 (mean time between failures)

Time:
EDS-505A Series: 352,000 hrs
EDS-508A Series: 339,000 hrs
EDS-516A Series: 247,000 hrs
Standard: Telcordia (Bellcore), GB

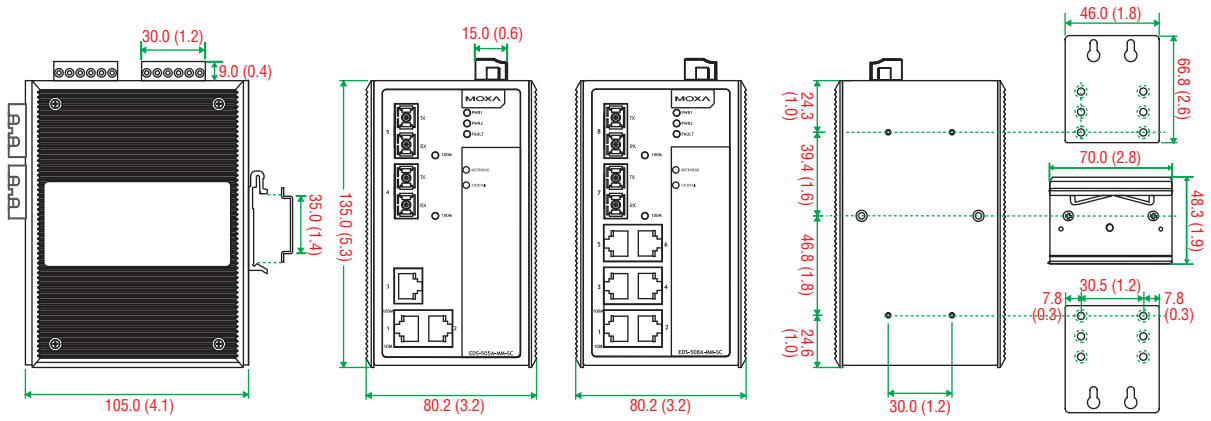
Warranty

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

Dimensions

Unit: mm (inch)

EDS-505A/508A Series

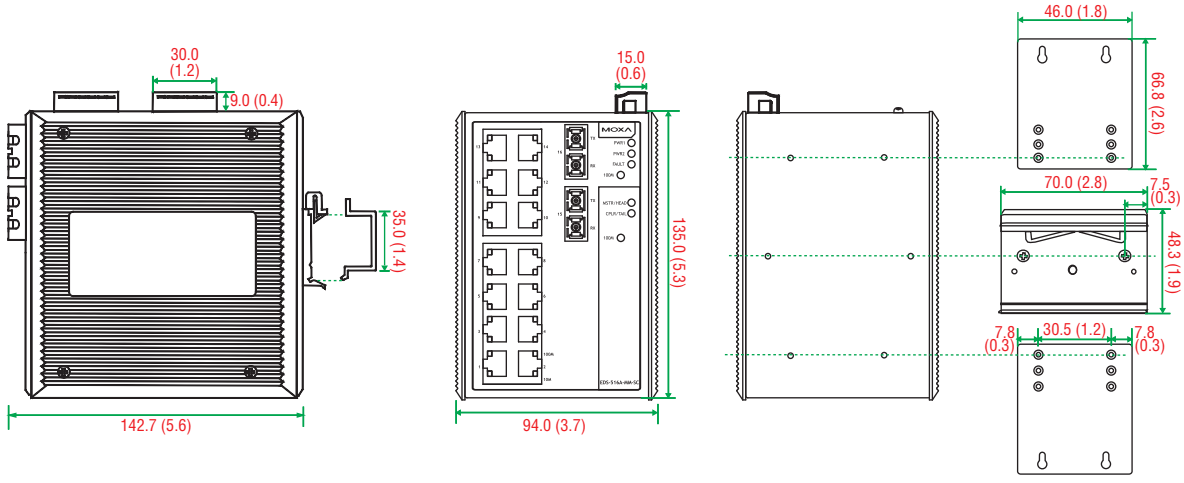


Side View | Front View | Rear View | DIN-Rail/Panel Mounting Kit

Dimensions

Unit: mm (inch)

EDS-516A Series



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	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-508A-SS-SC-80	–	6	–	–	–	2
EDS-516A Series						
EDS-516A	EDS-516A-T	16	–	–	–	–
EDS-516A-MM-SC	EDS-516A-MM-SC-T	14	2	–	–	–
EDS-516A-MM-ST	EDS-516A-MM-ST-T	14	–	2	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-505A or EDS-508A or EDS-516A switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-405A/408A Series

5 and 8-port entry-level managed Ethernet switches

- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- PROFINET or EtherNet/IP enabled by default (PN or EIP models)
- Supports MXstudio for easy, visualized industrial network management

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, Turbo Chain, ring coupling, IGMP snooping, IEEE 802.1Q VLAN, 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

- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, Modbus/TCP and PROFINET* protocols for device management and monitoring
- EtherNet/IP EDS (Electronic Data Sheet) file, custom AOI (Add-On Instructions) and FactoryTalk® View faceplate available
- PROFINET GSDML file and SIMATIC STEP 7 device icons available*
- 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
- 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

* EDS-405A/408A-PN series only

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-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1Q for VLAN Tagging

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, Turbo Ring v1/v2, Turbo Chain
Time Management: SNTP, NTP Server/Client
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

MAC Table Size: 2 K (EDS-405A), 8 K (EDS-408A)
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24 VDC, redundant dual inputs
Operating Voltage: 12 to 45 VDC
Input Current: EDS-405A, EDS-405A-EIP, EDS-405A-PN: 0.21 A @ 24 V
EDS-405A-MM/SS: 0.28 A @ 24 V
EDS-408A, EDS-408A-EIP, EDS-408A-PN: 0.22 A @ 24 V
EDS-408A-MM/SS: 0.3 A @ 24 V
EDS-408A-3M/3S/2M1S/1M2S: 0.28 A @ 24 V
Overload Current Protection: Present
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight:
EDS-405A, EDS-405A-MM, EDS-405A-SS, EDS-405A-PN, EDS-405A-EIP: 650 g (1.44 lb)
EDS-408A, EDS-408A-MM, EDS-408A-SS, EDS-408A-PN, EDS-408A-EIP: 650 g (1.44 lb)
EDS-408A-3M/3S/2M1S/1M2S: 890 g (1.97 lb)
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)

Standards and Certifications

Safety: UL 508, UL 60950-1*, CSA C22.2 No. 60950-1, EN 60950-1**
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D*, ATEX Zone 2 Ex nA nC IIC T4 Gc***,
ATEX Zone 2 Ex nA nC op is IIC T4 Gc****
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4**
Marine:
EDS-405A/408A, EDS-405A/408A 2 Fiber series: DNV, GL
EDS-408A 3 Fiber series: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

*EDS-405A/408A, EDS-405A/408A 2 Fiber series only
**EDS-408A only
***EDS-405A, EDS-405A 2 Fiber series only
****EDS-408A, EDS-408A 2 Fiber series only
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

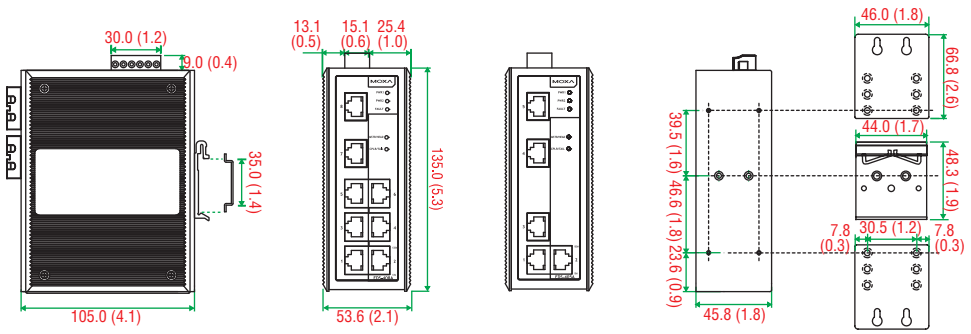
Time:
EDS-405A Series: 852,421 hrs
EDS-408A Series: 1,102,845 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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-405A/408A-SS-SC	EDS-405A/408A-SS-SC-T	3/6	–	–	2
EDS-408A-3M-SC	EDS-408A-3M-SC-T	5	3	–	–
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
EDS-405A/408A-EIP	EDS-405A/408A-EIP-T	5/8	–	–	–
EDS-405A/408A-PN	EDS-405A/408A-PN-T	5/8	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-405A or EDS-408A switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-405A-PTP Series

5-port IEEE 1588v2 PTP managed Ethernet switches

- IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-405A-PTP are 5-port IEEE 1588v2 PTP switches designed especially for real-time control applications. The switches support Modbus TCP, PROFINET RT, and EtherNet/IP for better SCADA integration. Other management functions such as IGMP snooping, IEEE 802.1Q VLAN, QoS, RMON and relay warning, make the network planning more flexible and easy.

IEEE 1588 PTP Features

- IEEE 1588v2 PTP (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support both IEEE 1588 Boundary Clock and Transparent Clock
- Support both End to End (2-step) and Peer to Peer (2-step) modes in Transparent Clock
- High precision time accuracy (under 1 μs)

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, Modbus/TCP and PROFINET protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- 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
- 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)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.1Q for VLAN Tagging

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, DDM, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, Turbo Ring v1/v2, Turbo Chain
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (hardware-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: 0.23 A @ 24 V

Overload Current Protection: Present
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 820 g (1.81 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 0.5 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 0.5 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 3 V
IEC 61000-4-8
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 (mean time between failures)

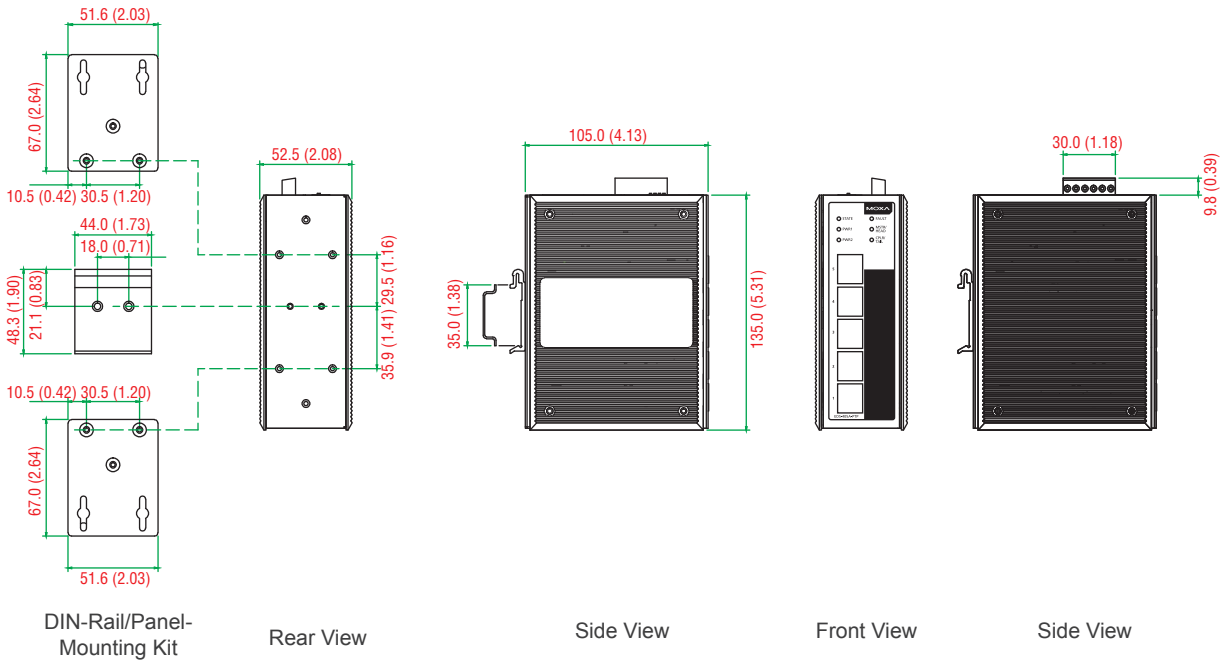
Time: 1,354,590 hours
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface			
Standard Temperature (-10 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-PTP	EDS-405A-PTP-T	5	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-405A-PTP switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G205-1GTXSFP/G308 Series

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

- Fiber optic options for extending distance and electrical noise immunity
- Redundant dual 12/24/48 VDC power inputs
- Supports jumbo frame transmission up to 10 KB (EDS-G205-1GTXSFP series) and 9.6 KB (EDS-G308 series)
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-G205-1GTXSFP and EDS-G308 switches are equipped with 5 and 8 Gigabit Ethernet ports, respectively, and up to 2 fiber optic ports (one for EDS-G205-1GTXSFP series and two for EDS-G308-2 SFP series), making them ideal for applications that demand high bandwidth. The EDS-G205-1GTXSFP/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. In addition, the add-on 4-pin DIP switches can be used for controlling over the functions of broadcast protection, jumbo frame, IEEE 802.3az energy saving and 100/1000 SFP speed switching (EDS-G205-1GTXSFP series only) is ideal for easy on-site configuration for any industrial automation application. Two models are available in this series. One model has an operating temperature range of -10 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-G205-1GTXSFP/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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.3az for Energy-Efficient Ethernet
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 1024 kbit (EDS-G205-1GTXSFP Series), 4 Mbit (EDS-G308 Series)
Jumbo Frame Size: 10 KB (EDS-G205-1GTXSFP Series), 9.6 KB (EDS-G308 Series)

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100/1000BaseSFP slot (SFP model)
DIP Switches: One for port break alarm, one for Enable/Disable broadcast storm protection, jumbo frame, IEEE 802.3az energy saving and 100/1000 SFP speed switching (EDS-G205-1GTXSFP series only)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: EDS-G205-1GTXSFP: 0.14 A @ 24 V
EDS-G308: 0.29 A @ 24 V
EDS-G308-2SFP: 0.31 A @ 24 V
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
EDS-G205-1GTXSFP Series: 29 x 135 x 105 mm (1.14 x 5.31 x 4.13 in)
EDS-G308 Series: 53 x 135 x 105 mm (2.08 x 5.31 x 4.13 in)
Weight:
EDS-G205-1GTXSFP Series: 290 g (0.64 lb)
EDS-G308 Series: 880 g (1.94 lb)
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)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
Hazardous Location:
UL/cUL Class 1 Division 2 Groups A/B/C/D,
ATEX Zone 2 Ex nA nC IIC T4 Gc (EDS-G205-1GTXSFP series)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4 (EDS-G205-1GTXSFP series)
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 (mean time between failures)

Time:
EDS-G205-1GTXSFP Series: 2,823,446 hrs
EDS-G308 Series: 2,424,649 hrs
Standard: Telcordia (Bellcore), GB

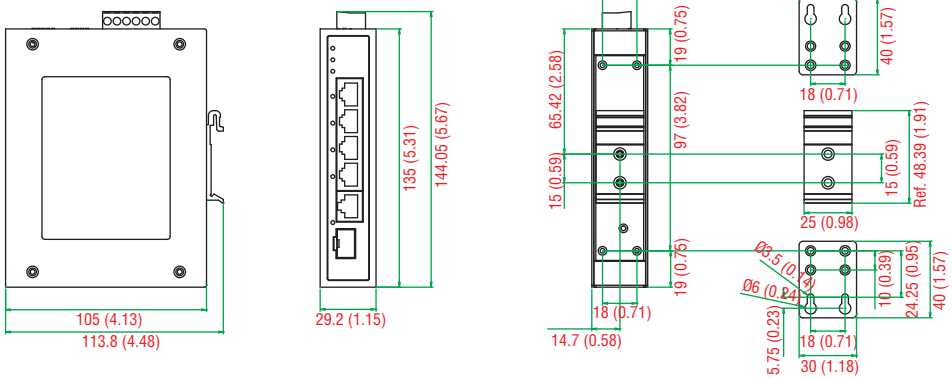
Warranty

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

Dimensions

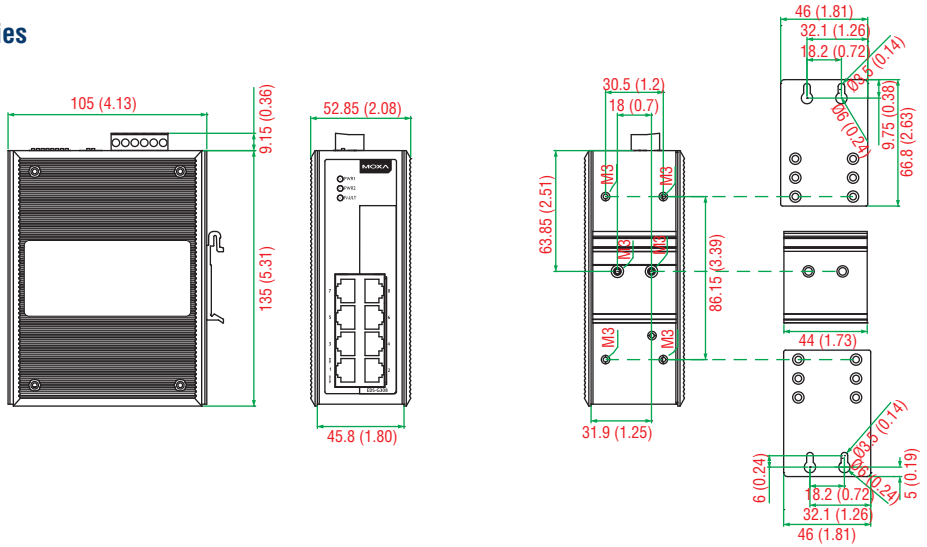
Unit: mm (inch)

EDS-G205-1GTXSFP Series



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

EDS-G308 Series



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

Ordering Information

Product Model		Port Interface	
		Gigabit Ethernet	
Standard Temperature	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*
EDS-G205-1GTXSFP	EDS-G205-1GTXSFP-T	4	1
EDS-G308	EDS-G308-T	8	–
EDS-G308-2SFP	EDS-G308-2SFP-T	6	2

* The EDS-G205-1GTXSFP and EDS-G205-1GTXSFP-T support 1 100/1000BaseSFP slot. The EDS-G308-2SFP and EDS-G308-2SFP-T support 2 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for 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
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit (EDS-G205 series only)
WK-46: Wall-mounting kit, 2 plates with 8 screws (EDS-G308 series only)

Package Checklist

- EDS-G205-1GTXSFP or EDS-G308 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-305/308/309/316 Series

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

- 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)

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 1 Div. 2 / ATEX Zone 2). The switches comply with FCC, 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 100BaseFX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K (EDS-305/308/309), 4 K (EDS-316)
Packet Buffer Size: n/a (EDS-305), 512 kbit (EDS-308/309), 1.25 Mbit (EDS-316)

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
DIP Switches:
• Port break alarm mask
• Enable/disable broadcast storm protection (EDS-316)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX			
		Multi-Mode		Single-Mode (40 km)	Single-Mode (80 km)
Fiber Cable Type		OM1	50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		4 km	5 km	40 km	80 km
Wave-length	Typical (nm)	1300		1310	1550
	TX Range (nm)	1260 to 1360		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1600		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	12		29	29
	Dispersion Penalty (dB)	3		1	1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage:
EDS-305/308: 24 VDC, redundant dual inputs
EDS-309: 24 VDC, redundant dual input
EDS-316: 12/24/48 VDC, redundant dual inputs
Operating Voltage:
EDS-305/308: 12 to 48 VDC
EDS-309: 12 to 45 VDC
EDS-316: 9.6 to 60 VDC

Input Current:
EDS-305: 0.11 A @ 24 V
EDS-305-M/S: 0.15 A @ 24 V
EDS-308: 0.11 A @ 24 V
EDS-308-M/S: 0.18 A @ 24 V
EDS-308-MM/SS: 0.22 A @ 24 V
EDS-309-3M: 0.27 A @ 24 V
EDS-316: 0.23 A @ 24 V
EDS-316-M/S/MM/SS/MS: 0.38 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
IP Rating: 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:
80.1 x 135 x 105 mm (3.15 x 5.31 x 4.13 in)
Weight:
EDS-305/308/309 Series: 790 g (1.75 lb)
EDS-316 Series: 1140 g (2.52 lb)
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)

Standards and Certifications

Safety:
EDS-305 Series: UL 508, UL 60950-1, CSA C22.2 No. 60950-1
EDS-308/309/316 Series: UL 508, UL 60950-1,
CSA C22.2 No. 60950-1, EN 60950-1
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D,
ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz, 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V (EDS-309/316: 10 V)
IEC 61000-4-8
Marine: DNV, ABS, 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 (mean time 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
Standard: MIL-HDBK-217F, GB 25°C

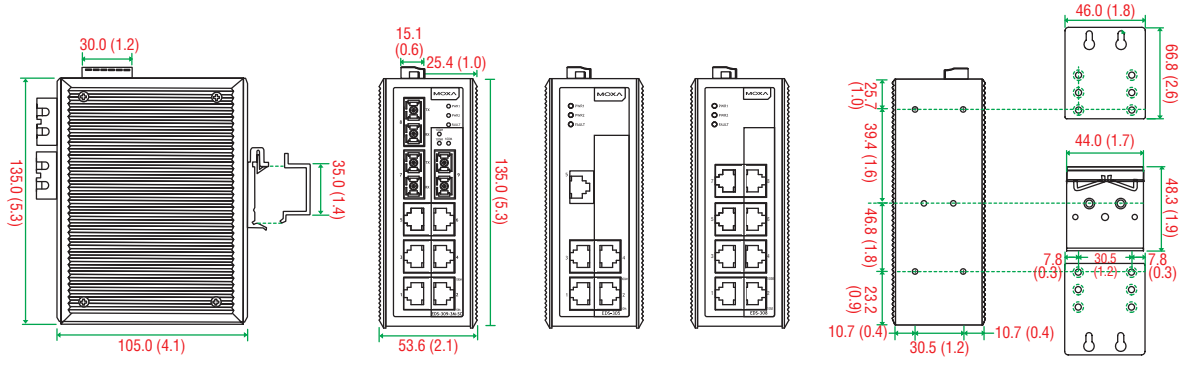
Warranty

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

Dimensions

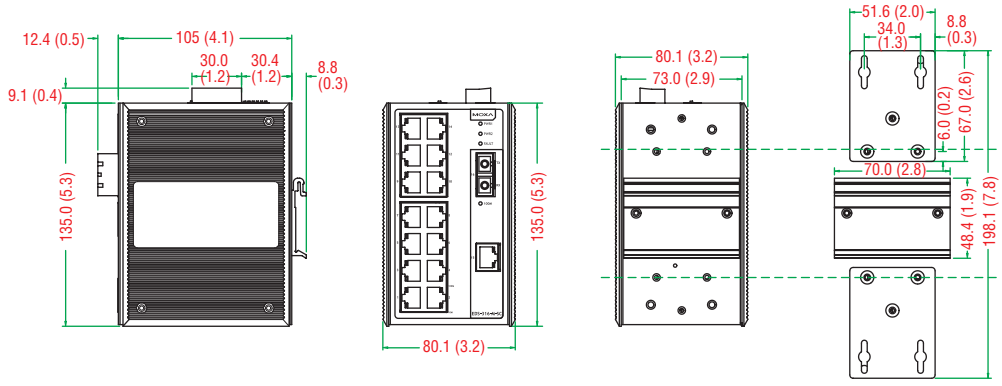
Unit: mm (inch)

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	–	7	–	–	–	1
EDS-308-SS-SC-80	–	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 Series						
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	–	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-SS-SC-80	–	14	–	–	–	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
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-305 or EDS-308 or EDS-309 or EDS-316 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-210A Series

8+2G/9+1G-port Gigabit unmanaged Ethernet switches

- Up to 2 Gigabit uplinks for high bandwidth data aggregation
- Multiple fiber ports with up to 4 100BaseSFP port combinations for maximum flexibility
- IP30 metal housing
- Redundant dual power input (12/24/48 VDC)
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-210A series 10-port industrial Ethernet unmanaged switches provide up to 2 Gigabit Ethernet ports and are ideal for applications that require high-bandwidth data convergence. In particular, the EDS-210A-1GSFP-1SFP is equipped with 1 Gigabit fiber SFP slot, whereas the EDS-210A-1GTX-1GSFP-4SFP is equipped with 1 Gigabit fiber SFP slot and 1 Gigabit copper port.

The EDS-210A unmanaged switches are also equipped with multiple 100M ports, up to 4 100BaseSFP slots, and 8 100BaseTX copper ports for maximum flexibility in port combinations and long-distance communications.

The EDS-210A series provides 12/24/48 VDC redundant power inputs, rugged IP30-rated metal housing, DIN-rail mounting, and high level EMI/EMC capability. In addition to its compact size for space-saving installation, each EDS-210A has passed a 100% burn-in test to ensure its quality. Moreover, the EDS-210A series has an operating temperature range of -10 to the 60°C with wide temperature (-40 to 75°C) models also available.

All of these features make the EDS-210A ideal for applications that require high-bandwidth transmission and data converge for uplink, such as video surveillance, tolling systems, ITS, and factory automation.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3z for 1000BaseX
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection, 10/100/1000 BaseT(X)*
*EDS-210A-1GTX-1GSFP-4SFP series only
Fiber Ports: 100BaseSFP slot and 1000BaseSFP slot

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual input
Operating Voltage: 9.6 to 60 VDC
Input Current: EDS-210A-1GSFP-1SFP: 0.39 A @ 24 V
EDS-210A-1GTX-1GSFP-4SFP: 0.39 A @ 24 V
Overload Current Protection: 3A
Connection: 2 removable 2-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions:
45.8 x 134 x 105 mm (1.8 x 5.28 x 4.13 in)
Weight:
EDS-210A-1GSFP-1SFP: 520 g (1.15 lb)
EDS-210A-1GTX-1GSFP-4SFP: 570 g (1.26 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
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 (mean time between failures)

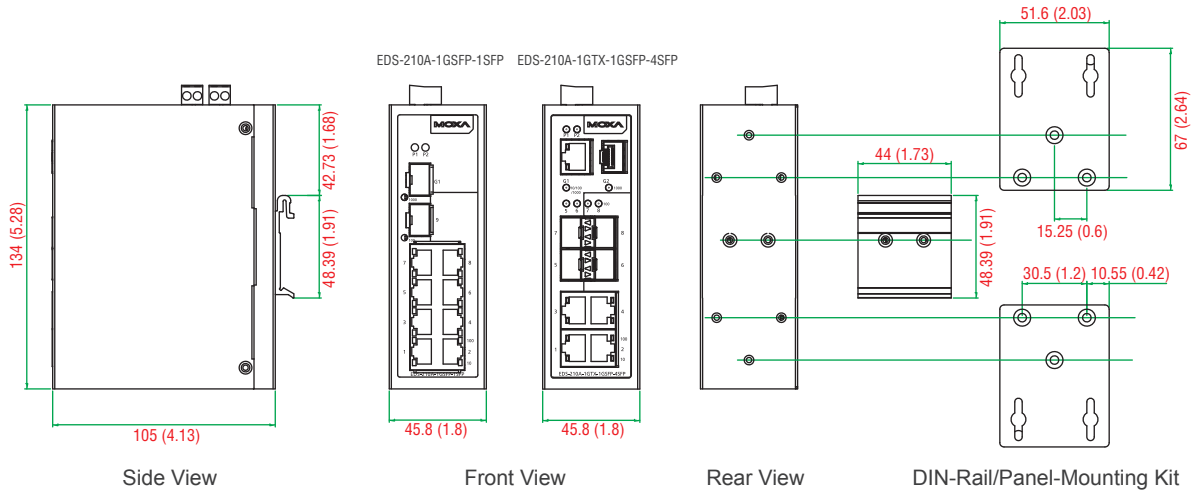
Time:
EDS-210A-1GSF-1SFP: 2,469,233 hrs
EDS-210A-1GTX-1GSF-4SFP: 2,485,402 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface			
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	Gigabit Ethernet		Fast Ethernet	
		10/100/1000 BaseT(X)	1000BaseSFP	100BaseSFP	10/100BaseT(X)
EDS-210A-1GSFP-1SFP	EDS-210A-1GSFP-1SFP-T	0	1	1	8
EDS-210A-1GTX-1GSFP-4SFP	EDS-210A-1GTX-1GSFP-4SFP-T	1	1	4	4

Note: The EDS-210A series supports 100BaseSFP and 1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for 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-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-210A switch
- Hardware installation guide (printed)
- Warranty card

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 1 Div. 2/ATEX Zone 2), Transportation (NEMA TS2/ EN 50121-4/e-Mark), and maritime environments (DNV/GL/LR/ABS/NK)
- -40 to 75°C operating temperature range (T models)

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/LR/ABS/NK), rail wayside, highway, or mobile applications(EN 50121-4/NEMA TS2/e-Mark), or hazardous locations (Class I Div. 2, ATEX Zone 2) that comply with FCC, 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

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode, single-mode)
DIP Switches: Enable/Disable broadcast storm protection

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 12/24/48 VDC, 18 to 30 VAC (47 to 63 Hz), redundant dual inputs
Operating Voltage: 9.6 to 60 VDC, 18 to 30 VAC (47 to 63 Hz)
Input Current: EDS-205A: 0.09 A @ 24 V
EDS-205A-M/S: 0.1 A @ 24 V
EDS-208A: 0.11 A @ 24 V
EDS-208A-M: 0.15 A @ 24 V
EDS-208A-MM/SS: 0.19 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum
IP Rating: IP30 protection
Dimensions:
EDS-205A Series: 30 x 115 x 70 mm (1.18 x 4.52 x 2.76 in)
EDS-208A Series: 50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)
Weight:
EDS-205A Series: 175 g (0.39 lb)
EDS-208A Series: 275 g (0.61 lb)
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)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Wheeled Vehicles: e-Mark (E1) (EDS-208A only)
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

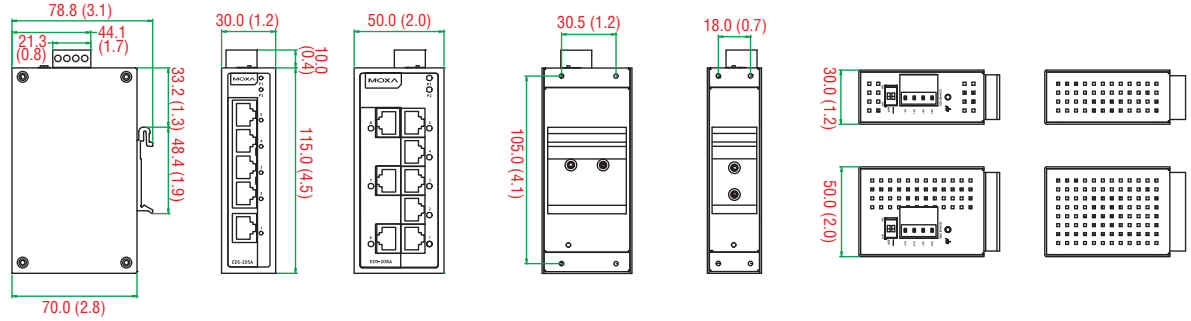
Time: EDS-205A Series: 3,040,784 hrs
EDS-208A Series: 2,428,212 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

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-205A-M-SC	EDS-205A-M-SC-T	4	1	–	–
EDS-205A-M-ST	EDS-205A-M-ST-T	4	–	1	–
EDS-205A-S-SC	EDS-205A-S-SC-T	4	–	–	1
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
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws (EDS-205A series only)
WK-46: Wall-mounting kit, 2 plates with 8 screws (EDS-208A series only)

Package Checklist

- EDS-205A or EDS-208A switch
- Hardware installation guide (printed)
- Warranty card

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

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 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

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector, multi-mode)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage:
EDS-205: 24 VDC (12 to 48 VDC), 18 to 30 VAC (47 to 63 Hz), single input
EDS-208 Series: 24 VDC (12 to 45 VDC), 18 to 30 VAC (47 to 63 Hz), single input
Input Current:
EDS-205: 0.11 A @ 24 V
EDS-208: 0.12 A @ 24 V
EDS-208-M: 0.2 A @ 24 V
Overload Current Protection: 1.1 A
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic
IP Rating: IP30 protection
Dimensions:
EDS-205: 24.9 x 100 x 86.5 mm (0.98 x 3.94 x 3.41 in)
EDS-208 Series: 40 x 100 x 86.5 mm (1.57 x 3.94 x 3.41 in)
Weight:
EDS-205: 135 g (0.30 lb)
EDS-208 Series: 170 g (0.38 lb)
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)

Standards and Certifications

Safety:
EDS-205: UL 508, EN 60950-1
EDS-208 Series: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8
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 (mean time between failures)

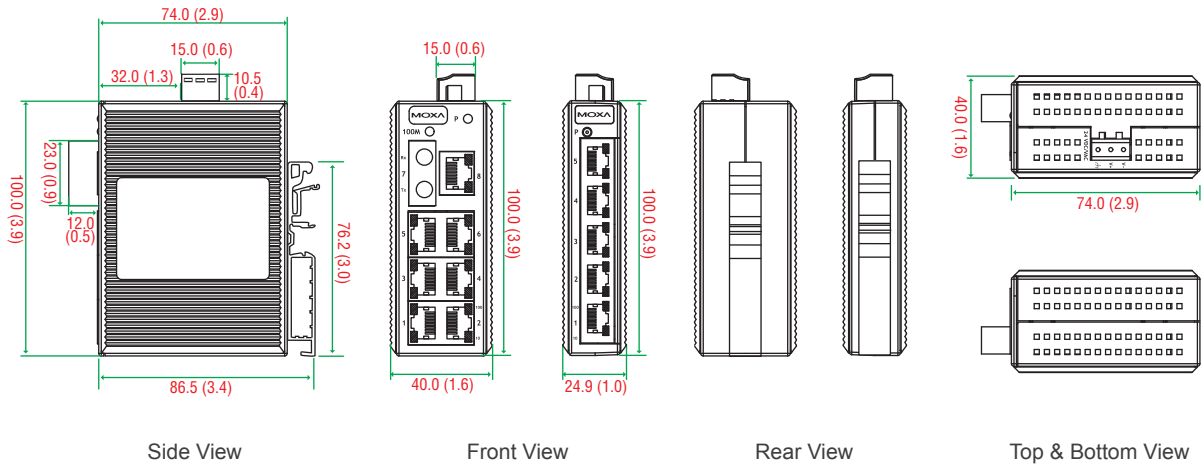
Time:
EDS-205: 3,915,945 hrs
EDS-208: 401,624 hrs
EDS-208-M-SC/ST: 368,353 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

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
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-inch rack-mounting kit

Package Checklist

- EDS-205 or EDS-208 switch
- Hardware installation guide (printed)
- Warranty card

IKS-6728A-8PoE Series

24+4G-port Gigabit modular managed PoE+ Ethernet switches

- 8 built-in PoE+ ports compliant with IEEE 802.3af/at
- Up to 36 W output per PoE+ port
- 3 kV LAN surge protection for extreme outdoor environments
- PoE diagnostics for powered-device mode analysis
- 4 Gigabit combo ports for high bandwidth communication
- -40 to 75°C operating temperature range at 720 W full loading
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The Moxa IKS-6728A-8PoE series of Gigabit modular managed PoE+ Ethernet switches are designed to meet the demands of mission critical applications for business and industry. The IKS-6728A-8PoE comes standard with up to 24 10/100BaseT(X), or PoE/PoE+, and 4 combo Gigabit Ethernet ports. The IKS-6728A-8PoE Ethernet switches provide up to 30 watts of power per PoE+ port in standard mode, and also support high power output of up to 36 watts for heavy-duty industrial PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, high-performance wireless access points, and rugged IP phones. IKS-6728A-8PoE Ethernet switches support two types of power input sources: 48 VDC for PoE+ ports and system power, and 110/220 VAC for system power. These Ethernet switches also support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, PoE diagnostic, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The IKS-6728A-8PoE series is designed especially for harsh outdoor applications with 3kV surge protection to ensure the uninterrupted reliability of PoE systems.

Features and Benefits

- Advanced PoE management functions: PoE output setting, PD failure check, PoE scheduling, and PoE diagnostics
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, IEEE 802.1X, SNMPv3, 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, CLI, Windows utility, and ABC-02-USB automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3af/at for PoE/PoE+ output
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
Jumbo Frame Size: 9.6 KB

Interface

Fast Ethernet: 8-port 10/100BaseT(X) or PoE+ 10/100BaseT(X) 2 modular slots for any 8-, or 6-port Interface Modules with 10/100BaseT(X), 100BaseFX (SC/ST connector), 100Base SFP, or PoE+ 10/100BaseT(X)
Note: See the IM-6700A datasheet for Fast Ethernet module and PoE+ module product information.
Gigabit Ethernet: 4-port 10/100/1000BaseT(X) or 100/1000Base SFP
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC

Power Requirements

Input Voltage:
HV models:
• 110/220 VAC for switch system
• 48 VDC for PoE system (53 to 57 VDC is recommended for PoE+ devices)
48 VDC models:
• 48 VDC (46 to 57 VDC) for switch and PoE system
Operating Voltage:
HV models:
• 85 to 264 VAC for switch system
• 46 to 57 VDC for PoE system
48 VDC models:
• 46 to 57 VDC for Switch and PoE system

Modular Rackmount Ethernet Switch System, IKS-6728A-8PoE series

IKS-6728A-8PoE-4GTXSFP-HV-T
IKS-6728A-8PoE-4GTXSFP-HV-HV-T
IKS-6728A-8PoE-4GTXSFP-48-T
IKS-6728A-8PoE-4GTXSFP-48-48-T

Input Current:
HV models:
• PWR input current (switch system):
Max. 0.33 A @ 110 VAC
Max. 0.24 A @ 230 VAC
• EPS input current (PoE system):
Max. 0.29 A @ 48 VDC (excluding power consumption of PoE devices)
48 VDC models:
• PWR/EPS input current (switch and PoE systems):
Max. 0.53 A @ 48 VDC (excluding power consumption of PoE devices)
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

IP Rating: IP30 protection
Dimensions: 440 x 44 x 280 mm (17.32 x 1.37 x 11.02 in)
Weight: IKS-6728A-8PoE-4GTXSFP-HV-HV-T: 4250 g (9.38 lb)
IKS-6728A-8PoE-4GTXSFP-HV-T: 4150 g (9.15 lb)
IKS-6728A-8PoE-4GTXSFP-48-48-T: 4250 g (9.38 lb)
IKS-6728A-8PoE-4GTXSFP-48-T: 4150 g (9.15 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 3 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

Time:
IKS-6728A-8PoE-4GTXSFP-48-T: 224,420 hrs
IKS-6728A-8PoE-4GTXSFP-48-48-T: 215,994 hrs
IKS-6728A-8PoE-4GTXSFP-HV-T: 159,173 hrs
IKS-6728A-8PoE-4GTXSFP-HV-HV-T: 120,731hrs
Standard: Telcordia (Bellcore), GB

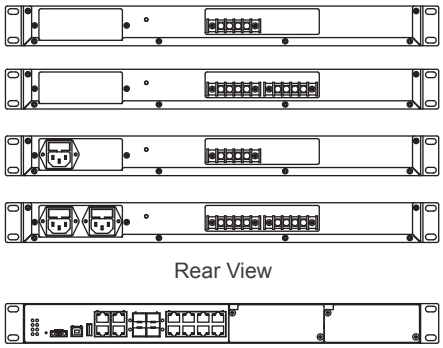
Warranty

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

Dimensions

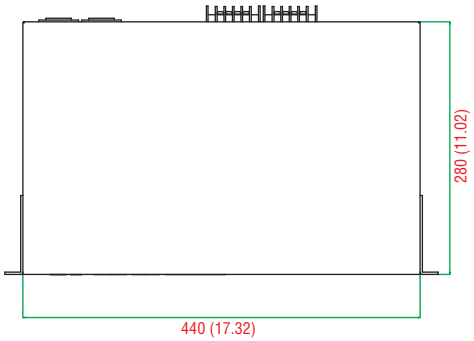
Unit: mm (inch)

IKS-6728A-8PoE-4GTXSFP Series

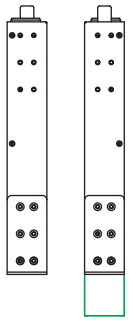


Rear View

Front View



Top View



Side View

Ordering Information

Step 1: Select Ethernet switch system

IKS-6728A-8PoE with power supply

Step 2: Select interface modules

IM-6700A modules (PoE+/Fast Ethernet)

Note: The IKS-6728A-8PoE Ethernet switch system is delivered without interface modules. See the IM-6700A datasheet to determine which interface modules are suitable for your application.

IKS-6728A-8PoE Modular Rackmount Ethernet PoE+ Switch System

Modular managed rackmount Ethernet PoE+ switch with 8 built-in 10/100BaseT(X) PoE+ ports, 4 Gigabit Copper/SFP combo ports, and 2 slots for Fast Ethernet PoE+ modules. Support up to 24+4G ports with 8 built-in PoE+ ports and up to 24 PoE+ ports, -40 to 75°C operating temperature.

Available Models	Port Interface				Power Supply			
	Gigabit Ethernet	Fast Ethernet			Isolated Power Supply 1		Isolated Power Supply 2	
Front Cabling, Wide Temperature (-40 to 75 °C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X) (or PoE+ ports)	100BaseFX	100BaseSFP*	HV (85 to 264 VAC)	48 VDC (46 to 57 VDC)	HV (85 to 264 VAC)	48 VDC (46 to 57 VDC)
IKS-6728A-8PoE Series								
IKS-6728A-8PoE-4GTXSFP-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	–	–
IKS-6728A-8PoE-4GTXSFP-HV-HV-T	4	Up to 24	Up to 12	Up to 20	1	–	1	–
IKS-6728A-8PoE-4GTXSFP-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	–
IKS-6728A-8PoE-4GTXSFP-48-48-T	4	Up to 24	Up to 12	Up to 20	–	1	–	1

Note:
The IKS-6728A-8PoE series needs an external 48 VDC (46 to 57 VDC) power supply for PoE+ output
The IKS-6728A-8PoE series supports up to 24 PoE+ ports. 8 PoE+ ports are built in. Two IM-6700A-8PoE modules can add up to 16 more PoE+ ports.
The IKS-6728A-8PoE series supports 100BaseSFP and 100/1000BaseSFP slots. Please the SFP-1G and SFP-1FE datasheets for SFP module product information

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See Appendix A for details

Package Checklist

- IKS-6728A-8PoE switch
- USB Cable: CBL-USBA/B-100
- AC power cord (US type x1, EU type x1, HV model only)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G512E-8PoE-4GSFP Series

12G-port full gigabit PoE+ managed Ethernet switches

- 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports
- 8 IEEE 802.3af and IEEE 802.3at PoE+ standard ports
  - 36-watt output per PoE+ port in high-power mode
  - Intelligent PoE power management functions
- Operate with 240 watts full PoE+ loading at -40 to 75°C
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-G512E-8PoE Series are full gigabit managed PoE+ Ethernet switches that come standard with 8 10/100/1000BaseT(X), 802.3af (PoE), and 802.3at (PoE+)-compliant Ethernet ports, and up to 4 fiber optic ports.

With the gigabit Ethernet PoE+ ports, it is perfect for high bandwidth PD device communications, such as IEEE 802.11n and IEEE 802.1ac wireless access points and high resolution GigE machine vision cameras for tolling systems. It can provide up to 30 watts of power per PoE+ port in standard mode and allow high power output of up to 36 watts for industrial heavy-duty PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, and rugged IP phones.

The EDS-G512E-8PoE Ethernet switches are highly versatile, and the SFP fiber ports can transmit data up to 120 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- 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
- Command Line Interface (CLI) for quickly configuring major managed functions
- IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output Features and Benefits
- ABC-02-USB (Automatic Backup Configurator) for system

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256

VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
PoE Pinout: V+, V+, V-, V-, for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Button: Reset button

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC (> 50 VDC for PoE+ output recommended)
Input Current: 5.42 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present
Note: When selecting power supply, check the PD power consumption.
Power Consumption: Max. 20.16 W full loading without PDs' consumption
Power Budget:
Max. 240 W for total PD consumption
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)
Weight: 1540 g (3.40 lb)
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)

Standards and Certifications

Safety: UL 508, EN60950-1 (LVD)
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 kV
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50121-4
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 (mean time between failures)

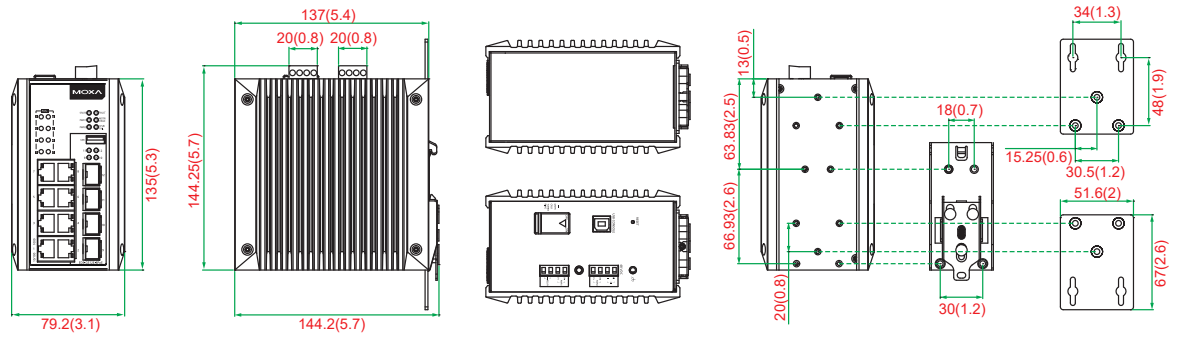
Time: 361,368 hrs.
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	PoE+, 10/100/1000BaseT(X)	100/1000BaseSFP*
EDS-G512E-8PoE-4GSFP	EDS-G512E-8PoE-4GSFP-T	8	4

*Note: The EDS-G512E-8PoE series supports up to 4 100/1000BaseSFP slots. See page 4 and 5 for SFP-1G/1FE series Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: 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
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
SDR-480P-48: 480 W DIN-rail 48 VDC power supplies
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-G512E-8PoE switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

EDS-P510A-8PoE Series

8+2G-port Gigabit PoE+ managed Ethernet switches with 8 IEEE 802.3af/at PoE+ ports

- Built-in 8 PoE+ ports compliant with IEEE 802.3af/at standards
- Up to 36 W output per PoE+ port
- 3 kV LAN surge protection for extreme outdoor environments
- PoE diagnostic for powered device mode analysis
- 2 Gigabit combo ports for high-bandwidth and long-distance communication
- Operates with 240 watts full PoE+ loading at -40 to 75°C
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The Moxa EDS-P510A-8PoE Series are Gigabit managed PoE+ Ethernet switches that come standard with 8 10/100BaseT(X), 802.3af (PoE), and 802.3at (PoE+)-compliant Ethernet ports, and 2 combo Gigabit Ethernet ports. The EDS-P510A-8PoE Ethernet switches provide up to 30 watts of power per PoE+ port in standard mode and allow high power output of up to 36 watts for industrial heavy-duty PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, high-performance wireless access points, and rugged IP phones. The EDS-P510A-8PoE Ethernet switches are highly versatile, and the SFP fiber ports can transmit data up to 120 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, PoE diagnostic, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The EDS-P510A-8PoE series is designed especially for harsh outdoor applications with 3 kV surge protection to ensure uninterrupted reliability of PoE systems.

Features and Benefits

- Advanced PoE management function (PoE output setting, PD failure check, PoE scheduling, and PoE diagnostic)
- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocol for device management and monitoring
- Compatible with PROFINET protocol for transparent data transmission
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1024
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 5.36 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 17.28 W full loading without PDs' consumption
Power Budget:
Max. 240 W for total PDs' consumption
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 105 mm (3.12 x 5.31 x 4.13 in)
Weight: 1030 g (2.28 lb)
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)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class 1 Division 2
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Traffic Control: NEMA-TS2
Rail Traffic: EN 50121-4
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 (mean time between failures)

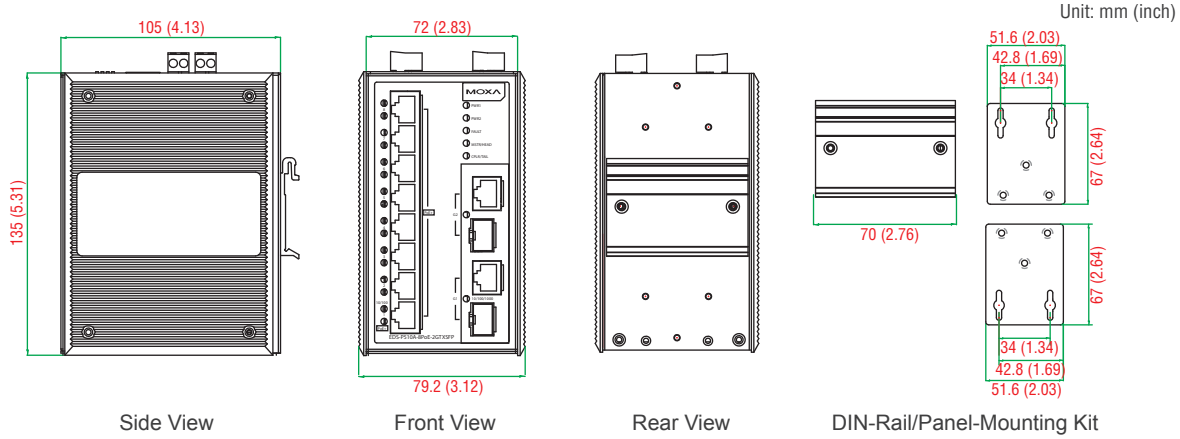
Time: 710,166 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	Combo Port, 10/100/1000BaseT(X) or 100/1000BaseSFP*	PoE+, 10/100BaseT(X)
EDS-P510A-8PoE-2GTXSFP	EDS-P510A-8PoE-2GTXSFP-T	2	8

*The EDS-P510A-8PoE series supports 2 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P510A-8PoE switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P510 Series

7+3G-port Gigabit managed Ethernet switches with 4 IEEE 802.3af PoE ports

- 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, PD failure check, 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 and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-P510 series Gigabit managed redundant Ethernet switches 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 advanced management and security features. 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 (PoE port setting, PD failure check, and PoE scheduling)
- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- 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 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 1024
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
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 +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 1.58 A @ 48 VDC
Overload Current Protection: Present
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 14.24 W full loading without PDs' consumption
Power Budget: Max. 61.6 W for total PDs' consumption
Max. 15.4 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight: 1170 g (2.58 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

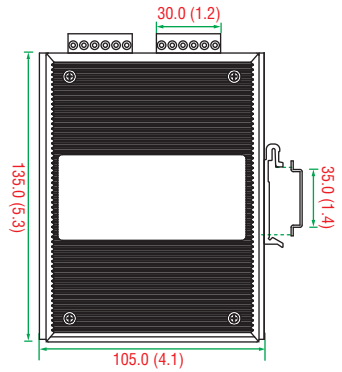
Time: 205,384 hrs
Standard: Telcordia (Bellcore), GB

Warranty

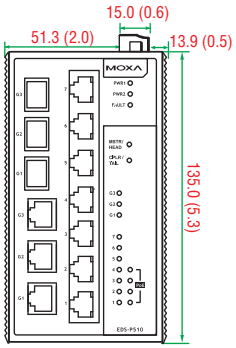
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

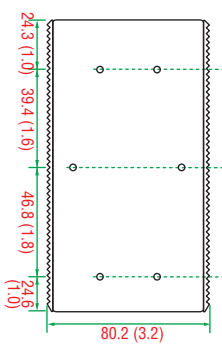
Unit: mm (inch)



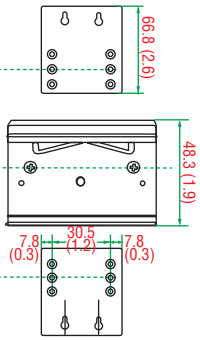
Side View



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

*The EDS-P510 series supports 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P510 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-P506A-4PoE Series

Award-winning Product
TAIWAN EXCELLENCE 2011

6-port managed Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- 4 IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Advanced PoE management functions, including PD failure check and PoE scheduling
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- -40 to 75°C operating temperature range (T models)
- Supports MXstudio for easy, visualized industrial network management

Introduction

The EDS-P506A-4PoE series managed redundant Ethernet switches come standard with 4 10/100BaseT(X) 802.3at (PoE+) and 802.3af (PoE) compliant Ethernet ports and 2 10/100BaseT(X) or 2 10/100BaseFX Ethernet ports. The EDS-P506A-4PoE switches provide up to 30 watts of power per PoE port, and allow power to be supplied to connected high-power devices when AC power is not readily available or is cost-prohibitive to provide locally. The EDS-P506A-4PoE 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 (PoE port setting, PD failure check, and PoE scheduling)
- 24/48 VDC wide range redundant power inputs
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
Console Port: RS-232 (RJ45 connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
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 +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 5.72 A @ 24 VDC
Connection: 2 removable 6-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 17.28 W full loading without PDs' consumption
Power Budget: Max. 120 W for total PDs' consumption
Max. 30 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 80 x 135 x 131.5 mm (3.15 x 5.31 x 5.18 in)
Weight: 1270 g (2.80 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

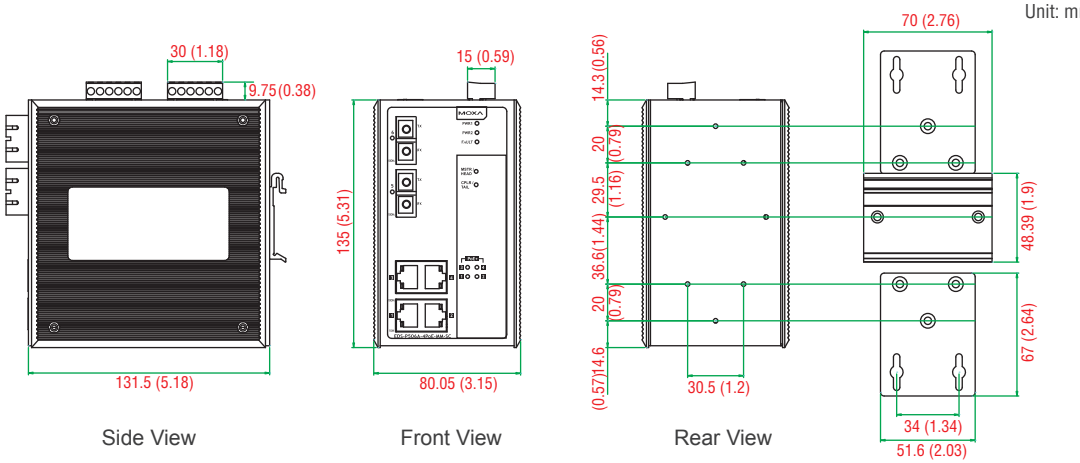
Time: 433,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface				
		PoE+, 10/100BaseT(X)	10/100BaseT(X)	100BaseFX		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)			Multi-Mode SC Connector	Multi-Mode ST Connector	Single-Mode SC Connector
EDS-P506A-4PoE	EDS-P506A-4PoE-T	4	2	–	–	–
EDS-P506A-4PoE-MM-SC	EDS-P506A-4PoE-MM-SC-T	4	–	2	–	–
EDS-P506A-4PoE-MM-ST	EDS-P506A-4PoE-MM-ST-T	4	–	–	2	–
EDS-P506A-4PoE-SS-SC	EDS-P506A-4PoE-SS-SC-T	4	–	–	–	2

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-P506A-4PoE switch
- Serial Cable: CN20070
- Protective caps for unused ports
- Document and software CD
- Hardware installation guide (printed)
- Warranty card

EDS-G205A-4PoE Series

Award-winning Product
TAIWAN EXCELLENCE 2013

5-port full Gigabit unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- Full Gigabit Ethernet ports
- IEEE 802.3af/at, PoE+ standards
- Up to 30 watts output per PoE port
- 24/48 VDC flexible redundant power inputs
- Supports 9.6 KB jumbo frames
- Intelligent power consumption detection and classification
- Smart PoE over current and short circuit protection
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-G205A-4PoE switches are smart, 5-port, unmanaged full Gigabit Ethernet switches supporting Power-over-Ethernet on ports 2 to 5. The switches are classified as power source equipment (PSE), and when used in this way, the EDS-G205A-4PoE switches enable centralization of the power supply, providing up to 30 watts of power per port and reducing the effort needed for installing power. The switches can be used to power IEEE 802.3af/at standard devices (PD), eliminating the need for additional wiring, and they support IEEE 802.3/802.3u/802.3x with 10/100/1000M, full/half-duplex, MDI/MDI-X auto-sensing to provide an economical high-bandwidth solution for your industrial Ethernet network.

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 8 K
Packet Buffer Size: 136 KB
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 1000BaseSFP slot
PoE Pinout: V+, V+, V-, V- for Pin 1,2,3,6 (Endspan, MDI Alternative A)

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 12 to 57 VDC
Input Current: 5.42 A @ 24 VDC
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present
Power Consumption: Max. 10.08 W full loading without PDs' consumption
Power Budget: Max. 62 W at 12 VDC, 120 W at 24 VDC, and 144 W at 48 VDC for total PDs' consumption,
Max. 36 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 29 x 135 x 105 mm (1.14 x 5.31 x 4.13 in)
Weight: 300 g (0.66 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
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 (mean time between failures)

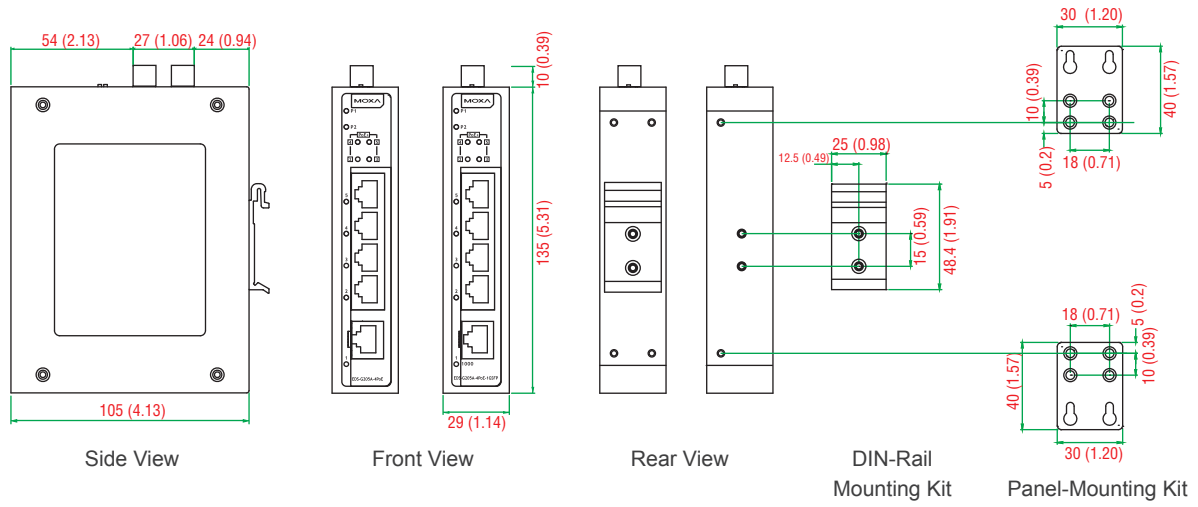
Time: 1,257,910 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models		Port Interface		
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	PoE/PoE+, 10/100/1000BaseT(X)
EDS-G205A-4PoE	EDS-G205A-4PoE-T	5	–	4
EDS-G205A-4PoE-1GSFP	EDS-G205A-4PoE-1GSFP-T	4	1	4

*See the SFP-1G datasheet for SFP module product information.

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws

Package Checklist

- EDS-G205A-4PoE switch
- Hardware installation guide (printed)
- Warranty card

EDS-P206A-4PoE Series

6-port unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

- IEEE 802.3af/at compliant PoE and Ethernet combo ports
- Up to 30 watts per PoE port
- 24/48 VDC wide range redundant power inputs
- Intelligent power consumption detection and classification
- Redundant dual VDC power inputs
- -40 to 75°C operating temperature range (T models)

Introduction

The EDS-P206A-4PoE switches are smart, 6-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-P206A-4PoE switches enable centralization of the power supply and provide up to 30 watts of power per port. The switches can be used to power IEEE 802.3af/at 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.

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 KB

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST connector)
PoE Pinout: V-, V-, V+, V+ for pin 1, 2, 3, 6 (Endspan, MDI-X Alternative A)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 5.48 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 11.52 W full loading without PDs' consumption
Power Budget: Max. 120 W for total PDs' consumption
Max. 30 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 50.3 × 115 × 70 mm (1.98 x 4.53 x 2.76 in)
Weight: 375 g (0.83 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8

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 (mean time between failures)

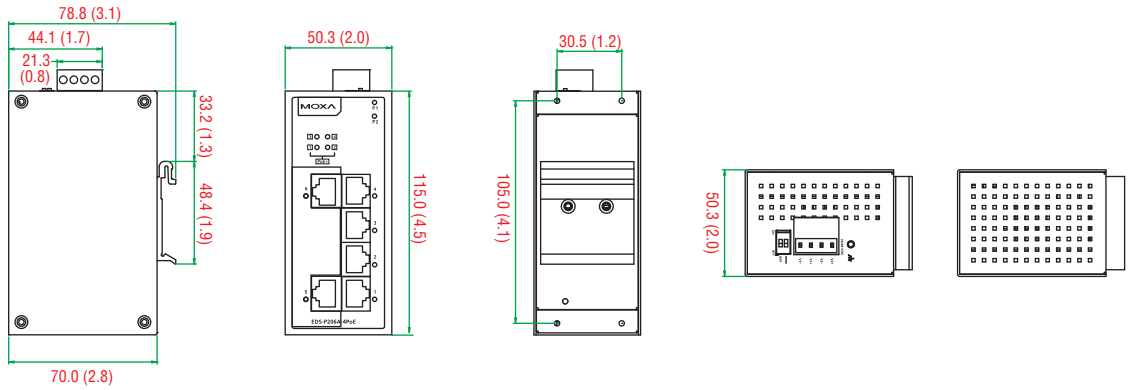
Time: 645,138 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top and Bottom View

Ordering Information

Available Models		Port Interface			
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	100BaseFX		
			Mulit-Mode, SC Connector	Mulit-Mode, ST Connector	Single-Mode, SC Connector
EDS-P206A-4PoE	EDS-P206A-4PoE-T	6	–	–	–
EDS-P206A-4PoE-M-SC	EDS-P206A-4PoE-M-SC-T	5	1	–	–
EDS-P206A-4PoE-M-ST	EDS-P206A-4PoE-M-ST-T	5	–	1	–
EDS-P206A-4PoE-MM-SC	EDS-P206A-4PoE-MM-SC-T	4	2	–	–
EDS-P206A-4PoE-MM-ST	EDS-P206A-4PoE-MM-ST-T	4	–	2	–
EDS-P206A-4PoE-S-SC	EDS-P206A-4PoE-S-SC-T	5	–	–	1
EDS-P206A-4PoE-SS-SC	EDS-P206A-4PoE-SS-SC-T	4	–	–	2

Optional Accessories (can be purchased separately)

DR-75-24/120-24: 75/120 W DIN-rail 24 VDC power supplies
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P206A-4PoE switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

EDS-P308 Series

8-port unmanaged Ethernet switches with 4 IEEE 802.3af PoE ports

- 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 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
Processing Type: Store and Forward

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC connector)
PoE Pinout: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI Alternative A)
DIP Switches: Port break alarm mask
Alarm Contact: 1 relay output with current carrying capacity of 0.5 A @ 48 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Power Requirements

Input Voltage: 48 VDC, redundant dual inputs
Operating Voltage: 44 to 57 VDC
Input Current: 1.47 A @ 48 VDC
Overload Current Protection: 2.5 A @ 48 VDC
Connection: 1 removable 6-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 9.16 W full loading without PDs' consumption
Power Budget: Max. 61.4 W for total PDs' consumption
Max. 15.4 W for each PoE port

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 × 135 × 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 840 g (1.86 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Marine: DNV, GL, LR, ABS, NK
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 (mean time between failures)

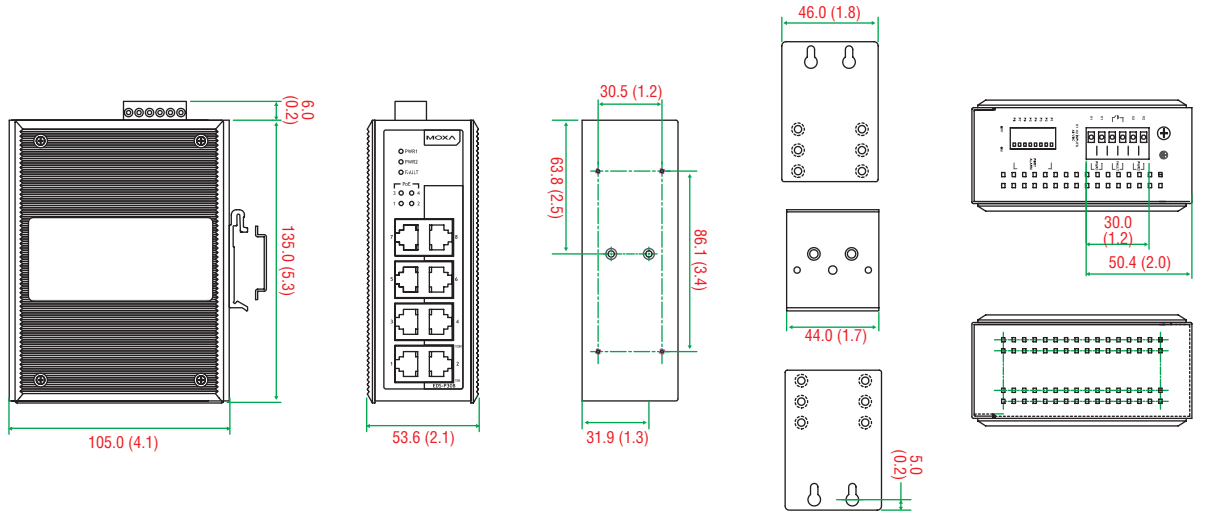
Time: 406,194 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

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)

DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
RK-4U: 4U-high 19-inch rack-mounting kit
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- EDS-P308 switch
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

INJ-24A Series

Gigabit high power IEEE 802.3af/at PoE+ injectors

- High power mode provides up to 60 W
- DIP switch configurator and LED indicator for PoE management
- 3kV surge resistance for harsh environments
- Mode A and Mode B selectable for flexible installation
- Built-in 24/48 VDC booster for redundant dual power inputs
- -40 to 75°C operating temperature range (T model)

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)

Interface

RJ45 Ports: 10/100/1000BaseT(X) for PoE OUT and DATA IN
PoE Pinout:
Default: V+, V+, V-, V- for pin 4, 5, 7, 8 (Midspan, MDI, Mode B)
Custom DIP switch setting: V+, V+, V-, V- for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)

Power Requirements

Input Voltage: 24/48 VDC, redundant dual inputs
Operating Voltage: 22 to 57 VDC
Input Current: 2.71 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 4-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 5.29 W full loading without PD's consumption
Power Budget: Max. 60 W for 1 PD's consumption

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 115 × 30.3 × 78.8 mm (4.53 x 1.19 x 3.10 in)
Weight: 245 g (0.54 lb)
Installation: DIN-rail mounting, wall mounting (with WK-30)

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)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 3 kV; Signal: 3 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
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 (mean time between failures)

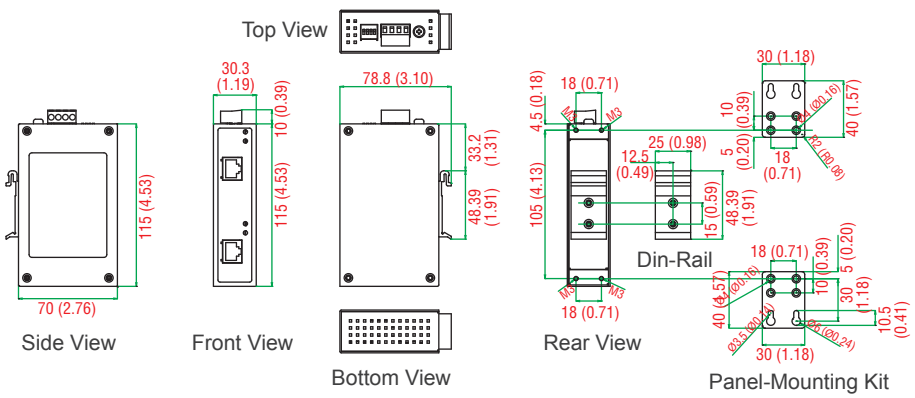
Time: 2,407,739 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

INJ-24A: Gigabit high-power PoE+ injector, max. output of 60 W at 24/48 VDC, 0 to 60°C operating temperature
INJ-24A-T: Gigabit high power PoE+ injector, max. output of 60 W at 24/48 VDC, -40 to 75°C operating temperature

Note: 60-watt PoE is not a standardized application. Check with Moxa for product compatibility before using 60-watt PoE.

Package Checklist

- INJ-24A high power PoE+ injector
- Hardware installation guide (printed)
- Warranty card

INJ-24 Series

Gigabit IEEE 802.3af/at PoE+ injectors

- PoE+ injector for 10/100/1000M networks; inject power and data to PD (Power Device) equipment
- IEEE 802.3af/at compliant; supports a full 30 watt output
- 24/48 VDC wide range power input
- -40 to 75°C operating temperature range (T model)

Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)

Interface

RJ45 Ports: 10/100/1000BaseT(X) for PoE OUT and DATA IN
PoE Pinout: V+, V+, V-, V- for pin 4, 5, 7, 8 (Midspan, MDI Alternative B)

Power Requirements

Input Voltage: 24/48 VDC, single input
Operating Voltage: 22 to 57 VDC
Input Current: 1.42 A @ 24 VDC
Overload Current Protection: Present
Connection: 1 removable 3-contact terminal block
Reverse Polarity Protection: Present
Power Consumption: Max. 4.08 W full loading without PD's consumption
Power Budget: Max. 30 W for 1 PD's consumption

Physical Characteristics

Housing: Plastic
IP Rating: IP30 protection
Dimensions: 24.9 × 100 × 86.2 mm (0.98 x 3.93 x 3.39 in)
Weight: 115 g (0.26 lb)
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)

Standards and Certifications

Safety: UL 508, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
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 (mean time between failures)

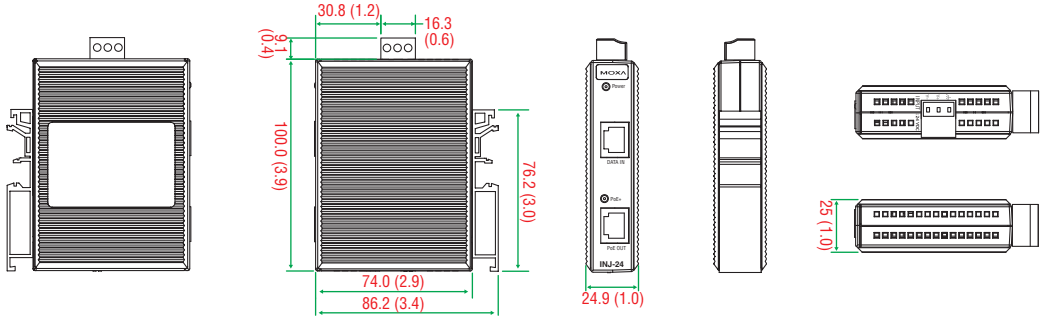
Time: 2,525,278 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top and Bottom View

Ordering Information

Available Models

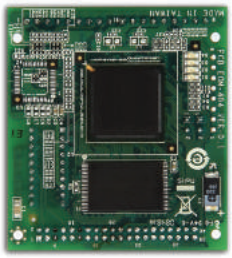
INJ-24: PoE+ Injector, maximum output of 30 W at 24/48 VDC, 0 to 60°C operating temperature
INJ-24-T: PoE+ Injector, maximum output of 30 W at 24/48 VDC, -40 to 75°C operating temperature

Package Checklist

- INJ-24 PoE+ injector
- Hardware installation guide (printed)
- Warranty card

EOM-104 Series

4-port embedded managed Ethernet switch modules



- 10/100BaseT(X) and 100BaseFX Ethernet interfaces
- Turbo Ring and 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

Introduction

The EOM-104 series Ethernet switch modules are designed for device manufacturers who would like to embed Ethernet modules in their products to enhance performance and reliability.

The EOM-104 series modules provide an easy and cost-effective integrated solution for adding an Ethernet switch module to an existing product. The modules support 10/100M Ethernet transmission and come with Turbo Ring's fast recovery time of under 20 ms. The EOM-104 series also provide 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

Software Features

MIB: MIB-II, Ethernet-Like MIB, P-Bridge MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Protocols: SNMPv1/v2c/v3, DHCP Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog

Switch Properties

MAC Table Size: 1 K
Packet Buffer Size: 512 kbit

Interface

Ethernet Ports:
EOM-104: 4 10/100BaseT(X) ports
EOM-104-FO: 2 10/100BaseT(X) and 2 100BaseFX ports
Connectors: 1 connector with 2 x 20 pins, 2 connectors with 1 x 9 pins, and 1 connector with 2 x 2 pins
Console Port: RS-232 (TxD, RxD, DTR, DSR)
GPIO: 4 programmable I/O pins

Power Requirements

Input Current: EOM-104: 0.5 A @ 3.3 V
EOM-104-FO: 1.04 A @ 3.3 V

Physical Characteristics

Dimensions: 54 x 60 x 8.25 mm (2.13 x 2.36 x 0.32 in)
Weight: 21 g (0.046 lb)

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)

Standards and Certifications

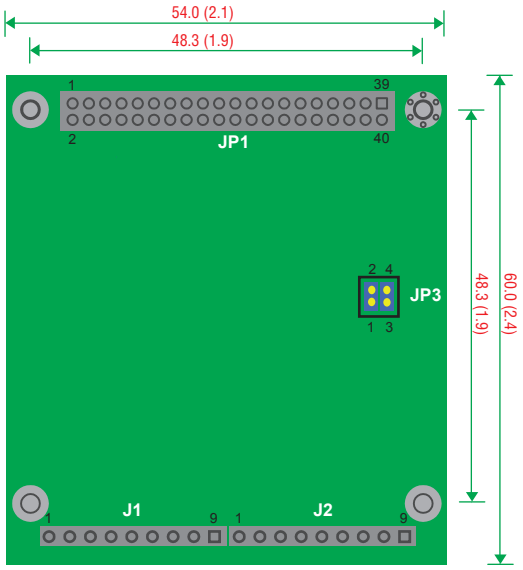
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

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

Dimensions

Unit: mm (inch)



Pin Assignment

JP1 (2 x 20 connector pin assignment)

PIN	1	3	5	7	9	11	13	15	17	19
SIGNAL	TX2 -	RX2 -	NC	RX1 +	TX1 +	NC	GND	3.3 V	GND	DTR

PIN	2	4	6	8	10	12	14	15	18	20
SIGNAL	TX2 +	RX2 +	NC	RX1 -	TX1 -	NC	GND	3.3 V	GND	DSR

PIN	21	23	25	27	29	31	33	35	37	39
SIGNAL	TXD	GPIO 4	GPIO 2	MASTER ENABLE	MASTER LED	PORT 1 LED	PORT 3 LED	MANUAL RESET	3.3 V	GND

PIN	22	24	26	28	30	32	34	36	38	40
SIGNAL	RXD	GPIO 3	GPIO 1	TURBO RING ENABLE	TURBO RING LED	RESET DEFAULT	PORT 4 LED	PORT 2 LED	3.3 V	GND

J1 (1 x 9 connector pin assignment)

PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX4 +	TX4 -	3.3 V	3.3 V	FXSD	RX4 -	RX4 +	GND

J2 (1 x 9 connector pin assignment)

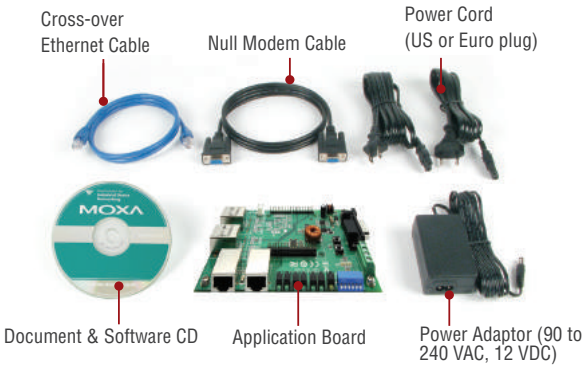
PIN	1	2	3	4	5	6	7	8	9
SIGNAL	GND	TX3 +	TX3 -	3.3 V	3.3 V	FXSD	RX3 -	RX3 +	GND

JP3 (2 x 2 connector pin assignment)

Jumpers 1 and 2 are used to enable the Ring Master
Jumpers 3 and 4 are used to enable Turbo Ring

Evaluation Kits

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 Ethernet ports, console port, and Turbo Ring DIP switch to help you test your modules and applications.



Ordering Information

Available Models

EOM-104: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature
EOM-104-FO: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature
EOM-104 20PCS: Embedded managed Ethernet switch module with 4 10/100BaseT(X) ports, -40 to 75°C operating temperature, 20 pcs per package
EOM-104-FO 20PCS: Embedded managed Ethernet switch module with 2 10/100BaseT(X) and 2 100BaseFX ports, -40 to 75°C operating temperature, 20 pcs per package

Evaluation Kits (must be purchased separately)

EOM-104 Evaluation Kit: Includes an EOM-104 switch module and evaluation board with 4 10/100BaseT(X) ports for testing and application development
EOM-104-FO Evaluation Kit: Includes an EOM-104-FO switch module and evaluation board with 2 10/100BaseT(X) ports and 2 100BaseFX multi-mode ports (SC connectors) for testing and application development

Evaluation Kit Package Checklist

- EOM-104 module
- EOM-104 evaluation board
- Universal power adaptor
- 2 power cords
- Null modem serial cable
- Cross-over Ethernet cable
- Accessories pack
- Documentation and software CD
- Warranty card

OBU-102 Series

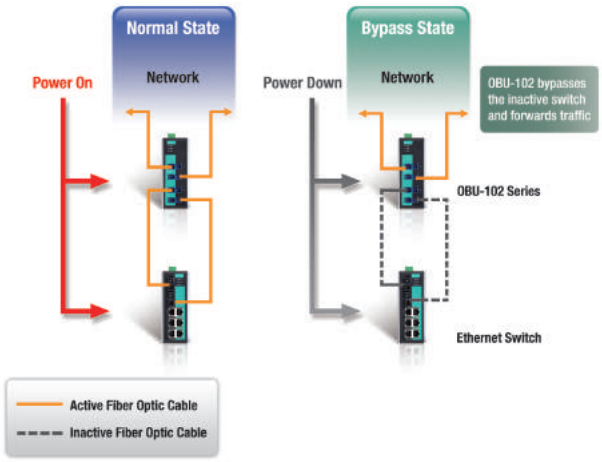
2-channel optical fiber bypass units

- Supports Fast, Gigabit, and 10 Gigabit Ethernet fiber connections in SC/ST/LC connectors
- Redundant dual 12/24/48 VDC power inputs
- IP30 metal housing
- -20 to 70°C operating temperature range
- DIN-rail mounting ability
- Ultra low power consumption 0.72 W

Introduction

Moxa's OBU-102 fiber optical bypass units add bypass relay functionality to any network node. In linear topologies, a single power outage or node failure can take out an entire chunk of the network, because communications to all the network nodes further down the line are also cut. With relay bypass, that node is instead simply bypassed in the event of a failure, and the rest of the network is unaffected.

The OBU-102 sits between a node and the network to add bypass relay functionality to any network switches that do not already support this important function. In normal operations, the OBU-102 simply acts as a gateway that forwards network traffic to and from the network switch. However, if power is lost, the OBU-102 will bypass the unpowered switch and simply pass network traffic to the next switch in the relay.



Specifications

Bypass Properties
Optical Switching Time: Max. 10 ms
Insertion Loss: Max. 1.6 dB

Interface
Fiber Ports: 100M/1G/10G fiber in SC/ST/LC connector, single mode
Rotary Switch: configure boot delay interval

Power Requirements
Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Overload Current Protection: 1100 mA @ 48 VDC
Connection: 2 removable 2-contact terminal block
Reverse Polarity Protection: Present

Physical Characteristics
Housing: Metal
IP Rating: IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 700 g (1.55 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

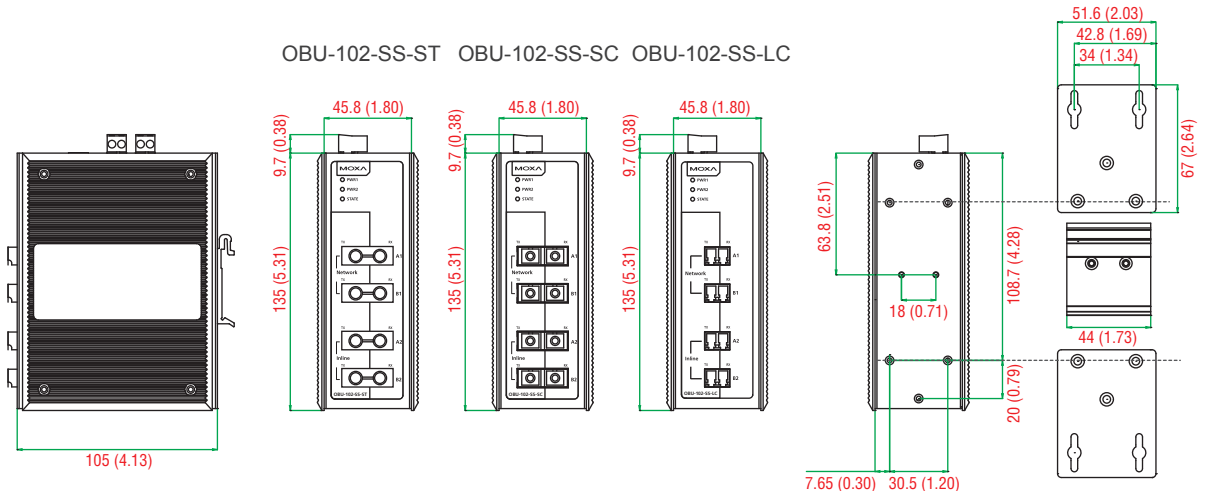
Environmental Limits
Operating Temperature: -20 to 70°C (-4 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508
EMC: EN 55022 Class A
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 0.5 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
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: 2 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models (-20 to 75°C)	Port Interface		
	Single-Mode, SC Connector	Single-Mode, ST Connector	Single-Mode, LC Connector
OBU-102-SS-SC	4	–	–
OBU-102-SS-ST	–	4	–
OBU-102-SS-LC	–	–	4

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
RK-4U: 4U-high 19-inch rack-mounting kit
WK-30: Wall-mounting kit, 2 plates with 4 screws
WK-46: Wall-mounting kit, 2 plates with 8 screws

Package Checklist

- OBU-102 unit
- Hardware installation guide (printed)
- Warranty card

SFP-10G Series

1-port 10 Gigabit Ethernet SFP+ modules

- Digital Diagnostic Monitor Function
- Compliant with IEEE 802.3ae
- SFF-8432 SFP+ MSA compliant
- Hot pluggable LC duplex connector
- Class 1 Laser International Safety Standard IEC 825 compliant
- RoHS compliant

Specifications

Interface

Connectors: Duplex LC Connector
10G Ethernet Ports: 1

Optical Fiber

		10G Ethernet SFP			
		SFP-SR		SFP-LR	SFP-ER
Transceiver Type		Multi-Mode		Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM3	G.652	G.652
Typical Distance		33 m	300 m	10 km	40 km
Wave-length	Typical (nm)	850		1310	1550
	TX Range (nm)	840 to 860		1260 to 1355	1530 to 1565
	RX Range (nm)	840 to 860		1260 to 1600	1260 to 1600
Optical Power	Link Budget (dB)	1.6	2.6	6.2	10.9

Note: When connecting the SFP-ER, we recommend using an attenuator to prevent damaged caused by excessive optical power.

Power Requirements

Power Consumption: Max. 1.5 W

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 176°F)
Note: When the SFP-10GERLC is used with ICS-G7750A/G7752A/G7850A/G7852A series, operating temperature is 0 to 55°C (32 to 131°F).
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

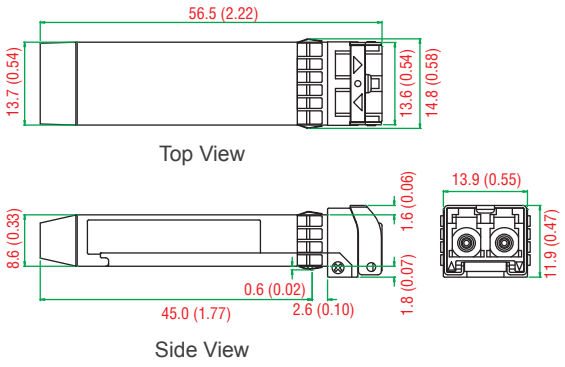
Safety: CE, FCC, TÜV, UL 60950-1

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SFP-10GSRLC: SFP+ module with 1 10GBase-SR port for 33 m transmission, LC connector, 0 to 60°C operating temperature
SFP-10GLRLC: SFP+ module with 1 10GBase-LR port for 10 km transmission, LC connector, 0 to 60°C operating temperature
SFP-10GERLC: SFP+ module with 1 10GBase-ER port for 40 km transmission, LC connector, 0 to 60°C operating temperature
Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-10G module
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules

- Digital Diagnostic Monitor Function
- -40 to 85°C operating temperature range (T models)
- IEEE 802.3z compliant
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product, complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1

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

Optical Fiber

		Gigabit Ethernet SFP								
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	1	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommened using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP					
		SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Transceiver Type		Single-Mode		Single-Mode		Single-Mode	
Fiber Cable Type		G.652		G.652		G.652	
Typical Distance		10 km		20 km		40 km	
Wave-length	Typical (nm)	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310
	TX Range (nm)	1270 to 1355	1530 to 1570	1270 to 1355	1530 to 1570	1290 to 1330	1530 to 1570
	RX Range (nm)	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360
Optical Power	TX Range (dBm)	-3 to -9		-2 to -8		+2 to -3	
	RX Range (dBm)	-3 to -21		-2 to -23		-1 to -23	
	Link Budget (dB)	12		15		20	
	Dispersion Penalty (dB)	2		3		1	

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)
Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

Typical Distance: To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

Power Requirements

Power Consumption: Max. 1 W

Environmental Limits

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

Standards and Certifications

Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

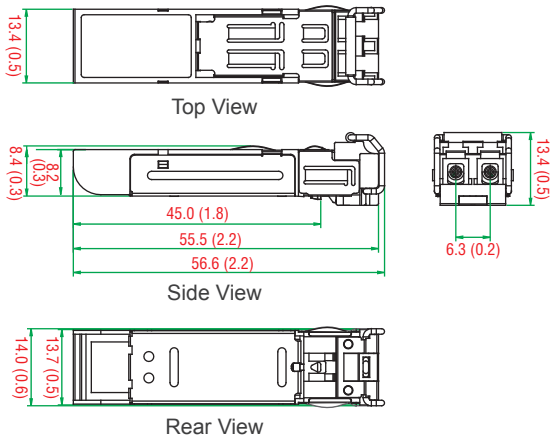
Warranty

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

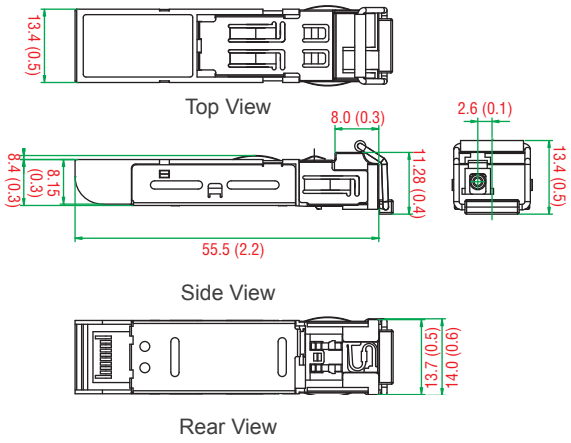
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1G Series (WDM Type)



Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Transceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transceiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T*	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 Km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 Km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 Km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 Km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 Km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 Km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 Km
SFP-1GLHXLC	SFP-1GLHXLC-T	Single-Mode	40 Km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 Km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 Km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 Km
SFP-1GEZXLC	–	Single-Mode	110 Km	–	–	–	–
SFP-1GEZXLC-120	–	Single-Mode	120 Km	–	–	–	–

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

Available Models

Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1G module
- Warranty card

SFP-1G Copper Series

1-port Gigabit Ethernet copper SFP modules

- Compliant with IEEE 802.3,2002
- Fixed 1000 BASE-T speed
- Hot pluggable RJ45 connector
- TTL signal detection (RX los)
- RoHS compliant and lead free

Specifications

Interface

Connectors: RJ45
The port can not be used for Turbo Ring v1, Turbo Ring v2, and Turbo Chain.
Gigabit Ethernet Ports: 1

Power Requirements

Power Consumption: Max. 1.2 W

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)

Standards and Certifications

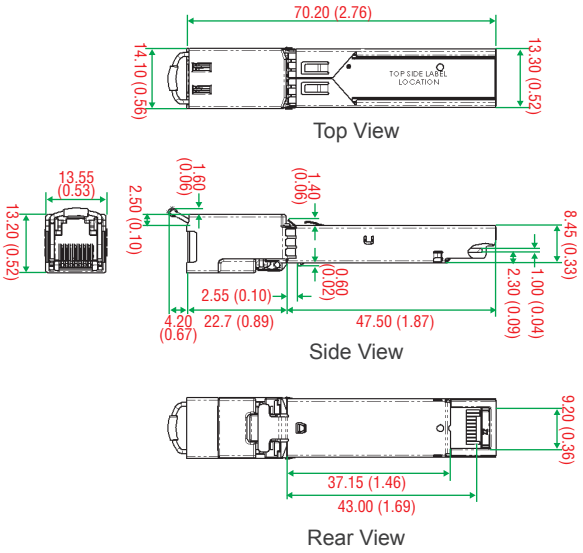
Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

SFP-1GTXRJ45-T: SFP module with fixed 1000BaseT port, RJ45 connector, -40 to 75°C operating temperature
Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1G copper module
- Warranty card

SFP-1FE Series

1-port Fast Ethernet SFP modules

- Digital Diagnostic Monitor Function
- IEEE 802.3u compliant
- Differential PECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product; complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

		Fast Ethernet SFP			
		SFP-M		SFP-S	SFP-L
Transceiver Type		Multi-Mode		Single-Mode	Single-Mode
Fiber Cable Type		OM1/OM2	62.5/125, 50/125 µm 800 MHz*Km	G.652	G.652
Typical Distance		2 km	4 km	40 km	80 km
Wave-length	Typical (nm)	1310		1310	1550
	TX Range (nm)	1280 to 1340		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1650		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-8 to -18		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	14		29	29
	Dispersion Penalty (dB)	2	3	1	1

Note: When connecting the SFP-S or L, we recommend using an attenuator to prevent damage caused by excessive optical power.

Power Requirements

Power Consumption: Max. 1 W

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)

Standards and Certifications

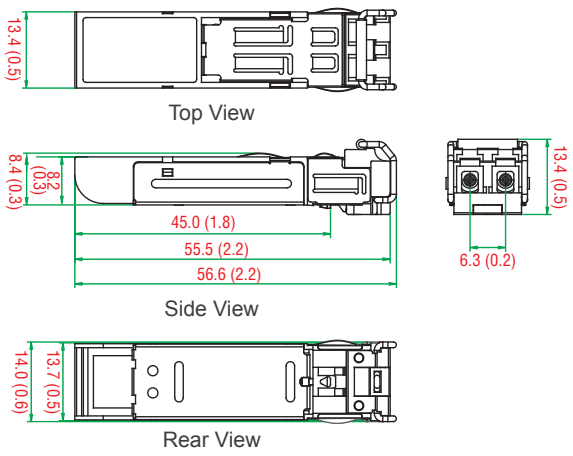
Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

Warranty

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

Dimensions

Unit: mm (inch)



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

Available Models

Please refer to the Moxa Ethernet SFP Transceiver Products Compatibility Matrix on the next page for available models.

Package Checklist

- SFP-1FE module
- Warranty card

Moxa Ethernet SFP Transceiver Product Compatibility Matrix

Refer to the product compatibility matrix below to determine which SFP modules are compatible with which product models. For more specification information about an SFP module, please refer to the module's datasheet.

Model	SFP-1FE Series	SFP-1G Series	SFP-1G Copper Series	SFP-10G Series
Industrial 10Gb Core Switches				
ICS-G7850A/G7852A Series	–	✓	✓	✓
ICS-G7750A/G7752A Series	–	✓	✓	✓
ICS-G7826A/G7828A Series	✓	✓	✓	✓
ICS-G7526A/G7528A Series	✓	✓	✓	✓
IM-G7000A-4GSFP	✓	✓	✓	–
Rackmount Ethernet Switches				
IKS-G6524A/G6824A Series	✓	✓	✓	–
IKS-6726A/6728A Series	✓	✓	–	–
IKS-6728A-8PoE Series	✓	✓	–	–
IM-6700A-8SFP	✓	–	–	–
DIN-Rail Etherne Switches				
EDS-611/619 Series	✓	✓	–	–
EDS-G516E Series	✓	✓	✓	–
EDS-G512E Series	✓	✓	✓	–
EDS-G509 Series	✓	✓	–	–
EDS-518E Series	✓	✓	–	–
EDS-510E Series	✓	✓	–	–
EDS-518A Series	–	✓	–	–
EDS-510A Series	–	✓	–	–
EDS-G308-2SFP Series	✓	✓	✓	–
EDS-G205-1GTXSFP Series	✓	✓	–	–
EDS-210A Series	–	✓	✓	–
IM-2GSFP	–	✓	–	–
Industrial Secure Router				
EDR-G903/G902 Series	✓	✓	–	–
EDR-810 Series	–	✓	✓	–
Industrial PoE Switches				
EDS-G512E-8PoE Series	✓	✓	✓	–
EDS-P510A-8PoE Series	✓	✓	–	–
EDS-P510 Series	✓	✓	–	–
EDS-G205A-4PoE Series	✓	✓	–	–
IEC61850-3 Ethernet Switches				
PT-G7509 Series	✓	✓	–	–
PT-7528 FX Series	–	✓	✓	–
PM-7500-2G/4GTXSFP	✓	✓	–	–
PM-7200-2G/4GTXSFP		✓	–	–
PM-7200-8SFP Series	✓	–	–	–
Industrial Media Converter				
IMC-21GA	–	✓	–	–
IMC-101G Series	–	✓	–	–

Note: For 10Gb core switches, the 10G SFP port slot can only support a 10G SFP transceiver.

ABC Series

Configuration backup and restoration tool for managed switches and wireless APs/Bridges/Clients

- Plug-n-Play system configuration backup and restoration
- Rugged, reliable design
- 1-click backup and auto-load technology to reduce system downtime (ABC-02 only)
- Powerful troubleshooting tool to record mass event logs (ABC-02 only)
- Supports Moxa's managed Ethernet switches and wireless APs/bridges/clients

Features

- ABC-01 series with RS-232 RJ45/M12 console port connection
- ABC-02 series can easily accessible as an USB 2.0 (type A) storage device using Windows OS
- Backup and restore switch configuration files
- Load the system configuration automatically after system reboot

ABC-02 Features

- One-click backup of system configurations using the RESET button
- Extend recorded entries of event logs
- Auto-backup of switch configuration files when any setting is changed

Introduction

The ABC series is designed for system backup and restoration to enhance maintenance efficiency and reduce system downtime.
The ABC-01 /ABC-01-M12 Automatic Backup Configurator tool can be used to save and load the configuration of Moxa's managed Ethernet switches and AWK series wireless APs/bridges/clients through the RS-232 console port.

The ABC-02-USB Automatic Backup Configurator is designed for Moxa's new generation of managed switches. It can save and load configuration files, back up event logs, and load firmware via the USB (universal serial bus) interface on the switches.
The ABC series makes it easier to manage the backup of system parameters and perform configuration. With the ABC series, users can quickly configure a replacement switch (of the same model).

Specifications

Interface

Connectors:
• ABC-01 Series: RS-232/RJ45/M12 port
• ABC-02 Series: USB 2.0 Type A

Basic Operation

Storage Capacity:
• ABC-01 Series: 128 KB Flash
• ABC-02 Series: 128 MB SLC type NAND Flash

Power Requirements

Input Voltage:
• ABC-01 Series: 3 to 5 VDC (through the RS-232 port's RTS signal)
• ABC-02 Series: 5 VDC (through USB Interface)

Physical Characteristics

Housing: PVC molding
IP Rating: IP40 protection
Dimensions: 32.5 x 97 x 12 mm (1.28 x 3.82 x 0.47 in)
Weight:
• ABC-01 and ABC-02-USB: 50 g (0.11 lb)
• nABC-01-M12: 60 g (0.14 lb)
Mounting Method: M4 screws (< 4 mm)
Cable Length: 35±3 cm (including connector)

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: Standard Models: -20 to 70°C (-4 to 158°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95 % (non-condensing)

Standards and Certifications

EMC: EN 55022 Class A
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8

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 and AWK series wireless APs/Bridges/Clients, 0 to 60°C operating temperature
ABC-01-M12: Configuration backup and restoration tool with M12 connector for ToughNet series EN 50155 managed Ethernet switches, 0 to 60°C operating temperature
ABC-02-USB: USB-based auto backup configurator, configuration backup/restoration, firmware upgrade and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T: USB-based auto backup configurator, configuration backup/restoration, firmware upgrade and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature

Package Checklist

- ABC-01 or ABC-02 configuration backup tool
- Hardware installation guide (printed)
- Warranty card

Industry-Specific Ethernet Switches

2

Industry-Specific Ethernet Switches

EN 50155 Ethernet Switches

	NAT Router	L3 Managed Switches	L2 Managed Ethernet Switches				
	Fast Ethernet Series	Gigabit and Fast Ethernet Series	Power-over-Ethernet Series	Gigabit Ethernet Series	Gigabit Ethernet and Power-over-Ethernet Series	Fast Ethernet Series	Power-over-Ethernet Series
							
	TN-5916 Series	TN-5816ABP/5818A Series	TN-5524-8PoE Series	TN-5510A/5518A Series	TN-5510A/5518A-8PoE Series	TN-5508A/5516A Series	TN-5508A/5516A-8PoE Series
Number of Ports							
Max. Number of Ports	16	16/18	24	10/18	10/18	8/16	8/16
Gigabit Ethernet, 10/100/1000 Mbps	–	2 (TN-5818A)	–	2	2	–	–
Gigabit Fiber Ethernet, 1000 Mbps	–	–	–	–	–	–	–
Fast Ethernet, 10/100 Mbps	16	16	24 (8 PoE)	8/16	8 (8 PoE) / 16 (8 PoE)	8/16	8 (8 PoE) / 16 (8 PoE)
Power Supply							
24 to 110 VDC	✓	✓	–	✓	✓	✓	✓
12/24/36/48 VDC	–	–	–	–	–	–	–
72/96/110 VDC	–	–	–	–	–	–	–
80 to 300 VDC 85 to 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							
-25 to 60°C (-13 to 140°F)	–	–	–	–	–	–	–
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options							
Turbo Ring (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	✓	✓
Turbo Chain (Recovery Time < 20 ms)	–	✓	✓	✓	✓	✓	✓
Turbo Ring v2 with Dynamic Ring Coupling	–	✓	–	✓	✓	✓	✓
STP/RSTP/MSTP	STP/RSTP	✓	✓	✓	✓	✓	✓
Bypass Relay	✓	✓	–	✓	✓	–	–
Network Management and Control							
IPv6	–	–	✓	✓	✓	✓	✓
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓
LLDP	✓	✓	✓	✓	✓	✓	✓
Modbus/TCP	–	✓	✓	✓	✓	✓	✓
IGMP/GMRP	IGMP v1/v2	✓	✓	✓	✓	✓	✓
Port Trunking	✓	✓	✓	✓	✓	✓	✓
IEEE 802.1X	–	✓	✓	✓	✓	✓	✓
Port Lock	–	✓	✓	✓	✓	✓	✓
SNMP/RMON	SNMP	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓
QoS	✓	✓	✓	✓	✓	✓	✓
Relay Warning	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications							
CE/FCC	✓	✓	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓	✓	✓
Railway Applications: EN 50155 EN 50121-4	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
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EN 50155 Ethernet Switches

	L2 Managed Ethernet Switches		Unmanaged Ethernet Switches		
	Gigabit Fiber Ethernet Series	Gigabit Fiber and Power-over-Ethernet Series	Fast Ethernet Series		Power-over-Ethernet Series
					
	TN-5510A-2GLSX-ODC Series	TN-5510A-8PoE-2GLSX-ODC Series	TN-5308 Series	TN-5305 Series	TN-5308-4PoE/8PoE Series
Number of Ports					
Max. Number of Ports	8	8	8	5	8
Gigabit Ethernet, 10/100/1000 Mbps	–	–	–	–	–
Gigabit Fiber Ethernet, 1000 Mbps	2	2	–	–	–
Fast Ethernet, 10/100 Mbps	8	8 (8 PoE)	8	5	8 (4 PoE) / 8 (8 PoE)
Power Supply					
24 to 110 VDC	✓	✓	–	–	–
12/24/36/48 VDC	–	–	✓	–	–
72/96/110 VDC	–	–	✓	–	–
80 to 300 VDC 85 to 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
Panel Mounting	✓	✓	✓	✓	✓
Operating Temperature					
-25 to 60°C (-13 to 140°F)	–	–	✓	✓	✓
-40 to 75°C (-40 to 167°F)	✓	✓	✓	✓	✓
Redundancy and Backup Options					
Turbo Ring (Recovery Time < 20 ms)	✓	✓	–	–	–
Turbo Chain (Recovery Time < 20 ms)	✓	✓	–	–	–
Turbo Ring v2 with Dynamic Ring Coupling	✓	✓	–	–	–
STP/RSTP/MSTP	✓	✓	–	–	–
Bypass Relay	–	–	–	–	–
Network Management and Control					
IPv6	✓	✓	–	–	–
DHCP Option 66/67/82	✓	✓	–	–	–
LLDP	✓	✓	–	–	–
Modbus/TCP	✓	✓	–	–	–
IGMP/GMRP	✓	✓	–	–	–
Port Trunking	✓	✓	–	–	–
IEEE 802.1X	✓	✓	–	–	–
Port Lock	✓	✓	–	–	–
SNMP/RMON	✓	✓	–	–	–
VLAN	✓	✓	–	–	–
QoS	✓	✓	–	–	–
Relay Warning	✓	✓	–	–	–
Standards and Certifications					
CE/FCC	✓	✓	✓	✓	✓
UL 508	✓	✓	✓	✓	✓
Railway Applications: EN 50155, EN 50121-4	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
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IEC 61850-3 Ethernet Switches

	Managed Ethernet Switches							
								
	PT-7728-PTP	PT-7828	PT-7728	PT-7528	PT-7710	PT-G7509	PT-508/510	PT-G503-PHR-PTP
Number of Ports								
Max. Number of Ports	28	28	28	28	10	9	8/10	3
Max. Number of Hardware PTP Ports	14	–	–	–	–	–	–	3
Gigabit Ethernet, 10/100/1000 Mbps	Up to 4	Up to 4	Up to 4	Up to 4	Up to 2	9	–	3
Fast Ethernet, 10/100 Mbps	Up to 28	Up to 28	Up to 28	Up to 28	Up to 10	9	8/10	3
Power Supply								
24 VDC, isolated	✓	✓	✓	–	–	✓	✓	–
48 VDC, isolated	✓	✓	✓	–	–	✓	✓	–
12/24/48 VDC	–	–	–	–	✓	–	–	–
24/48 VDC, isolated	–	–	–	✓	–	–	–	✓
88 to 300 VDC or 85 to 264 VAC, isolated	✓	✓	✓	✓	✓	✓	✓	✓
Installation Options								
Rack Mounting	✓	✓	✓	✓	✓	✓	–	–
Panel Mounting	–	–	–	–	✓	–	w/ optional kit	w/ optional kit
DIN-Rail Mounting	–	–	–	–	–	–	✓	✓
Operating Temperature								
-40 to 85°C (-40 to 185°F)	✓	✓	✓	✓	✓	✓	✓	✓
Redundancy and Backup Options								
PRP/HSR (Recovery Time ≈ 0 ms)	✓	–	–	–	–	–	–	✓
Turbo Ring/Turbo Chain (Recovery Time < 20 ms)	✓	✓	✓	✓	✓	–	✓	–
Turbo Ring/Turbo Chain (Recovery Time < 50 ms)	–	–	–	–	–	✓	–	–
STP/RSTP	✓	✓	✓	✓	✓	✓	✓	–
Automatic Backup Configurator (ABC-01)	✓	✓	✓	–	✓	✓	✓	–
Automatic Backup Configurator (ABC-02)	–	–	–	✓	–	–	–	✓
Ethernet console port	–	–	–	–	–	–	–	✓
Network Management and Control								
Layer 3 Switching	–	✓	–	–	–	–	–	–
IPv6	✓	–	✓	✓	✓	✓	✓	–
DHCP Option 66/67/82	✓	✓	✓	✓	✓	✓	✓	–
NTP/SNTP	✓	✓	✓	✓	✓	✓	✓	✓
Software-based IEEE 1588v2 PTP	✓	✓	✓	✓	✓	✓	✓	–
Hardware-based IEEE 1588v2 PTP	✓	–	–	–	–	–	–	✓
LLDP	✓	✓	✓	✓	✓	✓	✓	✓
Modbus TCP	✓	✓	✓	✓	✓	✓	✓	–
EtherNet/IP	✓	✓	✓	✓	✓	✓	✓	–
IGMP/GMRP	✓	✓	✓	✓	✓	✓	✓	–
Port Trunking	✓	✓	✓	✓	✓	✓	✓	–
IEEE 802.1X	✓	✓	✓	✓	✓	✓	✓	–
Port Lock	✓	✓	✓	✓	✓	✓	✓	–
TACACS+/RADIUS	✓	✓	✓	✓	✓	✓	✓	Later release
Port Mirror	✓	✓	✓	✓	✓	✓	✓	by Ethernet console port
SNMP/RMON	✓	✓	✓	✓	✓	✓	✓	✓
VLAN	✓	✓	✓	✓	✓	✓	✓	–
QoS	✓	✓	✓	✓	✓	✓	✓	–
Relay Warning	✓	✓	✓	✓	✓	✓	✓	✓
Standards and Certifications								
CE/FCC	✓	✓	✓	✓	✓	✓	✓	✓
UL/cUL 60950-1	✓	✓	✓	✓	✓	✓	–	–
UL 508	–	–	–	✓	–	–	✓	✓
IEC 61850-3 (Power Substation)	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 1613 (Power Substation)	✓	✓	✓	✓	✓	✓	✓	✓
50121-4 (Way-side Applications)	–	✓	✓	✓	✓	–	–	✓
EN 50155 (Railway Applications)	–	✓	✓	–	✓	–	–	–
NEMA TS2 (Traffic Control System)	–	✓	✓	✓	✓	–	–	–
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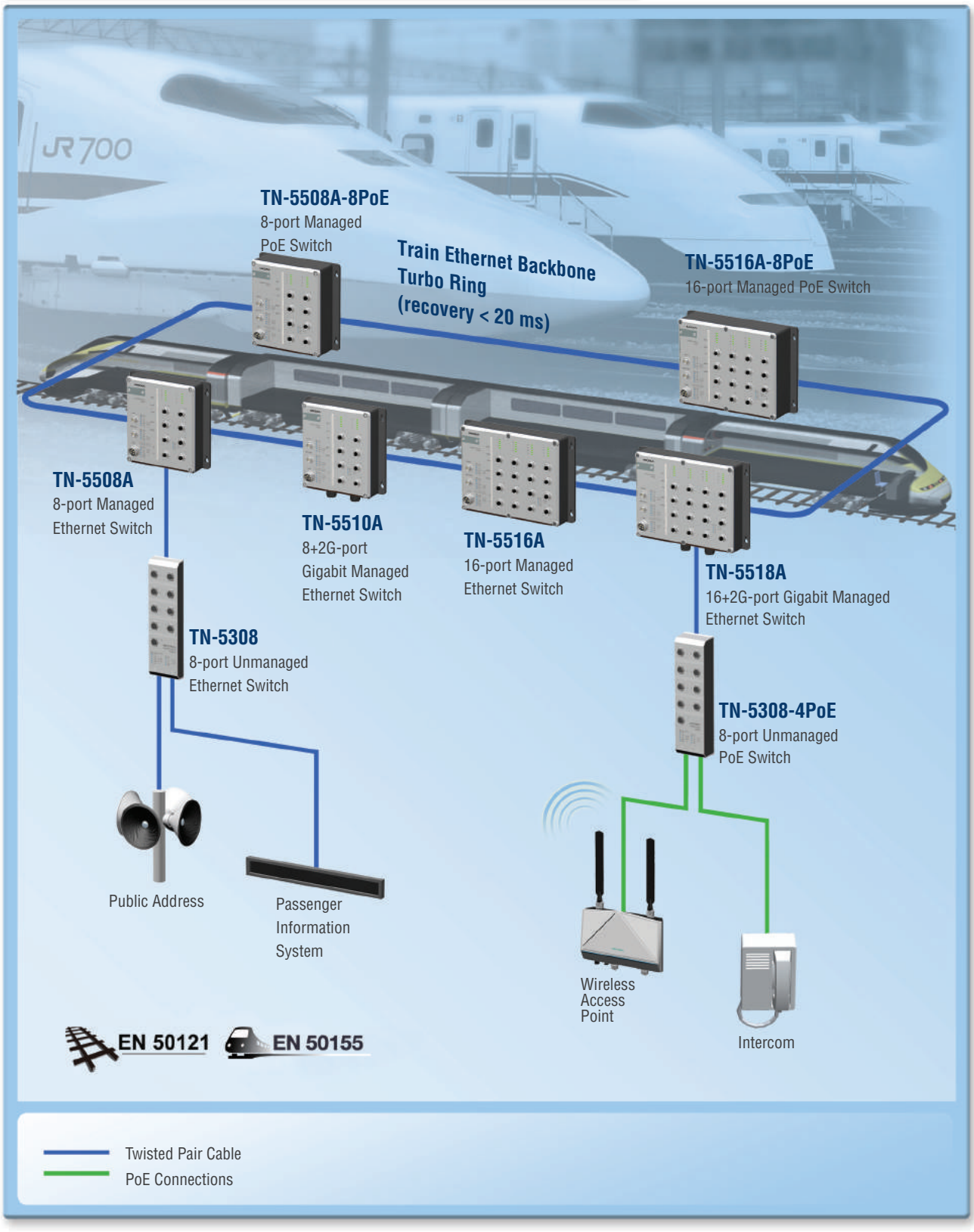
Introduction to EN 50155 Ethernet Switches

Designed for Rolling Stock and Rail Networks



Extensive Selection of EN 50155 Switches for Onboard Train Communications

Moxa's ToughNet Ethernet switches are specially designed to meet EN 50155, the onboard standard for electronic equipment, which encompasses not just EMC requirements but also shock, vibration, extended temperature range, humidity, and power supply variations. To let users choose a precise solution to fit their railway networks, over 100 models are offered. The product line supports the comprehensive features for next-generation train networks, including 10/100/1000 Mbps transmission rate, Power-over-Ethernet, Turbo Ring, bypass relay, and various mounting options.

Compliant with Industry Standards

- EN 50155
- EN 50121-4
- EN 45545-2

M12 Connectors

Robust vibration-proof connections

Wide Power Input Range

For universal applications

- Supports 24 to 110 VDC
- Redundant power inputs (non-PoE models)

Robust vibration-proof connection

- M23 connector

Tough Design

Withstands harsh environments

- -40 to 75°C operating temp.
- Die-cast metal housing
- IP54 protection
- Panel or DIN-rail mounting
- Fan-less design

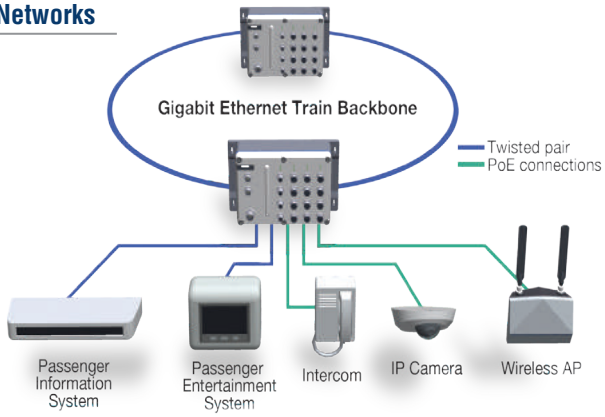
Gigabit Bandwidth

For a higher level of passenger comfort and security

- Gigabit TP ports with or without bypass relay function
- Gigabit ports with X-coded M12 connectors

Future-Proof Gigabit Solution Enables Next-Generation Train Networks

Many new applications in the railway industry, such as video surveillance, emergency intercom, and web-like entertainment require large amounts of bandwidth. Moxa's TN-5510A/5518A provides 2 Gigabit ports to allow video, audio, and data transmission over a single network.



Power-over-Ethernet Simplifies Network Connections

All applications can benefit from the ToughNet series' PoE function. Network designers can take advantage of the Power-over-Ethernet technology to power networked devices in difficult to reach locations and to simplify field wiring to reduce installation costs.

Enable High Network Availability with Excellent Redundancy

Turbo Ring™ for Ring Redundancy

All of Moxa's managed Ethernet switches support Turbo Ring™, which has a super fast fault recovery of under 20 ms at a full load of 250 Ethernet switches to minimize downtime caused by network failure. If a path in the network fails, the system will return to normal communication in under 20 ms.

Bypass Relay Function for Linear Topologies

In a linear topology, a failure in any of the upstream links will result in the failure of the downstream links as well. For railway communication systems with interconnected networks, such a failure will cause chaos. To prevent such a failure, Moxa's TN-5510A/5518A series provides 2 optional Gigabit Ethernet ports with bypass relay function. If one of the Ethernet switches fails due to power loss, its ports are bypassed with the relay circuit, and the transmission lines will interconnect automatically to assure continuous system operation.

TN-5916 Series

EN 50155 16-port NAT router

- Designed for rolling stock backbone networks
- Dual bypass relay
- Isolated power input range from 24 to 110 VDC
- Compliant with essential sections of EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and RSTP/STP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Turbo Ring

EN 50155

Introduction

The ToughNet TN-5916, designed for rolling stock backbone networks, is a high performance M12 router with four bypass relay backbone ports. It supports NAT and routing functionality to facilitate the deployment of applications across networks. The TN-5916 router uses M12 and other circular connectors to ensure tight, robust connections that guarantee reliability against environmental disturbances, such as vibration and shock. The TN-5916 router provides a wide power input range of 24 to 110 VDC. The TN-5916 operates in an extended operating temperature range of -40 to 75°C and is compliant with EN 50155/50121-4 requirements, making the router suitable for a variety of industrial applications.

Features and Benefits

- Routing functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- NAT makes IP management easier, since end devices in different carriages can use the same IP addresses
- Leading EN 50155-compliant Ethernet router for rolling stock applications
- Turbo Ring and RSTP/STP for network redundancy
- IGMP V1/V2 snooping for filtering multicast traffic
- IEEE 802.1Q VLAN to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to improve reliability
- IEEE 802.3ad for Static Port Trunking
- SNMPv3, HTTPS, and SSH to enhance network security
- SNMP v1/v2c/v3 for different levels of network management
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI 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 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.3ad for Static Port Trunking

Software Features

Management: SNMP v1/v2c/v3, Account Management, Telnet, Console - CLI, DHCP Server, LLDP, Port Mirror, Syslog, TFTP, SMTP Client, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, IGMPv1/v2, Static Multicast
Redundancy Protocols: STP/RSTP, Turbo Ring v2, Static Port Trunk
Security: Management Interface Control (TCP/UDP port blocking), Trusted Access Control
Time Management: SNTP, NTP Server/Client
Routing Redundancy: VRRP
NAT: N-1 NAT, 1-1 NAT, Port Forwarding

Router Properties

Priority Queues: 4
Max. Number of VLANs: 16
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection, with 4 bypass relays on backbone ports
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current: 0.85 A @ 24 VDC; 0.17 A @110 VDC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions: 250 x 175.8 x 116.3 mm (9.84 x 6.92 x 4.58 in)
Weight: 4030 g (8.88 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
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)
Altitude: 2,000 m

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMC: EN 55022, EN 55024
EMI: CISPR 22, FCC Part 15B Class A

EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, EN/IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, EN/IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

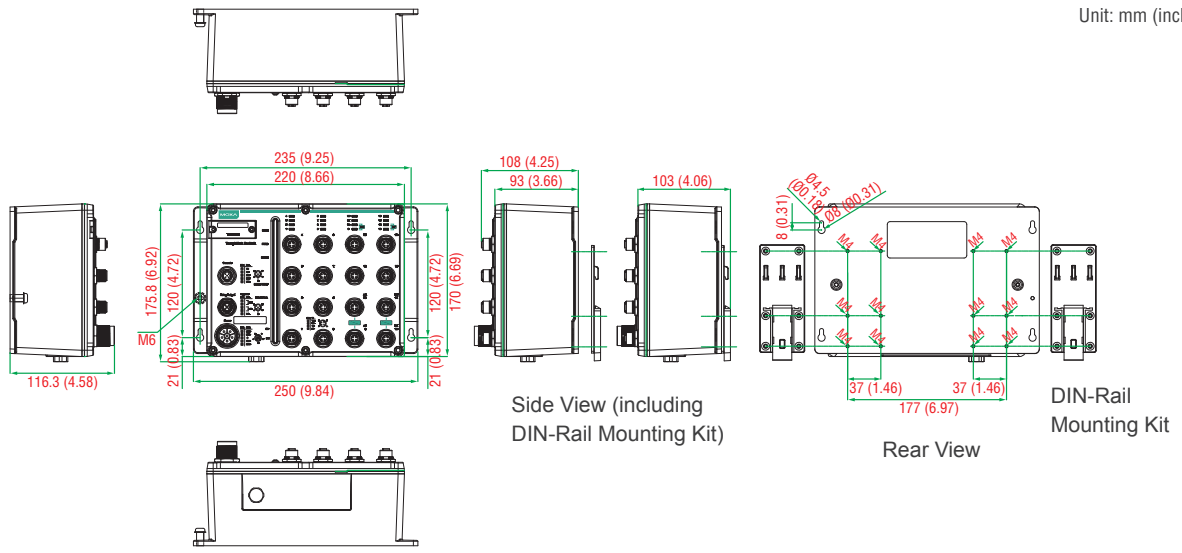
Time: 556,025 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface				Power Supply	Conformal Coating
	Front Cabling					
Wide Temperature (-40 to 75C)	10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector with bypass relay	10/100/1000 10/100BaseT(X), M12 connector	10/100/1000BaseT(X), M12 connector with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5916-WV-T	16	4	–	–	1 (Dual Input)	–
TN-5916-WV-CT-T	16	4	–	–	1 (Dual Input)	✓

Optional Accessories (can be purchased separately)

Power Cords, M12/M23 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet routers, 0 to 60°C operating temperature

Package Checklist

- TN-5916 router
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5816A/5818A Series

EN 50155 16/16+2G-port layer 3 Gigabit managed Ethernet switches

- Layer 3 routing interconnects multiple LAN segments
- 4 Fast Ethernet ports and 2 optional Gigabit ports with bypass relay function
- Isolated power with 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms with 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5816A/5818A switches are high performance M12 Layer 3 Ethernet switches that support Layer 3 routing to facilitate the deployment of applications across networks. By using M12 and other circular connectors, the TN-5516A/5518A series ensures tight, robust connections and reliability against environmental disturbances, such as vibration and shock. TN-5816A/5818A switches provide isolated power with 24 to 110 VDC power input range, which allows you to use the same model at different sites around the globe. In addition, TN-5816A/5818A switches provide up to 16 Fast Ethernet M12 ports with 4 bypass relay ports, and 2 Gigabit Ethernet ports with bypass relay function. Furthermore, the -40 to 75°C operating temperature and IP54-rated water and dust resistant enclosure allow deployment in harsh environments. The TN-5816A/5818A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial 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
- Leading EN 50155-compliant L3 Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring, Turbo Chain, and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN, and GVRP to ease network planning
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, SNMPv3, 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
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and Windows utility
- Panel mounting or DIN-rail mounting installation capability
- Loop protection to prevent network loops

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-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Q-in-Q VLAN, GVRP, IGMPv1/v2/v3, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Multicast Routing: DVMRP, PIM-DM

Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Routing Redundancy: VRRP

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: M12 X-coded 8-pin female connectors, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with bypass relay function
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
• TN-5816ABP Series: 1.1 A @ 24 VDC, 0.23 A @ 110 VDC
• TN-5818A Series: 1.24 A @ 24 VDC, 0.26 A @ 110 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5816ABP Series: 250 x 175.8 x 115 mm (9.84 x 6.92 x 4.53 in)
TN-5818A Series: 250 x 181.4 x 115 mm (9.84 x 7.14 x 4.53 in)
Weight:
TN-5816ABP Series: 2990 g (5.62 lb)
TN-5818A Series: 3160 g (6.97 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

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)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5816ABP series: 577,026 hrs
TN-5818A-2GTXBP series: 525,091 hrs
Standard: Telcordia SR332

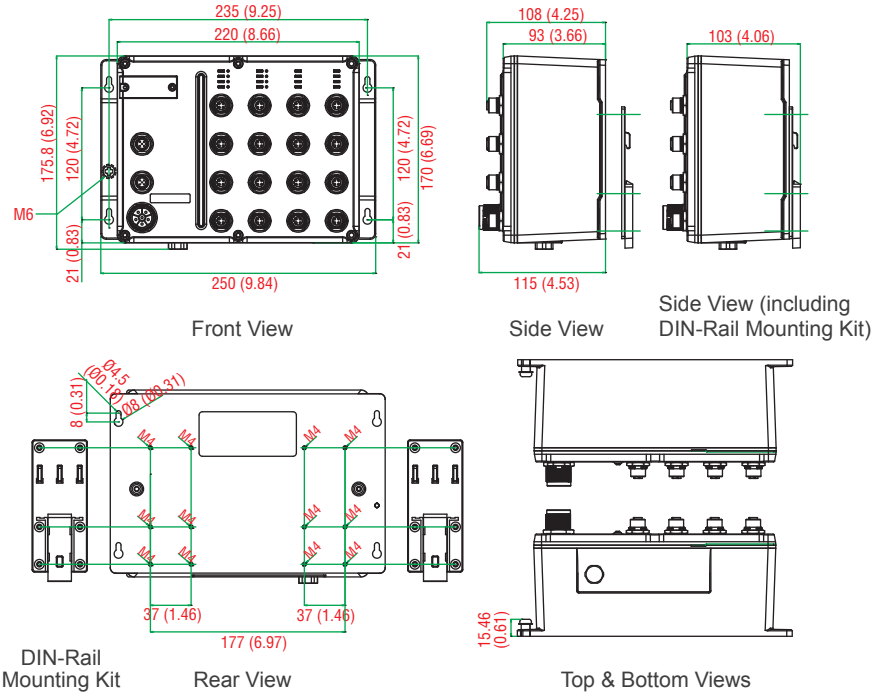
Warranty

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

Dimensions

TN-5816A Series

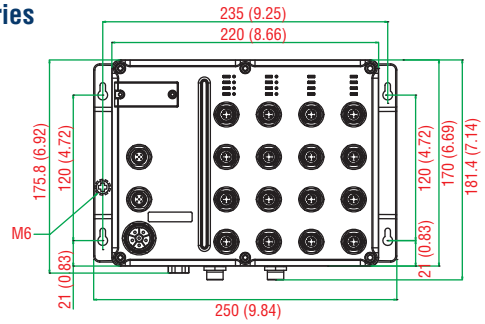
Unit: mm (inch)



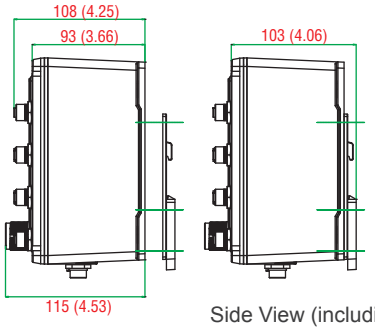
Dimensions

TN-5818A Series

Unit: mm (inch)

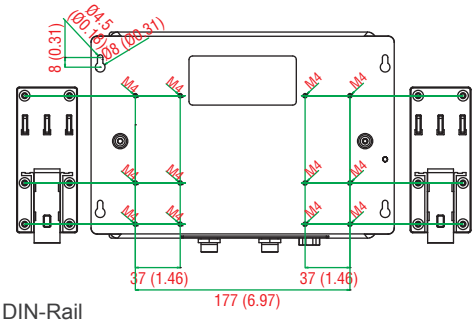


Front View



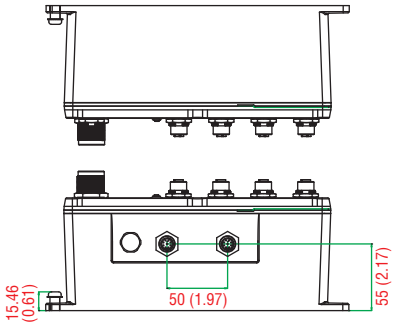
Side View

Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models	Port Interface			Power Supply	Conformal Coating
	Front Cabling		Down Cabling		
Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	10/100/1000BaseT(X), M12 connector, with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5816A Series					
TN-5816ABP-WV-T	12	4	–	1	–
TN-5816ABP-WV-CT-T	12	4	–	1	✓
TN-5818A Series					
TN-5818A-2GTXBP-WV-T	12	4	2	1	–
TN-5818A-2GTXBP-WV-CT-T	12	4	2	1	✓

Definitions:
1. GTXBP: Gigabit Ethernet copper port with bypass relay
2. WV: Wide Voltage
3. CT: Conformal Coating

Note: Conformal coating is available on request.

Optional Accessories (can be purchased separately)

Power Cords, M12/M23 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

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

ABC-01-M12: Configuration backup and restore tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5816A or TN-5818A series switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5524-8PoE Series

EN 50155 24-port managed Ethernet switches with 8 PoE ports

- IEEE 802.3af compliant PoE ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Isolated power inputs with universal 24 VDC power supply
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range (T models)
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5500 series M12 PoE managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. 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-5524-8PoE series Ethernet switches provide 24 Fast Ethernet M12 ports with 8 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port, and can be used to power IEEE 802.3af compliant powered devices (PDs) (such as surveillance cameras, wireless access points, and IP phones). Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500-PoE series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Advanced PoE management function
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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
- TACACS+, SNMPv3, 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
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Panel mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3af for Power-over-Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)

Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 3 A @ 30 VDC

Power Requirements

Input Voltage: 24 VDC
Operating Voltage: 16.8 to 30 VDC
Input Current: 8.4 (max.) @ 24 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP40 protection (optional protective caps available for unused ports)
Dimensions: 390 x 132 x 122.3 mm (15.35 x 5.20 x 4.81 in)
Weight: 3,506 g (7.73 lb)
Installation: Panel-mounting kit

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)
Altitude: 2000 m
Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

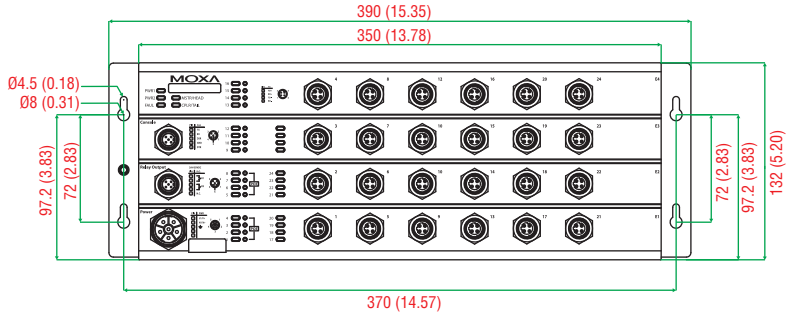
Time: 663,533 hrs
Standard: Telcordia SR332

Warranty

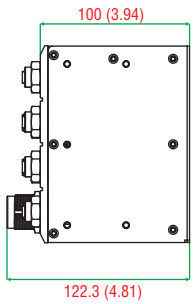
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

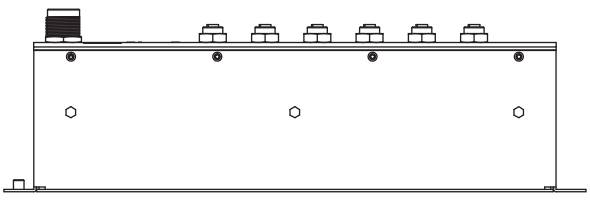
Unit: mm (inch)



Front View



Side View



Bottom View

Ordering Information

Available Models	Port Interface				Power Supply				
Wide Temperature (-40 to 75°C)	PoE, 10/100 BaseT(X), M12 Connector	10/100 BaseT(X), M12 Connector	10/100/1000 BaseT(X), M12 Connector	1000 Mbps Fiber Optic Q-ODC	P24 VDC (16.8 to 30 V)	PLV: 36/48 VDC (25.2 to 60 VDC)	PMV: 72/96/110 VDC (50.4 to 137.5 VDC)	WV: 24/36/48/ 72/96/110 VDC	Conformal Coating
TN-5524-8PoE-P24-T	8	16	–	–	1	–	–	–	–
TN-5524-8PoE-P24-CT-T	8	16	–	–	1	–	–	–	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5524-8PoE switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5510A/5518A Series

EN 50155 8+2G/16+2G-port Gigabit Ethernet switches with up to 8 PoE ports

- 2 Gigabit ports with optional bypass relay function
- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 watts at 48 VDC per PoE port
- Isolated power with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5500A series M12 managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. 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-5500A series Ethernet switches provide 8 or 16 Fast Ethernet M12 ports with or without 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports, and 2 ports on the down side to provide the Gigabit Ethernet interface with an optional bypass relay function. The PoE switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP surveillance, wireless access points, and IP phones. The TN-5500A series provides a wide power input range of 24/36/48/72/96/110 VDC that allows you to use the same type of power source at different sites around the globe. In addition, the 24 to 110 VDC wide power input range and isolated power increases the reliability of your communications system. In addition, the -40 to 75°C operating temperature and IP54 rated waterproof enclosure allow deployment in harsh environments. The TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- 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
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- 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-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (SW-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, M12 X-coded 8-pin female connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with or without bypass relay function
Console Port: M12 A-coding 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present
Input Current:
TN-5510A non-PoE series: 0.56 A @ 24 VDC; 0.13 A @ 110 VDC
TN-5518A non-PoE series: 0.68 A @ 24 VDC; 0.16 A @ 110 VDC
TN-5510A-8PoE series: 7.90 A @ 24 VDC; 1.61 A @ 110 VDC
TN-5518A-8PoE series: 8.66 A @ 24 VDC; 1.69 A @ 110 VDC

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5510A non-PoE Series: 185 x 180.9 x 76.0 mm (7.28 x 7.12 x 2.99 in)
TN-5518A non-PoE Sseries: 250 x 180.9 x 76.0 mm (9.84 x 7.12 x 2.99 in)
TN-5510A-8PoE Series: 185 x 180.9 x 115 mm (7.28 x 7.12 x 4.53 in)
TN-5518A-8PoE Series: 250 x 180.9 x 115 mm (9.84 x 7.12 x 4.53 in)
Weight:
TN-5510A non-PoE Series: 1,711 g (3.77 lb)
TN-5518A non-PoE Series: 2,250 g (4.96 lb)
TN-5510A-8PoE: 2,551 g (5.62 lb)
TN-5518A-8PoE: 3,439 g (7.58 lb)
Installation: Panel mounting, DIN-Rail mounting (with optional kit: DK-DC50131)

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)
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines “essential compliance” to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5510A-2GTX series: 758,855 hrs
TN-5510A-2GTXBP series: 742,880 hrs
TN-5518A-2GTX series: 647,128 hrs
TN-5518A-2GTXBP series: 628,808 hrs
TN-5510A-8PoE-2GTX: 502,756 hrs
TN-5510A-8PoE-2GTXBP: 495,703 hrs
TN-5518A-8PoE-2GTX: 448,300 hrs
TN-5518A-8PoE-2GTXBP: 439,442 hrs
Standard: Telcordia SR332

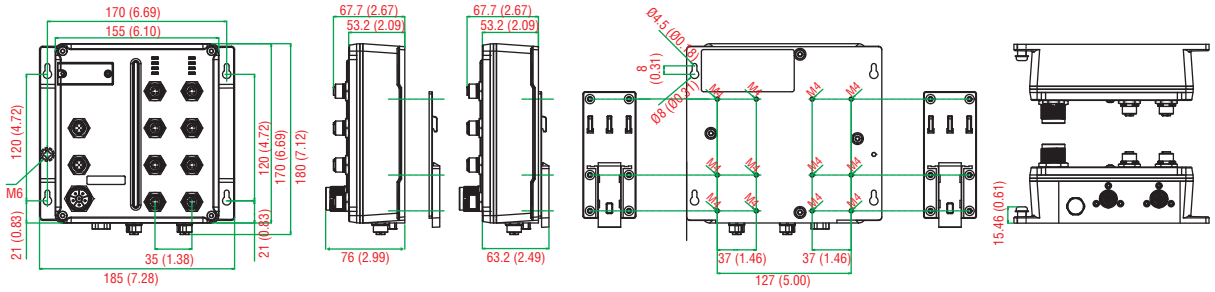
Warranty

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

Dimensions

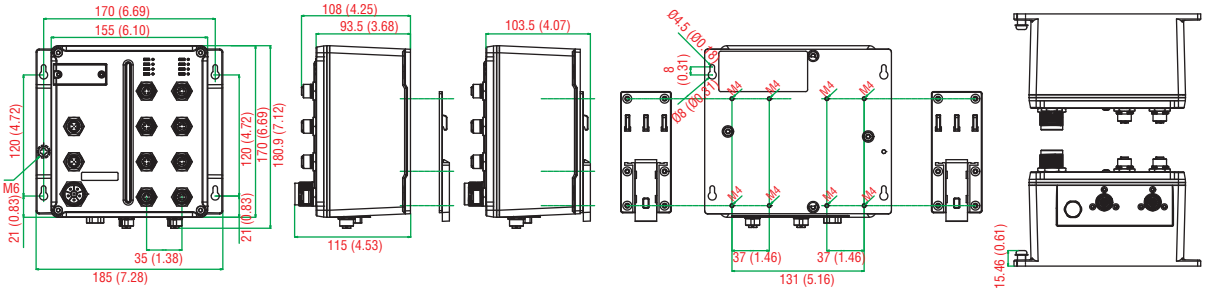
Unit: mm (inch)

TN-5510A non-PoE Series



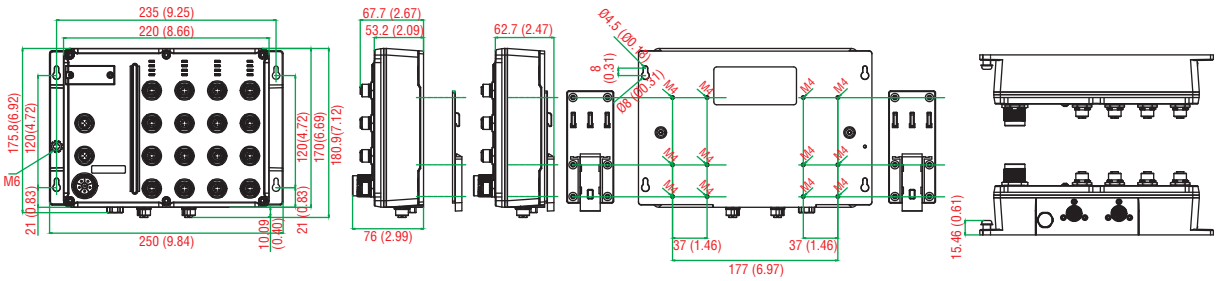
Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5510A-8PoE Series



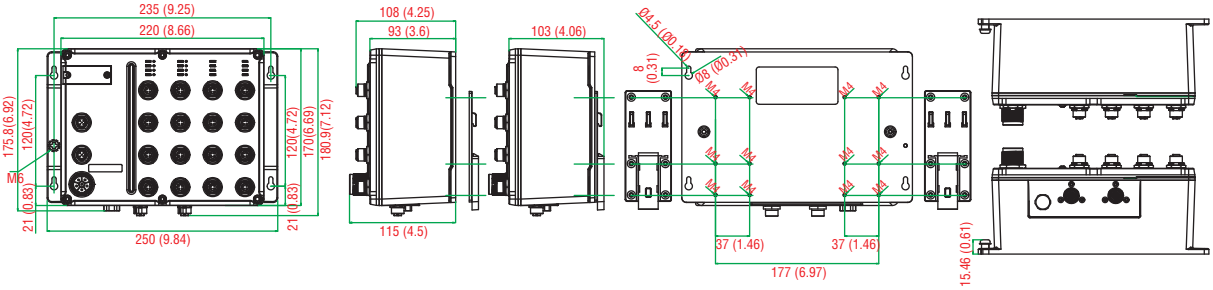
Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5518A non-PoE Series



Front View | Side View (including DIN-Rail Mounting Kit) | Rear View | DIN-Rail Mounting Kit | Top & Bottom Views

TN-5518A-8PoE Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

Ordering Information

Available Models	Port Interface				Power Supply	Conformal Coating
	Front Cabling		Down Cabling			
Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5510A Series						
TN-5510A-2GTX-WV-T	–	8	2	–	Dual Input	–
TN-5510A-2GTX-WV-CT-T	–	8	2	–	Dual Input	✓
TN-5510A-2GTXBP-WV-T	–	8	–	2	Dual Input	–
TN-5510A-2GTXBP-WV-CT-T	–	8	–	2	Dual Input	✓
TN-5518A Series						
TN-5518A-2GTX-WV-T	–	16	2	–	Dual Input	–
TN-5518A-2GTX-WV-CT-T	–	16	2	–	Dual Input	✓
TN-5518A-2GTXBP-WV-T	–	16	–	2	Dual Input	–
TN-5518A-2GTXBP-WV-CT-T	–	16	–	2	Dual Input	✓
TN-5510A-8PoE Series						
TN-5510A-8PoE-2GTX-WV-T	8	–	2	–	1	–
TN-5510A-8PoE-2GTX-WV-CT-T	8	–	2	–	1	✓
TN-5510A-8PoE-2GTXBP-WV-T	8	–	–	2	1	–
TN-5510A-8PoE-2GTXBP-WV-CT-T	8	–	–	2	1	✓
TN-5518A-8PoE Series						
TN-5518A-8PoE-2GTX-WV-T	8	8	2	–	1	–
TN-5518A-8PoE-2GTX-WV-CT-T	8	8	2	–	1	✓
TN-5518A-8PoE-2GTXBP-WV-T	8	8	–	2	1	–
TN-5518A-8PoE-2GTXBP-WV-CT-T	8	8	–	2	1	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

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

ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5500A switch
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Hardware installation guide
- Warranty card

TN-5510A-2GLSX-ODC Series

EN 50155 8+2G-port Q-ODC® managed Ethernet switches with up to 8 PoE ports

- 2 Gigabit fiber ports with embedded multi-mode Q-ODC® interface
- Isolated power inputs with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- 8 IEEE 802.3at/af compliant combo PoE and Ethernet ports
- Provides up to 30 watts per PoE port

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

Introduction

The ToughNet TN-5510A-2GLSX-ODC and TN-5510A-8PoE-2GLSX-ODC series M12 managed Ethernet switches are designed for railway applications, such as rolling stock and wayside installations. 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. In addition, the 24 to 110 VDC wide power input range and isolated power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communications system. The TN-5510A-2GLSX-ODC and TN-5510A-8PoE-2GLSX-ODC switches provide up to 8 Fast Ethernet M12 ports, and 2 ports on the down side to provide the Gigabit fiber interface with an embedded 2 km multimode fiber transceiver.

The TN-5510A-8PoE-2GLSX-ODC series Ethernet switches have 8 Fast Ethernet M12 ports with 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE); they provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP cameras, wireless access points, and IP phones. Moreover, the -40 to 75°C operating temperature and IP54-rated waterproof and dustproof enclosure allow deployment in harsh environments. The TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant Gigabit Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- 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
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- 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-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, Q-ODC® connector, 1000M (Gigabit Ethernet port), PoE (for PoE models)
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
TN-5510A-2GLSX-ODC series: 0.45 A @ 24 VDC; 0.1 A @ 110 VDC
TN-5510A-8PoE-2GLSX-ODC series: 7.8 A @ 24 VDC; 1.58 A @110 VDC
Overload Current Protection: Yes
Connection: M23 connector
Reverse Polarity Protection: Yes

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
- TN-5510A-2GLSX-ODC series:
  185 x 204.3 x 76.0 mm (7.28 x 8.04 x 2.99 in)
- TN-5510A-8PoE-2GLSX-ODC series:
  185 x 219.3 x 115 mm (7.28 x 8.63 x 4.53 in)

Weight:
TN-5510A-2GLSX-ODC series: 1,805 g (3.97 lb)
TN-5510A-8PoE-2GLSX-ODC series: 2,690 g (5.93 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

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)
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMC: EN 55022, EN 55024
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel-mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5510A-2GLSX-ODC series: 722,049 hrs
TN-5510A-8PoE-2GLSX-ODC series: 486,560 hrs
Standard: Telcordia SR332
Note: Please check Moxa's website for the most up-to-date certification status.

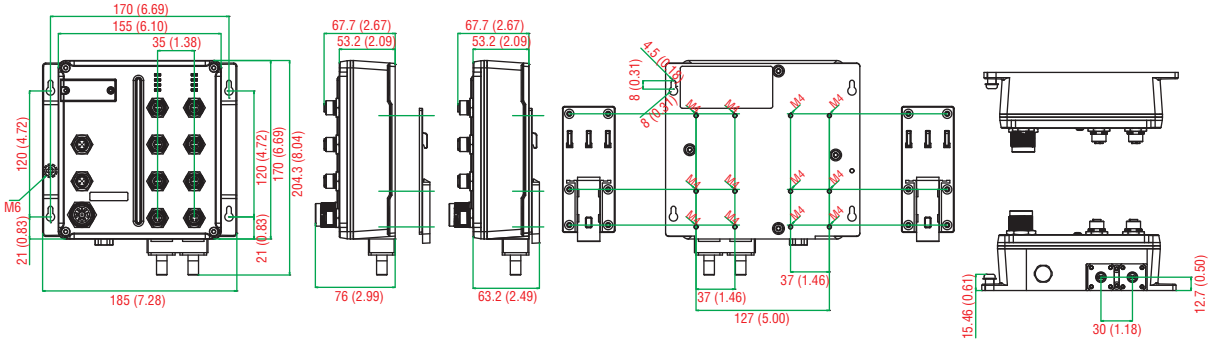
Warranty

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

Dimensions

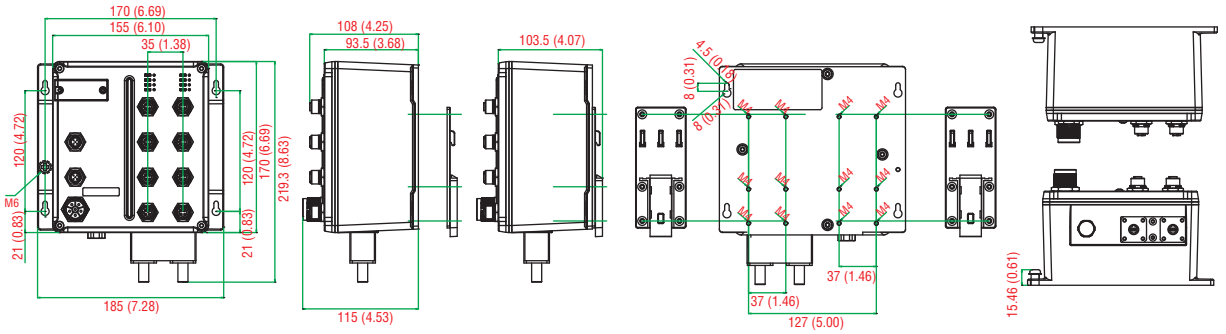
Unit: mm (inch)

TN-5510A-2GLSX-ODC Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5510A-8PoE-2GLSX-ODC Series



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

Ordering Information

Available Models	Port Interface			Power Supply	Conformal Coating
	Front Cabling	Down Cabling			
Wide Temperature (-40 to 75°C)	PoE, 10/100 BaseT(X), M12 connector	10/100baseT(X), M12 connector	1000BaseLSX fiber optic, Q-ODC® interface	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5510A-2GLSX-ODC Series					
TN-5510A-2GLSX-ODC-WV-T	–	8	2	1 (Dual Input)	–
TN-5510A-2GLSX-ODC-WV-CT-T	–	8	2	1 (Dual Input)	✓
TN-5510A-8PoE-2GLSX-ODC Series					
TN-5510A-8PoE-2GLSX-ODC-WV-T	8	–	2	1	–
TN-5510A-8PoE-2GLSX-ODC-WV-CT-T	8	–	2	1	✓

Definitions:
1. GLSX: Gigabit fiber with 2 km fiber transceiver
2. Q-ODC®: Quick-Outdoor Connector
3. CT: Conformal Coating
4. WV: Wide Voltage

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- 1 TN-5500A switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

TN-5508A/5516A Series

EN 50155 8/16-port managed Ethernet switches with up to 8 PoE ports

- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 watts at 48 VDC per PoE port
- Isolated power with wide 24 to 110 VDC power supply range
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

Turbo Ring | Turbo Chain | EN 50155 | EN 50121 | CE | FC

Introduction

The ToughNet TN-5500A series M12 managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. 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-5500A series Ethernet switches provide 8 or 16 Fast Ethernet M12 ports with or without 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP cameras, wireless access points, and IP phones.

In addition, the 24 to 110 VDC wide power input range and isolated power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communications system. In addition, the -40 to 75°C operating temperature and IP54-rated waterproof and dustproof enclosure allow deployment in harsh environments. Moreover, the TN-5500A series Ethernet switches are compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- 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
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection prevents network loops
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control

Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Ring v2 with DRC, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (SW-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coded 5-pin male connector
Alarm Contact: 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current:
TN-5508A series: 0.28 A @ 24 VDC; 0.07 A @ 110 VDC
TN-5516A series: 0.39 A @ 24 VDC; 0.09 A @ 110 VDC
Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5508A non-PoE Series: 185 x 175.8 x 76.0 mm (7.28 x 6.92 x 2.99 in)
TN-5516A non-PoE Series: 250 x 175.8 x 76.0 mm (9.84 x 6.92 x 2.99 in)
TN-5508A-8PoE Series: 185 x 175.8 x 115 mm (7.28 x 6.92 x 4.53 in)
TN-5516A-8PoE Series: 250 x 175.8 x 115 mm (9.84 x 6.92 x 4.53 in)
Weight:
TN-5508A non-PoE Series: 1,610 g (3.54 lb)
TN-5516A non-PoE Series: 2,138 g (4.71 lb)
TN-5508A-8PoE: 2,383 g (5.25 lb)
TN-5516A-8PoE: 3,286 g (7.24 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-DC50131)

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)
Altitude: 2,000 m
Note: Please contact Moxa if you require products guaranteed to function at higher altitudes

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 50121-3-2, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5508A non-PoE series: 814,964 hrs
TN-5516A non-PoE series: 722,721 hrs
TN-5508A-8PoE: 526,372 hrs
TN-5516A-8PoE: 483,246 hrs
Standard: Telcordia SR332

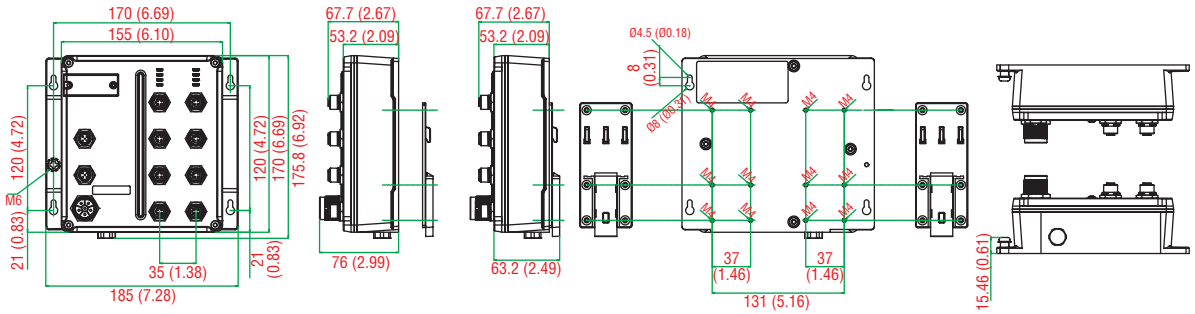
Warranty

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

Dimensions

Unit: mm (inch)

TN-5508A non-PoE Series

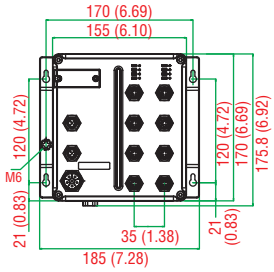


Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

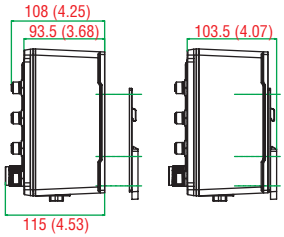
Dimensions

Unit: mm (inch)

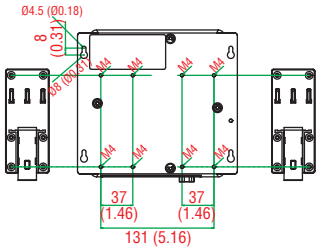
TN-5508A-8PoE Series



Front View

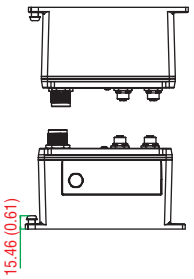


Side View (including DIN-Rail)



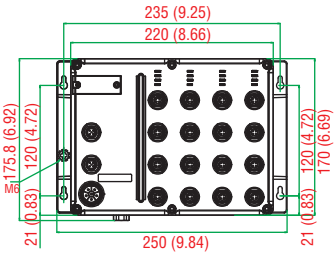
DIN-Rail Mounting Kit

Rear View

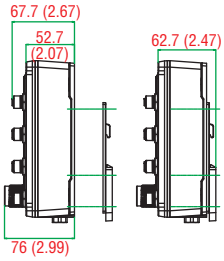


Top & Bottom Views

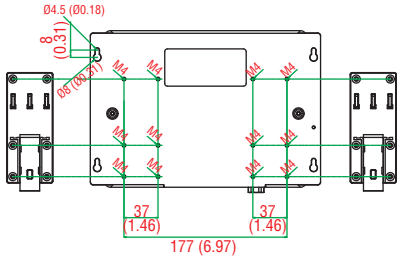
TN-5516A non-PoE Series



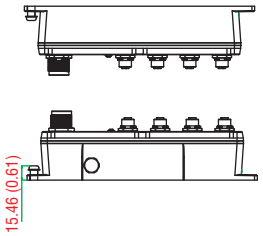
Front View



Side View (including DIN-Rail Mounting Kit)



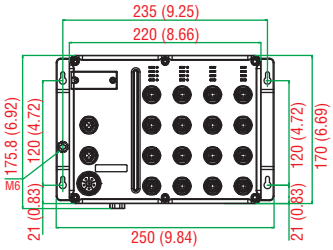
Rear View



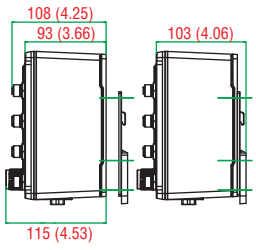
DIN-Rail Mounting Kit

Top & Bottom Views

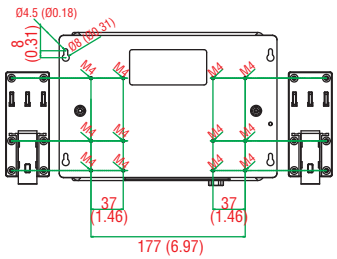
TN-5516A-8PoE Series



Front View

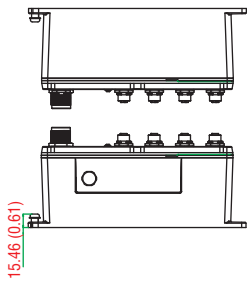


Side View (including DIN-Rail)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models	Port Interface		Power Supply	Conformal Coating
Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5508A Series				
TN-5508A-WV-T	–	8	Dual Input	–
TN-5508A-WV-CT-T	–	8	Dual Input	✓
TN-5516A Series				
TN-5516A-WV-T	–	16	Dual Input	–
TN-5516A-WV-CT-T	–	16	Dual Input	✓
TN-5508A-8PoE Series				
TN-5508A-8PoE-WV-T	8	–	1	–
TN-5508A-8PoE-WV-CT-T	8	–	1	✓
TN-5516A-8PoE Series				
TN-5516A-8PoE-WV-T	8	8	1	–
TN-5516A-8PoE-WV-CT-T	8	8	1	✓

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01-M12: Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- TN-5500A switch
- 2 protective caps for console and relay output ports
- Panel mounting kit
- Hardware installation guide
- Warranty card

TN-5308 Series

EN 50155 8-port unmanaged Ethernet switches

- M12 connectors and IP40 metal housing
- Supports IEEE 802.3/802.3u/802.3x
- Essential compliance with EN 50155*
- -40 to 75°C operating temperature range (T models)

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50155 EN 50121

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 comply with those EN 50155 requirements that make products more suitable for rolling stock applications, including operating temperature, power input voltage, surge, ESD, and vibration, 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

Interface

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

Power Requirements

Input Voltage:
• TN-5308-LV: 12/24/36/48 VDC
• TN-5308-MV: 72/96/110 VDC
Note: Compliant with EN 50155 on 24/48/72/96/110 VDC
Operating Voltage:
• TN-5308-LV: 8.4 to 60 VDC
• TN-5308-MV: 50.4 to 137.5 VDC
Input Current:
• TN-5308-LV: 0.19 A @ 12 VDC, 0.10 A @ 24 VDC, 0.054 A @ 48 VDC
• TN-5308-MV: 0.033 A @ 72 VDC, 0.024 A @ 96 VDC, 0.021 A @ 110 VDC
Connection:
• TN-5308-LV: M12 connector
• TN-5308-MV: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: 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 53.8 mm (2.36 x 8.53 x 2.12 in)
Weight:
TN-5308-LV: 485 g (1.07 lb)
TN-5308-MV: 685 g (1.51 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit: DK-TN-5308)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 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)

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155 (essential compliance*), EN 50121-4, EN 45545-2
*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5308-LV Series: 2,099,286 hrs
TN-5308-MV Series: 2.590.858 hrs
Standard: Telcordia SR332

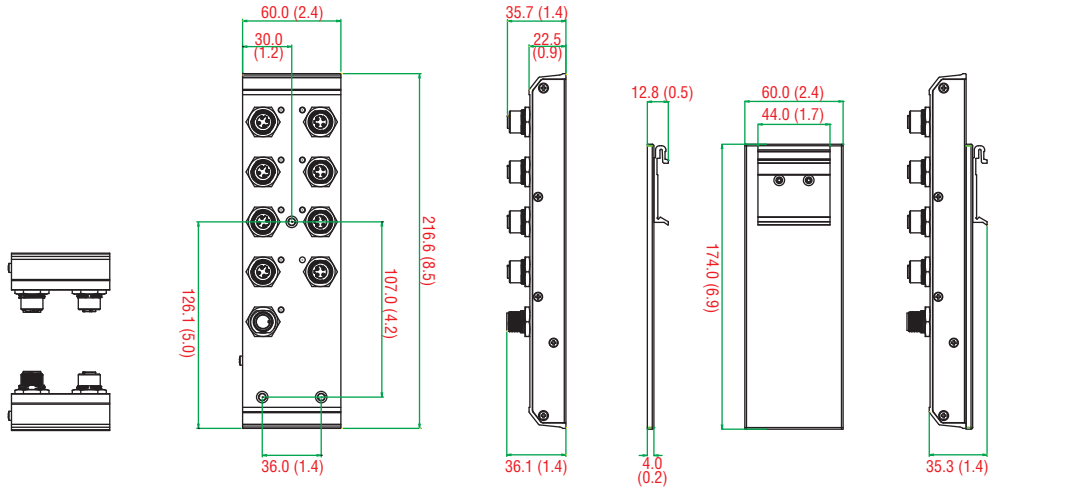
Warranty

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

Dimensions

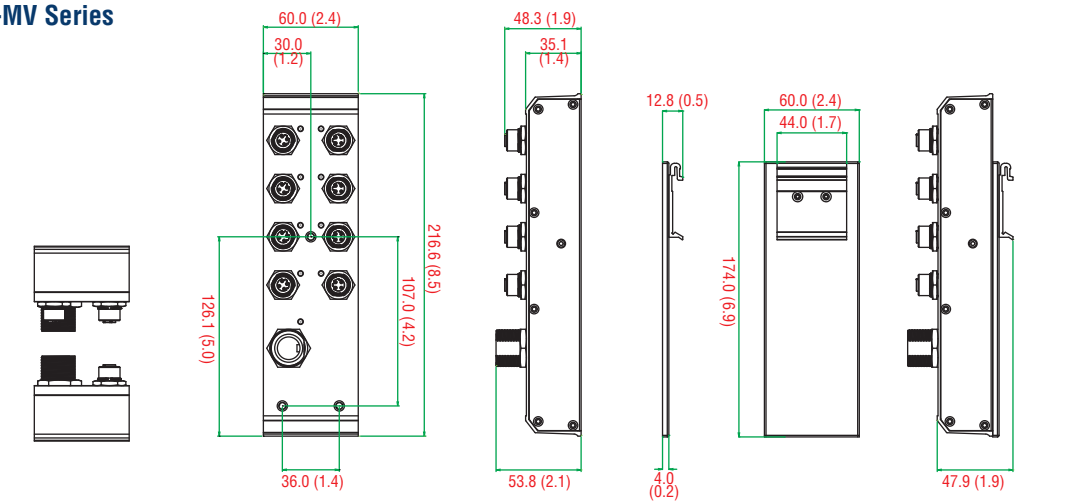
Unit: mm (inch)

TN-5308-LV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

TN-5308-MV Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Ordering Information

Available Models		Power Interface	Power Supply	
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector	LV	MV
			12/24/36/48 VDC (8.4 to 60 V)	72/96/110 VDC (50.4 to 137.5 V)
TN-5308-LV	TN-5308-LV-T	8	1	–
TN-5308-MV	TN-5308-MV-T	8	–	1

Note: Conformal coating is available on request.

Package Checklist

- TN-5308 switch
- Panel-mounting kit
- Hardware installation guide
- Warranty card

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
DK-TN-5308: DIN-rail mounting kit

TN-5308-4/8PoE Series

EN 50155 8-port unmanaged Ethernet switches with 4/8 PoE ports

- 4 or 8 IEEE 802.3af compliant PoE and Ethernet combo ports
- Provides up to 15.4 watts at 48 VDC per PoE port
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

EN 50121

Introduction

The ToughNet TN-5308-4/8PoE 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-5308-4/8PoE series Ethernet switches provide 8 Fast Ethernet M12 ports with 4/8 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-5308-4/8PoE 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-5308-4/8 PoE series Ethernet switches comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, 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
IEEE 802.3af for Power-over-Ethernet
Processing Type: Store and Forward

Interface

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

Power Requirements

Input Voltage: 48 VDC
Operating Voltage: 46 to 50 V
Input Current:
• TN-5308-4PoE: 1.6 A @ 48 VDC
• TN-5308-8PoE: 2.9 A @ 48 VDC
Overload Current Protection: 3 A @ 48 VDC
Connection: M12 connector
Reverse Polarity Protection: 3 A @ 48 VDC

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
IP Rating: IP40 protection
Dimensions:
TN-5308-4PoE: 60 x 216.6 x 48.7 mm (2.36 x 8.53 x 1.91 in)
TN-5308-8PoE: 80 x 216.6 x 52.9 mm (3.15 x 8.53 x 2.1 in)
Weight:
TN-5308-4PoE: 675 g (1.49 lb)
TN-5308-8PoE: 970 g (2.14 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 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)

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact 6 kV; Air 8 kV
IEC 61000-4-3 RS: 20 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Power 2 kV; Signal 2 kV
IEC 61000-4-5 Surge: Power 2 kV; Signal 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: (for panel mounting installations)
EN 50155*, EN 50121-4, EN 45545-2
*Complies with a portion of EN 50155 specifications.
Shock: EN 50155, IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
TN-5308-4PoE-48 Series: 252,075 hrs
TN-5308-8PoE-48 Series: 308,392 hrs
Standard: Telcordia SR332

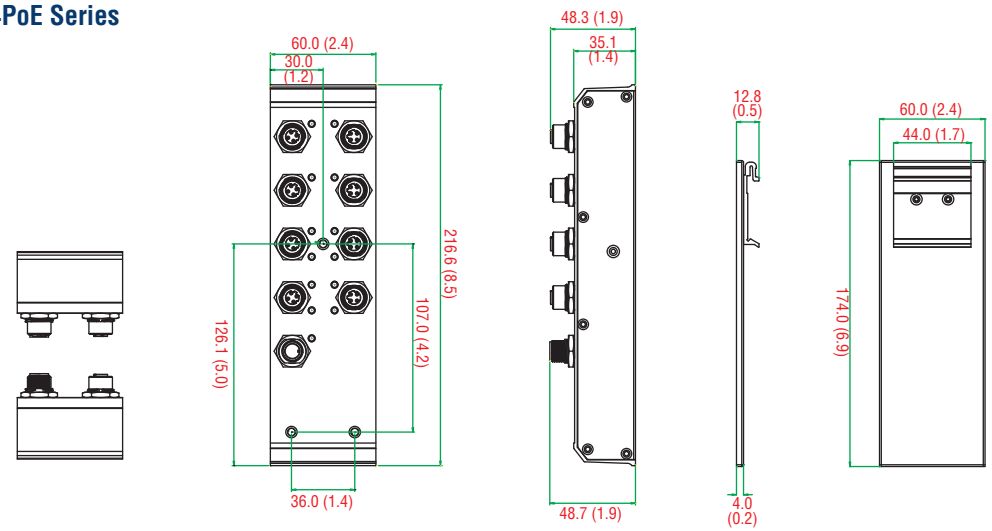
Warranty

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

Dimensions

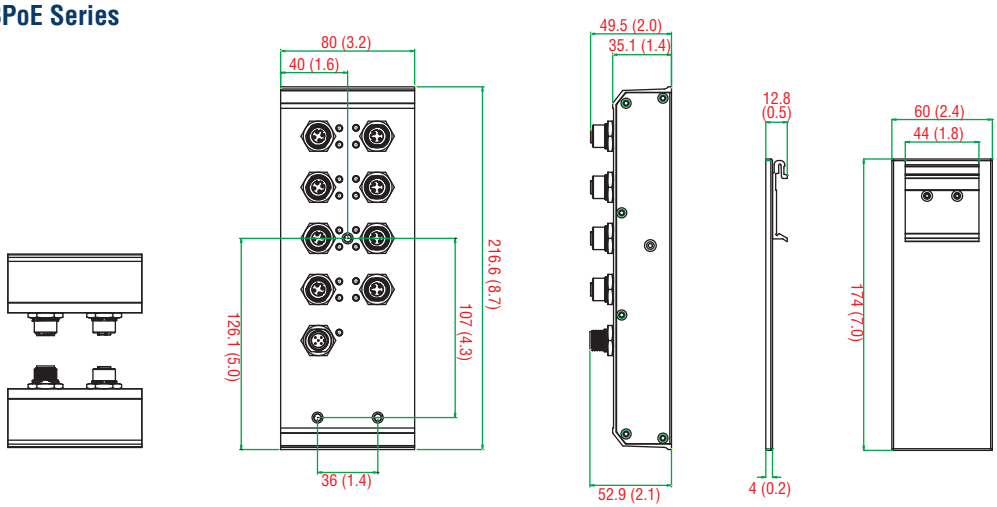
Unit: mm (inch)

TN-5308-4PoE Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit

TN-5308-8PoE Series



Top & Bottom Views | Front View | Side View | DIN-Rail Mounting Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	PoE, 10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector
TN-5308-4PoE-48	TN-5308-4PoE-48-T	4	4
TN-5308-8PoE-48	TN-5308-8PoE-48-T	8	0

Note: Conformal coating is available on request.

Package Checklist

- TN-5308-4/8PoE switch
- Hardware installation guide
- Warranty card

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies

TN-5305 Series

EN 50155 5-port IP67 unmanaged Ethernet switches

- 10/100BaseT(X), 4-pin M12 (D-coded), F/H duplex mode, and auto MDI/MDI-X connection
- IP67 rated housing protection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- Complies with a portion of EN 50155 specifications
- -40 to 75°C operating temperature range (T models)

Introduction

The TN-5305 series Ethernet switches are IP67-rated for tough industrial applications. 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 TN-5305 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the most extreme weather conditions. The TN-5305 Series Ethernet switches comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, 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

Software Features

Processing Type: Store and Forward

Interface

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

Power Requirements

Input Voltage:
• 24 VDC
• 18 to 30 VAC (47 to 63 Hz)
Note: Compliant with EN 50155 on 24 VDC
Operating Voltage:
• 12 to 45 V
• 18 to 30 VAC (47 to 63 Hz)
Input Current:
• 0.12 A @ 24 VDC
• 0.28 A @ 24 VAC
Overload Current Protection: 1.1 A (Limited Current)
Connection: 1 M12 socket (A-coded), single power input
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Plastic
IP Rating: IP67 protection
Dimensions: 60 x 125 x 29.6 mm (2.36 x 4.92 x 1.09 in)
Weight: 250 g (0.56 lb)
Installation: Field-style mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -25 to 60°C (-13 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)

Standards and Certifications

Safety: UL/cUL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Rail Traffic: EN 50155* (for panel-mounting installations)
*Complies with a portion of EN 50155 specifications.
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 (mean time between failures)

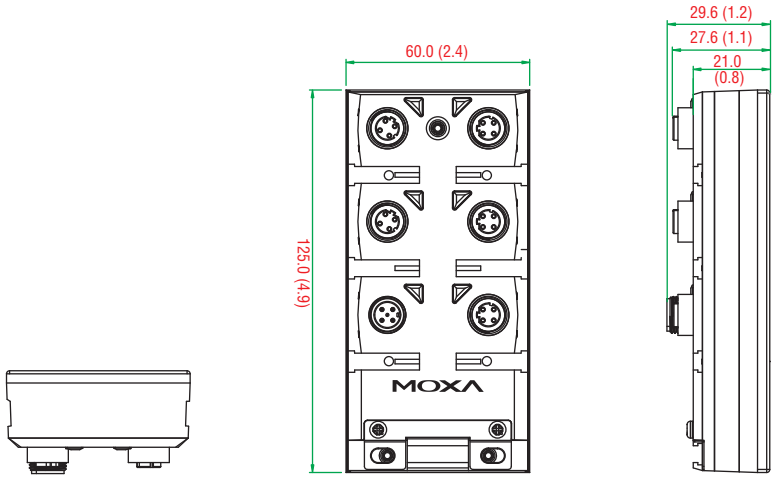
Time: 370,224 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Top View | Front View | Side View

Ordering Information

Available Models		Port Interface
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X), M12 connector
TN-5305	TN-5305-T	5

Note: Conformal coating is available on request.

Optional Accessories (can be purchased separately)

Power Cords, M12 Connectors, Protective Caps: See the EN 50155 Switch Accessories datasheet for details

DK-TN-5308: DIN-rail mounting kit

Package Checklist

- TN-5305 switch
- Panel-mounting kit
- 3 protective caps for unused ports and 8 port labels
- Hardware installation guide
- Warranty card

EN 50155 Switch Accessories

M12/M23 Cords

CBL-M12D(MM4P)/RJ45-100 IP67

1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with
IP67-rated 4-pin male D-coded M12 connector

CBL-M12(FF5P)/OPEN-100 IP67

1-meter M12-to-5-pin power cable with IP67-rated
5-pin female A-coded M12 connector

CBL-M23(FF6P)/Open-BK-100 IP67

1-meter M23-to-6-pin power cable with
IP67-rated 6-pin female M23 connector

CBL-M12XMM8PRJ45-Y-200-IP67

2-meter M12-to-RJ45 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

CBL-M12XMM8P-Y-300-IP67

3-meter M12-to-M12 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

CBL-M12XMM8P-Y-100-IP67

1-meter M12-to-M12 Cat-5 UTP Ethernet cable with
IP67-rated 8-pin male X-coded crimp type M12 connector

M12 Connectors

M12D-4P-IP68

Field-installable M12 D-coded screw-in
sensor connector, 4-pin male, IP68-rated

M12A-5P-IP68

Field-installable M12 A-coded screw-in
sensor connector, 5-pin female, IP68-rated

M12X-8PMM-IP67-HTG

Field-installable M12 X-coded crimp type,
slim design connector, 8-pin male, IP67-rated

M12 IP67 Protective Caps

A-CAP-M12F-M

Metal cap for M12 female connector

A-CAP-M12M-M

Metal cap for M12 male connector

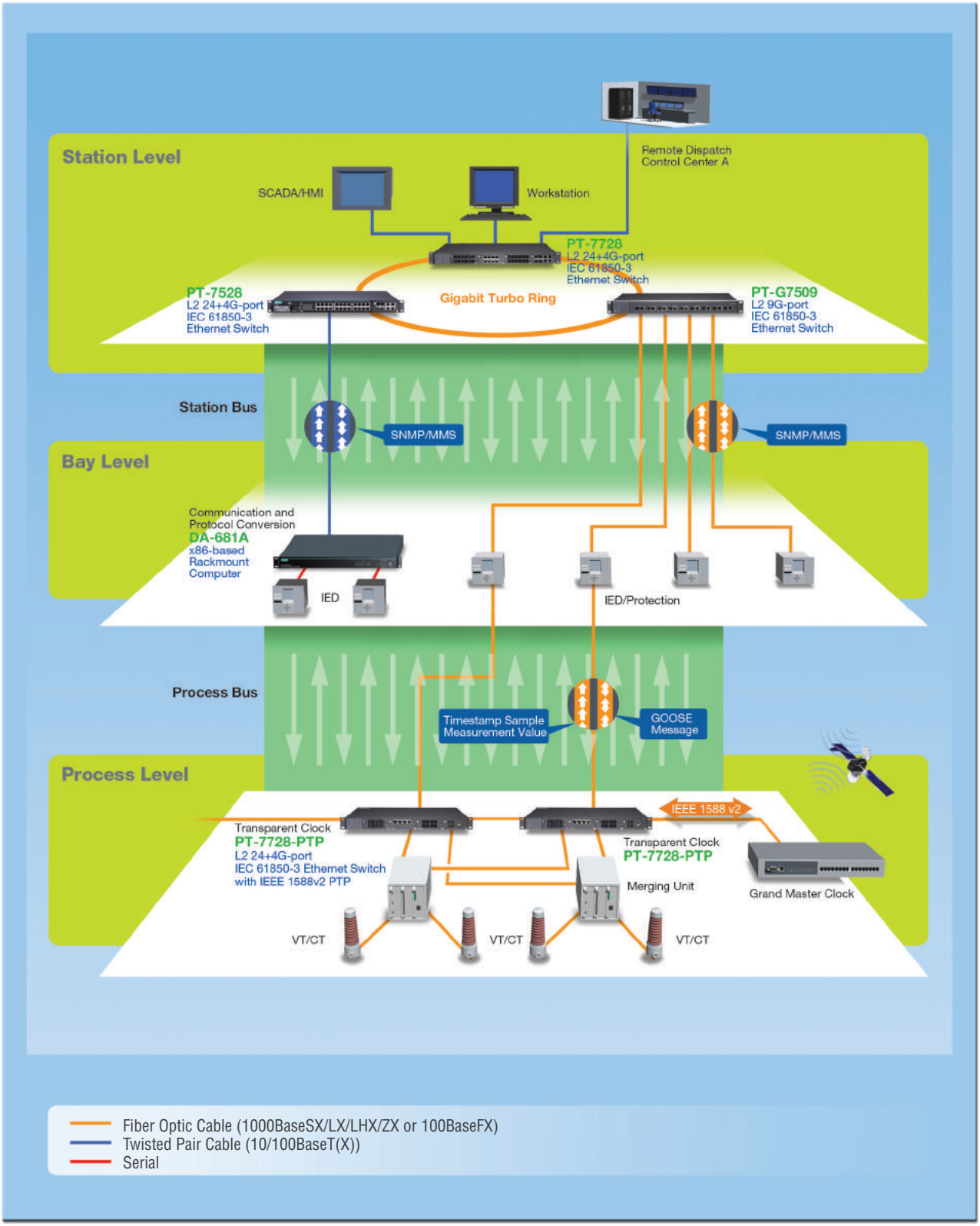
M23 Connectors

A-PLG-WPM23-01

M23 cable connector, 6-pin female, crimp type

Introduction to IEC 61850-3 Ethernet Switches

Suitable for All Demanding Power Utility Applications



IEC 61850 Makes Substations Smarter

The end goal of IEC 61850 is to transform the electricity distribution industry by building more intelligence and more complete automation into power substations. With intelligent electronic devices (IEDs), it's possible to extend new controls and automation deep into the substation's process layer, thus allowing for real-time monitoring and management from a centralized remote control hub.

According to IEC 61850, an intelligent substation is characterized by these three basic features:

- All primary substation machinery (switchgear, transformers) are engineered with a relatively high level of device intelligence.
- All secondary devices are networked.
- All routine operations and system management are fully automated.

To meet these objectives, the IEC 61850 standard stipulates that power substations will use Ethernet switches for data communications all throughout the station, bay, and process levels. Because commercial devices are far too frail for the demanding conditions of a power substation environment, devices specifically engineered to heavy industrial standards (e.g. IEC 61850-3 and IEEE 1613 requirements) which are optimized for use in power substations will be required.

Certifications to Ensure Reliable Operation

IEC 61850-3

IEC 61850-3 specifically addresses the device's electromagnetic 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, cannot experience 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.

Maximizing Substation System Availability

Maximizing a power substation's availability and safety is the ultimate goal for both transmission grid operators and Substation Automation System (SAS) integrators. A properly optimized SAS will help ensure that the substation's operation is always well within what are considered safe conditions.

Overall, a power substation's daily operation can be classified into three states:

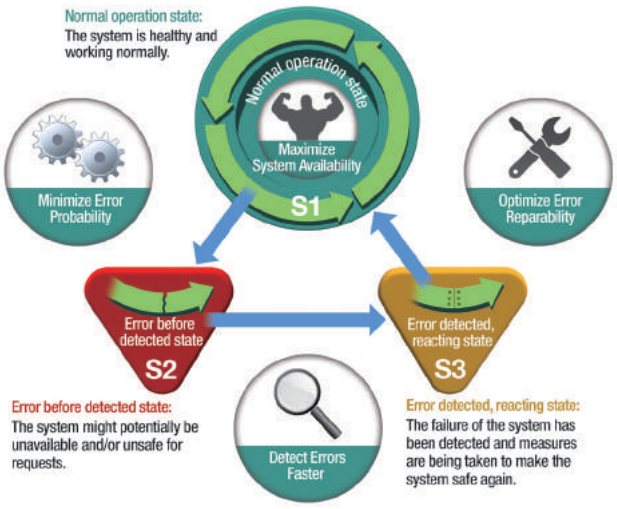
State 1: When the system is healthy and working properly.

State 2: When the system encounters errors that reduce availability and/or make it unsafe.

State 3: When a State 2 error has been detected and measures are being taken to make the system available again, by returning it to State 1.

The foremost concern for electricity suppliers is substation availability, that is, keeping the operation in State 1 as much as possible. The following guidelines address every aspect of the design and operation substation networks:

- Minimize Error Probability: Cut the possibility for errors in any way possible.
- Detect Errors Faster: Increase the speed at which errors are detected, thereby minimizing interruptions to the smallest possible window.
- Optimize Error Repairability: Increase the efficiency and effectiveness of fixing substation failures.



Minimize Error Probability

PRP/HSR Standardized Protocols for Zero Recovery Time

IEC 62439-3 Clause 4 defines "Parallel Redundancy Protocol" (PRP) and IEC 62439-3 Clause 5 defines "High-availability Seamless Redundancy" (HSR). PRP and HSR are the newest standardized redundancy protocols for industrial automation networks where zero recovery time is needed. These protocols are suitable for electrical substation automation or mission-critical applications that cannot tolerate any system downtime.

Moxa's integrated PRP/HSR technology provides the following benefits:

- Full compliance with the latest international IEC 62439-3 standard for highest stability and interoperability
- PRP and HSR in a single box to give you a choice for improving reliability
- 100/1000 Mbps transmission speed across a combination of PRP/HSR/InterLink ports
- Support for hardware-based IEEE 1588v2 PTP

Noise Guard™: Wire-Speed Zero Packet Loss Technology

To meet IEEE 1613 Class 2 requirements, network devices must have a level 4 EMC rating to guarantee that they will reliably tolerate high EMI conditions.

- Mechanical Design: Integrated housing for better conduction
- Customized Component: Newly redesigned fiber transceiver
- Enhanced Power Supply Unit: Optimized circuit design, upgraded components

IEC 61850 QoS

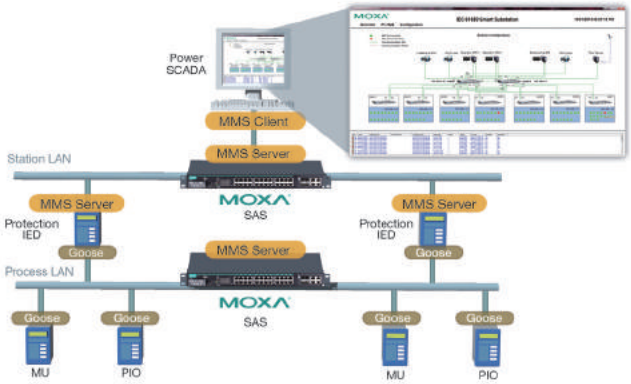
Substation automation devices must communicate critical, low-level IEC 61850 multicasts (GOOSE/SMV) with the highest priority, without fail. Prioritizing the transmission of GOOSE/SMV packets guarantees that these messages are clearly received without distortion throughout the entire network, regardless of what other communications may be currently congesting the lines. Ping-based solutions are not sufficient to achieve this. To fully satisfy IEEE 1613 Class 2 requirements, substation switches must support strong QoS traffic shaping.

- Communications packets may be assigned different priorities, depending on their importance
- Packet types: GOOSE, SMV, PTP
- Packet priorities: High, medium, normal, low

Detect Errors Faster

IEC 61850-90-4 Modeling Switch for Power SCADA

Moxa's PowerTrans PT-7528 substation Ethernet switches come with fully integrated MMS support. PT-7528 IEC 61850-90-4 switches give substation engineers the option of bringing their IT devices into the same SCADA overview as the IEDs, or any other IEC 61850 device that uses MMS as its device-to-device messaging model.



Fiber Check™: A Fiber Digital Diagnostic Monitoring (DDM) Tool

Using Fiber Check™, a fiber Digital Diagnostic Monitoring (DDM) tool, Moxa's IEC 61850 certified substation switches can monitor ST/SC (as well as SFP) connectors, and notify power SCADA systems via SNMP trap or MMS when abnormalities are detected, allowing operators to initiate maintenance procedures. Fiber Check™ reports and alarms may be communicated via web, CLI, or serial console; via MMS reporting or SNMP traps; by a digital relay; or in the system log. Preferably, several methods will be used to provide redundancy. This arrangement further allows system operators real time monitoring of things like transmission and reception power, temperature, and voltage/current along optical fiber connections.

- Fiber status monitoring: Fiber temperature, working voltage, Tx/Rx power
- Auto-warning: SNMP trap, relay, email, MMS, event log

Optimize Error Repairability

Substation Configuration Wizard

Because substations are such a specialized environment, IT setups will only require a few key features. Thus, simplifying and streamlining the configuration process makes a lot of sense: by reducing the configuration interface to only the relevant network features, setup and maintenance becomes much more efficient. Using Moxa's browser-based configuration wizard, effectively deploying one of our network devices can take as few as 7 steps.

PT-7828 Series

IEC 61850-3 / EN 50155 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) and EN 50121-4 (railway applications) compliant
- Complies with a portion of EN 50155 specifications
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Up to 12 ports with M12 connectors
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- Supports multicast routing protocols PIM-DM/DVMRP
- -40 to 85°C operating temperature range

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), and railway applications (EN 50121-4). The PT-7828 series also features critical packet prioritization (GOOSE, SMVs, and PTP).

The PT-7828's Gigabit and Fast Ethernet backbone, redundant ring, and 24 VDC, 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.

General Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Supports multicast routing protocols PIM-DM/DVMRP
- Supports advanced VLAN capability with Q-in-Q tagging
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828

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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2/v3, GMRP, GVRP, 802.1Q, Q-in-Q VLAN
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, VRRP
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Unicast Routing: Static routing, RIP V1/V2, OSPF
Multicast Routing: DVMRP and PIM-DM
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Power Substation: IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ 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)
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
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

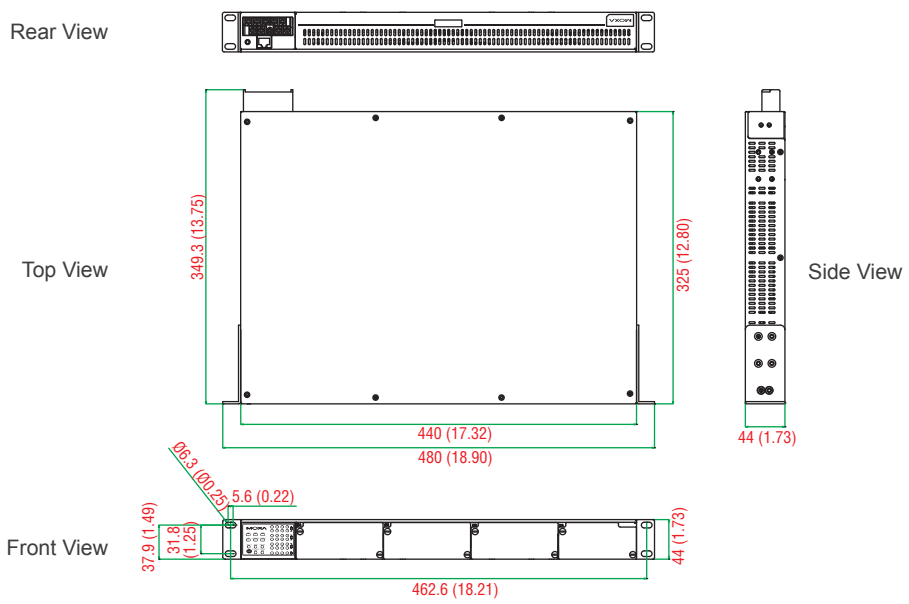
Time: 393,828 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



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 the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 16 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 28 or 24+4G ports can be installed, and the switch can be used in temperatures ranging 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	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/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-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 combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet to select 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 Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	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-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNO2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7828 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728-PTP Series

IEC 61850-3 Layer 2 IEEE 1588v2 PTP rackmount (PRP/HSR) Ethernet switches

- IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- IEC 61850-3 and IEEE 1613 (power substations) compliant
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant*
- Isolated redundant power supplies with universal 24 VDC, or 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA

*Only available with PM-7200-4GTX-PHR-PTP and PM-7200-4GSFP-PHR-PTP modules

Introduction

The PowerTrans PT-7728-PTP switches are designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-7728-PTP's redundant ring, and dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

Moxa's PT-7728-PTP IEC 61850-3 Ethernet switches support the latest version of IEEE 1588 technology (IEEE 1588v2 PTP) to fulfill precision time synchronization requirements for protection and control applications. These Ethernet switches guarantee time-stamping accuracy within 1 µs for the IEC 61850 process layer. They can be configured for 1588 v2 Master, Boundary Clock, and Transparent Clock functionality.

When used with specific PM-7200 PRP/HSR series modules, the PT-7728-PTP series switches are compliant with the latest standardized redundancy protocols for industrial automation networks. IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High-availability Seamless Redundancy, HSR) ensure the highest system availability and data integrity for mission-critical applications in electrical substations and/or process automation systems that require zero recovery time redundancy.

The modular design of the PT-7728-PTP also makes network planning easy, and allows greater flexibility by letting you install up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit (PRP/HSR)*ports. Along with a choice of either front or rear wiring, these features together make the PT-7728-PTP suitable for a variety of industrial applications.

* Only available with PM-7200 PRP/HSR series module

IEEE 1588 PTP Features

- IEEE 1588v2 PTP (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support for both IEEE 1588 Boundary Clock and Transparent Clock
- Support for both End-to-End (2-step) and Peer-to-Peer (2-step) modes in Transparent Clock*
- High precision time accuracy (under 1 µs)

*Only available with PM-7200 PRP/HSR series modules.

General 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
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring for zero switchover time.
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA
- PRP (Parallel Redundancy Protocol)*: Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy)*: Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.

*Only available with PM-7200 PRP/HSR series modules

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SNMP Inform, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Fiber Check, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q, Q-in-Q VLAN
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation, PRP, HSR
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (hardware-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9, IEC 62439-3 MIB
Power Substation: MMS, IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

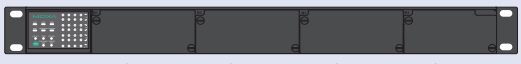
Interface

IEEE 1588 PTP: Up to 12 x 10/100BaseT(X), 12 x 100BaseFX (multi-mode, SC connector), or 14 x 100BaseFX (multi-mode, ST connector) and 4 x 10/100/1000BaseT(X) or 4 x 100/1000BaseSFP IEEE 1588 ports with hardware time stamping
Fast Ethernet:
• Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP
• Slot 4 for BNC port and 100BaseFX (ST connector)
Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module or 4-port PM-7200 Gigabit Ethernet PRP/HSR module, 10/100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
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
• 48 VDC
• 110/220 VDC/VAC

Modular Rackmount Ethernet Switch System, PT-7728-PTP



Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

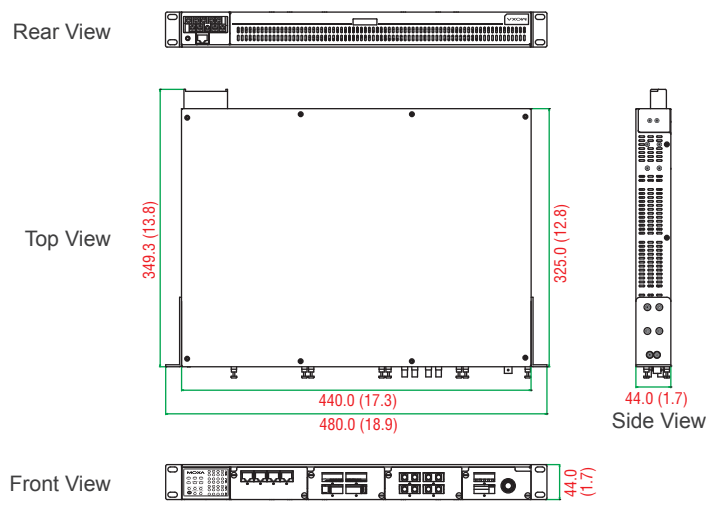
Time: 340,365 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728-PTP with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7728-PTP Ethernet switch system is delivered without interface module. See the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7728-PTP Modular Rackmount Ethernet Switch System

The PT-7728-PTP switch system consists of 14 modular managed rackmount Ethernet switch systems. A total of up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit ports can be installed, and the switch can be used in temperatures ranging 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	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-7728-PTP-F-24	PT-7728-PTP-R-24	1	–	–	–	–	–
PT-7728-PTP-F-24-24	PT-7728-PTP-R-24-24	1	–	–	1	–	–
PT-7728-PTP-F-24-HV	PT-7728-PTP-R-24-HV	1	–	–	–	–	1
PT-7728-PTP-F-48	PT-7728-PTP-R-48	–	1	–	–	–	–
PT-7728-PTP-F-48-48	PT-7728-PTP-R-48-48	–	1	–	–	1	–
PT-7728-PTP-F-HV	PT-7728-PTP-R-HV	–	–	1	–	–	–
PT-7728-PTP-F-HV-HV	PT-7728-PTP-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728-PTP Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

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

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

Gigabit/Fast Ethernet Modules for the PT-7728-PTP

	IEEE 1588 Interface Modules						non-IEEE 1588 Interface Modules																	
	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTX-PHR-PTP	PM-7200-4GSFP-PHR-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	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-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ
Slot 1	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 2	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 3	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 4	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728-PTP switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7528 Series

IEC 61850-3 28-port Layer 2 managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) compliant
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA
- Noise Guard™ wire speed zero packet loss technology
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power supplies with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7528 series is designed for power substation automation applications that operate in extremely harsh environments. The PT-7528 series supports Moxa's Noise Guard technology, is compliant with IEC 61850-3, and its EMC immunity exceeds IEEE 1613 Class 2 standards to ensure zero packet loss while transmitting at wire speed. The PT-7528 series also features critical packet prioritization (GOOSE, SMVs, and PTP), a built-in MMS server, and a configuration wizard designed specifically for substation automation. With Gigabit Ethernet, redundant ring, and 110/220 VDC/VAC isolated redundant power supplies, the PT-7528 series further increases the reliability of your communications and saves cabling/wiring costs. The wide range of PT-7528 models available support multiple types of port configuration, with up to 28 copper or 24 fiber ports, and with up to 4 Gigabit ports. Taken together, these features allow greater flexibility, making the PT-7528 suitable for a variety of industrial applications.

General Features and Benefits

- Built-in MMS server for integration with power SCADA systems
- Switch data modeling based on the IEC 61850-90-4 standard
- Fiber Check™ provides monitoring and diagnosis functions on MST/MSC/SSC/SFP fiber ports
- Noise Guard™ provides a high level of EMC immunity for critical applications, exceeding IEEE 1613 Class 2
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multiport mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/Serial console, CLI, Windows utility, and ABC-02 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/ Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure, SNMP Inform, Port Mirror, Fiber Check, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Power Substation: MMS, IEC 61850 QoS, Configuration Wizard

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
Jumbo Frame Size: 9728 bytes

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot, 100BaseFX Multi-mode ST/SC Connector
Console Port: USB console port (Type B connector)
Storage Port: USB storage port (Type A connector)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

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:
• WV: 24/48 VDC
• HV: 110/220 VDC/VAC
Operating Voltage:
• WV: 18 to 72 V
• HV: 88 to 300 VDC and 85 to 264 VAC
Input Current: For models with fewer than 8 fiber ports:
• Max. 0.741 A @ 24 VDC
• Max. 0.364 A @ 48 VDC
• Max. 0.147/0.077 A @ 110/220 VDC
• Max. 0.283/0.19 A @ 110/220 VAC
For models with 8 or more fiber ports:
• Max. 1.428 A @ 24 VDC
• Max. 0.735 A @ 48 VDC
• Max. 0.313/0.167 A @ 110/220 VDC
• Max. 0.586/0.382 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 4900 g (10.89 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50121-4
Transportation: NEMA TS2
Electrical Substation: IE C61850-3, IEEE 1613 Class 2 (models with MCS and SSC fiber ports are compliant with IEEE 1613 Class 1)

MTBF (mean time between failures)

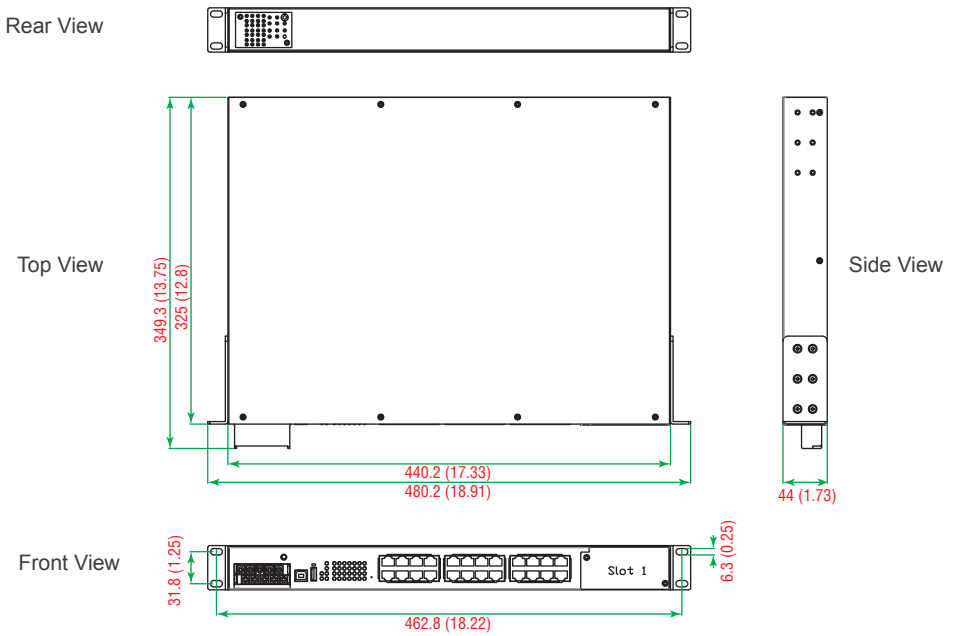
Time: 422,912 hrs
Standard: Telcordia TR/SR

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV: 24/48 VDC	HV: 110/220 VDC/VAC	WV: 24/48 VDC	HV: 110/220 VDC/VAC
PT-7528-24TX-WV	–	–	–	–	24	1	✓	–	–	–
PT-7528-24TX-HV	–	–	–	–	24	1	–	✓	–	–
PT-7528-24TX-WV-WV	–	–	–	–	24	1	✓	–	✓	–
PT-7528-24TX-WV-HV	–	–	–	–	24	1	✓	–	–	✓
PT-7528-24TX-HV-HV	–	–	–	–	24	1		✓	–	✓
PT-7528-8MST-16TX-4GSFP-WV	4	8	–	–	16	–	✓	–	–	–
PT-7528-8MST-16TX-4GSFP-WV-WV	4	8	–	–	16	–	✓	–	✓	–
PT-7528-8MST-16TX-4GSFP-HV	4	8	–	–	16	–	–	✓	–	–
PT-7528-8MST-16TX-4GSFP-HV-HV	4	8	–	–	16	–	–	✓	–	✓
PT-7528-12MST-12TX-4GSFP-WV	4	12	–	–	12	–	✓	–	–	–
PT-7528-12MST-12TX-4GSFP-WV-WV	4	12	–	–	12	–	✓	–	✓	–
PT-7528-12MST-12TX-4GSFP-HV	4	12	–	–	12	–	–	✓	–	–
PT-7528-12MST-12TX-4GSFP-HV-HV	4	12	–	–	12	–	–	✓	–	✓
PT-7528-16MST-8TX-4GSFP-WV	4	16	–	–	8	–	✓	–	–	–
PT-7528-16MST-8TX-4GSFP-WV-WV	4	16	–	–	8	–	✓	–	✓	–
PT-7528-16MST-8TX-4GSFP-HV	4	16	–	–	8	–	–	✓	–	–
PT-7528-16MST-8TX-4GSFP-HV-HV	4	16	–	–	8	–	–	–	–	✓
PT-7528-20MST-4TX-4GSFP-WV	4	20	–	–	4	–	✓	–	–	–
PT-7528-20MST-4TX-4GSFP-WV-WV	4	20	–	–	4	–	✓	–	✓	–
PT-7528-20MST-4TX-4GSFP-HV	4	20	–	–	4	–	–	✓	–	–
PT-7528-20MST-4TX-4GSFP-HV-HV	4	20	–	–	4	–	–	✓	–	✓
PT-7528-8MSC-16TX-4GSFP-WV	4	–	8	–	16	–	✓	–	–	–
PT-7528-8MSC-16TX-4GSFP-WV-WV	4	–	8	–	16	–	✓	–	✓	–

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV: 24/48 VDC	HV: 110/220 VDC/VAC	WV: 24/48 VDC	HV: 110/220 VDC/VAC
PT-7528-8MSC-16TX-4GSFP-HV	4	–	8	–	16	–	–	✓	–	–
PT-7528-8MSC-16TX-4GSFP-HV-HV	4	–	8	–	16	–	–	✓	–	✓
PT-7528-12MSC-12TX-4GSFP-WV	4	–	12	–	12	–	✓	–	–	–
PT-7528-12MSC-12TX-4GSFP-WV-WV	4	–	12	–	12	–	✓	–	✓	–
PT-7528-12MSC-12TX-4GSFP-HV	4	–	12	–	12	–	–	✓	–	–
PT-7528-12MSC-12TX-4GSFP-HV-HV	4	–	12	–	12	–	–	✓	–	✓
PT-7528-16MSC-8TX-4GSFP-WV	4	–	16	–	8	–	✓	–	–	–
PT-7528-16MSC-8TX-4GSFP-WV-WV	4	–	16	–	8	–	✓	–	✓	–
PT-7528-16MSC-8TX-4GSFP-HV	4	–	16	–	8	–	–	✓	–	–
PT-7528-16MSC-8TX-4GSFP-HV-HV	4	–	16	–	8	–	–	✓	–	✓
PT-7528-20MSC-4TX-4GSFP-WV	4	–	20	–	4	–	✓	–	–	–
PT-7528-20MSC-4TX-4GSFP-WV-WV	4	–	20	–	4	–	✓	–	✓	–
PT-7528-20MSC-4TX-4GSFP-HV	4	–	20	–	4	–	–	✓	–	–
PT-7528-20MSC-4TX-4GSFP-HV-HV	4	–	20	–	4	–	–	✓	–	✓
PT-7528-8SSC-16TX-4GSFP-WV-WV	4	–	–	8	16	–	✓	–	✓	–
PT-7528-8SSC-16TX-4GSFP-HV-HV	4	–	–	8	16	–	–	✓	–	✓

Note:
PT-7528-24TX high density copper port models have a slot reserved for PM-7500 series modules for fiber and gigabit extension. A selection table of PM-7500 interface modules is included towards the end of this datasheet.
Models with mixed WV and HV power and models with mixed Multi-mode and Single-mode fiber are available by request on a project basis.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7528 switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7728 Series

IEC 61850-3 24+4G-port Layer 2 Gigabit modular managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations), and EN 50121-4 (railway applications) compliant
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for power SCADA
- Complies with a portion of EN 50155 specifications
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 12 ports with M12 connectors
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4), and also features critical packet prioritization (GOOSE, SMVs, and PTP) and a built-in MMS server. The PT-7728's Gigabit and Fast Ethernet backbone, redundant ring, and 24 VDC, 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.

General Features and Benefits

- Built-in MMS server for integration with power SCADA systems
- Switch data modeling based on the IEC 61850-90-4 standard
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- Supports advanced VLAN capability with Q-in-Q tagging
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

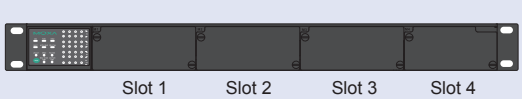
- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control

Modular Rackmount Ethernet Switch System, PT-7728



IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Fiber Check, Syslog, RMON
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Q-in-Q VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Power Substation: MMS, IEC 61850 QoS

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ 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)
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
• 48 VDC
• 110/220 VDC/VAC
Note: Compliant with EN 50155 on 24/48/110 VDC

Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
• Max. 2.38 A @ 24 VDC
• Max. 1.12 A @ 48 VDC
• Max. 0.59/0.30 A @ 110/220 VDC
• Max. 0.49/0.26 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 5900 g (13.11 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

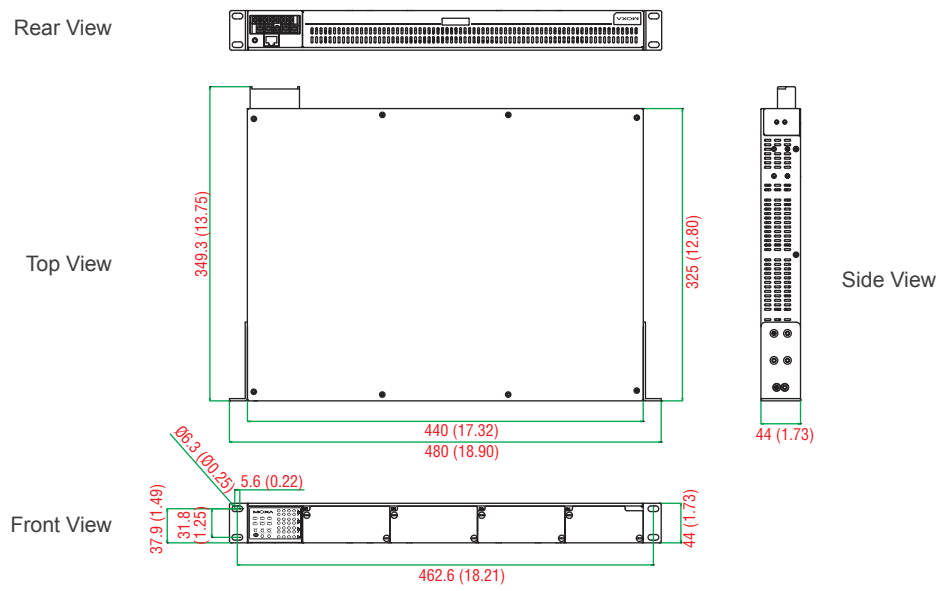
Time: 393,828 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



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 the PM-7200/7500 Series datasheet to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 16 modular managed rackmount Ethernet switch systems with 3 slots for Fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 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	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/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-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 combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See the PM-7200/7500 Series datasheet 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

	Interface Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	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-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 3	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 4	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7728 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-G7509 Series

IEC 61850-3 9G-port Layer 2 full Gigabit managed rackmount Ethernet switches

- IEC 61850-3, IEEE 1613 (power substations) compliant
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Turbo Ring, Turbo Chain, RSTP/STP, and MSTP for network redundancy
- Isolated redundant power supplies with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-G7509 is equipped with 9 combo Gigabit Ethernet ports, making it ideal for upgrading an existing network to Gigabit speeds and building a new full Gigabit backbone. The PT-G7509 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). Gigabit transmission increases bandwidth to provide higher performance and transfer large amounts of video, voice, and data across a network quickly. The redundant Ethernet Turbo Ring, Turbo Chain, and RSTP/STP/MSTP (IEEE 802.1w/D/s) functions increase system reliability and the availability of your network backbone. The choice of either front or rear wiring makes the PT-G7509 suitable for different types of application.

General Features and Benefits

- Command line interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific devices
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: RS-232 (RJ45)
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
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VAC/VDC)
Input Current: (all ports are equipped with fiber)
• Max. 1.08 A @ 24 VDC
• Max. 0.55 A @ 48 VDC
• Max. 0.25/0.15 A @ 110/220 VDC
• Max. 0.57/0.33 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 440 x 44 x 254 mm (17.32 x 1.73 x 10.00 in)
Weight: 3300 g (7.33 lb)
Installation: 19-inch 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)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
*Complies with a portion of EN 50155 specifications.
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

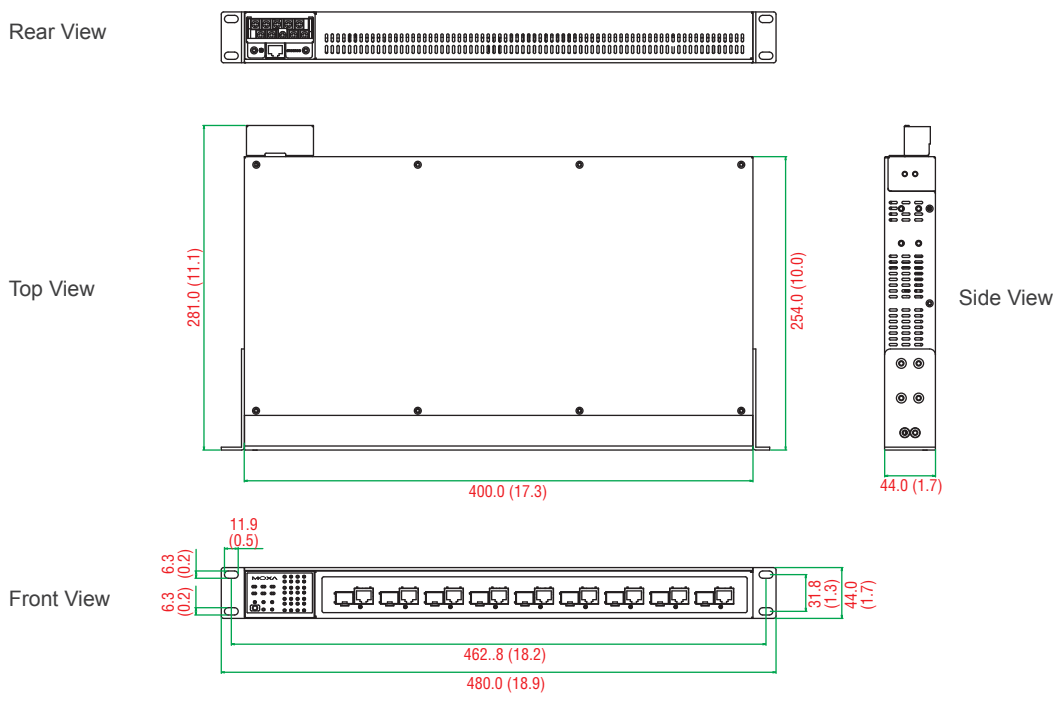
Time: 258,058 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

PT-G7509 Full Gigabit Managed Rackmount Ethernet Switch System

The PT-G7509 switch system consists of 9 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit ports and the switch can be used in a temperature range from -40 to 85°C.

Note: See the SFP-1G and SFP-1FE datasheets for SFP-1G/1FE series Gigabit/Fast Ethernet SFP module product information.

Available Models		Power Supply					
		Isolated Power Supply 1			Isolated Power Supply 2		
Front Cabling, Front Display	Rear Cabling, Front Display	24 VDC	48 VDC	HV: 110/220 VDC/VAC	24 VDC	48 VDC	HV: 110/220 VDC/VAC
PT-G7509-F-24	PT-G7509-R-24	1	–	–	–	–	–
PT-G7509-F-24-24	PT-G7509-R-24-24	1	–	–	1	–	–
PT-G7509-F-24-HV	PT-G7509-R-24-HV	1	–	–	–	–	1
PT-G7509-F-48	PT-G7509-R-48	–	1	–	–	–	–
PT-G7509-F-48-48	PT-G7509-R-48-48	–	1	–	–	1	–
PT-G7509-F-HV	PT-G7509-R-HV	–	–	1	–	–	–
PT-G7509-F-HV-HV	PT-G7509-R-HV-HV	–	–	1	–	–	1

PT-G7509-F series
(Front Cabling, Front Display)

PT-G7509-R series
(Rear Cabling, Front Display)

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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

Package Checklist

- PT-G7509 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-7710 Series

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

- IEC 61850-3, IEEE 1613 (power substations), and EN50121-4 (railway applications) compliant
- Complies with a portion of EN 50155 specifications
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- Up to 4 ports with M12 connectors
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4). The PT-7710's Gigabit and Fast Ethernet backbone, redundant ring, and 12/24/48 VDC redundant power inputs 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.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security to protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP

Modular Rackmount Ethernet Switch System, PT-7710

IEEE 802.1s for Multiple Spanning Tree Protocol
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

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, DHCP Option 66/67/82, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Syslog
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock, Rate Limit
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Slot 1 for any combination of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ 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, 100/1000BaseT(X) or 1000BaseSFP
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• LV: 12/24/48 VDC
• HV: 110/220 VDC/VAC
Note: Compliant with EN 50155 on 12/24/48/110 VDC
Operating Voltage:
• LV: 9 to 60 V
• HV: 88 to 300 VDC, 85 to 264 VAC
Input Current: (all ports are equipped with fiber)
• Max. 0.75 A @ 24 VDC
• Max. 0.39 A @ 48 VDC
• Max. 0.16/0.10 A @ 110/220 VDC
• Max. 0.19/0.11 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP30 protection
Dimensions: 266.5 x 44 x 195 mm (10.5 x 1.7 x 7.7 in)
Weight: 2200 g (4.89 lb)
Installation: 19-inch rack mounting, wall mounting (with optional kit)

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)

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50155*, EN 50121-4
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.
Note: Please check Moxa's website for the most up-to-date certification status.
Transportation: NEMA TS2
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

Time: 416,1008 hrs
Standard: Telcordia SR332

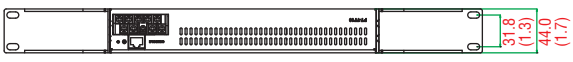
Warranty

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

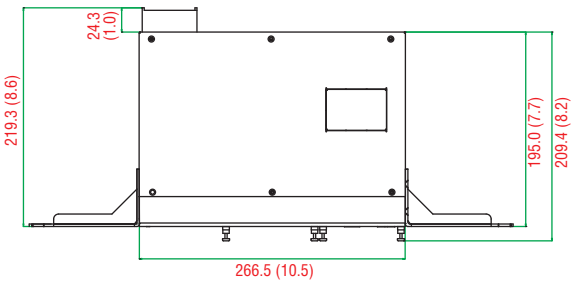
Dimensions

Unit: mm (inch)

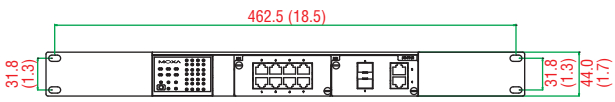
Rack Mounting



Rear View

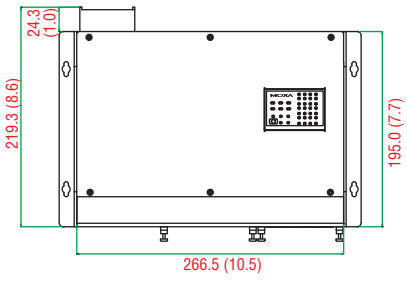


Top View

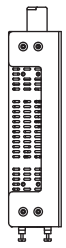


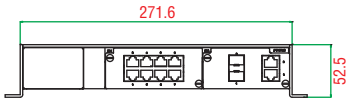
Front View

Wall Mounting



Top View


Side View



Front View

Ordering Information

Step 1: Select Ethernet switch system

PT-7710 with power supply

Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 2-52 to choose PM-7200 interface modules.

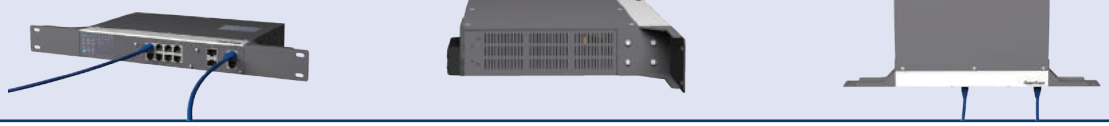
PT-7710 Modular Rackmount Ethernet Switch System

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 temperatures ranging from -40 to 85°C.

Available Models		Power Supply	
Rack Mounting, 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 or Fast Ethernet interface module and 1 slot for a Fast Ethernet interface module. See page 2-52 to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rack Mounting, Front Cabling, Front Display)



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

Gigabit/Fast Ethernet Modules for the PT-7710

	Interface Modules																						
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	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-7200-8SFP	PM-7200-4M12	PM-7200-8MTRJ	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP
Slot 1	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
Slot 2	–	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
WK-195: Wall-mounting kit

Package Checklist

- PT-7710 switch
- Serial Cable: CN20070
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PM-7200/7500 Series

Gigabit and Fast Ethernet modules for PT and IKS series rackmount Ethernet switches

Specifications

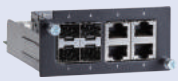
Gigabit Ethernet Interface Modules, PM-7200/7500-2G/4G Series


PM-7200-4GTXSFP


PM-7200-2GTXSFP

PM-7200-4GTX-PHR-PTP

PM-7200-4GSFP-PHR-PTP


PM-7500-4GTXSFP


PM-7500-2GTXSFP

Interface

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

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200/7500-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See the SFP-1G datasheet to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200/7500 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-7200-2MSC
PM-7200-2SSC


PM-7200-2MST


PM-7200-1MSC


PM-7200-1MST


PM-7200-8SFP*


PM-7200-4M12


PM-7200-8MTRJ


PM-7200-4TX-PTP


PM-7200-4MSC-PTP


PM-7200-4MST-PTP


PM-7200-1BNC2MST-PTP


PM-7500-4MSC
PM-7500-4SSC


PM-7500-2MSC
PM-7500-2SSC


PM-7500-2MST


PM-7500-4MST

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Interface

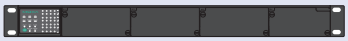
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Fiber Ports: 100BaseFX ports (SC/ST/MTRJ or SFP LC connector)
M12 Ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection
BNC Ports: Time clock signal PPS (pulses per second) output for IEEE 1588 time synchronization

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Modular Rackmount Ethernet Switch System:

PT-7828/PT-7728-PTP/ PT-7728



PT-7528-24TX

PT-7710

		IEEE 1588 Interface Modules						Interface Modules																						
		PM-7200-4TX-PTP	PM-7200-4MSC-PTP	PM-7200-4MST-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTX-PHR-PTP	PM-7200-4GSFP-PHR-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7500-2GTXSFP	PM-7500-4GTXSFP	PM-7200-1MSC/2MSC	PM-7200-1MST/2MST	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-7200-8SFP*	PM-7200-4M12	PM-7200-8MTRJ	PM-7500-2MSC/4MSC	PM-7500-2MST/4MST	PM-7500-2SSC/4SSC
PT-7828 PT-7728	Slots 1 to 3	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 4	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PT-7728-PTP	Slots 1 to 3	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 4	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PT-7528-24TX	Slot 1	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓
PT-7710	Slot 1	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–
	Slot 2	–	–	–	–	–	–	–	✓	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Gigabit Ethernet Modules, PM-7200/7500-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4
PM-7500-2GTXSFP	2
PM-7500-4GTXSFP	4

*The PM-7200/7500-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots.

Gigabit PRP/HSR Ethernet Modules, PM-7200-PHR-PTP Series:

Available Mode	Port Interface	
	10/100/1000BaseT(X)	100/1000BaseSFP
PM-7200-4GTX-PHR-PTP	4	–
PM-7200-4GSFP-PHR-PTP	–	4

Fast Ethernet Modules, PM-7200/7500 Series

Available Models	Port Interface									
	10/100BaseT(X)		10BaseFX	100BaseFX					100BaseSFP	PPS output, BNC connector
	TP	M12	Multi-mode, ST Connector	Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, MTRJ 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-7200-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7200-2MST	–	–	–	–	2	–	–	–	–	–
PM-7200-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7200-1MSC	–	–	–	1	–	–	–	–	–	–
PM-7200-1MST	–	–	–	–	1	–	–	–	–	–
PM-7200-8SFP*	–	–	–	–	–	–	–	–	8	–
PM-7200-4M12	–	4	–	–	–	–	–	–	–	–
PM-7200-8MTRJ	–	–	–	–	–	8	–	–	–	–
PM-7200-4TX-PTP	4	–	–	–	–	–	–	–	–	–
PM-7200-4MSC-PTP	–	–	–	4	–	–	–	–	–	–
PM-7200-4MST-PTP	–	–	–	–	4	–	–	–	–	–
PM-7200-1BNC2MST-PTP	–	–	–	–	2	–	–	–	–	1
PM-7500-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7500-2MST	–	–	–	–	2	–	–	–	–	–
PM-7500-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7500-4MSC	–	–	–	4	–	–	–	–	–	–
PM-7500-4MST	–	–	–	–	4	–	–	–	–	–
PM-7500-4SSC	–	–	–	–	–	–	4	–	–	–

*Note: See the SFP-1FE datasheet to select SFP-1FE series Fast Ethernet modules for your application.

Package Checklist

- PM-7200/7500 interface modules
- Warranty card

PT-508/510 Series

IEC 61850-3 8/10-port Layer 2 DIN-rail managed Ethernet switches

- IEC 61850-3 and IEEE 1613 (power substations) compliant
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Easy network management by web browser, CLI, Telnet/serial console, windows utility, and ABC-01
- Isolated universal 24 VDC or 48 VDC redundant power inputs
- Wide 110/220 VDC/VAC power supply range
- Modbus/TCP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-508/510 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-508/510's optical fiber Fast Ethernet backbone, redundant ring, redundant power inputs (24 VDC or 48 VDC), and isolated power inputs (24 VDC, 48 VDC, or 110/220 VDC/VAC) increase the reliability of your communications and save on cabling/wiring costs. In addition, the DIN-rail and wall-mounting design of the PT-508/510 makes network planning easy, and allows greater flexibility by letting you install up to 8/10 Fast Ethernet ports for power distribution applications.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

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 Spanning Tree Protocol
IEEE 802.1D-2004 for Spanning Tree Protocol
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
IEEE 802.1s for Multiple Spanning Tree Protocol

Software Features

Management: IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, SNMP Inform, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Syslog, RMON
Filter: IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP
Redundancy Protocols: STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

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/LC/MTRJ connector)
Console Port: RS-232 (RJ45)
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC

Power Requirements

Input Voltage:
• 24 VDC
• 48 VDC
• 110/220 VDC/VAC
Operating Voltage:
• 18 to 36 V (24 VDC)
• 36 to 72 V (48 VDC)
• 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)
Input Current: (all ports are equipped with fiber)
PT-508:
• Max. 0.27 A @ 24 VDC
• Max. 0.12 A @ 48 VDC
• Max. 0.084/0.043 A @ 110/220 VDC
• Max. 0.18/0.11 A @ 110/220 VAC
PT-510:
• Max. 0.39 A @ 24 VDC
• Max. 0.18 A @ 48 VDC
• Max. 0.10/0.052 A @ 110/220 VDC
• Max. 0.234/0.148 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions:
PT-508: 60 x 160 x 110 mm (2.36 x 6.30 x 4.33 in)
PT-510: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight:
PT-508: 995 g (2.21 lb)
PT-510: 1210 g (2.69 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

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)

Standards and Certifications

Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS: IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz:
PT-508: 20 V/m
PT-510: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power; 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Electrical Substation: IEC 61850-3, IEEE 1613
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time:
PT-508: 394,238 hrs
PT-510: 372,276 hrs
Standard: Telcordia SR332

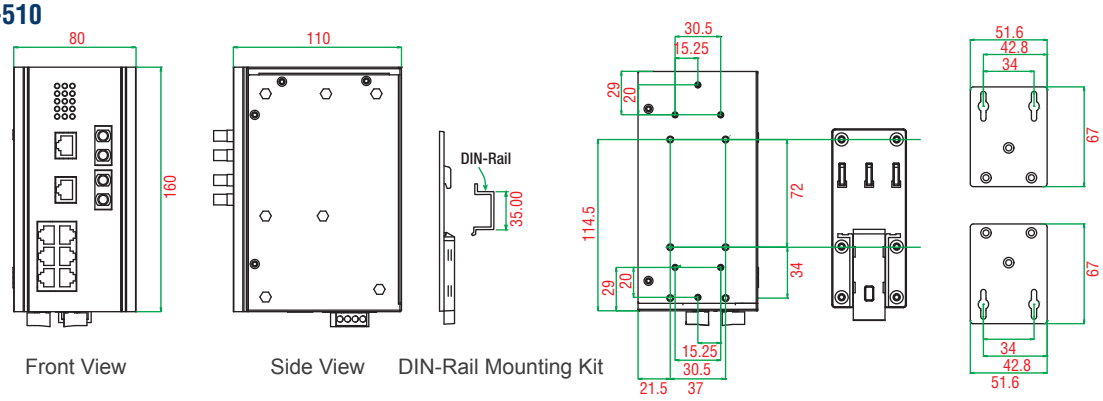
Warranty

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

Dimensions

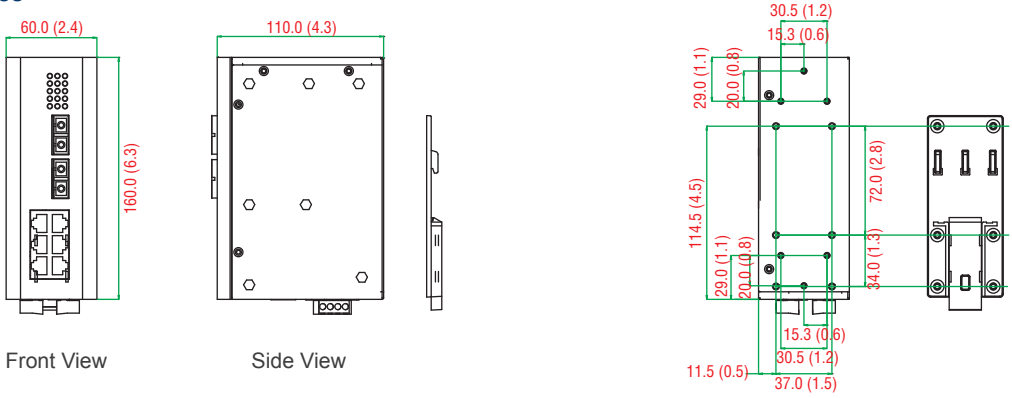
Unit: mm (inch)

PT-510



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

PT-508



Front View | Side View | DIN-Rail Mounting Kit

Ordering Information

Available Models				Port Interface						
DIN-Rail, Front Cabling, Front Display	Power Supply			10/100 BaseT(X)	100BaseFX					
	24 VDC	48 VDC	HV: 110/220 VDC/VAC		Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, LC Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, LC Connector
PT-508-MM-SC-24	1	–	–	6	2	–	–	–	–	–
PT-508-MM-SC-48	–	1	–	6	2	–	–	–	–	–
PT-508-MM-SC-HV	–	–	1	6	2	–	–	–	–	–
PT-508-MM-ST-24	1	–	–	6	–	2	–	–	–	–
PT-508-MM-ST-48	–	1	–	6	–	2	–	–	–	–
PT-508-MM-ST-HV	–	–	1	6	–	2	–	–	–	–
PT-508-MM-LC-24	1	–	–	6	–	–	2	–	–	–
PT-508-MM-LC-48	–	1	–	6	–	–	2	–	–	–
PT-508-MM-LC-HV	–	–	1	6	–	–	2	–	–	–
PT-508-SS-SC-24	1	–	–	6	–	–	–	–	2	–
PT-508-SS-SC-48	–	1	–	6	–	–	–	–	2	–
PT-508-SS-SC-HV	–	–	1	6	–	–	–	–	2	–
PT-508-SS-LC-24	1	–	–	6	–	–	–	–	–	2
PT-508-SS-LC-48	–	1	–	6	–	–	–	–	–	2
PT-508-SS-LC-HV	–	–	1	6	–	–	–	–	–	2
PT-510-4M-ST-24	1	–	–	6	–	4	–	–	–	–
PT-510-4M-ST-48	–	1	–	6	–	4	–	–	–	–
PT-510-4M-ST-HV	–	–	1	6	–	4	–	–	–	–
PT-510-MM-SC-24	1	–	–	8	2	–	–	–	–	–
PT-510-MM-SC-48	–	1	–	8	2	–	–	–	–	–
PT-510-MM-SC-HV	–	–	1	8	2	–	–	–	–	–
PT-510-MM-ST-24	1	–	–	8	–	2	–	–	–	–
PT-510-MM-ST-48	–	1	–	8	–	2	–	–	–	–
PT-510-MM-ST-HV	–	–	1	8	–	2	–	–	–	–
PT-510-MM-LC-24	1	–	–	8	–	–	2	–	–	–
PT-510-MM-LC-48	–	1	–	8	–	–	2	–	–	–
PT-510-MM-LC-HV	–	–	1	8	–	–	2	–	–	–
PT-510-SS-SC-24	1	–	–	8	–	–	–	–	2	–
PT-510-SS-SC-48	–	1	–	8	–	–	–	–	2	–
PT-510-SS-SC-HV	–	–	1	8	–	–	–	–	2	–
PT-510-3S-SC-HV	–	–	1	7	–	–	–	–	3	–
PT-510-3S-SC-24	1	–	–	7	–	–	–	–	3	–
PT-510-3S-SC-48	–	1	–	7	–	–	–	–	3	–
PT-510-SS-LC-24	1	–	–	8	–	–	–	–	–	2
PT-510-SS-LC-48	–	1	–	8	–	–	–	–	–	2
PT-510-SS-LC-HV	–	–	1	8	–	–	–	–	–	2

Note:
Additional switch configurations with 2 Gigabit ports or 3 or 4 fiber ports are available by special request.
24 VDC, 48 VDC, and HV models support isolated power; only 24 VDC and 48 VDC models support redundant power inputs.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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

Package Checklist

- PT-508/510 switch
- Serial Cable: CN20070
- DIN-rail kit or wall-mounting ears (optional)
- 1 grounding cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card

PT-G503-PHR-PTP Series

IEC 61850-3/62439-3 3-port full Gigabit managed redundancy boxes

- IEC 61850-3, IEEE 1613 (power substations) compliant
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant
- PRP/HSR Coupling and QuadBox functions supported
- Ethernet console reserved for local access
- Built-in MMS server, based on IEC 61850-90-4 switch modeling for power SCADA
- Hardware-based IEEE 1588v2 PTP supported
- Design ready for NERC CIP compliance system development
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PT-G503-PHR-PTP series redundancy boxes (RedBoxes) are compliant with the latest standardized redundancy protocols for industrial automation networks, IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High-availability Seamless Redundancy, HSR). PRP/HSR ensures the highest system availability and data integrity for mission-critical applications in electrical substation and/or process automation systems that require zero recovery time redundancy. The redundant protocols Coupling and QuadBox are also supported. With Coupling and QuadBox, HSR rings can be connected to make the redundant network more versatile. The PT-G503-PHR-PTP series comes with three 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports.

One slot (INTERLINK port) is for an internal link for connecting with a SAN (Singly Attached Node). The other two ports (LAN A and LAN B ports) are for PRP/HSR redundant protocol communications. With this full Gigabit Ethernet port design, the PT-G503-PHR-PTP series provides high performance for PRP/HSR systems.

The PT-G503-PHR-PTP series also provides IEEE 1588v2 PTP in end-to-end one-step transparent clock mode for timing-critical applications and isolated redundant power inputs with 24/48 VDC or 110/220 VDC/VAC power supply ranges to increase the reliability of the power supply.

General Features and Benefits

- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.
- PRP/HSR coupling: Supports coupling from an HSR ring node to redundant PRP LANs (Up to 7 PRP LANs).
- QuadBox function: Supports peer coupling of rings via interconnecting two INTERLINK ports on two separate RedBoxes.
- Fiber Check™ provides monitoring and diagnosis functionality on SFP fiber ports.
- Hardware-based IEEE 1588v2 PTP (Precision Time Protocol) end-to-end one-step transparent clock for precise time synchronization of networks.
- Built-in MMS server for integration with power SCADA systems.
- Switch data modeling based on the IEC 61850-90-4 standard.
- Automatic warning by exception through email, relay output.
- Configurable via web browser, CLI, Windows utility, and ABC-02 automatic backup configurator.

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 1000BaseX

Software Features

Management: IPv4/IPv6, PRP/HSR, SNMPv1/v2c/v3, DHCP Client, BootP, SMTP, RARP, HTTP, Telnet, LLDP, Flow Control, Back Pressure Flow Control, SNMP Inform, Port Mirror, Fiber Check, Syslog, RMON
Filter: Multicast Filter Behavior
Redundancy Protocols: PRP/HSR, RSTP Transparent
Security: RADIUS, TACACS+, Trusted Access Control, Authentication Certificate (SSL Certificate, SSH Key Regenerate)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: Modbus/TCP
MIB: IEC 62439-3 MIB
Power Substation: MMS

Interface

Gigabit Ethernet: 3 x 10/100/1000BaseT(X) ports or 100/1000BaseSFP combo ports
Console Port: Ethernet console (10/100/1000 Mbps RJ45), USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
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 +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage:
• WV: 24/48 VDC
• HV: 110/220 VDC/VAC
Operating Voltage:
• WV: 18 to 72 VDC
• HV: 88 to 300 VDC, 85 to 264 VAC
Input Current:
• Max. 0.660/0.360 A @ 24/48 VDC
• Max. 0.150/0.080 A @ 110/220 VDC
• Max. 0.260/0.170 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminum alloy
IP Rating: IP40 protection
Dimensions: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight: 1210 g (2.69 lb)
Installation: DIN-rail 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)

Standards and Certifications

High Availability Automation Networks: IEC 62439-3
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
IEC 61000-4-11
Rail Traffic: EN 50121-4
Electrical Substation: IEC 61850-3, IEEE 1613

MTBF (mean time between failures)

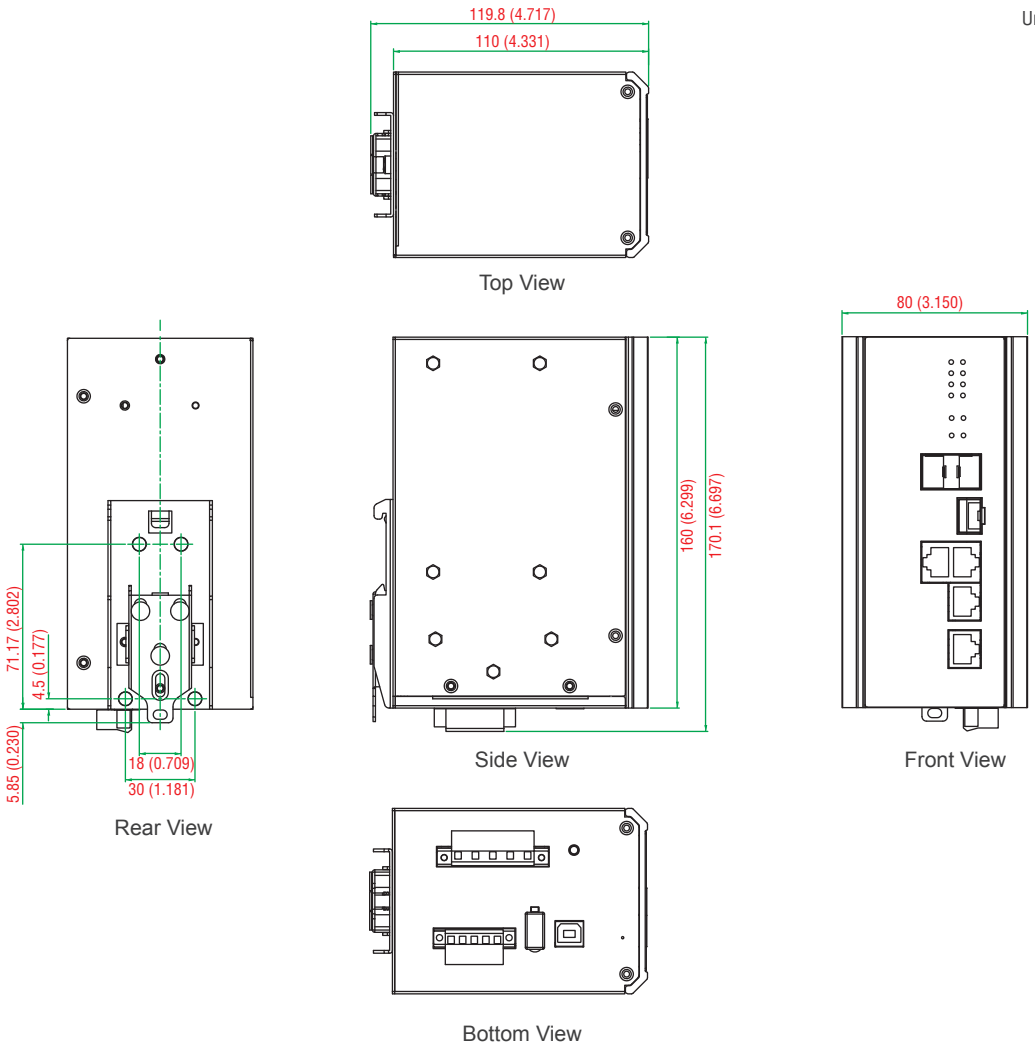
Time:
PT-G503-PHR-PTP-WV:440,857 hrs
PT-G503-PHR-PTP-HV:566,844 hrs
Standard: Telcordia TR/SR

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models		
DIN Rail, Front Cabling, Front Display	Power Supply	
	WV: 24/48 VDC (18 to 72 VDC), isolated (dual power inputs)	HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC), isolated (dual power inputs)
PT-G503-PHR-PTP-WV	1	–
PT-G503-PHR-PTP-HV	–	1

Optional Accessories (can be purchased separately)

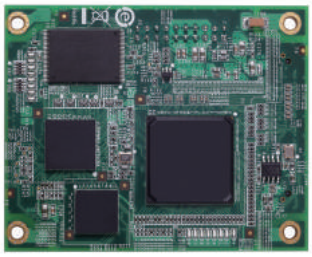
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-G503-PHR-PTP redundancy box
- USB Cable: CBL-USBA/B-100
- DIN-rail kit or wall-mounting ears (optional)
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card

EOM-G103-PHR-PTP Series

IEC 62439-3 3-port full Gigabit embedded managed redundancy modules



- **IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant**
- **3 SGMII pinouts reserved for PRP/HSR (LAN A/LAN B/Inter Link) and an extra 1 SGMII reserved for Ethernet console connection**

Introduction

The EOM-G103-PHR-PTP series full Gigabit managed redundancy modules are designed for device manufacturers who would like to embed and integrate the advanced IEC 62439-3 supported modules with minimum effort into their products to enhance performance and reliability of certain mission-critical applications.

IEC 62439-3 Clause 4 (PRP) and IEC 62439-3 Clause 5 (HSR) are the newest standardized redundancy protocols for industrial automation networks where zero recovery time is needed. PRP and HSR are suitable for electrical substation automation and other mission-critical applications that cannot tolerate any system downtime.

The EOM-G103-PHR-PTP series modules are compliant with the latest IEC 62439-3 standards and provide an easy and cost-effective integrated solution for adding a redundancy module to a non-IEC 62439-3 supported product. The modules support two IEC 62439-3 Ethernet ports for constructing PRP or HSR networks: SGMII (MAC mode) / SERDES (1000BaseX). It also includes one standard Ethernet port SGMII (MAC mode) / SERDES (1000BaseX) for connecting with standard IEEE 802.3 Ethernet devices. Additionally, the EOM-G103-PHR-PTP series provides an extra SGMII (MAC mode) / SERDES (1000BaseX) for building up a local access Ethernet console port to easily maintain, control, and manage devices at the local site.

General Features and Benefits

- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously in a zero recovery time network.
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time.
- Hardware-based IEEE 1588v2 PTP (Precision Time Protocol) end-to-end one-step transparent clock for precise time synchronization of networks.
- Configurable via CLI.

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 1000BaseX

Software Features

Management: IPv4 / IPv6, SNMP v1/v2c/v3, Telnet/SSH, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Fiber Check, Syslog, RMON
Filter: Multicast Filter Behavior
Redundancy Protocols: PRP/HSR, RSTP Transparent
Security: RADIUS, TACACS+, Trusted Access Control, Authentication Certificate (SSL Certificate, SSH Key Regenerate)
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP
Industrial Protocols: Modbus/TCP
Power Substation: MMS

Interface

Ethernet Ports: 3, SGMII (MAC mode) / SERDES (1000BaseX) (PRP/HSR LAN A/LAN B/INTERLINK)
Connectors: 1 connector with 2 x 40 pins, and 1 connector with 2 x 10 pins
Console Port: Ethernet console (SGMII (MAC mode) / SERDES (1000BaseX))
GPIO: 3 programmable I/O pins

Power Requirements

Input Current: Max. 1.625 W @ 3.3 V

Physical Characteristics

Dimensions: 80 x 1.6 x 65 mm (3.15 x 0.06 x 2.56 in)
Weight: 28.6 g (0.06 lb)

Environmental Limits

Operating Temperature: -40 to 60°C (-40 to 140°F)
Note: Products with a higher operating temperature are available by special request.
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

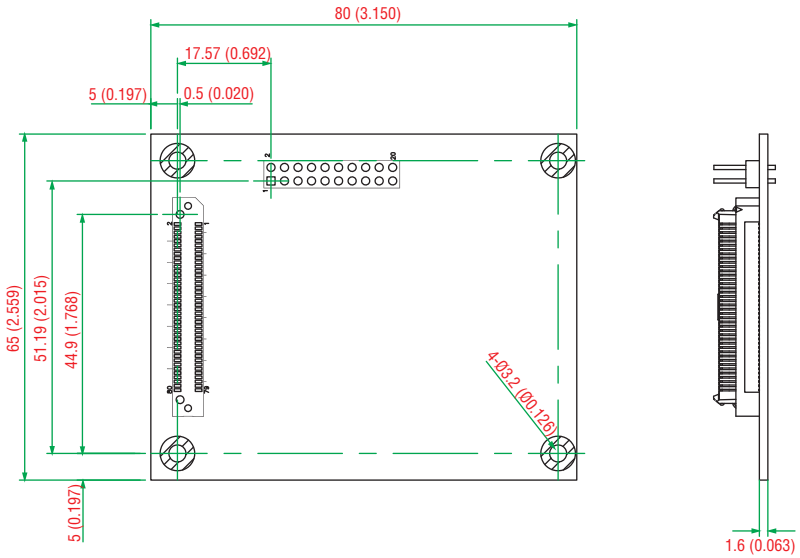
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A, CE Class A
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

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

Dimensions

Unit: mm (inch)



Pin Assignment

Pin assignment table for JP1 (2 x 40)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	41	PRP_LED	42	DI
3	DTR(UART)	4	DCD(UART)	43	FAULT_LED	44	Reserved
5	RTS(UART)	6	DSR(UART)	45	STAT_R_LED	46	Reserved
7	TXD(UART)	8	CTS(UART)	47	STAT_G_LED	48	Reserved
9	GND	10	RXD(UART)	49	TX_DIS_G3(SFP)	50	GND
11	GXB_RX_P_0(SGMII)	12	GND	51	PRESENT_G3(SFP)	52	Reserved
13	GXB_RX_N_0(SGMII)	14	GXB_TX_P0(SGMII)	53	LOS_G3(SFP)	54	Reserved
15	GND	16	GXB_TX_N0(SGMII)	55	TX_DIS_G2(SFP)	56	GND
17	GXB_RX_P_1(SGMII)	18	GND	57	PRESENT_G2(SFP)	58	SDA-(I2C)
19	GXB_RX_N_1(SGMII)	20	GXB_TX_P1(SGMII)	59	LOS_G2(SFP)	60	SCK-(I2C)
21	GND	22	GXB_TX_N1(SGMII)	61	TX_DIS_G1(SFP)	62	GND
23	GXB_RX_P_2(SGMII)	24	GND	63	PRESENT_G1(SFP)	64	MDIO-PHY(SMI)
25	GXB_RX_N_2(SGMII)	26	GXB_TX_P2(SGMII)	65	LOS_G1(SFP)	66	MDC-PHY(SMI)
27	GND	28	GXB_TX_N2(SGMII)	67	TX_DIS_G0(SFP)	68	GND
29	GXB_RX_P_3(SGMII)	30	GND	69	PRESENT_G0(SFP)	70	Reserved
31	GXB_RX_N_3(SGMII)	32	GXB_TX_P3(SGMII)	71	LOS_G0(SFP)	72	Reserved
33	GND	34	GXB_TX_N3(SGMII)	73	Reserved	74	GND
35	COUP_LED	36	GND	75	Reserved	76	USB-HOST-DP
37	QB_LED	38	DO(1)	77	Reserved	78	USB-HOST-DM
39	HSR_LED	40	DO(0)	79	Reserved	80	GND

Pin assignment table for JP2 (2 x 10)

Pin	Signal	Pin	Signal
1	Reserved	2	Reserved
3	Reserved	4	Reserved
5	Reserved	6	Reserved
7	3.3V	8	3.3V
9	3.3V	10	3.3V
11	3.3V	12	GND
13	GND	14	GND
15	GND	16	GND
17	Reset_PHY	18	Reset
19	Reserved	20	Reset to Default

Starter Kit

The EOM Starter Kit includes an evaluation board, power adapter, software CD, and USB-IF certified cable to allow quick and easy evaluation of all embedded redundancy module functions. The evaluation board is equipped with 3 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports.

Ordering Information

Available Modules

EOM-G103-PHR-PTP: IEC 62439-3 managed redundancy module with 3 SGMII pinouts reserved for 2 IEC 62439-3 ports and 1 standard Ethernet port, with an extra 1 SGMII reserved for Ethernet console connection, 3.3 V operating power input voltage, -40 to 85°C operating temperature

Optional Starter Kits (must be purchased separately)

EOM-G103-PHR-PTP-ST: Includes an EOM-G103-PHR-PTP managed redundancy module and an evaluation board with 3 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports for testing and application development

Package Checklist (modules)

- EOM-G103-PHR-PTP module
- Developer's guide

Package Checklist (starter kits)

- EOM-G103-PHR-PTP module
- EOM-G103-PHR-PTP evaluation board
- USB Cable: CBL-USBA/B-100
- Universal power adapter
- 2 power cords (US or Euro plug)
- Developer's guide

Ethernet Media Converters and Extenders

3

Ethernet Media Converters and Extenders

Chassis Media Converters

	TRC-190-AC TRC-190-DC-48	CSM-200-1213 CSM-200-1214	CSM-200-1218
Optical Fiber Interface			
Fiber Connector	–	SC or ST	SC
Cable Requirements	–	Multi-mode: 50/125, 62.5/125, or 100/140 µm	Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 µm
Transmission Distance	–	5 km	40 km
Wavelength	–	1300 nm	1310 nm
Tx Output	–	-10 to -20 dBm	0 to -5 dBm
Rx Sensitivity	–	-32 dBm	-34 dBm
Point-to-Point Transmission	–	Point-to-Point Transmission: Half-duplex or full-duplex	Point-to-Point Transmission: Half-duplex or full-duplex
Fast Ethernet Interface			
Connector	–	RJ45	
Speed	–	10/100BaseT(X)	
Physical Characteristics			
Housing	SECC (1.2 mm)	–	
Dimensions (mm)	440 x 260 x 77 mm (18.6 x 11 x 3.3 in)	86.8 x 136.5 x 21 mm (3.42 x 4.89 x 0.83 in)	
Weight	5.2 kg (11.4 lb), with one power module installed	CSM-200-1213: 115 g (0.25 lb) CSM-200-1214: 125 g (0.28 lb)	125 g (0.28 lb)
Number of Slots	19 slots in the front for slide-in modules, 2 slots in the back for power supply modules	–	
Environmental Limits			
Operating Temperature	0 to 60°C (32 to 140°F)	0 to 60°C (32 to 140°F)	
Ambient Relative Humidity	5 to 95% (non-condensing)		
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Power Requirements			
Input Voltage	100 to 240 VAC or 36 to 72 VDC	12 VDC	
Input Current	3.2 A @ 36 VDC	180 mA @ 12 VDC	
Standards and Certifications			
Safety	UL 60950-1		
EMC	EN 55022/24		
EMI	CISPR 22, FCC Part 15B Class A		
EMS	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	
Freefall	–	IEC 60068-2-32	
MTBF	Time: 1,055,112 hrs Standard: Telcordia (Bellcore), GB	Time: 1,454,560 hrs Standard: Telcordia (Bellcore), GB	
Reliability			
Warranty	5 years (see www.moxa.com/warranty)		
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Ethernet-to-Fiber Media Converters

	PTC-101 Series (LV models)	PTC-101 Series (HV models)	IMC-P101 Series	IMC-101G Series	IMC-21GA Series	IMC-101 Series	IMC-21A Series	IMC-21 Series
IEEE Standards								
IEEE 802.3af	–	–	✓	–	–	–	–	–
Interface								
RJ45 Ports	10/100BaseT(X)			10/100/1000BaseT(X)	10/100/1000BaseT(X), auto MDI/MDI-X	10/100BaseT(X)		
M12 Port	✓	–	–	–	–	–	–	–
Fiber Modes	Multi-mode Fiber / Single-mode Fiber			Multi-mode Fiber / Single-mode Fiber				
Fiber Ports	100BaseFX (SC, ST, or LC connectors)		100BaseFX (SC or ST connectors)	Optional 1000BaseSX/ LSX/LX/LH/LHX/ZX/EZX (LC connector)	100/1000BaseSX/LX or 100/1000BaseSFP slot	100BaseFX (SC or ST connectors)	100BaseFX (SC or ST)	
LED Indicators	PWR1, PWR2, Fiber Link/ Act, 10/100M (TP port)	PWR, Fiber Link/Act, 10/100M (TP port)	PWR1, PWR2, Fiber Link/ Act, PSE Indicator, 10/100M (TP port)	PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, G1 (copper port 10M/100M/1000M), G2 (fiber port 100M/1000M), 10/100M (TP port), 1000M (TP and Fiber port)	PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/ COL (Fiber port)	Power, 10/100M (TP port), 100M (fiber port), FDX/ COL (fiber port)	
DIP Switches	Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode		Auto Negotiation, Force TP Speed, Force TP Duplex, Link Fault Pass Through, Operating Mode, PSE, P.R.R. (PD Remote Reset)	Port break alarm, Fault Pass-Through, Fiber AN/ Force	Fiber speed 100M/1000M, Link Fault Pass-through, Energy Efficient Ethernet	100BaseFX Full/Half duplex selection, Port break alarm	TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)	
Alarm Contact	Relay output: 1 A @ 24 VDC						–	
Multi-mode Transmission Distance								
1000BaseSX	–			See SFP-1G series datasheet	See SFP-1G series datasheet (IMC-21GA-SX-SC) 100/1000BaseSX: 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)	–		
1000BaseLX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
Single-mode Transmission Distance								
1000BaseLX	–			See SFP-1G series datasheet	See SFP-1G series datasheet (IMC-21GA-LX-SC) 100/1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km)	–		
1000BaseLHX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
1000BaseZX	–			See SFP-1G series datasheet	See SFP-1G series datasheet	–		
Physical Characteristics								
Housing	Metal (IP30)							Plastic (IP30)
Dimensions (mm)	66.65 x 135.1 x 101.4 mm (5.99 x 4.86 x 2.62 in)	66.65 x 135.1 x 101.4 mm (5.99 x 4.86 x 2.62 in)	51.65 x 144.45 x 110.2 mm (2.03 x 5.69 x 4.34 in)	53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)	30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)	53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)	30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)	25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)
Weight	690 g (1.52 lb)	690 g (1.52 lb)	525 g (1.16 lb)	630 g (1.39 lb)	170 g (0.37 lb)	630 g (1.39 lb)	170 g (0.37 lb)	125 g (0.27 lb)
Installation	DIN-rail mounting, wall mounting (with optional kit)						DIN-rail mounting	
Environmental Limits								
Operating Temperature	-40 to 85°C (-40 to 185°F)		Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)					-10 to 60°C (14 to 140°F)
Operating Humidity	5 to 95% (non-condensing)							
Storage Temperature	-40 to 85°C (-40 to 185°F)						-40 to 75°C (-40 to 167°F)	-40 to 70°C (-40 to 158°F)
Power Requirements								
Input Voltage	20 to 72 VDC	85 to 264 VAC 88 to 300 VDC	48 VDC (46 to 57 VDC), redundant inputs	12 to 45 VDC redundant inputs	12 to 48 VDC redundant inputs	12 to 45 VDC redundant inputs	12 to 48 VDC	
Input Current	170 mA @ 20 VDC	73 mA @ 85 VAC 47 mA @ 88 VDC	130 mA @ 46 VDC	220 mA @ 12 VDC	285 mA @ 12 VDC	320 mA @ 12 VDC	265 mA @ 12 VDC	300 mA @ 12 VDC
Connection	Removable terminal block							
Overload Current Protection	1.6 A	1.6 A	1.6 A	2.5 A	1.5 A	1.1 A	1.1 A	1.1 A
Reverse Polarity Protection	✓	✓	✓	✓	✓	✓	✓	✓
PoE	–	–	PSE, provides up to 15.4 W for PD	–	–	–	–	–
Standards and Certifications								
Safety	UL 60950-1	UL 60950-1	UL 508	UL 508	UL 60950-1	UL 508, UL 60950-1	UL 60950-1	UL 508
EMI	CISPR 22, FCC Part 15B Class A			CISPR 22, FCC Part 15B Class A				
EMS	EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV EN 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11		EN 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m EN 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 1 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11	EN 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV EN 61000-4-3 RS: 80 MHz to 1 GHz: 1 V/m EN 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV EN 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV EN 61000-4-6 CS: 150 kHz to 80MHz: 3 V/m EN 61000-4-8 PFMF EN 61000-4-11
Hazardous Location	–	–	–	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC	–	UL/cUL Class1, Division 2, Groups A, B, C, and D, ATEX Class1, Zone 2, Ex nC IIC	–	–
Electrical Substation	IEC 61850-3, IEEE 1613	IEC 61850-3, IEEE 1613	–	–	–	–	–	–
Rail Traffc	EN 50121-4	EN 50121-4	–	–	–	–	–	–
Freefall	IEC 60068-2-32							
Shock	IEC 60068-2-27							
Vibration	IEC 60068-2-6							
Maritime	–	–	–	–	–	DNV, GL	–	–
MTBF	Time: 1,211,613 hrs Standard: Telcordia (Bellcore), GB	Time: 1,211,613 hrs Standard: Telcordia (Bellcore), GB	Time: 435,210 hrs Standard: Telcordia (Bellcore), GB	Time: 500,540 hrs Standard: Telcordia (Bellcore), GB	Time: 2,573,203 hrs Standard: Telcordia (Bellcore), GB	Time: 401,000 hrs Standard: MIL-HDBK-217F	Time: 353,000 hrs Standard: MIL-HDBK-217F	Time: 353,000 hrs Standard: MIL-HDBK-217F
Reliability								
Warranty	5 years (see http://www.moxa.com/warranty)							
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Managed DSL Ethernet Extenders

Preliminary

	IEX-408E-2VDSL2	IEX-402-SHDSL	IEX-402-VDSL2
Number of Ports			
Fast Ethernet, 10/100 Mbps	6	1	1
DSL Port	2	1	1
Available Power Input			
12/24/48 VDC	✓	✓	✓
110/220 VDC/VAC	✓	–	–
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
Supported Operating Temperatures			
-10 to 60°C	✓	✓	✓
-40 to 75°C	✓	✓	✓
Redundancy and Backup Options			
Turbo Ring	✓	–	–
Turbo Chain	✓	–	–
STP/RSTP	✓	–	–
MSTP	✓	–	–
Automatic Backup Configurator (ABC-01)	–	✓	✓
Automatic Backup Configurator (ABC-02)	✓	–	–
Network Management and Control			
SNMP v1/v2c/v3	✓	✓	✓
LLDP	✓	✓	✓
IPv6	✓	✓	✓
Layer 3 Switching	–	–	–
Port Trunking	✓	–	–
Modbus/TCP	✓	–	–
Ethernet/IP	✓	–	–
PROFINET	✓	–	–
SNMP/RMON	✓	–	–
DHCP Option 66/67/82	✓	–	–
IGMP Snooping/GMRP	✓	–	–
QoS	✓	–	–
IEEE 802.1Q VLAN	✓	–	–
Port-based VLAN	✓	–	–
IEEE 802.1X	✓	–	–
Port Lock	✓	–	–
Relay Warning	✓	–	–
Maximum Support Speed / Distance over Twisted-Pair Copper Wire			
100 Mbps / 3 km	✓	–	✓
15.3 Mbps / 8 km	–	✓	–
Standards and Certifications			
CE/FCC	✓	✓	✓
UL 61010-2-201	✓	–	–
EN 60950-1 (LVD)	✓	–	–
UL 508	–	✓	✓
NEMA TS2	✓	–	✓
EN 50121-4	✓	✓	✓
Page	3-26	3-24	3-24

TRC-190 Series

Rackmount chassis for the NRack System™

- 19-inch chassis for rackmount use
- 19 slots for high density applications
- Supports hot-swap and dual power input with redundancy
- Fanless chassis design reduces servicing costs

Introduction

The TRC-190 series provides 19 slots for media converter modules from the CSM-200 series of Ethernet-to-fiber modules and TCF-142-RM series of serial-to-fiber modules. A TRC-190 chassis comes with one AC or DC power input, with an optional redundant power expansion module available for greater reliability. The TRC-190 series' power input module supports the hot-swap feature.

Specifications

Physical Characteristics

Housing: SECC (1.2 mm)
Dimensions: 440 x 260 x 77 mm (18.6 x 11 x 3.3 in)
Weight: 5.2 kg (11.4 lb), with one power module installed
Number of Slots: 19 slots on the front for slide-in modules, 2 slots at the back for power supply modules

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: Universal 100 to 240 VAC (47 to 63 Hz) or ±48 VDC (36 to 72 VDC and -36 to -72 VDC) or 220 VDC
Input Current:
3.2 A @ 36 VDC max.

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: CE, FCC
EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A
EMS:
EN 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
EN 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 Surge: Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 PFMF
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE

MTBF (mean time between failures)

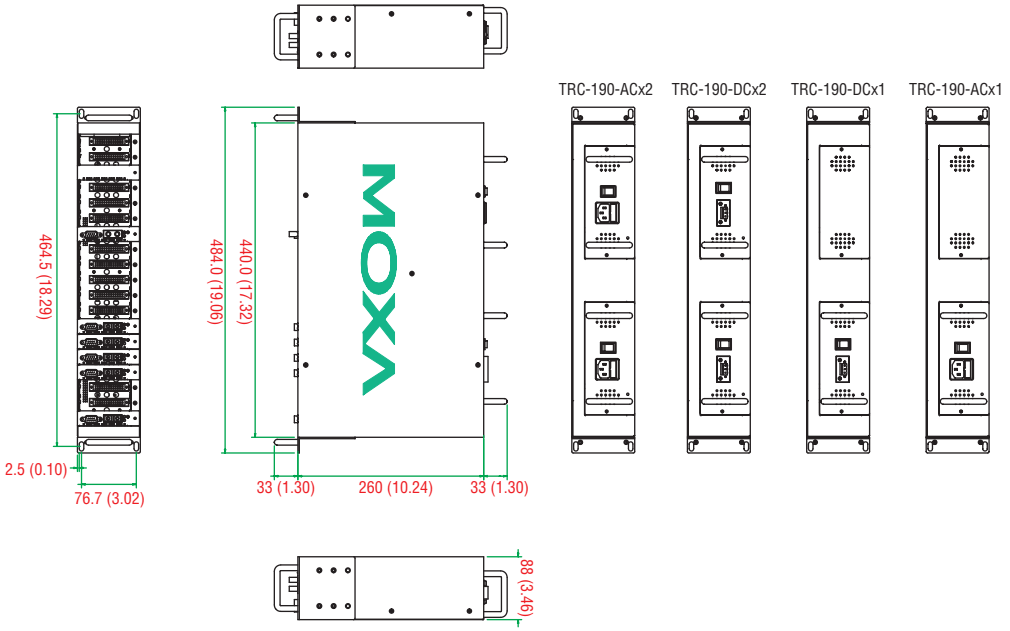
Time: 1,055,112 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

TRC-190-AC: Rack chassis, 2U, single 110 to 240 VAC input, with 19 slots on front panel
TRC-190-DC-48: Rack chassis, 2U, single 36 to 72 VDC input, with 19 slots on front panel

Available Slide-in Modules

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector
TCF-142-M-SC-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, SC connector
TCF-142-M-ST-RM: RS-232/422/485 to multi-mode fiber slide-in module converter, ST connector
TCF-142-S-SC-RM: RS-232/422/485 to single-mode fiber slide-in module converter, SC connector
TCF-142-S-ST-RM: RS-232/422/485 to single-mode fiber slide-in module converter, ST connector

Optional Accessories (can be purchased separately)

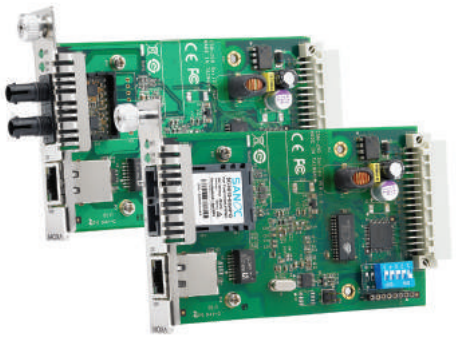
PWR-190-AC: 110 to 240 VAC power supply for the TRC-190-AC
PWR-190-DC-48: 36 to 72 VDC power supply for the TRC-190-DC-48
Plate-1: Face plate to cover unused front panel slots (required for all unused slots)

Package Checklist

- 1 TRC-190 with single power input
- Power cord (for the TRC-190-AC only)
- 17 face plates
- User's manual (printed)
- Warranty card

CSM-200 Series

10/100BaseT(X) to 100BaseFX slide-in modules for the NRack System™



- LFP (Link Fault Pass-through) and FEF (Far End Fault)
- Two different operation modes
  - Store-and-Forward
  - Pass Through
- Auto Negotiation
- Plug and Play
- Hot-swap

Introduction

The CSM-200/400 modules are slide-in Ethernet-to-fiber media converters for the NRack System™. The modules provide media conversion from 10/100BaseT(X) to 100BaseFX (SC/ST connectors), and can be installed in any NRack System™ chassis.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT,
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR, Fiber Link, 10/100M (TP port)
DIP Switches:

DIP	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Through	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Dimensions: 86.8 x 124.3 x 21 mm (3.42 x 4.89 x 0.83 in)
Weight:
Product only:
CSM-200-1213: 115 g (0.25 lb)
CSM-200-1214/1218: 125 g (0.28 lb)
Packaged:
CSM-200-1213: 170 g (0.37 lb)
CSM-200-1214/1218: 180 g (0.40 lb)

Environmental Limits

Operating Temperature: 0 to 55°C (32 to 131°F)
Storage Temperature: -20 to 75°C (-4 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 VDC
Input Current: 180 mA @ 12 VDC max.

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 4 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 0.5 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Freefall: IEC 60068-2-32

MTBF (mean time between failures)

Time: 1,454,560 hrs
Standard: Telcordia (Bellcore), GB

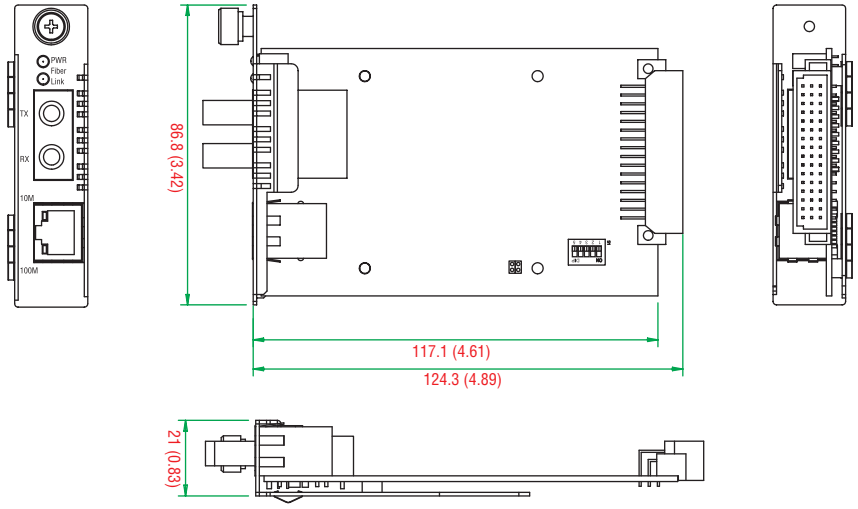
Warranty

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

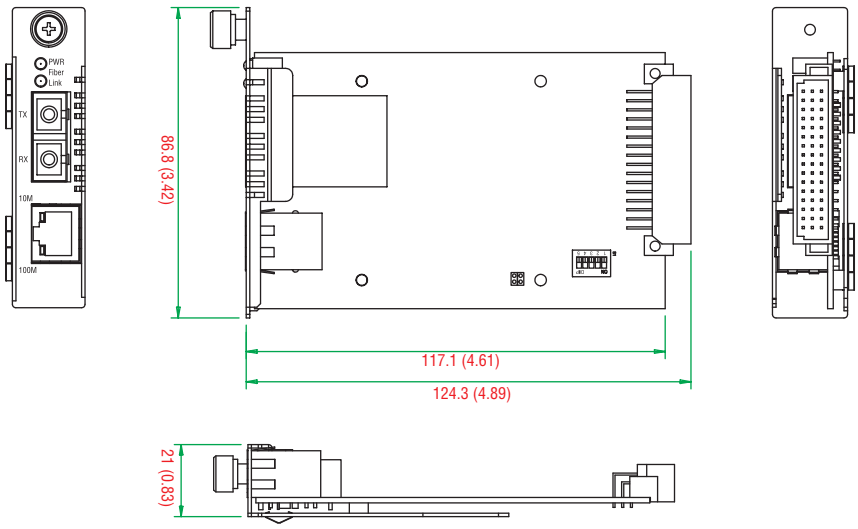
Dimensions

Unit: mm (inch)

CSM-200-1213



CSM-200-1214/CSM-200-1218



Ordering Information

Available Models

CSM-200-1213: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector
CSM-200-1214: 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector
CSM-200-1218: 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector

Package Checklist

- 1 CSM-200 media converter
- Quick installation guide (printed)
- Warranty card

PTC-101 Series

IEC 61850-3 and railway Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure alarm by relay output (LV model only)
- -40 to 85°C operating temperature range
- Redundant dual DC power inputs (LV model only)
- Integrated high-reliability power supply eliminates the need for external power transformer
- Compliant with EN 50121-4
- Essential compliance with EN 50155*

*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.

EN 50121 EN 50155 IEC 61850-3 IEEE 1613 RoHS c UL us LISTED CE FC

Introduction

The PTC-101 Ethernet-to-fiber media converters convert from 10/100BaseT(X) to 100BaseFX. Models are available with either SC, ST, or LC connectors. The PTC-101 converters eliminate the need for additional wiring, and support IEEE 802.3 and IEEE 802.3u/x protocols with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing to provide a total solution for your industrial Ethernet networks. The PTC-101 is compliant with essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45/M12 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST/LC connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port)
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 Mbps	10 Mbps
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Throuth	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

The default setting for all DIP switches is ON.

Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC (LV model only)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 152.15 x 123.46 x 66.65 mm (5.99 x 4.86 x 2.62 in)
Weight:
Product only: 690 g (1.52 lb)
Packaged: 875 g (1.92 lb)

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)
Conformal Coating: Available upon request

Power Requirements

Input Voltage:

Power Supply Type		Power Consumption	Fuse Rating
LV-DC	20 to 72 VDC	170 mA @ 20 VDC	3.15A(T) 2
HV-AC	85 to 264 VAC	73 mA @ 85 VAC	3.15A(T) 2
HV-DC	88 to 300 VDC	47 mA @ 88 VDC	3.15A(T) 2
V-DC compliant with EN 50155 on 48 VDC HV-DC compliant with EN 50155 on 110 VDC			

Input Current:
LV-DC: 170 mA @ 20 VDC max.
HV-AC: 73 mA @ 85 VDC max.
HV-DC: 47 mA @ 88 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A

EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 4 kV
EN 61000-4-5 (Surge): Power: 4 kV; Signal: 4 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Note: Refer to the "Environmental Type Tests" table below for more detailed information.
Freefall: IEC 60068-2-32
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50121-4
*Please contact Moxa or a Moxa distributor for details.
Vibration: IEC-61850-3, IEC-60870-2-2, EN 50125-3 (M12 models only)

MTBF (mean time between failures)

Time: 1,211,613 hrs
Standard: Telcordia (Bellcore), GB

Warranty

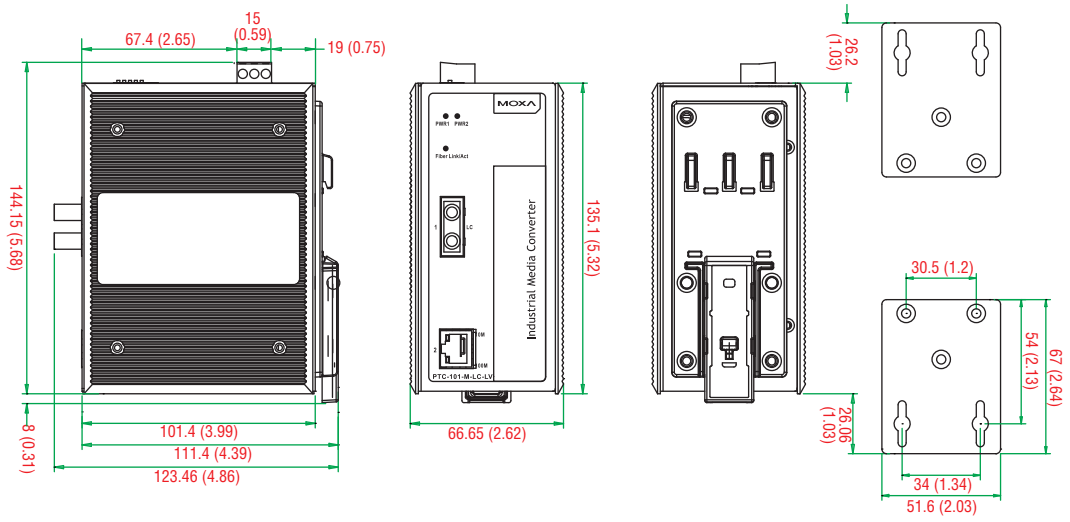
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Environmental Type Tests			
Test	**Description**		**Test Levels**
IEC 60068-2-1	Cold, operating (power ON/OFF)	Test Ad	-40°C, 48 hours
IEC 60068-2-3	Damp heat, steady state, operating	Test Ca	85°C, 95% R.H., 24 hours
IEC 60068-2-14	Changing temperature, operating	Test Nb	-40 to 85°C, Ramp rate: 3°C/min, 8 cycles
IEC 60068-2-48 IEC 60068-2-1	Cold, storage	Test Ad	-40°C, 12 hours
IEC 60068-2-48 IEC 60068-2-3	Damp heat, steady state, storage	Test Ca	90°C, 95% R.H., 24 hours
IEC 60068-2-32 ISTA-2A	Freefall, package	Test Ed	90 cm
IEC 60068-2-34	Random vibration, package	Test Fd	3 grms (5 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-6 IEC 60721-3-3	Vibration, operating	Class Cm (3M6, 4M6)	20 m/s² (9 to 200 Hz) 15 m/s² (200 to 500 Hz)
IEC 61850-3 IEC 60870-2-2 IEC 60068-2-27 IEC 60721-3-3	Shock, operating	Class Cm (3M6, 4M6)	300 m/s², 11 ms

Dimensions

Unit: mm (inch)

PTC-101-M-ST-HV (other models available by request)

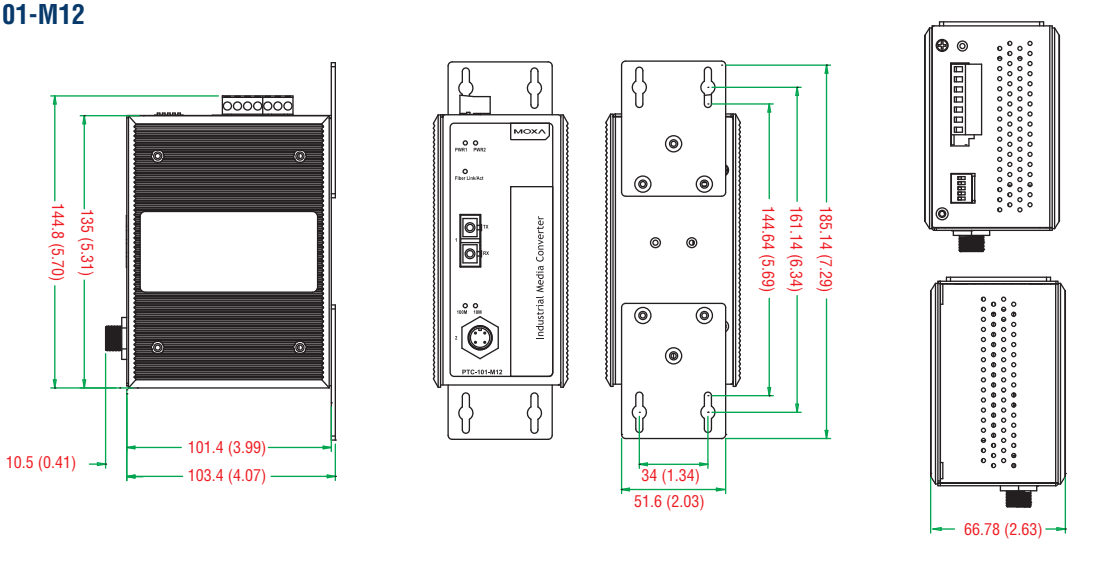


Side View | Front View | Rear View | Panel-Mounting Kit (Optional)

Dimensions

Unit: mm (inch)

PTC-101-M12



Side View | Front View | Panel-Mounting Kit (Optional) | Top & Bottom View

Ordering Information

Available Models

PTC-101-M-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-SC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-ST-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-S-LC-LV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, dual redundant power inputs (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-SC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with SC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-ST-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with ST connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-S-LC-HV: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode with LC connector, 1 isolated power supply (88-300 VDC or 85-264 VAC), -40 to 85°C operating temperature
PTC-101-M12-S-SC-LV-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with SC connector (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M12-S-ST-LV-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with ST connector (20-72 VDC), -40 to 85°C operating temperature
PTC-101-M12-S-SC-LV-T-CT: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with SC connector (20-72 VDC), -40 to 85°C operating temperature, conformal coating
PTC-101-M12-S-ST-LV-T-CT: Industrial 10/100BaseT(X) to 100BaseFX media converter, M12 connector, single-mode with ST connector (20-72 VDC), -40 to 85°C operating temperature, conformal coating
Conformal coating: Available for PTC-101-M12 series

Package Checklist

- 1 PTC-101 media converter
- Hardware installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

WK-51: Wall-mounting kit
DK-DC50131: DIN-rail mounting kit
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
DK-DC50131-01: DIN-rail mounting kit, 2 plates with 8 screws

IMC-P101 Series

IEEE 802.3af PoE Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- IEEE 802.3af compliant PoE PSE equipment
- Power failure alarm by relay output
- Store-and-forward mode and pass through mode
- -40 to 75°C operating temperature range (T models)
- Redundant dual DC power inputs

Introduction

IMC-P101 series Ethernet-to-fiber media converters provide Ethernet media conversion from 10/100BaseT(X) to 100BaseFX (with SC or ST connectors). These converters are classified as power source equipment (PSE), and when used in this way provide up to 15.4 watts to IEEE 802.3af compliant powered devices (PDs), eliminating the need for additional wiring. The IMC-P101 converters support IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing, providing a complete solution for your industrial Ethernet network.

Specifications

Technology

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

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, Fiber Link, 10/100M (TP port), PSE Indicator
DIP Switches:

DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable*	Disable
2	Force TP Speed	100 Mbps*	10 Mbps
3	Force TP Duplex	Full Duplex*	Half Duplex
4	Link Fault Pass Through	Enable*	Disable
5	Operating Mode	Store-and-Forward*	Pass Through
6	PSE	Disable	Enable*
7	P.R.R. (PD Remote Reset)	Enable	Disable*

* Default DIP switch setting.

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

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal
Dimensions: 144.45 x 122.3 x 51.65 mm (5.69 x 4.81 x 2.03 in)
Weight:
Product only: 525 g (1.16 lb)
Packaged: 710 g (1.56 lb)
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)

Power Requirements

Input Voltage: 48 VDC (46 to 57 VDC), redundant inputs
Input Current: 130 mA @ 48 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.6 A (protects against two signals shorted together)
Reverse Polarity Protection: Protects against V+/V- reversal

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 4 kV; Signal: 4 kV
EN 61000-4-5 (Surge): Power: 2 kV; Signal: 2 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

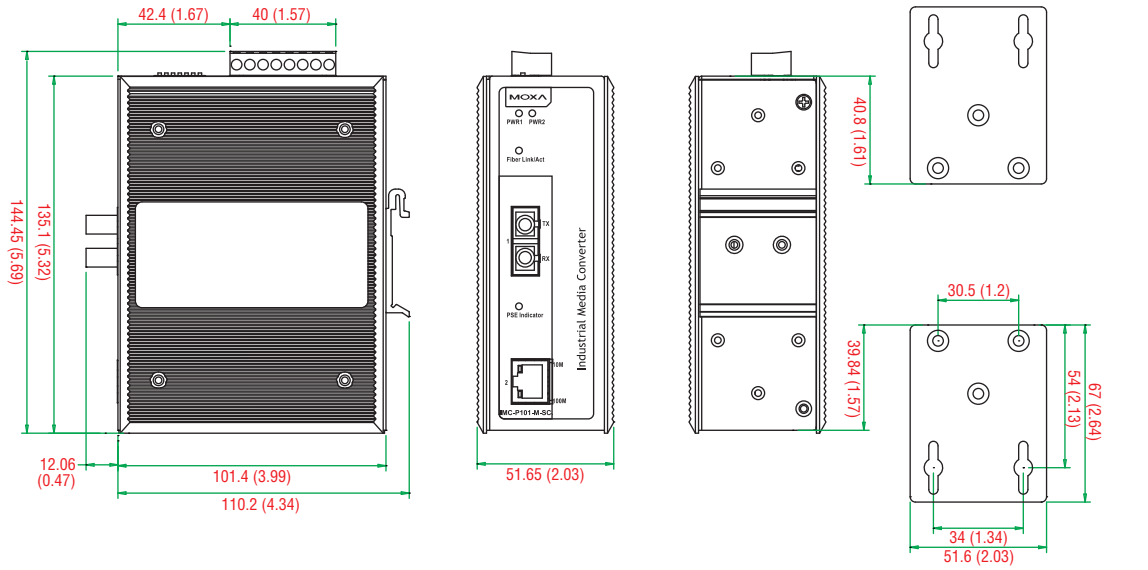
Time: 435,210 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit (Optional)

Ordering Information

Available Models

IMC-P101-M-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-M-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-S-SC: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, 0 to 60°C operating temperature
IMC-P101-S-ST: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, 0 to 60°C operating temperature
IMC-P101-M-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-M-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode port with ST connector, -40 to 75°C operating temperature
IMC-P101-S-SC-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with SC connector, -40 to 75°C operating temperature
IMC-P101-S-ST-T: PoE industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode port with ST connector, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-51: Wall-mounting kit

Package Checklist

- 1 IMC-P101 media converter
- Hardware installation guide (printed)
- Warranty card

IMC-101G Series

Industrial gigabit Ethernet-to-fiber media converter

- 10/100/1000BaseT(X) and 1000BaseSFP slot supported
- Link Fault Pass-through (LFP)
- Power failure, port break alarm by relay output
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2, IECEx)
- More than 20 options available*

*See the SFP-1G Series datasheet for details.

Introduction

The IMC-101G industrial gigabit modular media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 1000BaseSX/LX/LHX/ZX media conversion in harsh industrial environments. The IMC-101G's industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101G converter comes with a relay output warning alarm to help prevent damage and loss. All IMC-101G models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

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/LSX/LX/LH/LHX/ZX/E2X

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 1000BaseSFP slot
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (TP and Fiber port)
DIP Switches: Port break alarm mask, Link Fault Pass-through, SFP Auto/Force
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.32 x 4.13 in)
Weight: 630 g (1.39 lb)
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)

Power Requirements

Input Voltage: 12 to 45 VDC redundant inputs
Input Current: 220 mA @ 45 VDC max.
Connection: Removable terminal block
Overload Current Protection: 2.5 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC nL IIC T4, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

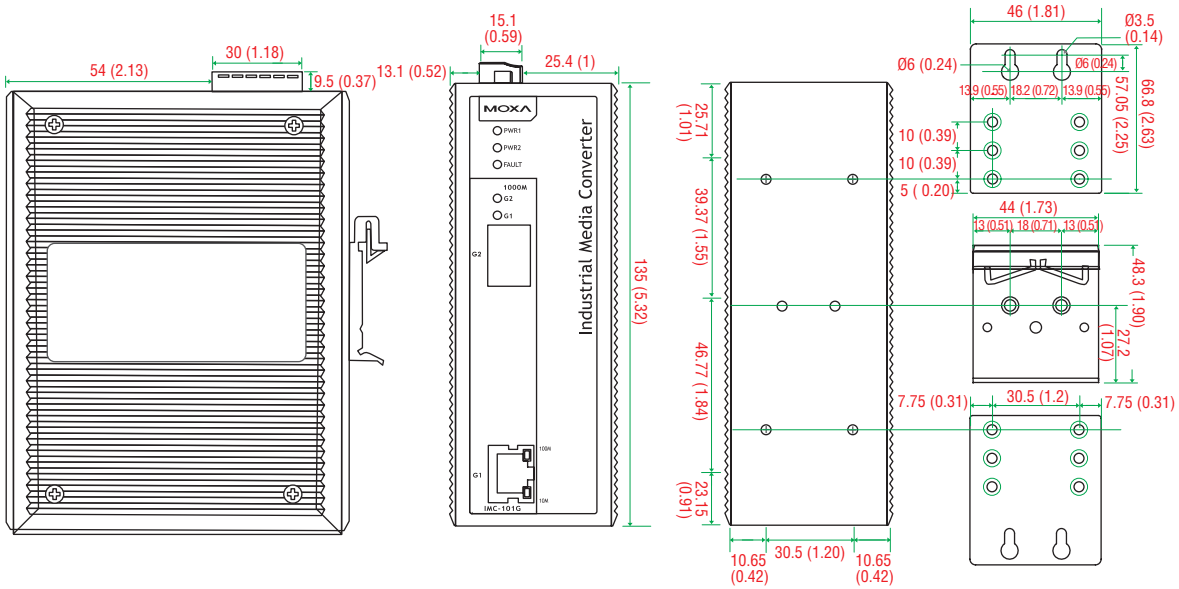
Time: 500,540 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit

Ordering Information

Available Models

IMC-101G: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, 0 to 60°C operating temperature

IMC-101G-T: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, -40 to 75°C operating temperature

Note: You must purchase at least one SFP-1G module to use these products. See the SFP-1G Series datasheet for details.

Package Checklist

- 1 IMC-101G media converter
- Quick installation guide (printed)
- Warranty card

IECEx Models

IMC-101G-IEX: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, IECEx, 0 to 60°C operating temperature

IMC-101G-T-IEX: Industrial 10/100/1000BaseT(X) to 1000BaseSFP media converter, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input

DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input

DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch

WK-46: DIN-rail/wall-mounting kit, 2 plates with 4 screws

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

IMC-101 Series

Industrial Ethernet-to-fiber media converters

- 10/100BaseT(X) auto-negotiation and auto-MDI/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power inputs
- -40 to 75°C operating temperature range (T models)
- Designed for hazardous locations (Class 1 Div. 2/Zone 2, IECEx)

Introduction

The IMC-101 industrial media converters provide industrial-grade media conversion between 10/100BaseT(X) and 100BaseFX (SC/ST connectors). The IMC-101 converters' reliable industrial design is excellent for keeping your industrial automation applications running continuously, and each IMC-101 converter comes with a relay output warning alarm to help prevent damage and loss. The IMC-101 media converters are designed for harsh industrial environments, such as in hazardous locations (Class 1, Division 2/Zone 2, IECEx, DNV, and GL Certification), and comply with FCC, UL, and CE standards. The IMC-101 series is available in models that support an operating temperature from 0 to 60°C, and an extended operating temperature from -40 to 75°C. All IMC-101 series converters are subjected to a 100% burn-in test.

Specifications

Technology

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

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: PWR1, PWR2, FAULT, 10/100M (TP port), 100M (Fiber port), FDX/COL (Fiber port)
DIP Switches: 100BaseFX Full/Half duplex selection, port break alarm mask
Alarm Contact: One relay output with current carrying capacity of 1 A @ 24 VDC

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 630 g (1.39 lb)
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)

Power Requirements

Input Voltage: 12 to 45 VDC redundant inputs
Input Current: 320 mA @ 45 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone2 Ex nA nC op is IIC T4 Gc, IECEx Ex nA nC IIC T4 Gc
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 3 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power 1 kV; Signal 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Marine: DNV, GL

MTBF (mean time between failures)

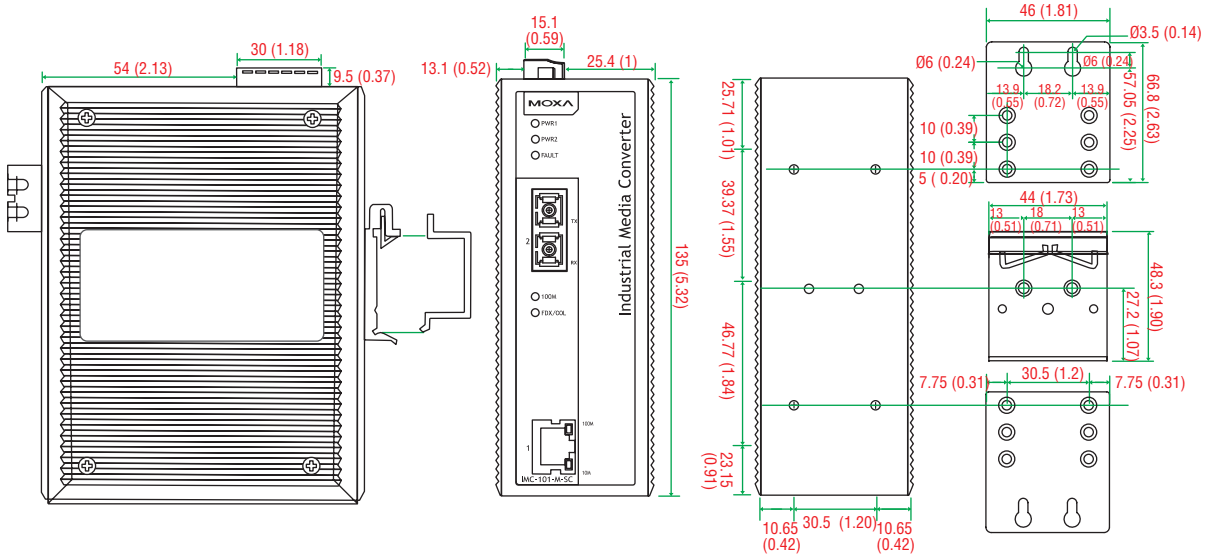
Time: 401,000 hrs
Standard: MIL-HDBK-217F

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Panel-Mounting Kit

Ordering Information

Available Models

IMC-101-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, 0 to 60°C operating temperature
IMC-101-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, 0 to 60°C operating temperature
IMC-101-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, 0 to 60°C operating temperature
IMC-101-S-SC-80: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, 0 to 60°C operating temperature
IMC-101-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -40 to 75°C operating temperature
IMC-101-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -40 to 75°C operating temperature
IMC-101-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, -40 to 75°C operating temperature
IMC-101-S-SC-80-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, -40 to 75°C operating temperature

Package Checklist

- 1 IMC-101 media converter
- Quick installation guide (printed)
- Warranty card

IECEx Models

IMC-101-M-SC-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, IECEx, 0 to 60°C operating temperature
IMC-101-M-ST-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, IECEx, 0 to 60°C operating temperature
IMC-101-S-SC-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, IECEx, 0 to 60°C operating temperature
IMC-101-S-SC-80-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, IECEx, 0 to 60°C operating temperature
IMC-101-M-SC-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, IECEx, -40 to 75°C operating temperature
IMC-101-M-ST-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, IECEx, -40 to 75°C operating temperature
IMC-101-S-SC-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 40 km, IECEx, -40 to 75°C operating temperature
IMC-101-S-SC-80-T-IEX: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, 80 km, IECEx, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC/176 to 264 VAC input by switch
WK-46: Wall-mounting kit
WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit
DK-DC50131-01: DIN-rail mounting kit, 2 plates with 8 screws

IMC-21A Series

Industrial 10/100BaseT(X) to 100BaseFX media converters

- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- -40 to 75°C operating temperature range (T models)
- DIP switches to select FDX/HDX/10/100/Auto/Force

Introduction

The IMC-21A industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters can operate reliably in temperatures ranging from -40 to 75°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21A converters are easy to mount 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 802.3x for Flow Control

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches: TP port's 10/100M, Half/Full modes, Force/Auto modes; fiber port's Half/Full modes, Link Fault Pass-Through (LFP)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)
Weight: 170 g (0.37 lb)
Installation: DIN-rail mounting

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 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 265 mA @ 48 VDC max.
Connection: Removable 3-contact terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

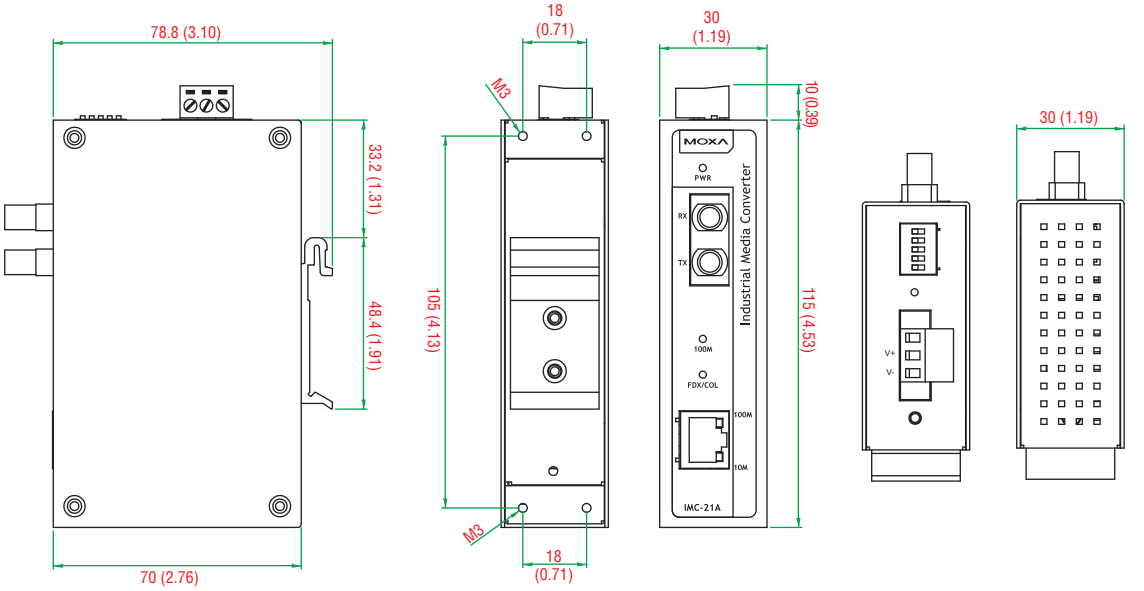
Time: 353,000 hrs
Standard: MIL-HDBK-217F

Warranty

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View | Bottom View

Ordering Information

Available Models

IMC-21A-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -10 to 60°C operating temperature
IMC-21A-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -10 to 60°C operating temperature
IMC-21A-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, -10 to 60°C operating temperature
IMC-21A-M-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector, -40 to 75°C operating temperature
IMC-21A-M-ST-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector, -40 to 75°C operating temperature
IMC-21A-S-SC-T: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector, -40 to 75°C operating temperature

Package Checklist

- 1 IMC-21A media converter
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

SC to ST Connectors: See Appendix A

IMC-21 Series

Entry-level industrial 10/100BaseT(X) to 100BaseFX media converters

- Multi-mode or single-mode, with SC or ST fiber connector
- Link Fault Pass-Through (LFP)
- DIP switches to select FDX/HDX/10/100/Auto/Force

Introduction

The IMC-21 industrial media converters are entry-level 10/100BaseT(X) to 100BaseFX media converters designed to provide reliable and stable operation in harsh industrial environments. The converters are a cost-effective solution that run on either a 12 to 48 VDC power input and can operate reliably in temperatures ranging from -10 to 60°C. The rugged hardware design ensures that your Ethernet equipment can withstand demanding industrial conditions. The IMC-21 converters are easy to mount 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 802.3x for Flow Control

Interface

RJ45 Ports: 10/100BaseT(X)
Fiber Ports: 100BaseFX (SC/ST connectors)
LED Indicators: Power, 10/100M (TP port), 100M (fiber port), FDX/COL (fiber port)
DIP Switches: TP port's 10/100M, Half/Full modes, and Force/Auto modes, fiber connection's Full/Half mode, Link Fault Pass-Through (LFP)

Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm	G.652
			800 MHz*km	
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Physical Characteristics

Housing: Plastic, IP30 protection
Dimensions: 25 x 109 x 97 mm (0.98 x 4.29 x 3.82 in)
Weight: 125 g (0.27 lb)
Installation: DIN-rail mounting

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 70°C (-40 to 158°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC
Rated Voltage: 300 mA @ 48 VDC max.
Connection: Removable 3-contact terminal block
Overload Current Protection: 1.1 A
Reverse Polarity Protection: Present

Standards and Certifications

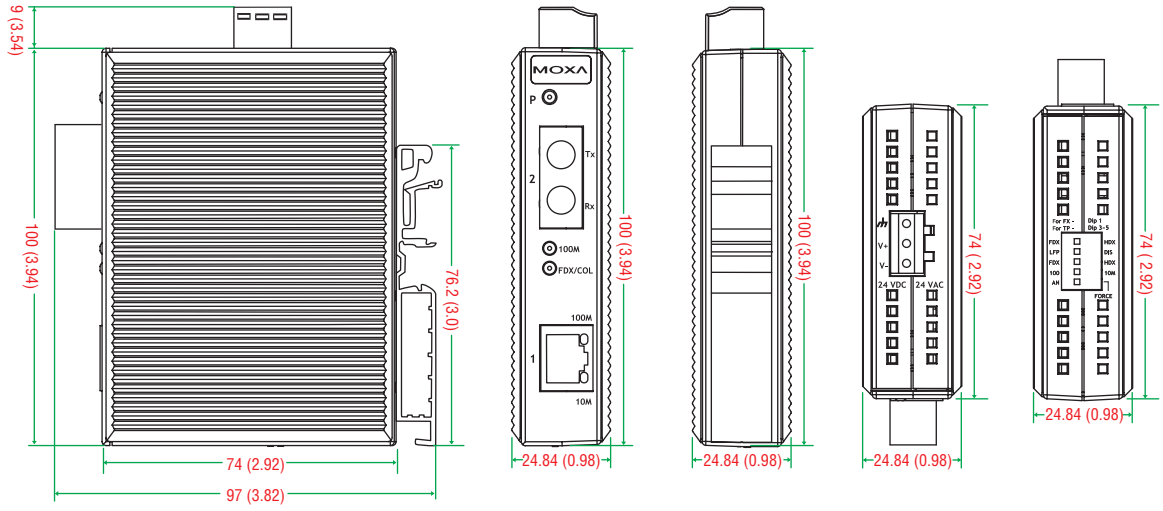
Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)
Time: 353,000 hrs
Standard: MIL-HDBK-217F

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

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | Top View | Bottom View

Ordering Information

Available Models

IMC-21-M-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, SC connector
IMC-21-M-ST: Industrial 10/100BaseT(X) to 100BaseFX media converter, multi-mode, ST connector
IMC-21-S-SC: Industrial 10/100BaseT(X) to 100BaseFX media converter, single-mode, SC connector

Package Checklist

- 1 IMC-21 media converter
- Quick installation guide (printed)
- Warranty card

IMC-21GA Series

Industrial gigabit Ethernet-to-fiber media converters

- Supports 1000Base-SX/LX with SC connector, or SFP slot
- Link Fault Pass-through (LFP)
- 10K jumbo frame
- Redundant power input
- -40 to 75°C operating temperature range (T models)
- Supports Energy Efficient Ethernet (IEEE 802.3az)

Introduction

The IMC-21GA industrial Gigabit media converters are designed to provide reliable and stable 10/100/1000BaseT(X) to 100/1000Base-SX/LX or selected 100/1000Base SFP module media conversion. The IMC-21GA supports IEEE 802.3az (Energy Efficient Ethernet) and 10K jumbo frames, allowing them to save power and enhance transmission performance. The converters come with a relay output warning alarm to help prevent damage and loss, and all IMC-21GA models are subjected to a 100% burn-in test, and are available in models that support a standard operating temperature range of 0 to 60°C, and an extended operating temperature range of -40 to 75°C.

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 1000BaseX
IEEE 802.3az (Energy Efficient Ethernet)

Interface

RJ45 Ports: 10/100/1000BaseT(X)
Fiber Ports: 100/1000Base-SX/LX or 100/1000BaseSFP slot
LED Indicators: PWR1, PWR2, G1 (copper port 10M/100M/1000M), G2 (fiber port 100M/1000M)
DIP Switches: Fiber speed 100M/1000M, Link Fault Pass-through, Energy Efficient Ethernet

Optical Fiber

Multi-mode Transmission Distance (IMC-21GA-SX-SC):
1000BaseSX: 0 to 500 m, 850 nm (50/125 µm, 400 MHz*km)
Single-mode Transmission Distance (IMC-21GA-LX-SC):
1000BaseLX: 0 to 10 km, 1310 nm (9/125 µm, 3.5 PS/(nm*km))

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in)
Weight: 170 g (0.37 lb)
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 75°C (-40 to 167°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant inputs
Input Current: 285 mA @ 48 VDC max.
Connection: Removable terminal block
Overload Current Protection: 1.5 A
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 1 V/m
EN 61000-4-4 (EFT): Power: 1 kV; Signal: 1 kV
EN 61000-4-5 (Surge): Power: 1 kV; Signal: 1 kV
EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m
EN 61000-4-8 (PFMF)
EN 61000-4-11
Green Product: RoHS, CRoHS, WEEE
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6

MTBF (mean time between failures)

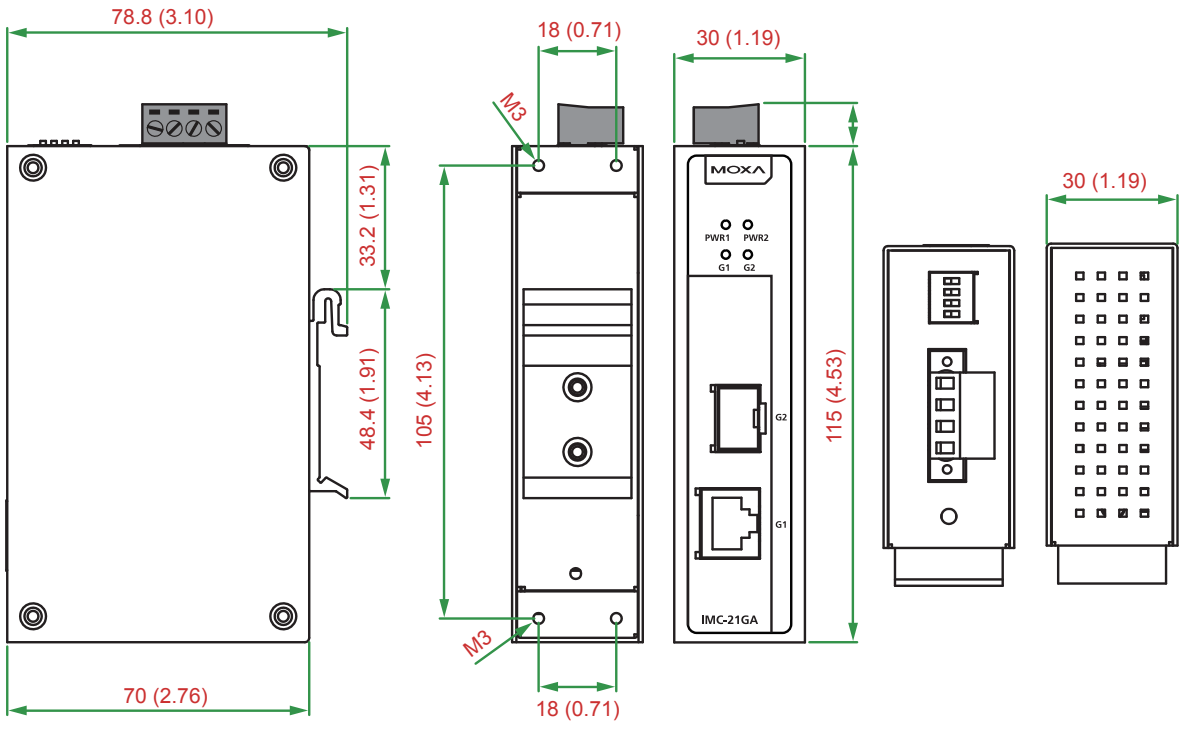
Time:
IMC-21GA: 2,762,058 hrs
IMC-21GA-LX-SC: 2,573,203 hrs
IMC-21GA-SX-SC: 2,573,203 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

IMC-21GA: Industrial 10/100/1000BaseT(X) to 100/1000BaseSFP media converter, -10 to 60°C operating temperature
IMC-21GA-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSFP media converter, -40 to 75°C operating temperature
IMC-21GA-SX-SC: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 0.5 km, -10 to 60°C operating temperature
IMC-21GA-SX-SC-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 0.5 km, -40 to 75°C operating temperature
IMC-21GA-LX-SC: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 10 km, -10 to 60°C operating temperature
IMC-21GA-LX-SC-T: Industrial 10/100/1000BaseT(X) to 100/1000BaseSC media converter, 10 km, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DR-4524: 45W/2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply, 85 to 264 VAC input
DR-120-24: 120W/5A DIN-rail 24 VDC power supply, 88 to 132 VAC or 176 to 264 VAC input by switch
SFP-1FE Series: 1-port Fast Ethernet SFP modules
SFP-1G Series: 1-port Gigabit Ethernet SFP modules

Package Checklist

- 1 IMC-21GA media converter
- Quick installation guide (printed)
- Warranty card

SFP Module Version Compatibility Table

Mode	Data Rate	Distance	Part Number	Center Wavelength
SM	100M	40 km	SFP-1FESLC-T V1.3	1310 nm
		80 km	SFP-1FELLC-T V1.3	1550 nm
	1G	10 km	SFP-1G10ALC V1.1	1310/1550 nm
		10 km	SFP-1G10BLC V1.1	
		10 km	SFP-1GLXLC V1.1	1310 nm
		10 km	SFP-1GLXLC-T V1.1	1310 nm
		20 km	SFP-1G20ALC V1.1	1310/1550 nm
		20 km	SFP-1G20BLC V1.1	
		20 km	SFP-1GLHLC V1.1	1310 nm
		20 km	SFP-1GLHLC-T V1.1	1310 nm
		30 km	SFP-1GLHXLC V1.1	1310 nm
		30 km	SFP-1GLHXLC-T V1.1	1310 nm
		40 km	SFP-1G40ALC V1.1	1310/1550 nm
		40 km	SFP-1G40BLC V1.1	
		70 km	SFP-1GZXLC V1.1	1550 nm
		70 km	SFP-1GZXLC-T V1.1	1550 nm
		110 km	SFP-1GEZXLC V1.1	1550 nm
		120 km	SFP-1GEZXLC-120 V1.1	1550 nm
MM	100M	2 km	SFP-1FEMLC-T V1.3	1310 nm
	1G	550 m	SFP-1GSXLC V1.1	850 nm
		550 m	SFP-1GSXLC-T V1.1	850 nm
		2 km	SFP-1GLSXLC V1.1	1310 nm
		2 km	SFP-1GLSXLC-T V1.1	1310 nm

IEX-402 Series

Managed DSL Ethernet extenders

- Automatic CO/CPE negotiation reduces configuration time
- Up to 100 Mbps over twisted-pair copper wires (IEX-402-VDSL2)
- Turbo mode connection, up to 15.3 Mbps over twisted-pair copper wires (IEX-402-SHDSL)
- Link Fault Pass-through (LFP) support and interoperable with Turbo Ring and Turbo Chain
- Link quality indicators for simple troubleshooting
- Easy network management by web browser, Telnet/serial console, Windows utility, ABC-01, and MXview

Introduction

The IEX-402 series is an industrial managed Ethernet extender designed with one 10/100BaseT(X) and one DSL port. The Ethernet extender provides a point-to-point extension over twisted copper wires based on G.SHDSL.bis and VDSL2 standards. The IEX-402-SHDSL supports data rates of up to 15.3 Mbps with a long transmission distance of up to 8 km, while the IEX-402-VDSL2 provides data rates of up to 100 Mbps with transmission distance of up to 3 km.

The IEX-402 series is designed for use in harsh operating environments. The DIN-rail mount, wide operating temperature range (-40 to 75°C), and dual power input make it ideal for installation in industrial applications.

To simplify configuration, the IEX-402 series uses CO/CPE auto negotiation. By factory default, the device will automatically assign CPE status to one of each pair of IEX devices. In addition, Link Fault Pass-through (LFP) and network redundancy interoperability enhance the reliability and accessibility of communication networks. Advanced managed and monitored functionality through MXview, including a virtual panel, improve the user experience for quick troubleshooting.

Features and Benefits

- Automatic CO/CPE negotiation reduces configuration time
- IEX-402-SHDSL series: Standard G.SHDSL data rate up to 5.7 Mbps (Turbo Speed connections up to 15.3 Mbps), with up to 8 km transmission distance (performance varies by cable quality)
- IEX-402-VDSL2 series: Standard VDSL2 data rate up to 100 Mbps, with up to 3 km transmission distance (performance varies with line conditions)
- Supports Link Fault Pass-Through (LFP) and Line-swap fast recovery
- Supports SNMP v1/v2c/v3 for different levels of network management
- Interoperable with Turbo Ring/Turbo Chain network redundancy
- Compatible with EtherNet/IP and PROFINET protocols for transparent transmission
- Easy network management through web browser, Telnet/Serial console, Windows utility, MXview, and ABC-01
- IPv6 Ready

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1p for Class of Service
ITU-T G.991.2 for Single-pair high-speed digital subscriber line transceivers (IEX-402-SHDSL only)
ITU G.993.2 for very high speed digital subscriber line transceivers 2 (IEX-402-VDSL2 only)

Software Features

Management: SNMPv1/v2c/v3, DHCP Client, TFTP, SNTP, HTTP, Telnet, Syslog, LLDP
MIB: MIB-II
Flow Control: IEEE 802.3x flow control, back pressure flow control

Interface

DSL Port: DSL Port: RJ11 (RJ45 connector) or detachable 2-contact terminal block
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: RS-232 (RJ45 connector)
LED Indicators: PWR1, PWR2, FAULT, STATE, LINK/ACT, CO/CPE, 10/100 (TP port)
DIP Switches:
IEX-402-SHDSL series: CO/CPE, SNR/SPEED, ANNEX B/ANNEX A, STD/TURBO
IEX-402-VDSL2 series: CO/CPE, SNR/SPEED, STD/INP
Button: Reset button

Switch Properties

MAC Table Size: 1K
Packet Buffer Size: 512K

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions:
35 x 130 x 105 mm (1.38 x 5.12 x 4.13 in)
Weight:
IEX-402-SHDSL Series: 290 g (0.64 lb)
IEX-402-VDSL2 Series: 275 g (0.61 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Altitude: Up to 2000 m
Note: Contact Moxa for products guaranteed to function at higher altitudes.

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)

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current:
IEX-402-SHDSL Series: 0.36 A @ 24 VDC
IEX-402-VDSL Series: 0.33 A @ 24 VDC
Connection: 2 removable 2-contact terminal block
Overload Current Protection: Present
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 2 kV; Signal: 2 kV
EN 61000-4-5 (Surge): Power: 0.5 kV; Signal: 1 kV
EN 61000-4-6 (CS): 10 V
EN 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Traffic Control: NEMA TS2 (IEX-402-VDSL2 only)
Rail Traffic: EN 50121-4
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

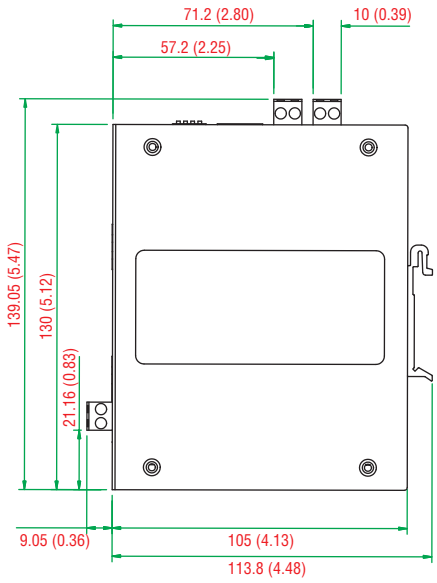
Time:
IEX-402-SHDSL series: 1,310,000 hrs
IEX-402-VDSL2 series: 1,490,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

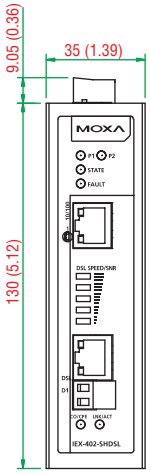
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

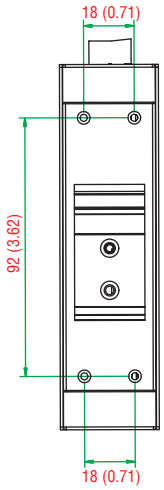
Unit: mm (inch)



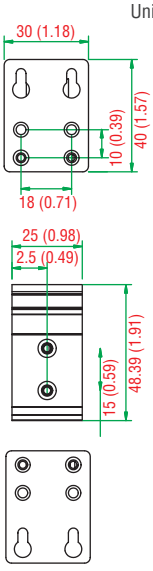
Side View



Front View



Rear View



DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100BaseT(X)	DSL
IEX-402-SHDSL	IEX-402-SHDSL-T	1	1
IEX-402-VDSL2	IEX-402-VDSL2-T	1	1

Optional Accessories (can be purchased separately)

RK-4U: 4U-high 19-inch rack-mounting kit
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
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-30: Wall-mounting kit, 2 plates with 4 screws

Package Checklist

- IEX-402 DSL Ethernet Extender
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IEX-408E-2VDSL2 Series

Preliminary

Industrial managed 6 FE + 2 VDSL2 Ethernet extender

- VDSL2 high-speed long distance copper connections; up to 300 m at 100 Mbps and up to 3 km at 1 Mbps over twisted-pair copper wires
- Automatic CO/CPE negotiation reduces configuration time
- Turbo Ring / Turbo Chain on both Fast Ethernet and VDSL2 ports for fast recovery
- Controllable bypass mode on VDSL2 ports gives higher availability in a daisy chain topology
- Flexible deployment with 2-pin or RJ11/45 connector on VDSL2 ports
- Easy network management by web browser, Telnet/serial console, Windows utility, ABC-02, and MXview

NEMA TS2 | c UL us LISTED | EN 50121 | CE | FC

Introduction

The IEX-408E-2VDSL2 is an industrial managed Ethernet extender switch for establishing long distance Ethernet transmissions over twisted-pair copper wiring. IEX-408E-2VDSL2 units can easily be linked in series to form a long distance multi-drop configuration, with one IEX-408E-2VDSL2 unit located at each drop-point. Adjacent drop points can be separated theoretically by up to 3 km, with a transmission speed of 1 Mbps achieved using a VDSL2 connection (with a connection distance of 300 m, a transmission speed of 100 Mbps can be theoretically achieved). Each IEX-408E-2VDSL2 unit provides six 10/100BaseT(X) and two DSL ports, giving users an incredible amount of flexibility for linking together a wide variety of devices separated by vast distances.

Ethernet redundancy is provided by Turbo Ring, Turbo Chain, RSTP/STP, and MSTP, and a state-of-the-art controllable bypass solution on the DSL ports increases the system reliability and availability of your network. The IEX-408E-2VDSL2 series also supports advanced management and security features. It is the perfect solution for reducing the cost of establishing new network cable installations using existing twisted-pair copper wiring to extend copper cable networks beyond the conventional distance limitations imposed by the Ethernet protocol.

With its compact DIN-rail design, the IEX-408E-2VDSL2 series is perfect for use in harsh operating environments with limited installation space, such as ITS, rail wayside, oil and gas, mining, factory automation, and process automation applications. The DIN-rail mount, wide operating temperature range (-40 to 75°C), and dual power inputs make it ideal for installation in industrial applications.

To simplify configuration, the IEX-408E-2VDSL2 uses CO/CPE automatic negotiation (the factory default setting). The device will automatically assign CPE status to one of each pair of IEX devices. In addition, advanced management and monitoring functionalities through NMS, including a virtual panel, improve the user experience by enabling quick troubleshooting.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Automatic CO/CPE negotiation reduces configuration time
- Standard VDSL2 data rate up to 100 Mbps, with up to 3 km transmission distance (performance varies with line conditions)
- Turbo Ring and Turbo Chain, RSTP/STP, and MSTP supported on both Ethernet and DSL ports for network redundancy
- Controllable bypass mode supported in between DSL ports for higher availability in long distance daisy chain topologies
- Port Trunking on Ethernet and DSL ports for optimum bandwidth utilization
- 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 efficiency
- Supports EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- DHCP Option 82 for IP address assignment with different policies
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- Supports SNMP v1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Port mirroring for online debugging
- Automatic warning by exception through e-mail and relay output
- ABC-02-USB (Automatic Backup Configurator) for system configuration backup/restore and firmware upgrade
- Easy network management through web browser, Telnet/Serial console, Windows utility, MXview, and ABC-02-USB

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 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 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
ITU G.993.2 for very high speed digital subscriber line transceivers 2
Management: SNMP v1/v2c/v3, LLDP, Syslog, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP. TFTP, SMTP, RARP, Telnet, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ringv1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH
Time Management: SNTP, NTP Server/Client
Industrial Protocols: EtherNet/IP, PROFINET IO, Modbus/TCP
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Interface

DSL Port: RJ11 (RJ45 connector) or detachable 2-contact terminal block
RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
Console Port: USB-serial console (Type B connector)
LED Indicators: PWR1, PWR2, FAULT, STATE, LINK/ACT, CO/CPE, 10/100 (Fast Ethernet port), MSTR/HEAD, CPLR/TAIL, DSL BYPASS
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Storage Port: USB storage port (Type A connector)
Button: Reset button
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Switch Properties

MAC Table Size: 16K
Packet Buffer Size: 1.5 MB for Fast Ethernet side; 8 KB for DSL side
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 70 x 111 x 135 mm (2.76 x 4.37 x 5.39 in)
Installation: DIN-rail mounting, wall mounting (with optional kit)
Altitude: Up to 2000 m
Note: Contact Moxa for products guaranteed to function at higher altitudes.

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)

Power Requirements

Input Voltage:
LV Models: 12/24/48 VDC, redundant dual inputs
HV Models: 110/220 VDC/VAC
Operating Voltage:
LV Models: 9.6 to 60 VDC
HV Models: 88 to 300 VDC, 85 to 264 VAC
Connection: 5-pin terminal block
Overload Current Protection: Present
Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 61010-2-201, EN 60950-1 (LVD) (In plan)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
EN 61000-4-2 (ESD): Contact: 8 kV; Air: 15 kV
EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m
EN 61000-4-4 (EFT): Power: 4 kV
EN 61000-4-5 (Surge): Power: 4 kV; Signal: 4 kV
EN 61000-4-6 (CS): 10 V
EN 61000-4-8
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Traffic Control: NEMA TS2 (In plan)
Rail Traffic: EN 50121-4 (In plan)
Vibration: IEC 60068-2-6
Note: Please check Moxa’s website for the most up-to-date certification status.

MTBF (mean time between failures)

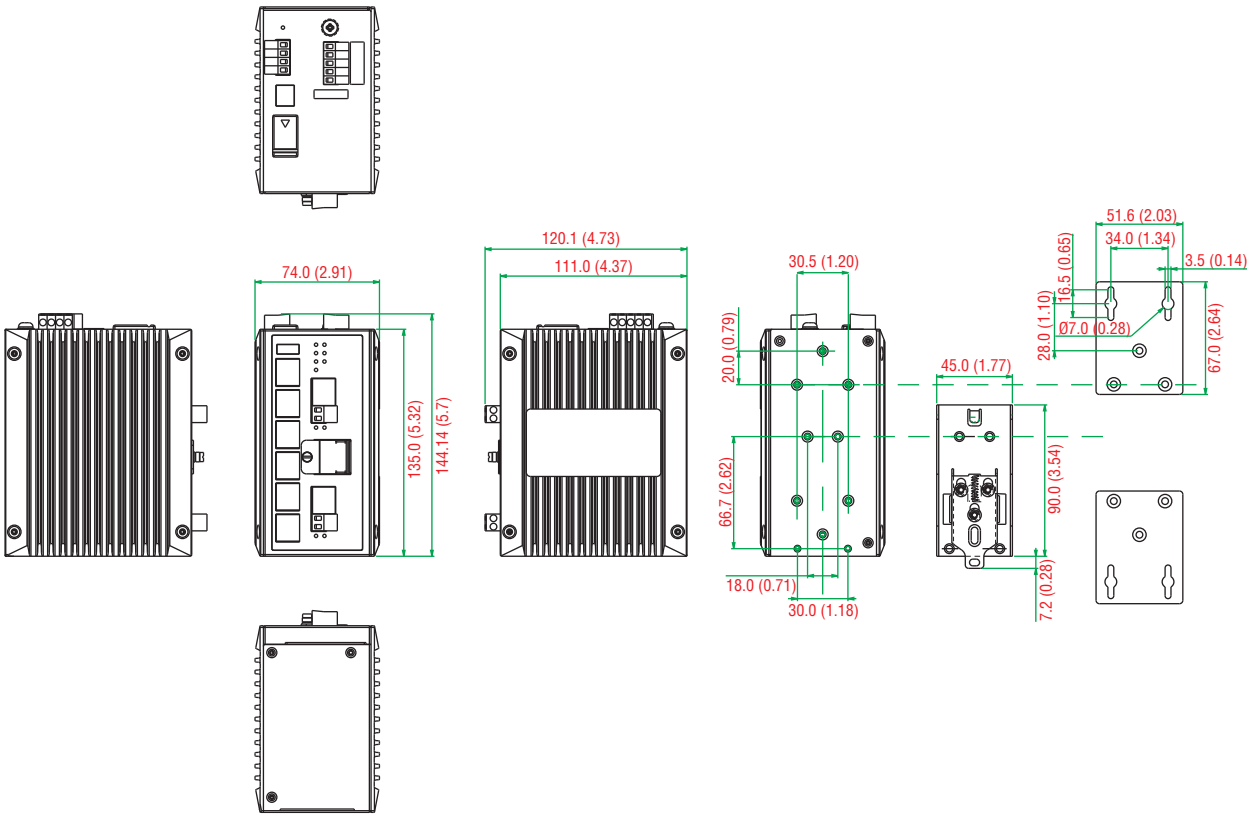
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Operating Temperature		Power Supply		Port Interface		Bypass (DSL ports)
	Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	LV: 12/24/48 VDC (9.6 to 60 VDC), isolated (dual power inputs)	HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC), isolated	DSL	10/100BaseT(X)	
IEX-408E-2VDSL2-LV	✓	–	1	–	2	6	1
IEX-408E-2VDSL2-LV-T	–	✓	1	–	2	6	1
IEX-408E-2VDSL2-HV	✓	–	–	1	2	6	1
IEX-408E-2VDSL2-HV-T	–	✓	–	1	2	6	1

Optional Accessories (can be purchased separately)

WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit
MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB-T: Configuration backup and restoration tool for managed Ethernet switches, -40 to 75°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
DR-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
SDR-480P-48: 480 W DIN-rail 48 VDC power supplies

Package Checklist

- IEX-408E-2VDSL2 Extender Switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Industrial Ethernet Gateways

4

Industrial Ethernet Gateways

Industrial Ethernet Gateways (Modbus)







	MGate MB3180	MGate MB3280	MGate MB3480	MGate MB3170 MGate MB3170-T MGate MB3170I MGate MB3170I-T	MGate MB3170-M-SC (-T) MGate MB3170-M-ST (-T) MGate MB3170-S-SC (-T) MGate MB3170I-M-SC (-T) MGate MB3170I-S-SC (-T)	MGate MB3270 MGate MB3270-T MGate MB3270I MGate MB3270I-T	MGate MB3660-8-2AC MGate MB3660-8-2DC MGate MB3660I-8-2AC MGate MB3660-16-2AC MGate MB3660-16-2DC
Ethernet Interface							
Protocols	Modbus TCP						
Number of Ports	1			2 (1 IP, Cascade)	–	2 (1 IP, Cascade)	2 (2 IPs)
Number of Fiber Ports	–				1	–	
Speed	10/100 Mbps, Auto MDI/MDIX				100 Mbps	10/100 Mbps, Auto MDI/MDIX	
Connector	RJ45				SC, ST	RJ45	
Magnetic Isolation Protection	1.5 kV (built-in)						
Serial Interface							
Protocols	Modbus RTU/ASCII						
Number of Ports	1	2	4	1		2	8, 16
Serial Standards	RS-232/422/485						
Connectors	DB9-M			RS-232: DB9-M, RS-422/485: Terminal block		DB9-M	
ESD Protection	15 kV						
RS-485 Data Direction Control	ADDC®						
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2						
Parity	None, Even, Odd, Space, Mark						
Flow Control	RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)						
Baudrate	50 bps to 921.6 kbps						
Isolation	–	–	–	2 kV (built-in, -I model only)			
Software							
Utility	MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2						Device Search Utility (DSU) for Windows O.S.
Smart Routing	✓	✓	✓	✓	✓	✓	✓
Serial Redirection	–	–	–	–	–	✓	✓
ProCOM	–	–	–	✓	✓	✓	–
Priority Control	–	–	–	✓	✓	✓	✓
MXview/MXconfig	✓	✓	✓	✓	✓	✓	✓
SNMP	v1 (read only)						
Physical Characteristics							
Housing	Metal (IP30)			Plastic (IP30)			Metal (IP30)
Dimensions	22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)	22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)	35.5 x 102.7 x 157.2 mm (1.40 x 4.04 x 6.19 in)	29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)			440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
Weight	340 g (0.75 lb)	360 g (0.79 lb)	740 g (1.63 lb)	360 g (0.79 lb)	360 g (0.79 lb)	380 g (0.84 lb)	2,830 g (6.24 lb), max.
Environmental Limits							
Operating Temperature	0 to 60°C (32 to 140°F)			Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)			0 to 60°C (32 to 140°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)			-40 to 85°C (-40 to 185°F)			
Ambient Relative Humidity	5 to 95% RH (non-condensing)						
Shock	–			IEC 60068-2-27			
Drop	–			IEC 60068-2-32			
Vibration	–			IEC 60068-2-6, IEC 60068-2-64			
Power Requirements							
Input Voltage	12 to 48 VDC						For DC models: Dual 20 to 60 VDC For AC models: Dual 100 to 240 VAC, 47 to 63 Hz
Input Current	200 mA @ 12 VDC	250 mA @ 12 VDC	385 mA @ 12 VDC	MGate MB3170: 435 mA @ 12 VDC MGate MB3170I: 555 mA @ 12 VDC	MGate MB3170-M-SC: 510 mA @ 12 VDC MGate MB3170-M-ST: 435 mA @ 12 VDC MGate MB3170-S-SC: 555 mA @ 12 VDC MGate MB3170I-M-SC: 555 mA @ 12 VDC MGate MB3170I-S-SC: 555 mA @ 12 VDC	MGate MB3270: 435 mA @ 12 VDC MGate MB3270I: 510 mA @ 12 VDC	MGate MB3660-8-2AC: 144 mA @ 110 VAC MGate MB3660-8-2DC: 312 mA @ 24 VDC MGate MB3660I-8-2AC: 244 mA @ 110 VAC MGate MB3660-16-2AC: 178 mA @ 110 VAC MGate MB3660-16-2DC: 390 mA @ 24 VDC
Power Connector	Power jack	Power jack and terminal block		Terminal block			Terminal block (for DC models)
Standards and Certifications							
Safety	UL 60950-1, EN 60950-1			UL 508, EN 60950-1			UL 60950-1, EN 60950-1
Hazardous Location	–	–	–	UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA IIC T3 Gc, IECEx			–
EMC	EN 55022/24			EN 55022/24			
EMI	CISPR 22, FCC Part 15B Class A			CISPR 22, FCC Part 15B Class A			
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 1 kV (MB3180/MB3280) IEC 61000-4-5 Surge: Power: 1 kV; Signal: 2 kV (MB3480) IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11			IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF
Marine	–	–	–	DNV		–	–
Reliability							
Warranty	5 years (see www.moxa.com/warranty)						
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Industrial Ethernet Gateways






	MGate 4101-MB-PBS MGate 4101-MB-PBS-T MGate 4101I-MB-PBS MGate 4101I-MB-PBS-T	MGate 5101-PBM-MN MGate 5101-PBM-MN-T	MGate 5102-PBM-PN MGate 5102-PBM-PN-T	MGate 5105-MB-EIP MGate 5105-MB-EIP-T	MGate EIP3170 MGate EIP3170-T MGate EIP3170I MGate EIP3170I-T	MGate EIP3270 MGate EIP3270-T MGate EIP3270I
Ethernet Interface						
Protocols	–	Modbus TCP	PROFINET RT	EtherNet/IP, Modbus TCP	CIP (PCCC) on EtherNet/IP	
Number of Ports	–	1	2 (1 IP, Ethernet cascade)			
Connectors	–	RJ45				
Magnetic Isolation Protection	–	1.5 kV (bulit-in)				
Speed	–	10/100 Mbps, Auto MDI/MDIX				
Serial Interface 1: PROFIBUS						
Protocols	PROFIBUS DP-V0 Slave	PROFIBUS DP-V1 Master		–		
Number of Ports	1			–		
Data Rate	9600 bps to 12 Mbps			–		
Connector	DB9-F			–		
Isolation Protection	2 kV (built-in)			–		
Serial Interface 2: Modbus						
Protocols	Modbus RTU/ASCII	–	–	Modbus RTU/ASCII	DF1 (full-duplex)	
Number of Ports	1	–	–	1	1	2
Serial Standards	RS-232/422/485, software selectable	–	–	RS-232/422/485, software selectable	RS-232/422	
Connectors	DB9-M	–	–	DB9-M	RS-232: DB9-M, RS-422: Terminal block	DB9-M
ESD Protection	15 kV	–	–	–	15 kV	
RS-485 Data Direction Control	ADDC®	–	–	ADDC®		
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2	–	–	Data Bits: 7, 8 Stop Bits: 1, 2	Data Bits: 8 Stop Bits: 1, 2	
Parity	None, Even, Odd, Space, Mark	–	–	None, Even, Odd, Space, Mark	None, Even, Odd	
Flow Control	RTS/CTS, DTR/DSR (RS-232 only)	–	–	RTS/CTS, RTS Toggle (RS-232 only)	RTS/CTS, DTR/DSR (RS-232 only)	
Baudrate	50 bps to 921.6 Kbps	–	–	50 bps to 921.6 kbps	1200 bps to 921.6 Kbps	
Isolation Protection	2 kV (built-in, -I model only)	–	–	2 kV (built-in)	2 kV (built-in, -I model only)	
Software						
Utility	MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2					
QuickLink	✓	–	–	–	–	
Paging	✓	–	–	–	–	
AutoScan	–	✓	✓	–	–	
MXview/Mxconfig	–	✓	✓	✓	✓	
SNMP	–	v1, v2, v3, Private MIB			v1 (read only)	
Physical Characteristics						
Housing	Metal (IP30)				Plastic (IP30)	
Dimensions	36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)				29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)	
Weight	500 g (1.10 lb)			507 g (1.12 lb)	360 g (0.79 lb)	380 g (0.84 lb)
Storage Card Slot	–		1 microSD (SDHC) card slot (supports up to 32 GB)		–	
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% RH (non-condensing)					
Shock	IEC 60068-2-27					
Drop	IEC 60068-2-32					
Vibration	IEC 60068-2-6, IEC 60068-2-64					
Power Requirements						
Input Voltage	12 to 48 VDC					
Input Current	MGate 4101-MB-PBS: 340 mA @ 12 VDC; 130 mA @ 48 VDC MGate 4101I-MB-PBS: 375 mA @ 12 VDC; 140 mA @ 48 VDC	365 mA @ 12 VDC	430 mA @ 12 VDC	455 mA @ 12 VDC; 125 mA @ 48 VDC	MGate EIP3170: 435 mA @ 12 VDC MGate EIP3170I: 555 mA @ 12 VDC	MGate EIP3270: 435 mA @ 12 VDC MGate EIP3270I: 510 mA @ 12 VDC
Power Connector	Terminal block					
Standards and Certifications						
Safety	UL 60950-1, EN 60950-1		UL 508, EN 60950-1			
Hazardous Location	Class 1 Division 2, ATEX, IECEx					
EMC	EN 55022/24					
EMI	CISPR 22, FCC Part 15B Class A		CISPR 22, FCC Part 15B Class B		CISPR 22, FCC Part 15B Class A	
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 4 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF IEC 61000-4-11	
Reliability						
Warranty	5 years (see www.moxa.com/warranty)					
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Industrial Ethernet Gateways (Wireless)

Preliminary

*Available in March, 2016

Preliminary

*Available in March, 2016

	MGate W5108 MGate W5108-T	MGate W5208 MGate W5208-T
Ethernet Interface		
Protocols	Modbus TCP, DNP3, TCP Server/Client modes supported	
Number of Ports	1	
Connectors	RJ45	
Magnetic Isolation Protection	1.5 kV (built-in)	
Speed	10/100 Mbps, Auto MDI/MDIX	
Serial Interface		
Protocols	Modbus RTU/ASCII, DNP3	
Number of Ports	1	2
Serial Standards	RS-232/422/485, software selectable	
Baudrate	50 bps to 921.6 kbps	
Flow Control	RTS/CTS, RTS Toggle (for RS-232 only), XON/XOFF (for RAW TCP only)	
Serial Communication Parameters	Data Bits: 7, 8 Stop Bits: 1, 2	
Parity	None, Even, Odd, Space, Mark	
Connector	DB9-M	
Isolation Protection	2 kV (built-in)	
Wireless Interface		
Standards	802.11 a/b/g/n	
Number of Antenma	1	
Network Mode	Infrastructure, Ad-Hoc	
Antenna Connector	Reverse SMA	
Transmission Rate	802.11a/g: 65, 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto rate; 802.11b: 11, 5.5, 2, 1 Mbps, auto rate; 802.11n 2.4 GHz: HT20, MCS 0-7; 802.11n 5 GHz: HT20 & HT40 MCS 0-7	
Transmission Distance	Up to 100 meters (in open areas)	
Inputs and Outputs		
Digital Input	2 channel	
Digital Output	2 channel	
Contact Type	6-pin terminal block	
DI: Dry Contact	On: Short to GND Off: Open	
DI: Wet Contact (source type, COM to DI)	Sensor Type: NPN Off: +3 VDC max. On: +10 to 30 V	
Digital Output (Sink Type):	On: Short to GND Off: OPEN to GND Driver Current: Max. 200 mA per channel On-state voltage: 24 VDC nominal, open collector to 30 V	
Software		
Utility	Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64),Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2	
Network Protocols	TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, ARP, Telnet	
Security	Authentication: WEP encryption (64 or 128 bit), WPA / WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES) Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5,PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP+F120	
MXview/Mxconfig	✓	
SNMP	v1, v2, v3, Private MIB	
Physical Characteristics		
Housing	Metal (IP30)	
Dimensions	45.8 x 105 x 134 mm (1.8 x 4.13 x 5.28 in)	59.6 x 101.7 x 134 mm (2.35 x 4 x 5.28 in)
Weight	589 g (1.30 lb)	738 g (1.63 lb)
Storage Card Slot	1 microSD (SDHC) card slot (supports up to 32 GB)	
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	
Ambient Relative Humidity	5 to 95% (non-condensing)	
Shock	IEC 60068-2-27	
Drop	IEC 60068-2-32	
Vibration	IEC 60068-2-6, IEC 60068-2-64	
Power Requirements		
Input Voltage	9 to 60 VDC	
Input Current	495 mA @ 9 VDC; 202 mA @ 24 VDC; 114 mA @ 48 VDC; 99 mA @ 60 VDC	
Power Connector	3-pin terminal block	
Standards and Certifications		
Safety	UL 508, EN 60950-1	
Hazardous Location	Class 1 Division 2, ATEX, and IECEx certification processes are underway. Please contact a Moxa sales representative for details.	
EMC	EN 55022/24	
EMI	CISPR 22, FCC Part 15B Class B	
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m IEC 61000-4-8 PFMF	
Radio	EN 300328, EN 301893, TELECOM CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66	
Reliability		
Warranty	5 years (see www.moxa.com/warranty)	
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Introduction to Industrial Ethernet Gateways

Get Integrated—It's Quick, Easy, and Reliable

Innovative and Easy-to-Use Industrial Gateways Create Seamless Connections and Compatibility

The need for industrial Ethernet gateway solutions is not only driven by the increasing demand for connecting industrial Ethernet protocols (such as EtherNet/IP, Modbus TCP, or PROFINET) to existing fieldbus networks, but by maximizing efficiency as well. Moxa's comprehensive industrial Ethernet gateway solutions, the MGate series, are designed with innovative and automated technology to ensure quick installation and easy management of your industrial fieldbus-to-Ethernet networks. To help users master fieldbus communications, Moxa also delivers industrial fieldbus gateways to transfer control data between different fieldbus protocols.

Quick Installation, in Just Minutes

To assist engineers of complex industrial automation systems with the troublesome configuration process, Moxa's MGate industrial gateway solution, MGate Manager, provides a user-friendly windows-based utility to make integration easier. It contains AutoCalibration or QuickLink patented technologies to enable a quick installation and configuration of industrial gateways in just minutes.

AutoCalibration

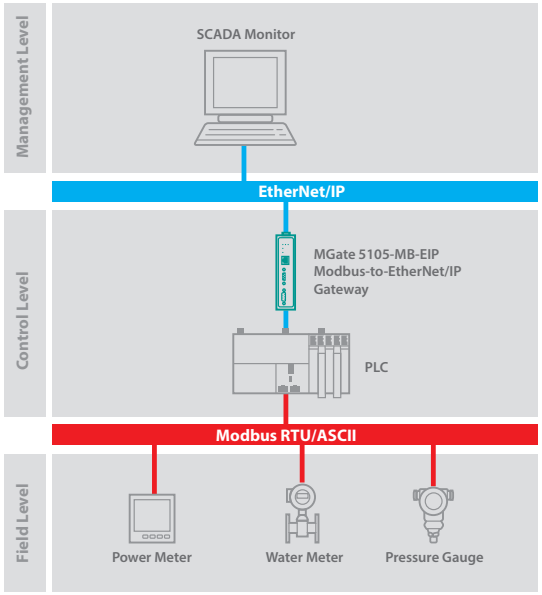
One-Click Detection of Response Timeout

In master-slave fieldbus communication networks, precise response timeout settings are an important yet complicated task for network integrators when trying to calibrate accurate timeframes to achieve optimized system performance. In the past, integrators often spent a substantial amount of time in trying to manually configure timeout settings through trial-and-error methods. Moxa's patented AutoCalibration technology offers a 1-click automated approach to auto-configure response timeout settings.

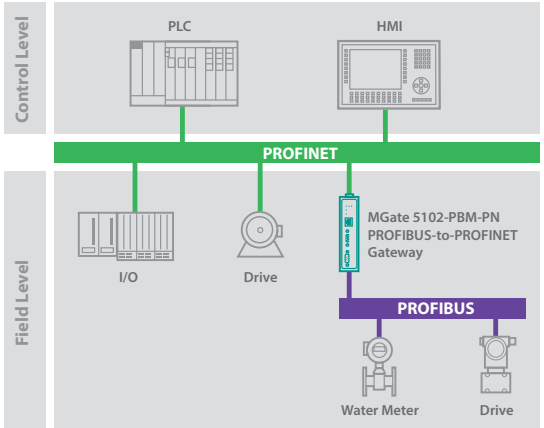
Products: MGate MB3180/3280/3480 Series, MGate MB3170/3270/3660 Series

Typical MGate Gateway Applications

- **PLC as slave:**
  Integrate field devices to allow remote monitoring and management



- **PLC as master:**
  Integrate new intelligent devices with existing devices



QuickLink

AutoLearning and AutoMapping Intelligence for Connecting Modbus to PROFIBUS

QuickLink, an innovative Moxa technology, simplifies the configuration of gateways to enable seamless connections between Modbus and PROFIBUS communications. QuickLink supports intelligent AutoLearning and AutoMapping, and replaces traditional methods of gateway configuration that are tedious and time-consuming. QuickLink is a standard feature of Moxa's MGate Manager utility that not only allows system integrators to finish their gateway configuration in just minutes, but also ensures that configurations are done right the first time, virtually eliminating the possibility of human error.

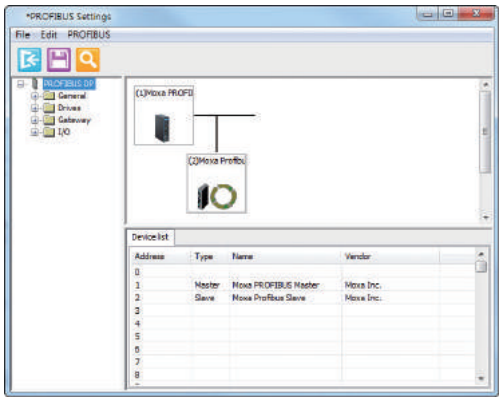
Products: MGate 4101-MB-PBS Series

AutoScan

One-Click Detection of I/O Parameters

Moxa's industrial Ethernet gateways feature AutoScan, which detects all connected PROFIBUS slave devices and their available Read Configuration Data (Get_Cfg). After configuration is done, an easy-to-read data mapping table is created to assist in the configuration of Modbus TCP masters, such as SCADA servers and PLCs. With Moxa's AutoScan, you no longer need to spend a lot of time configuring devices yourself, but instead can focus on monitoring data without needing to worry about every different protocol.

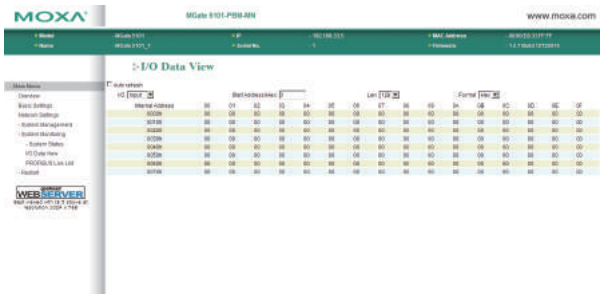
Products: MGate 5101-PBM-MN Series, MGate 5102-PBM-PN Series



Easy to Maintain, with Built-in Monitoring and Diagnostics

Web-based Monitoring Tool

Moxa's industrial Ethernet gateways feature a web-based monitoring tool that supports data import/export and log recording capabilities. The monitoring tool streamlines device configuration, maintenance, and troubleshooting, and supports encryption functions such as HTTPS and SSH to prevent unauthorized access. With this tool, users can reduce their cost since they won't need to purchase additional monitoring tools.



Real-Time Control of Fieldbus-to-Ethernet Networks

Real-time monitoring is critical for any industrial system, and Moxa's MGate Manager Windows utility is not only designed for easy configuration, but also for uninterrupted monitoring and troubleshooting of the connections between the fieldbus system and remote control system. MGate Manager logs events initiated by the gateway, and records all commands and responses that pass through the gateway, assisting users in determining the root cause of failures and identifying performance bottlenecks. The automatic relay output warning for the Ethernet link and power input status gives maintenance engineers an intelligent notification tool for quick troubleshooting and easy maintenance.

Reliable Performance, for Uninterrupted Operation

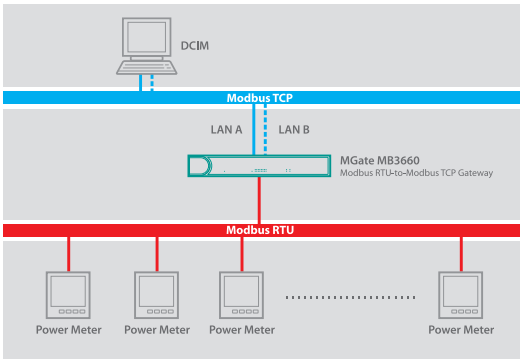
For mission-critical industrial applications, the failure of a single link can affect operational efficiency. Moxa's gateways are certified for use in hazardous environments (ATEX Zone 2, Class 1 Division 2), support a -40 to 75°C wide operating temperature (the highest operating temperature on the market; available with some models), and feature dual power inputs for connecting to a redundant power source to ensure reliable performance. In addition, Moxa gateways are recognized by several important organizations, such as PROFIBUS & PROFINET International (PI), Open DeviceNet Vendors Association (ODVA™), and the Modbus Organization (Modbus.org).

Applications

Data Center Power Monitoring

Modbus RTU/ACSII to Modbus TCP

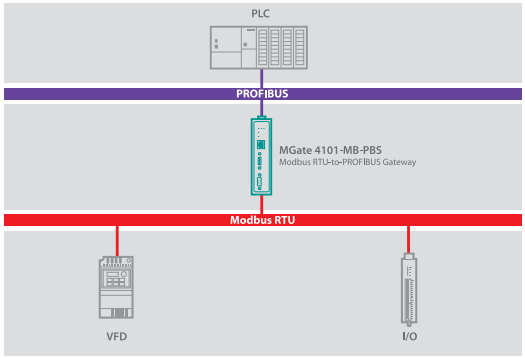
Data centers and server rooms use a significant amount of energy, with many industrial facilities spending nearly 25% of their total operating budget on this expense. Consumption is measured by power meters located throughout the facility, with many of the meters integrated with a Modbus RTU. Data from the meters is transmitted via an industrial gateway to a Modbus TCP network, and finally to a DCIM (data center infrastructure management) system.



Production Line Control

Modbus RTU/ASCII to PROFIBUS

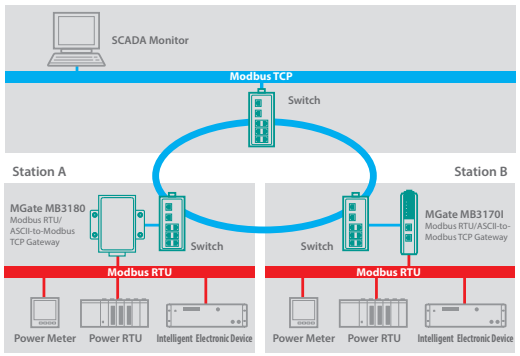
As labor costs increase year after year, manufacturers have transitioned to using automation systems to reduce labor costs, with PLCs used as one solution to accomplish this. Most devices still use Modbus RTU, which is the most common protocol. For this reason, industrial Ethernet gateways are the right choice for converting Modbus RTU to PROFIBUS, which can be controlled by PROFIBUS PLCs.



Monitoring a Small-Scale Power Generation System

Modbus RTU/ASCII to Modbus TCP

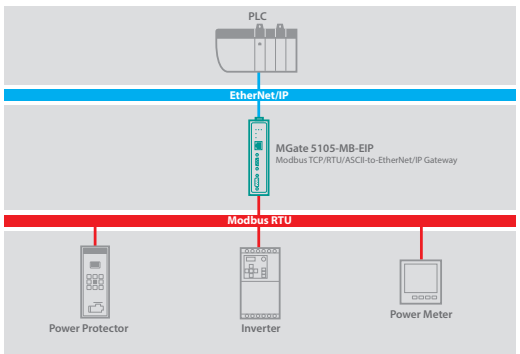
Industrial plants often have their own power generation systems to provide an uninterrupted power supply. To enable continuous monitoring, Modbus is commonly adopted as a communication protocol to transmit large volumes of Modbus RTU monitoring information from power RTUs, Intelligent Electronic Devices, and meters, via industrial gateways to the process control system running on a Modbus TCP network.



Electric Control Panel Monitoring

Modbus RTU/ASCII to EtherNet/IP

EtherNet/IP is a communication protocol developed by Rockwell Automation, and is widely used in many large-scale power systems for remote monitoring to ensure reliable performance and energy control. Although ControlLogix PLCs support Modbus modules for connecting a Modbus RTU to EtherNet/IP, it may be too expensive to modify the PLC code and a convenient rack slot may not be available. For this reason, gateways have become a popular way to achieve Modbus communication requirements.



MGate™ MB3180/3280/3480

1, 2, and 4-port standard serial-to-Ethernet Modbus gateways

- Convert between Modbus TCP and Modbus RTU/ASCII
- 1 Ethernet port and 1, 2, or 4 RS-232/422/485 ports
- 16 simultaneous TCP masters with up to 32 simultaneous requests per master
- Easy hardware setup and configuration

Overview

The MB3180, MB3280, and MB3480 are standard Modbus gateways that convert between Modbus TCP and Modbus RTU/ASCII protocols. Up to 16 simultaneous Modbus TCP masters are supported, with up to 31 RTU/ASCII slaves per serial port. For RTU/ASCII masters, up to 32 TCP slaves are supported.

Standard Modbus Network Integration

The three standard MGate™ models (MB3180, MB3280, and MB3480) are designed for easy integration of Modbus TCP and RTU/ASCII networks. With these models, Modbus serial slave devices can be seamlessly incorporated into an existing Modbus TCP network, and Modbus TCP slaves can be made accessible to serial masters. The MB3180, MB3280, and MB3480 offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

High Density, Cost-effective Gateways

The MGate™ MB3000 gateways can effectively connect a high density of Modbus nodes to the same network. The MB3280 can manage up to 62 serial slave nodes, and the MB3480 can manage up to 124 serial slave nodes. Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

Specifications

Ethernet Interface

Protocols: Modbus TCP
Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocol: Modbus RTU/ASCII Slave/Master
Number of Ports:
MB3180: 1
MB3280: 2
MB3480: 4
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Support: Smart Routing, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Metal, IP30
Weight:
MGate MB3180: 340 g (0.75 lb)
MGate MB3280: 360 g (0.79 lb)
MGate MB3480: 740 g (1.63 lb)
Dimensions:
Without ears:
MB3180: 22 x 52 x 80 mm (0.87 x 2.05 x 3.15 in)
MB3280: 22 x 77 x 111 mm (0.87 x 3.03 x 4.37 in)
MB3480: 35.5 x 102.7 x 157.2 mm (1.40 x 4.04 x 6.19 in)

With ears:
MB3180: 22 x 75 x 80 mm (0.87 x 2.95 x 3.15 in)
MB3280: 22 x 100 x 111 mm (0.87 x 3.94 x 4.37 in)
MB3480: 35.5 x 102.7 x 181.3 mm (1.40 x 4.04 x 7.14 in)

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)

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate M3180: 200 mA @ 12 VDC
MGate M3280: 250 mA @ 12 VDC
MGate M3480: 385 mA @ 12 VDC
Power Connector:
MGate MB3180: Power jack
MGate MB3280/3480: Power jack and terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 1 kV (MB3180/MB3280)
IEC 61000-4-5 Surge: Power: 1 kV; Signal: 2 kV (MB3480)
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

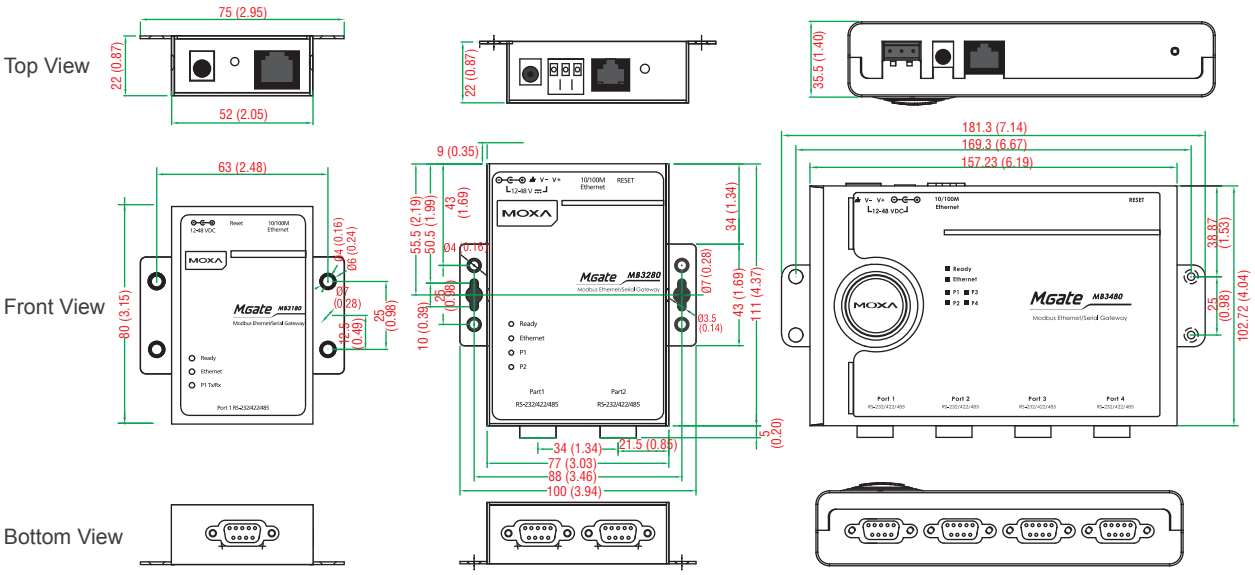
Time:
MGate M3180: 628,376 hrs
MGate M3280: 503,029 hrs
MGate M3480: 295,812 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3180: 1-port standard Modbus gateway
MGate MB3280: 2-port standard Modbus gateway
MGate MB3480: 4-port standard Modbus gateway

Optional Accessories (can be purchased separately)

CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector
DK35A: DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to Appendix for detail.

Package Checklist

- 1 MGate MB3180 or MB3280 or MB3480 Modbus gateway
- 100 to 240 VAC power adapter (excluding T models)*
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

*The package includes one power adapter suitable for your region.

DK35A

MGate™ MB3170/3270

1 and 2-port advanced serial-to-Ethernet Modbus gateways

- Accessible by up to 16 TCP master/client devices, or connect to up to 32 TCP slave/server devices
- Supports up to 31 or 62 serial slave devices
- Ethernet cascading for easy wiring
- Serial port routing by IP address, TCP port, or ID mapping
- Serial redirector function provided
- Embedded Modbus traffic monitor
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC/ST connector)
- Emergency request tunnels ensure QoS control

ProCOM

IEC IECEx Ex cULus LISTED DNV-GL CE FC

Overview

The MGate MB3170 and MB3270 are 1 and 2-port Modbus gateways, respectively, that convert between Modbus TCP, ASCII, and RTU communications protocols. The gateways provide both serial-to-Ethernet communication and serial (Master) to serial (Slave) communications. In addition, the gateways support simultaneously connecting serial and Ethernet masters with serial Modbus devices. The MGate MB3170 and MB3270 series gateways can be accessed by up to 16 TCP master/clients or connect to up to 32 TCP slave/servers. Routing through the serial ports can be controlled by IP address, TCP port number, or ID mapping. A featured priority control function allows urgent commands to obtain an immediate response. All models are rugged, DIN-rail mountable, and offer optional built-in optical isolation for serial signals.

Integrate TCP Masters without Altering the Modbus RTU/ASCII Network or Software

The MB3270 can integrate Modbus TCP with Modbus RTU/ASCII, without modifying the existing Modbus RTU/ASCII architecture or software. With the serial redirector function, a serial master can maintain direct access to serial slave devices through a specially mapped serial port. This allows the serial and TCP masters to access serial slaves simultaneously.

Optical Fiber for Ethernet Communications

The MGate MB3170 fiber series includes 100BaseFX fiber models that support transmission distances up to 4 km for multi-mode models, and up to 40 km for single-mode models. Optical fiber is well-suited for industrial applications because it is immune to electromagnetic noise and interference. For environments that experience high ground loop voltages, fiber provides the best isolation protection, and because there is no danger of sparking, optical fiber is safer than copper wire to use in hazardous environments.

Priority Control for Urgent Commands (Patented)

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system's requirements, different methods are available to define which commands receive priority.

Patent Numbers: (US/TW)
US7,743,192 B2 / I332618
US7,725,635 B2 / I321007

Specifications

Ethernet Interface

Protocols: Modbus TCP
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Optical Fiber Interface

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz*km	G.652
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Serial Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports:
MB3170/3170I: 1
MB3270/3270I: 2
Serial Standards: RS-232/422/485, software selectable
Connectors:
MB3170/3170I: DB9 male for RS-232, terminal block for RS-422/485
MB3270/3270I: DB9 male x 2
Magnetic Isolation Protection: 2 kV (for "I" models)
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Multi-master and Multi-drop:
Master mode: 32 TCP slaves
Slave mode: 16 TCP masters (request queue 32-deep for each master)
Support: Smart Routing, Serial Redirection, ProCOM, Priority Control, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Plastic, IP30
Weight:
MGate MB3170: 360 g (0.79 lb)
MGate MB3270: 380 g (0.84 lb)
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate MB3170: 435 mA @ 12 VDC
MGate MB3170I: 555 mA @ 12 VDC
MGate MB3270: 435 mA @ 12 VDC
MGate MB3270I: 510 mA @ 12 VDC
MGate MB3170-M-SC: 510 mA @ 12 VDC
MGate MB3170-M-ST: 435 mA @ 12 VDC
MGate MB3170-S-SC: 555 mA @ 12 VDC
MGate MB3170I-M-SC: 555 mA @ 12 VDC
MGate MB3170I-S-SC: 555 mA @ 12 VDC
Power Connector: Terminal block
Relay Output: 1 digital relay output to alarm (normal closed), with current carrying capacity 1 A @ 30 VDC

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11
Marine: DNV

MTBF (mean time between failures)

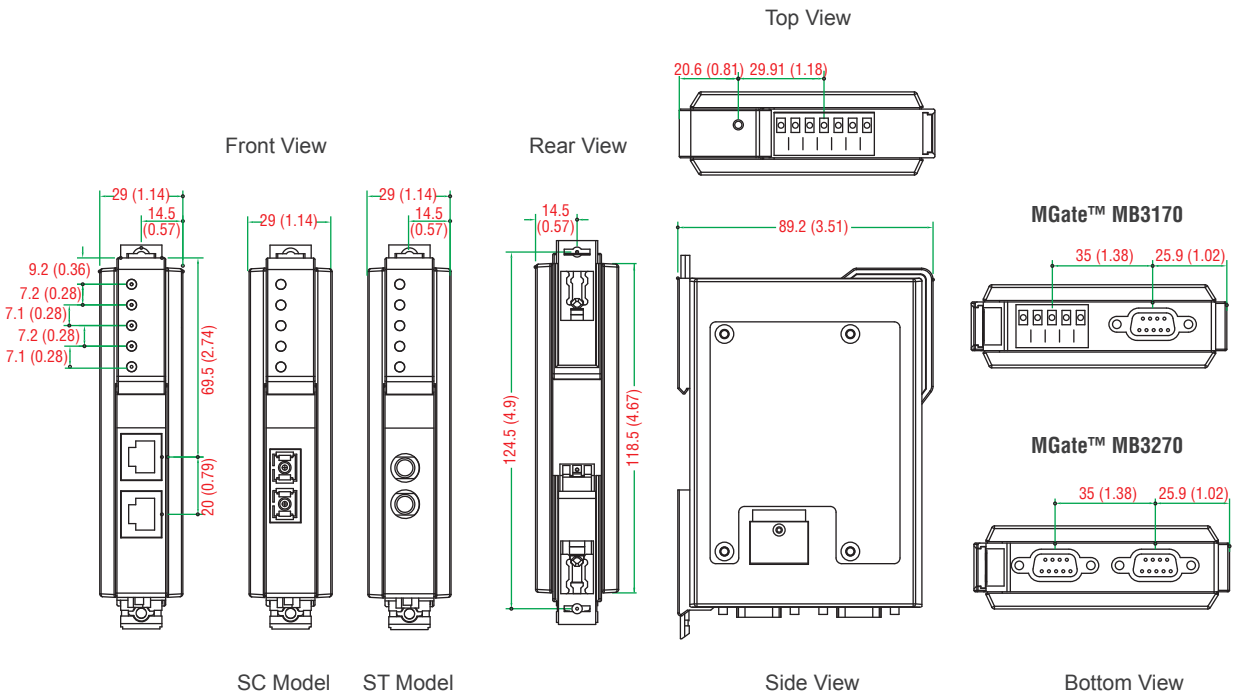
Time:
MGate MB3170: 346,790 hrs
MGate MB3170-M-SC: 1,175,887 hrs
MGate MB3170-M-ST: 1,175,887 hrs
MGate MB3170-S-SC: 1,175,887 hrs
MGate MB3170I-M-SC: 768,343 hrs
MGate MB3170I-S-SC: 763,707 hrs
MGate MB3270: 342,098 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate MB3170: 1-port advanced Modbus gateway, 0 to 60°C operating temperature
MGate MB3170I: 1-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate MB3270: 2-port advanced Modbus gateway, 0 to 60°C operating temperature
MGate MB3270I: 2-port advanced Modbus gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate MB3170-T: 1-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3170I-T: 1-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate MB3270-T: 2-port advanced Modbus gateway, -40 to 75°C operating temperature
MGate MB3270I-T: 2-port advanced Modbus gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate MB3170-M-SC: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector), 0 to 60°C operating temperature
MGate MB3170-M-SC-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector), -40 to 75°C operating temperature
MGate MB3170-M-ST: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (ST connector), 0 to 60°C operating temperature
MGate MB3170-M-ST-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (ST connector), -40 to 75°C operating temperature
MGate MB3170-S-SC: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector), 0 to 60°C operating temperature
MGate MB3170-S-SC-T: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector), -40 to 75°C operating temperature
MGate MB3170I-M-SC: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector) and 2 kV optical isolation, 0 to 60°C operating temperature
MGate MB3170I-M-SC-T: 1-port advanced Modbus gateway with 100BaseFX multi-mode fiber port (SC connector) and 2 kV optical isolation, -40 to 75°C operating temperature
MGate MB3170I-S-SC: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector) and 2 kV optical isolation, 0 to 60°C operating temperature
MGate MB3170I-S-SC-T: 1-port advanced Modbus gateway with 100BaseFX single-mode fiber port (SC connector) and 2 kV optical isolation, -40 to 75°C operating temperature

Package Checklist

- 1 MGate MB3170 or MB3270 Modbus gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to Appendix A for details.

MGate™ MB3660 Series

8 and 16-port redundant Modbus gateways

- Innovative Command Learning eliminates the need to key-in SCADA Modbus commands (acts as an agent gateway)
- High performance through active and parallel polling of serial devices
- Supports serial (Master) to serial (Slave) communications
- 2 Ethernet ports with the same IP or dual IP addresses
- SD card for configuration backup
- Access by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices
- Dual VDC or VAC power inputs with wide power input range
- 3-pin fault relay circuit for event alarms
- 2 kV isolation protection (for "-I" models)

Overview

The MGate MB3660 (MB3660-8 and MB3660-16) series gateways are redundant Modbus gateways that convert between the Modbus TCP and Modbus RTU/ASCII protocols. They can be accessed by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices. The MGate MB3660 series isolation model provides 2 kV isolation protection suitable for power substation applications. The MGate MB3660 gateways are designed to easily integrate Modbus TCP and RTU/ASCII networks. The MGate MB3660 series gateways offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

For large-scale Modbus deployments, MGate MB3660 gateways can effectively connect a large number of Modbus nodes to the same network. The MB3660 series can physically manage up to 248 serial slave nodes for 8-port models or 496 serial slave nodes for 16-port models (the Modbus standard only defines Modbus IDs from 1 to 247). Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

High Performance with Innovative Command Learning

The MGate MB3660 series gateways support two communication modes: transparent mode and agent mode. For transparent mode, the gateway converts Modbus commands from Modbus TCP to Modbus RTU/ASCII, and vice versa, or from serial (Master) to serial (Slave). However, since only one Modbus protocol request-response action can be executed at any given time, each Modbus device has to wait its turn, resulting in poorer performance. Agent mode is designed to overcome this performance weakness. By allowing users to manually key in Modbus commands, the gateway can send Modbus commands to multiple Modbus devices at the same time. Since the gateway actively and continuously retrieves data from Modbus devices simultaneously through the different serial ports, users will see a dramatic reduction in the amount of time a Modbus device needs to wait to be accessed. SCADA systems can retrieve Modbus device data directly from the gateway's memory, instead of waiting for the gateway to pass commands to the serial ports, enhancing the Modbus gateway's communication performance.

Transparent mode helps users adopt existing SCADA programs, but with reduced communication performance, whereas agent mode is characterized by high performance, but requires users to go through the trouble of keying in Modbus commands. In order to provide better performance, without requiring users to key in a lot of Modbus commands, the MGate MB3660 series gateways are designed with an innovative Command Learning function, which can be activated with a single mouse click. Once activated, the gateway will learn and remember the Modbus commands it receives, and once a command has been learned, the gateway will act as though it were in agent mode, and actively send Modbus requests to the relevant Modbus devices. Since the data is saved in a different memory space that can be accessed by the SCADA system, the SCADA system can retrieve Modbus response data directly from the gateway's memory, instead of waiting for the data to pass through the Modbus devices, dramatically increasing communication performance.

Modbus Gateway with Power and Ethernet Redundancy

For a complicated Modbus system, redundancy is extremely important. The MGate MB3660 Modbus gateways support redundancy for both the power input and Ethernet connection. The MGate MB3660 gateways come with dual AC or DC power inputs built-in for power redundancy, and have dual Ethernet ports (with different IPs) for network redundancy. To accomodate different types of applications, the dual Ethernet ports can be configured in one of two ways:

1. Use the same IP for both Ethernet ports. In this case, the MGate MB3660 gateway will automatically switch to the backup LAN when the main LAN fails.
2. Use different IP addresses for each of the two Ethernet ports.

Specifications

Ethernet Interface

Protocols: Modbus TCP Client/Server
Number of Ports: 2 (2 IP addresses)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: RJ45 x 2

Serial Interface

Protocols: Modbus RTU/ASCII Master/Slave
Number of Ports:
MGate MB3660-8: 8
MGate MB3660I-8: 8
MGate MB3660-16:16
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Isolation Protection: 2 kV (for "-I" model)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web console, Serial console, Telnet console
Utility: Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Network Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, SNMPv1 (read only), ARP, Telnet, Radius
Multi-master and Multi-drop:
Master mode: 128 TCP slaves/servers
Slave mode: 256 TCP masters/clients

Physical Characteristics

Fault Relay Circuit: 3-pin circuit with current carrying capacity of 2 A @ 30 VDC
External Storage Drive: SD card for configuration backup
Housing: Metal, IP30
Weight:
MGate MB3660-8-2AC: 2,731 g (6.02 lb)
MGate MB3660-8-2DC: 2,684 g (5.92 lb)
MGate MB3660I-8-2AC: 2,753 g (6.07 lb)
MGate MB3660-16-2AC: 2,830 g (6.24 lb)
MGate MB3660-16-2DC: 2,780 g (6.13 lb)
Dimensions:
Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage:
For DC models: Dual 20 to 60 VDC (1.5 kV isolation)
For AC models: Dual 100 to 240 VAC, 47 to 63 Hz
Input Current:
MGate MB3660-8-2AC: 144 mA @ 110 VAC; 101 mA @ 220 VAC
MGate MB3660-8-2DC: 312 mA @ 24 VDC; 156 mA @ 48 VDC
MGate MB3660I-8-2AC: 244 mA @ 110 VAC; 159 mA @ 220 VAC
MGate MB3660-16-2AC: 178 mA @ 110 VAC; 120 mA @ 220 VAC
MGate MB3660-16-2DC: 390 mA @ 24 VDC; 195 mA @ 48 VDC
Power Connector: Terminal block (for DC models)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1 (LVD)
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

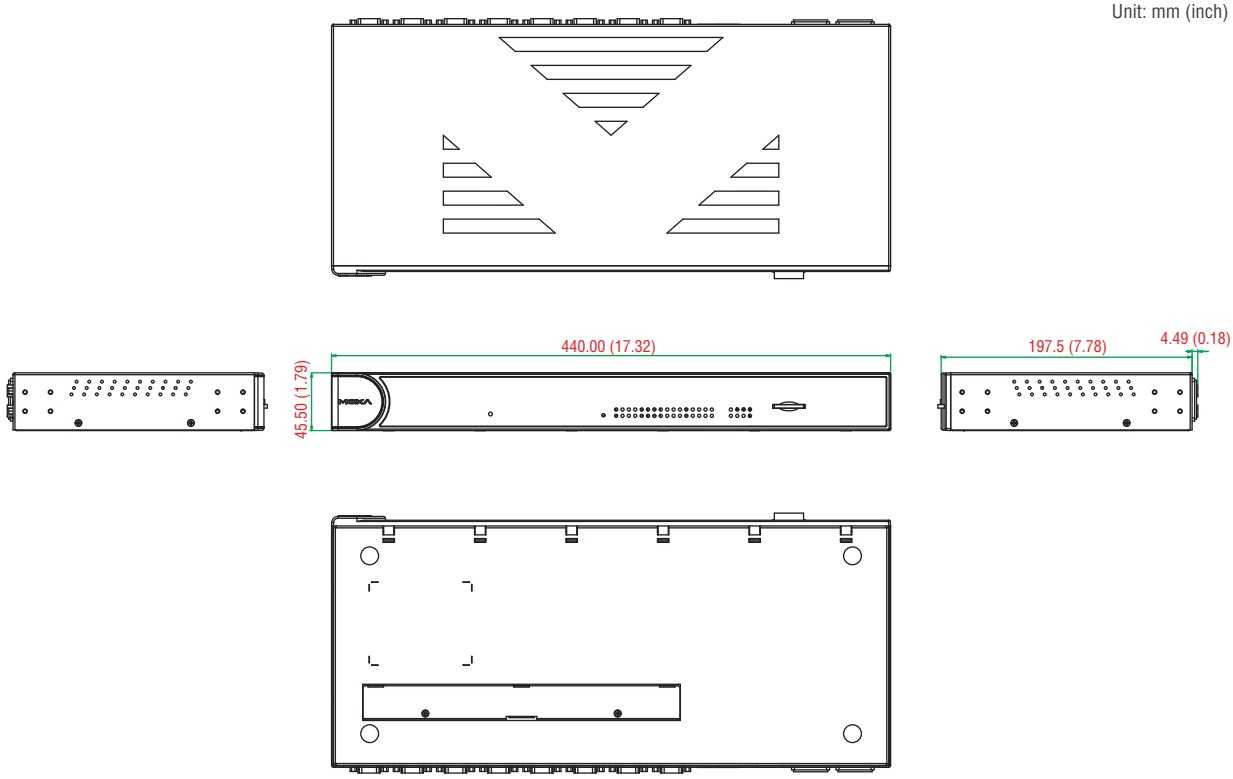
Time:
MGate MB3660-8-2AC: 716,647 hrs
MGate MB3660-8-2DC: 706,783 hrs
MGate MB3660I-8-2AC: 224,851 hrs
MGate MB3660-16-2AC: 487,416 hrs
MGate MB3660-16-2DC: 482,835 hrs
Standard: Telcordia SR332

Warranty

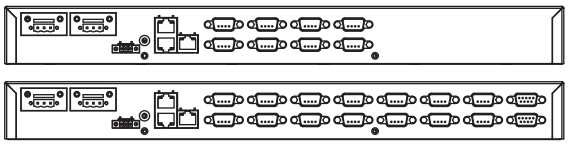
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

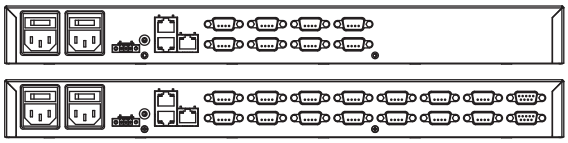
Unit: mm (inch)



DC Models



AC Models



Ordering Information

Available Models

MGate MB3660-8-2AC: Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660-8-2DC: Modbus gateway with dual LANs, dual DC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660I-8-2AC: Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature, 2 kV isolation
MGate MB3660-16-2AC: Modbus gateway with dual LANs, dual AC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature
MGate MB3660-16-2DC: Modbus gateway with dual LANs, dual DC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate MB3660-8 or MB3660-16 Modbus gateway
- 1 serial cable: DBL-RJ45F9-150
- 2 L-shaped brackets for wall mounting
- 2 power cords (suitable for your region)
- Documentation and software CD
- Quick installation guide
- Warranty card

MGate™ 4101-MB-PBS Series

1-port Modbus RTU/ASCII-to-PROFIBUS slave gateways

- Protocol conversion between Modbus and PROFIBUS
- Windows utilities with innovative QuickLink function for automatic configuration within minutes
- Redundant dual DC power inputs and relay output supported
- Embedded data packet analyzer
- Powerful and visual diagnostic tool
- -40 to 75°C wide operating temperature models available

Overview

The MGate 4101-MB-PBS gateway provides a communication portal between PROFIBUS PLCs (e.g. Siemens S7-400 and S7-300 PLCs) and Modbus devices. With the QuickLink feature, I/O mapping can be accomplished within a matter of minutes. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer optional built-in optical isolation.

QuickLink and Windows Utilities for Easy Setup and Traffic Monitoring

The QuickLink windows utility uses a serial console port to connect to the MGate 4101-MB-PBS and makes configuration and operation as easy as possible. QuickLink can finish the configuration in just a few minutes by passively detecting Modbus requests with the AutoLearning function, and performing error-free I/O mapping with the AutoMapping feature. QuickLink drastically reduces Modbus-to-PROFIBUS integration time when compared to conventional I/O mapping, which can easily require days to complete. Additionally, embedded monitoring tools can maintain logs of Modbus communication packets and assist in troubleshooting.

Redundant Power Inputs

The MGate 4101-MB-PBS has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus-to-PROFIBUS gateways ideal for demanding industrial applications.

Warning by Relay Output

A relay output is provided for the power input status. The relay output gives maintenance engineers an additional tool for troubleshooting and maintenance.

Specifications

PROFIBUS Interface

Protocol: PROFIBUS DP-V0 Slave
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)
DIP Switch: For termination
Rotary Switch: PROFIBUS address 0-99 (address 100-125 supported through software configuration)

Modbus Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports: 1
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
ESD Protection: 15 kV for all signals
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Serial Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: QuickLink, Paging

Physical Characteristics

Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate 4101-MB-PBS: 340 mA @ 12 VDC; 130 mA @ 48 VDC
MGate 4101I-MB-PBS: 375 mA @ 12 VDC; 140 mA @ 48 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

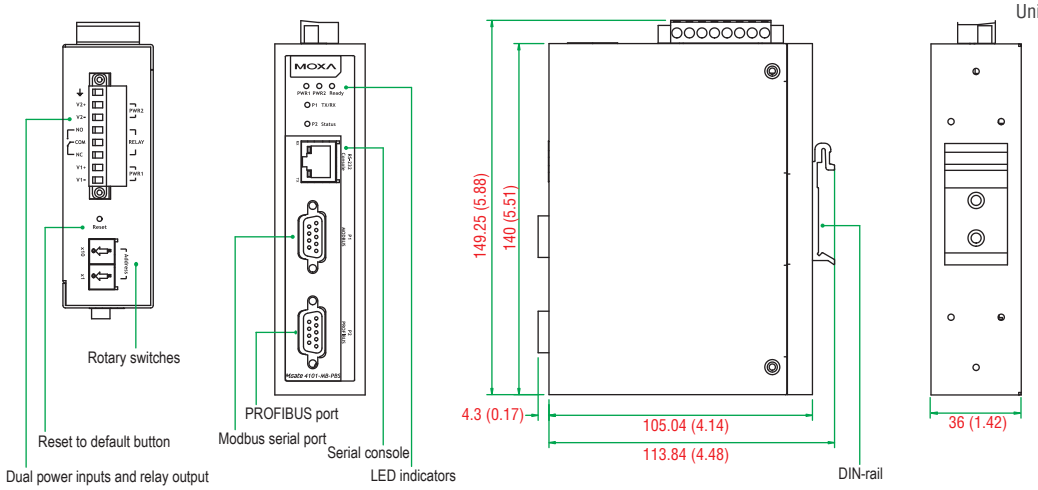
Time: 513,139 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate 4101-MB-PBS: 1-port Modbus-to-PROFIBUS slave gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 4101I-MB-PBS: 1-port Modbus-to-PROFIBUS slave gateway with 2 kV isolation, 12-48 VDC, 0 to 60°C operating temperature
MGate 4101-MB-PBS-T: 1-port Modbus-to-PROFIBUS slave gateway, 12-48 VDC, -40 to 75°C operating temperature
MGate 4101I-MB-PBS-T: 1-port Modbus-to-PROFIBUS slave gateway with 2 kV isolation, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-36-02: DIN-rail/wall-mounting kit, 2 plates with 6 screws
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 4101-MB-PBS or 4101I-MB-PBS Modbus-to-PROFIBUS slave gateway
- 1 Serial Cable: CBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ 5101-PBM-MN Series

1-port PROFIBUS-to-Modbus TCP gateways

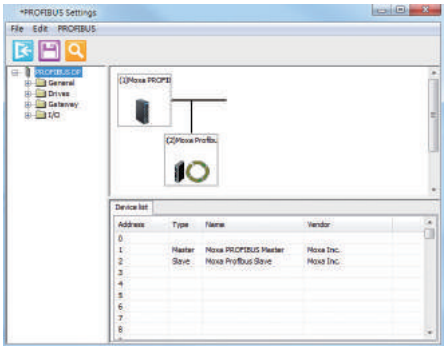
- Protocol conversion between PROFIBUS and Modbus TCP
- Automatic scan of PROFIBUS devices for easy configuration
- Redundant dual DC power inputs and relay output supported
- Embedded data packet analyzer and diagnostic tool
- Web-based GUI for I/O data visualization
- -40 to 75°C wide operating temperature models available

Overview

The MGate 5101-PBM-MN gateway provides a communication portal between PROFIBUS devices (e.g. PROFIBUS drives or instruments) and Modbus TCP hosts. All models are protected with a rugged metallic casing, DIN-rail mountable, and offer optional built-in optical isolation. The PROFIBUS and Ethernet status LED indicators are provided for easy maintenance. The rugged design is suitable for industrial applications such as oil/gas, power, process automation, and factory automation.

Windows Utility for Easy Configuration and Traffic Monitoring

The MGate Manager utility provides a user friendly interface to make configuration and operation as easy as possible. Moxa's innovative AutoScan function can automatically detect all connected PROFIBUS slave devices and their available I/O modules to quickly complete gateway configuration, after which an easy to read data mapping table is created to assist in the configuration of Modbus TCP master (e.g. SCADA, PLC) settings. In addition, users can configure import/export maintenance functions, and use embedded monitoring tools to maintain logs of Modbus communication packets, which can used for troubleshooting.



Various Maintenance Functions

The MGate 5101-PBM-MN provides a Web console and Telnet console for remote maintenance, with both consoles supporting encryption commutation functions such as HTTPS and SSH for preventing unauthorized access. The log functions are provided in firmware such as connection event of Modbus or PROFIBUS for maintenance. Users can monitor each I/O data and review the log through the web console remotely. A relay output alarm is provided for the power input status. It gives maintenance engineers an additional tool for troubleshooting and maintenance.

Redundant Power Inputs

The MGate 5101-PBM-MN has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources to provide uninterrupted operation even if one power source fails. The higher level of reliability makes these advanced PROFIBUS master to Modbus TCP gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)
Modbus TCP:
Operation Modes: Modbus TCP Client/Server

PROFIBUS Interface

Protocol: PROFIBUS DP-V1 Master
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)

Serial Signals (Serial Console)

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software

Configuration Options: Serial Console, Windows Utility, Web Console (HTTP/HTTPS), Telnet/SSH Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: AutoScan, MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics

Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 365 mA @ 12 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

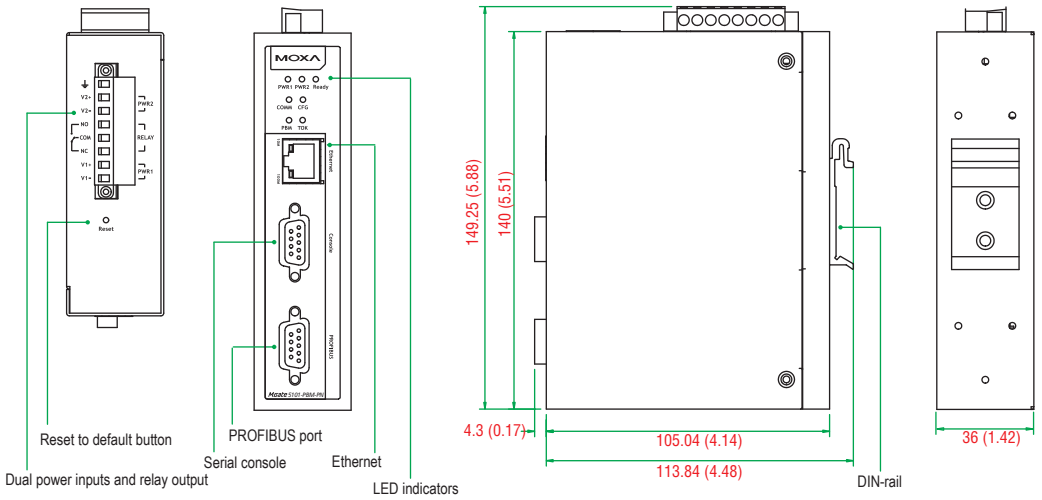
Time: 1,082,881 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate 5101-PBM-MN: 1-port PROFIBUS master to Modbus TCP gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 5101-PBM-MN-T: 1-port PROFIBUS master to Modbus TCP gateway, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 5101-PBM-MN PROFIBUS master to Modbus TCP gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ 5102-PBM-PN Series

1-port PROFIBUS-to-PROFINET gateways

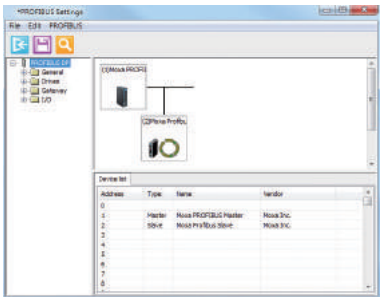
- Protocol conversion between PROFIBUS and PROFINET
- Automatic scan of PROFIBUS devices, and easy configuration
- microSD card for configuration backup
- Built-in Ethernet cascading for easy wiring
- Redundant dual DC power inputs and relay output supported
- Embedded I/O monitoring and diagnostic tools
- Web-based GUI for I/O data visualization
- -40 to 75°C wide operating temperature models available

Overview

The MGate 5102-PBM-PN gateway provides a communication portal between PROFIBUS devices (e.g., PROFIBUS PLC or drive) and the PROFINET host. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer optional built-in optical isolation. The PROFIBUS and Ethernet status LED indicators are provided for easy maintenance. The rugged design is suitable for industrial applications such as oil & gas, power, process automation, and factory automation.

Easy Setup Tools

Both the Windows MGate Manager utility and web console support the AutoScan function, which makes configuration and operation easy. AutoScan automatically detects all connected PROFIBUS slave devices and their available I/O modules, allowing you to configure your gateways very quickly, and a data mapping table is provided. Furthermore, one click is all that's needed to export all PROFIBUS I/O modules to a GSDML file to assist in the configuration of the PROFINET controller (e.g., a Siemens PLC).



Various Maintenance Functions

The MGate 5102-PBM-PN provides a web console and Telnet console for remote maintenance, with both consoles supporting encryption commutation functions such as HTTPS and SSH to prevent unauthorized access. The status and changes in I/O data of all PROFIBUS slaves can be monitored remotely via the web console, and users can also review the log from the web console to see which system events have occurred. A relay output alarm is provided for the power input and Ethernet cable status. These functions make it easy for maintenance engineers to troubleshoot and maintain devices.

Redundant Power Inputs

The MGate 5102-PBM-PN has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources to provide uninterrupted operation even if one power source fails. The higher level of reliability makes these advanced PROFIBUS master to PROFINET gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Protocols: PROFINET RT
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

PROFIBUS Interface

Protocol: PROFIBUS DP-V1 Master
Number of Ports: 1
Data Rate: 9600 bps to 12 Mbps
Connector: DB9 female
Isolation: 2 kV (built-in)

Serial Signals (Serial Console)
Connector: 8-pin RJ45
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Software
Configuration Options: Windows Utility, Serial Console, Web Console (HTTP/HTTPS), Telnet/SSH Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: AutoScan, MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics
Housing: Metal, IP30
Weight: 500 g (1.10 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements
Input Voltage: 12 to 48 VDC
Input Current: 430 mA @ 12 VDC
Power Connector: Terminal block

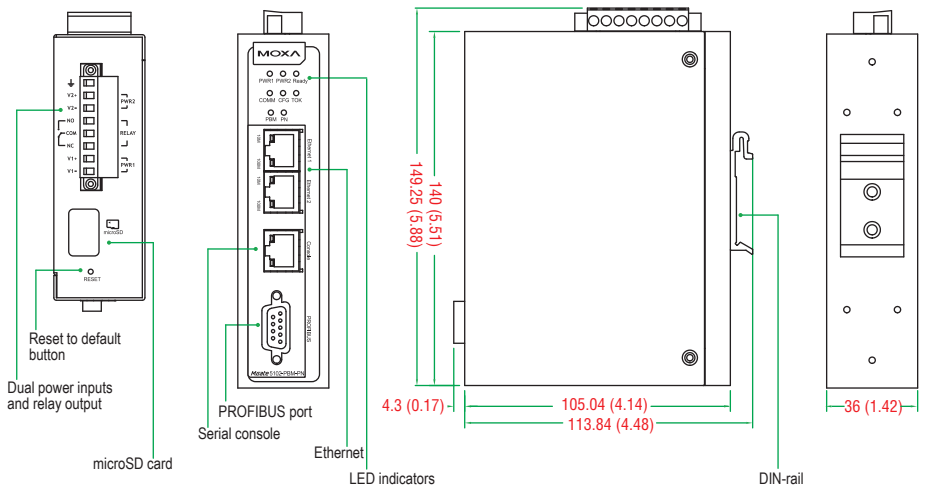
Standards and Certifications
Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)
Time: 980,417 hrs
Standard: Telcordia SR332

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models
MGate 5102-PBM-PN: 1-port PROFIBUS-to-PROFINET gateway, 12-48 VDC, 0 to 60°C operating temperature
MGate 5102-PBM-PN-T: 1-port PROFIBUS-to-PROFINET gateway, 12-48 VDC, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)
CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female shielded serial cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist
- 1 MGate 5102-PBM-PN PROFIBUS-to-PROFINET gateway
- 1 serial cable: CBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

▶ *Award-winning Product*

MGate™ 5105-MB-EIP Series

1-port Modbus RTU/ASCII/TCP-to-EtherNet/IP gateways

- Support for both EtherNet/IP adapter and scanner
- Effortless configuration via web or Windows utility
- Complete packet analysis and diagnosis information for maintenance
- Easy I/O data maintenance via web interface
- microSD card for configuration and system log backup
- -40 to 75°C wide operating temperature models available
- Modbus port with 2 kV built-in isolation protection
- Built-in Ethernet cascading for easy wiring

Overview

The MGate 5105-MB-EIP is an industrial Ethernet gateway for Modbus RTU/ASCII/TCP and EtherNet/IP network communications. To integrate existing Modbus devices onto an EtherNet/IP network, use the MGate 5105-MB-EIP as a Modbus master or slave to collect data and exchange data with EtherNet/IP devices. The latest exchange data will be stored in the gateway as well. The gateway converts stored Modbus data into EtherNet/IP packets so the EtherNet/IP scanner can control or monitor Modbus devices.

Configuration Backup via microSD Card

The MGate 5105-MB-EIP is equipped with a microSD card slot. A microSD card can be used to back up both the system configuration and system log, and can be used to conveniently copy the same configuration to several MGate 5105-MP-EIP units. The configuration file stored in the microSD card will be copied to the MGate itself when the system is rebooted.

Effortless Configuration and Troubleshooting via Web Console

The MGate 5105-MB-EIP also provides a web console to make configuration easy without having to install an extra utility. Simply log in as an administrator to access all settings, or as a general user with read-only permission. Besides configuring basic protocol settings, you can use the web console to monitor I/O data values and transfers. In particular, I/O Data Mapping shows data addresses for both protocols in the gateway's memory and I/O Data View allows you to track data values for online nodes. Moreover, diagnostics and communication analysis for each protocol can also provide helpful information for troubleshooting.

Redundant Power Inputs

The MGate 5105-MB-EIP has dual power inputs for greater reliability. The power inputs allow simultaneous connections to two live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus-to-EtherNet/IP gateways ideal for demanding industrial applications.

Specifications

Ethernet Interface

Protocols: EtherNet/IP, Modbus TCP
Number of Ports: 2 (1 IP, Ethernet cascade)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)
EtherNet/IP:
- Class: Adapter, Scanner
- CIP Objects Supported: Identity, Message Router, Assembly, Connection Manager, TCP/IP interface, Ethernet link, Port
- Max. Number of Connections:
  > MGate as Adapter: 16 connections for read-only, 1 connection for read/write
  > MGate as Scanner: 100 connections
- Max. Total I/O Data Size:
  Input: 2048 bytes (496 bytes per connection)
  Output: 2048 bytes (496 bytes per connection)

Modbus TCP:
- Mode: Client/Server
- Functions Supported: 1, 2, 3, 4, 5, 6, 15, 16, 23
- Max. Number of Commands: 100
- Max. Number of Connections:
  MGate as Modbus TCP Master: 32 connections
  MGate as Modbus TCP Slave: 16 connections
- Max. Total I/O Data Size:
  Input: 2048 bytes
  Output: 2048 bytes

Serial Interface

Protocol: Modbus RTU/ASCII Master/Slave
Number of Ports: 1

Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Isolation: 2 kV (built-in)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Software

Configuration Options: Web Console, Windows Utility, Serial Console
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: MXview, SNMP (v1, v2, v3), Private MIB

Physical Characteristics

Housing: Metal, IP30
Weight: 507 g (1.12 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 455 mA @ 12 VDC; 125 mA @ 48 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

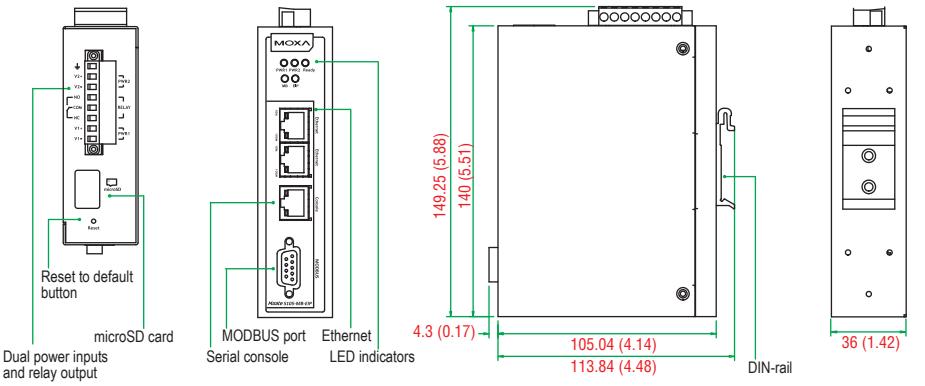
Time: 859,422 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

MGate 5105-MB-EIP: 1-port Modbus-to-EtherNet/IP gateway, 0 to 60°C operating temperature
MGate 5105-MB-EIP-T: 1-port Modbus-to-EtherNet/IP gateway, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45SF9-150: RJ45 to DB9 female serial shielded cable, 150 cm
ADP-RJ458P-DB9F: DB9 female to RJ45 connector
A-ADP-RJ458P-DB9F-ABC01: DB9 female to RJ45 connector
Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

- 1 MGate 5105-MB-EIP Modbus-to-EtherNet/IP gateway
- 1 serial cable: DBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

MGate™ EIP3000 Series

1 and 2-port EtherNet/IP-to-DF1 gateways

- PCCC objects for Rockwell Automation networks supported
- Use ProCOM to implement control via COM port mapping
- 8 simultaneous EtherNet/IP client/server pairs with up to 16 queued requests
- Serial redirector keeps the original serial master and slave connection while connecting devices to the Ethernet
- EtherNet/IP and DF1 protocol analyzer for easy troubleshooting
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring
- -40 to 75°C wide operating temperature models available

ProCOM

Overview

MGate™ EIP3000 gateways provide EtherNet/IP to DF1 protocol conversion for users who need to connect Allen Bradley PLCs to an EtherNet/IP network. With a number of innovative functions, the MGate™ series overcomes the difficulties of connecting between legacy serial devices and SCADA software. Both 1 and 2-port gateways are available for use with different sized control networks.

Protocol Conversion between DF1 and EtherNet/IP

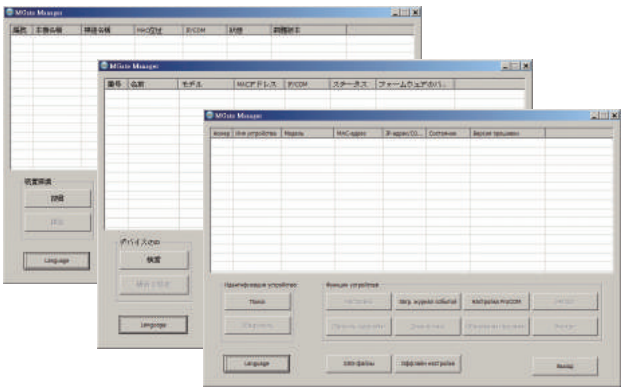
By supporting PCCC objects on CIP, the MGate™ EIP3000 can communicate seamlessly with SCADA software such as RSLinx. For users who develop control software based on EtherNet/IP, MGate EIP3000 offers the standard interface for connection.

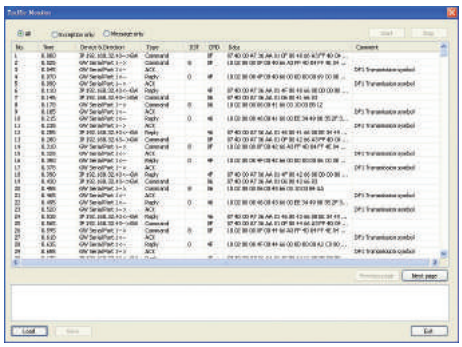
Support for Multiple EtherNet/IP Connections

MGate™ EIP3000 gateways support up to 16 EtherNet/IP clients and servers simultaneously. Each client can send up to 16 requests at a time, and the multiple connection capability can help establish redundancy for more complex control systems.

Windows Utility for Easy Setup and Traffic Monitoring

Moxa provides a user-friendly Windows utility with multi-language support. The utility supports a traffic monitoring function for EtherNet/IP and DF1 protocols, and not only logs events initiated by the gateway, but also records all commands and responses that pass through the gateway. The utility helps users determine the root cause of failures and performance bottlenecks.





Serial Redirector Function Maintains Original Master/Slave Connections

The serial redirector function allows the commands of a serial master (command initiator) to be redirected to the serial slave (command executor) on another port. In addition, a serial master can operate simultaneously with EtherNet/IP masters without changing the DF1 architecture or software. With the serial redirector function, MGate™ EIP3000 gateways can establish redundant control of legacy slave devices that were originally designed to be controlled by a single serial master.

ProCOM Implements Control via COM Port Mapping

Each MGate™ EIP3000 gateway supports virtual serial ports for the remote PC. You can connect to the MGate™ EIP3000 through the COM port by using Moxa's Real COM driver, with the actual physical connection over the Ethernet. The gateway supports up to 4 virtual COM port connections and offers greater flexibility when designing redundant control systems.

Pull high/low Resistors and Terminator Selection

When using termination resistors to prevent serial signal reflection, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since no set of resistor values is universally compatible with all environments, the EIP3000 has DIP switches on the bottom panel for setting the termination and pull high/low resistor values.

Built-in Isolation

Complex device networks that incorporate high amperage devices could be subject to electrical signal distortion from electrical discharges, magnetic noise, or common mode transients. MGate™ series products solve this problem by using built-in optical isolation.

Specifications

Ethernet Interface

Protocols: CIP (PCCC) on EtherNet/IP
Number of Ports: 2 (1 IP, supports Ethernet cascading)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocol: DF1 Full-duplex
Number of Ports:
EIP3170/3170I: 1
EIP3270/3270I: 2
Serial Standards: RS-232/422, software selectable
Connectors:
EIP3170/3170I: DB9 male for RS-232, terminal block for RS-422
EIP3270/3270I: DB9 male x 2
ESD Protection: 15 kV for all signals

Serial Communication Parameters

Data Bits: 8
Stop Bits: 1, 2
Parity: None, Even, Odd
Flow Control: RTS/CTS, DTR/DSR (RS-232 only)
Baudrate: 1200 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND

Software

Configuration Options: Serial Console, Telnet Console, Windows Utility
Utility: MGate Manager for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: Smart Routing, Serial Redirection, ProCOM, MXview, SNMP v1 (read only)

Physical Characteristics

Housing: Plastic, IP30
Weight:
MGate EIP3170: 360 g (0.79 lb)
MGate EIP3270: 380 g (0.84 lb)
Dimensions:
Without ears: 29 x 89.2 x 118.5 mm (1.14 x 3.51 x 4.67 in)
With ears extended: 29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current:
MGate EIP3170: 435 mA @ 12 VDC
MGate EIP3170I: 555 mA @ 12 VDC
MGate EIP3270: 435 mA @ 12 VDC
MGate EIP3270I: 510 mA @ 12 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 4 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
IEC 61000-4-11

MTBF (mean time between failures)

Time:
MGate EIP3170: 210,794 hrs
MGate EIP3270: 125,234 hrs
Standard: Telcordia SR332

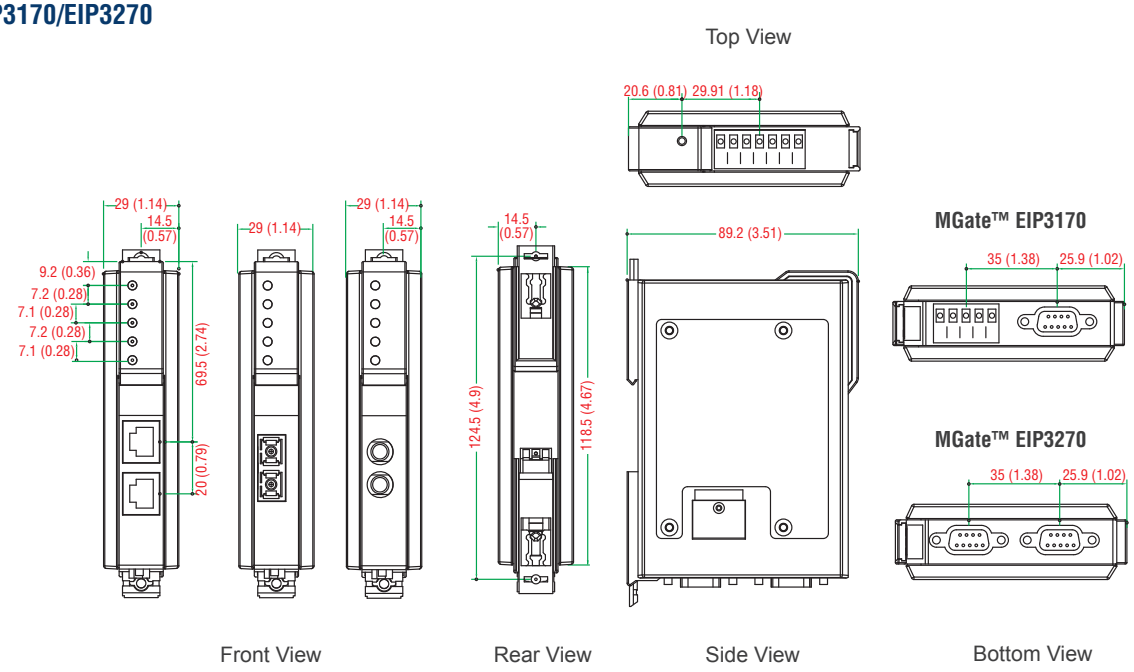
Warranty

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

Dimensions

Unit: mm (inch)

EIP3170/EIP3270



Ordering Information

Available Models

MGate EIP3170: 1-port EtherNet/IP-to-DF1 gateway, 0 to 60°C operating temperature
MGate EIP3170I: 1-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate EIP3270: 2-port EtherNet/IP-to-DF1 gateway, 0 to 60°C operating temperature
MGate EIP3270I: 2-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, 0 to 60°C operating temperature
MGate EIP3170-T: 1-port EtherNet/IP-to-DF1 gateway, -40 to 75°C operating temperature
MGate EIP3170I-T: 1-port EtherNet/IP-to-DF1 gateway with 2 kV isolation, -40 to 75°C operating temperature
MGate EIP3270-T: 2-port EtherNet/IP-to-DF1 gateway, -40 to 75°C operating temperature

Package Checklist

- 1 MGate EIP3170 or EIP3170I or EIP3270 or EIP3270I EtherNet/IP gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector

One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

MGate™ W5108/W5208 Series

Preliminary

1 and 2-port IEEE 802.11a/b/g/n wireless Modbus/DNP3 gateways

*Available in March, 2016

- Retrieve Modbus/DNP3 serial data through an 802.11 network
- Supports serial tunneling communications
- Slave mode supports 16 TCP masters and up to 31 or 62 serial slaves at the same time
- Embedded Modbus traffic monitor
- Dual DC power inputs for redundancy and relay output supported
- Secure data access with WEP/WPA/WPA2
- 2 kV serial port isolation
- microSD card for configuration backup
- -40 to 75°C wide operating temperature models available
- Supports 2 digital inputs and 2 digital outputs

Overview

The MGate W5108/W5208 series gateways are an ideal choice for connecting Modbus serial devices to a wireless LAN, or DNP3 serial to DNP3 IP through a wireless LAN. With IEEE 802.11a/b/g/n support, you can use fewer cables in difficult wiring environments, and for secure data transmission, the MGate W5108/W5208 series gateways support WEP/WPA/WPA2. The gateways' rugged design makes them suitable for industrial applications, including oil & gas, power, process automation, and factory automation.

Modbus Traffic Monitor

The MGate W5108/W5208 series gateways support Modbus Protocol Traffic Monitor for easy troubleshooting, especially during the installation stage. Communication issues could be caused by incorrect software parameters, such as slave ID and register address, or incorrect hardware parameters such as baudrate and interface. With Modbus Protocol Traffic Monitor support, you can check the captured data and easily identify the root cause.

Variety Maintenance Functions

The MGate W5108/W5208 series gateways support a web console and Telnet console for remote maintenance. Each gateway also supports encryption commutation functions such as HTTPS and SSH to prevent security issues. In addition, log functions are provided in the firmware to record connection events and Modbus for maintenance events. Users can review log data remotely through the web console.

Specifications

Ethernet Interface

Protocols: Modbus TCP, DNP3, TCP Client/Server modes supported
Number of Ports: 1
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)

Serial Interface

Protocols: Modbus RTU/ASCII Master/Slave, DNP3
Number of Ports:
MGate W5108: 1
MGate W5208: 2
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Isolation: 2 kV (built-in)

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, RTS Toggle
Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w: Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w: Data+, Data-, GND

Wireless Network

Standards Compliance: 802.11a/b/g/n
Network Modes: Infrastructure, Ad-Hoc
Transmission Rate:
802.11a/g: 65, 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto rate
802.11b: 11, 5.5, 2, 1 Mbps, auto rate
802.11n 2.4 GHz: HT20, MCS 0-7
802.11n 5 GHz: HT20 & HT40 MCS 0-7
Transmission Distance: Up to 100 meters (in open areas)
Antenna Connector: Reverse SMA
TX Transmit Power (per antenna port):
2.4 GHz
- 802.11b:
  1 to 11 Mbps, Typ. 16 (±1.5 dBm)
- 802.11g:
  6 to 36 Mbps, Typ.16 (±1.5 dBm)
  48 Mbps, Typ. 15 (±1.5 dBm)
  54 Mbps, Typ. 14 (±1.5 dBm)
- 802.11n (20 MHz):
  MCS0-3: Typ. 16 dBm (± 1.5 dBm)
  MCS4-5: Typ. 14 dBm (± 1.5 dBm)
  MCS6-7: Typ. 12 dBm (± 1.5 dBm)

5 GHz
- 802.11a:
  6 to 36 Mbps, Typ.15 (±1.5 dBm)
  48 Mbps, Typ. 15 (±1.5 dBm)
  54 Mbps, Typ. 14 (±1.5 dBm)
- 802.11n (20/40 MHz):
  MCS0-3: Typ. 15 dBm (± 1.5 dBm)
  MCS4-5: Typ. 14 dBm (± 1.5 dBm)
  MCS6-7: Typ. 12 dBm (± 1.5 dBm)

RX Sensitivity:
2.4 GHz
- 802.11b:
  -92 dBm @ 1 Mbps,
  -88 dBm @ 2 Mbps,
  -87 dBm @ 5.5 Mbps,
  -84 dBm @ 11 Mbps
- 802.11g:
  -91 dBm @ 6 Mbps,
  -90 dBm @ 9 Mbps,
  -88 dBm @ 12 Mbps,
  -86 dBm @ 18 Mbps,
  -80 dBm @ 24 Mbps,
  -80 dBm @ 36 Mbps,
  -74 dBm @ 48 Mbps,
  -73 dBm @ 54 Mbps
- 802.11n(20MHz):
  -89 dBm @ MCS0
  -87 dBm @ MCS1
  -85 dBm @ MCS2
  -81 dBm @ MCS3
  -78 dBm @ MCS4
  -74 dBm @ MCS5
  -73 dBm @ MCS6
  -71 dBm @ MCS7

5 GHz
- 802.11a:
  -91 dBm @ 6 Mbps,
  -90 dBm @ 9 Mbps,
  -88 dBm @ 12 Mbps,
  -86 dBm @ 18 Mbps,
  -82 dBm @ 24 Mbps,
  -81 dBm @ 36 Mbps,
  -75 dBm @ 48 Mbps,
  -74 dBm @ 54 Mbps
- 802.11n (20MHz):
  -89 dBm @ MCS0
  -87 dBm @ MCS1
  -85 dBm @ MCS2
  -81 dBm @ MCS3
  -78 dBm @ MCS4
  -74 dBm @ MCS5
  -73 dBm @ MCS6
  -71 dBm @ MCS7
- 802.11n (40MHz):
  -85 dBm @ MCS0
  -84 dBm @ MCS1
  -81 dBm @ MCS2
  -77 dBm @ MCS3
  -75 dBm @ MCS4
  -70 dBm @ MCS5
  -69 dBm @ MCS6
  -67 dBm @ MCS7

Spread Spectrum and Modulation (Typical):
OFDM (54, 48, 36, 24, 18, 12, 9, 6 Mbps)
OFDM (MCS0, MCS1, MCS2, MCS3 MCS4, MCS5, MCS6, MCS7)
CCK (11 Mbps, 5.5 Mbps)
DQPSK (2 Mbps)
DBPSK (1 Mbps)
Operating Channels (Central frequency):
- US:
  2.412 to 2.462 GHz (11 channels)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (8 channels, excludes 5.600 to 5.640 GHz)
  5.745 to 5.825 GHz (5 channels)
- EU:
  2.412 to 2.472 GHz (13 channels)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (11 channels)
- JP:
  2.412 to 2.484 GHz (14 channels, DSSS)
  5.180 to 5.240 (4 channels)
  5.260 to 5.320 (4 channels)
  5.500 to 5.700 GHz (11 channels)

Digital Input/Output

Number of DIOs: 2 DIs and 2 DOs
Connectors: 6-pin terminal blocks
Dry Contact Level:
Logic “0”: Short to GND
Logic “1”: Open
Wet Contact Level:
Logic “0”: +3 VDC max.
Logic “1”: +10 to 30 V (COM to DI)
Digital Output (Sink Type):
Driver Current: Max. 200 mA per channel
On-state voltage: 24 VDC nominal, open collector to 30 V
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

Software

Configuration Options: Web console, Serial console, Telnet console
Utility: Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Network Protocols: TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, SNMP (v1, v2, v3), Private MIB, ARP, Telnet

Security

Authentication: WEP encryption (64 or 128 bit), WPA / WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Encryption: 128-bit TKIP/AES-CCMP EAP-TLS, PEAP/GTC, PEAP/MD5, PEAP/MSCHAPV2, EAP-TTLS/PAP, EAP-TTLS/CHAP, EAP-TTLS/MSCHAP, EAP-TTLS/MSCHAPV2, EAP-TTLS/EAP-MSCHAPV2, EAP-TTLS/EAP-GTC, EAP-TTLS/EAP-MD5, LEAP

Physical Characteristics

Housing: Metal, IP30
Weight:
MGate W5108: 589 g (1.30 lb)
MGate W5208: 738 g (1.63 lb)
Dimensions:
MGate W5108: 45.8 x 105 x 134 mm (1.8 x 4.13 x 5.28 in)
MGate W5208: 59.6 x 101.7 x 134 mm (2.35 x 4 x 5.28 in)

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)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 9 to 60 VDC
Input Current: 495 mA @ 9 VDC; 202 mA @ 24 VDC; 114 mA @ 48 VDC; 99 mA @ 60 VDC
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: UL/cUL, Class 1 Division 2, ATEX Zone 2, IECEx*
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class B
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV
IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m
IEC 61000-4-8 PFMF
Radio:
EN 300328, EN 301893, TELECOM
CE (ETSI EN 301 893, ETSI EN 300 328), ARIB RCR STD-33, ARIB STD-66
*Certification process is underway. Please contact a Moxa sales representative for details.

Reliability

Alarm Functions: SMS, relay, e-mail
Alert Tools: Built-in buzzer
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

MTBF (mean time between failures)

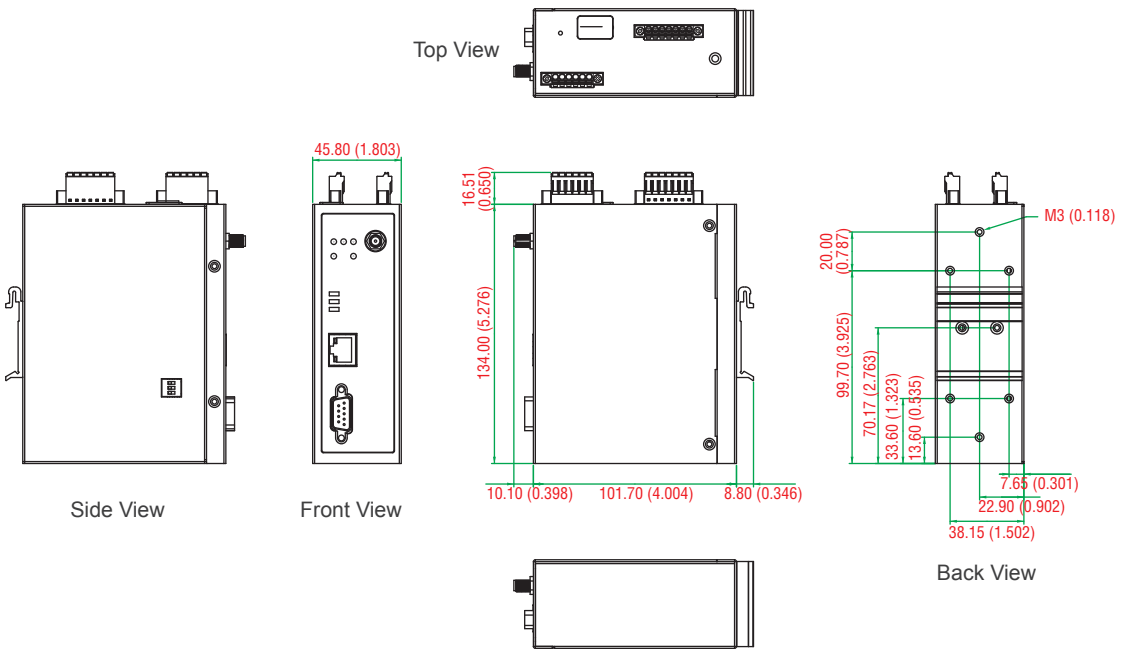
Time:
MGate W5108: 668,518 hrs
MGate W5208: 556,271 hrs
Standard: Telcordia SR332

Warranty

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

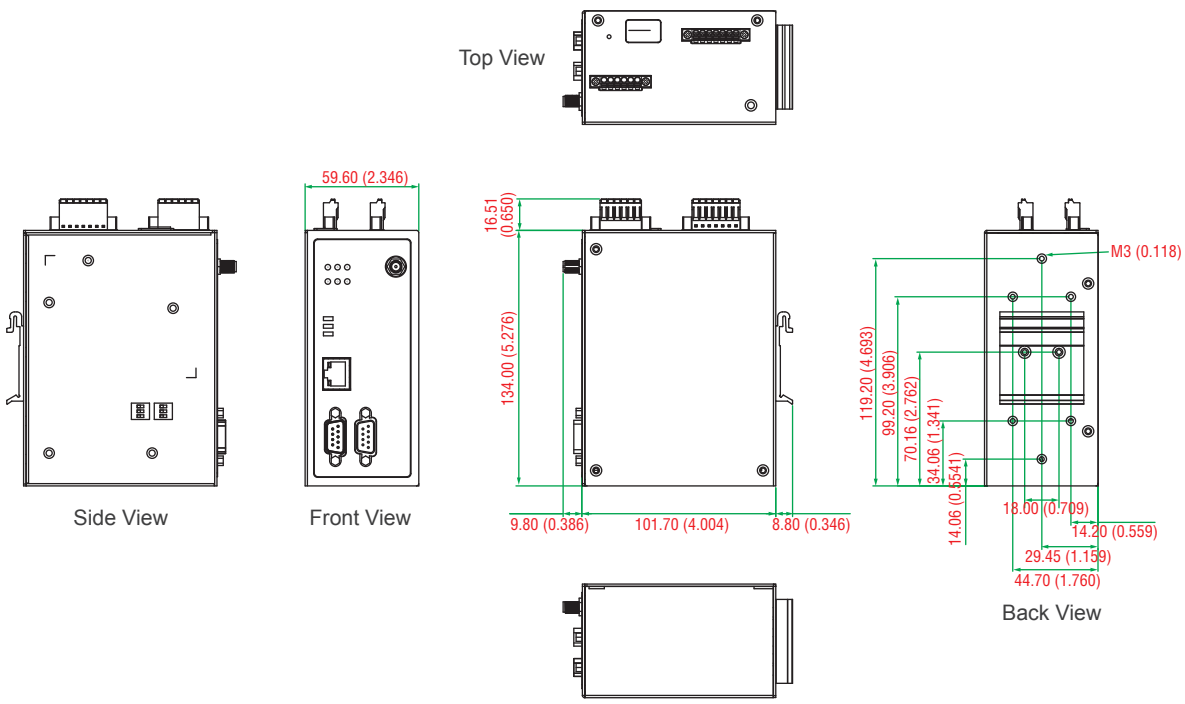
Dimensions (MGate W5108)

Unit: mm (inch)



Dimensions (MGate W5208)

Unit: mm (inch)



Ordering Information

Available Models

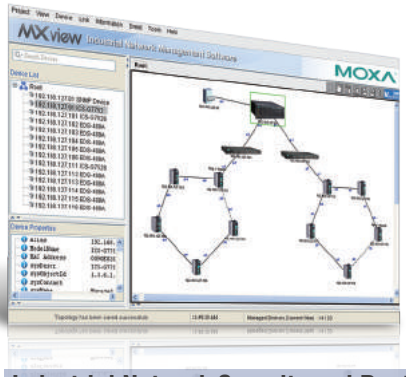
MGate W5108: 1-port Modbus/DNP3 gateway with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), 0 to 60°C operating temperature
MGate W5108-T: 1-port Modbus/DNP3 gateway with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), -40 to 75°C operating temperature
MGate W5208: 2-port Modbus gateway/DNP3 with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), 0 to 60°C operating temperature
MGate W5208-T: 2-port Modbus gateway/DNP3 with 802.11 a/b/g/n WLAN (includes US/Euro/Japan bands), -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

Mini DB9F-to-TB: DB9 female to terminal block connector
One power adapter suitable for your region is included in the product package. Additional power adapters can be purchased separately. Please refer to the Appendix for details.

Package Checklist

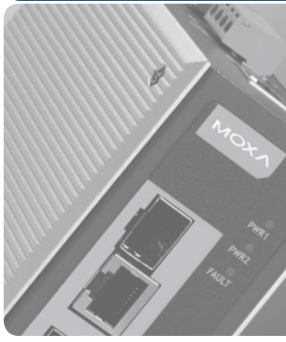
- 1 MGate W5108 or MGate W5208 WiFi gateway
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card



Industrial Network Security and Management

5

Industrial Network Security and Management



Introduction to Industrial Network Security and Routers

The convergence of IT and industrial automation networks has created tremendous opportunities, but it has also introduced concerns related to network security.

Security threats to industrial networks can originate either internally or externally and, if realized, cause significant damage to remote automation systems, compromise staff safety, and lead to production losses. EDR series routers use a Virtual Private Network (VPN) over a public network to provide secure remote access to field devices, and they use a firewall to protect mission-critical infrastructures and assets.

The increasing complexity of industrial networks requires the segmentation of the network into different function zones. EDR series routers can also be used as Layer 3 routers for packet routing between WANs and multiple LANs.

With the convergence of IT and industrial automation networks, data, voice, and even video are now being transmitted over the same medium; therefore, requiring high-bandwidth connections to prevent network congestion. The EDR series provides nonstop communications for industrial automation networks with gigabit bandwidth, making industrial control systems more reliable but at a lower total cost of ownership.

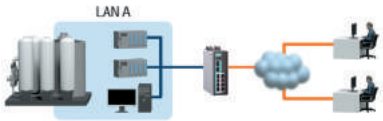
Enable Secure Industrial Automation Networks

VPN for Secure Remote Access

The EDR series' IPSec (Client/Server) and L2TP (Server) functions create secure, encrypted tunnels for secure remote access between industrial networks and remote locations, such as in water and wastewater, oil and gas, power, or intelligent transportation system networks.

IPSec provides a secure tunnel between different LANs, such as a headquarters and remote sites, and an L2TP server provides secure communications between a roaming user and critical devices on the automation network.

Sevure VPN Tunnel from LAN to LAN

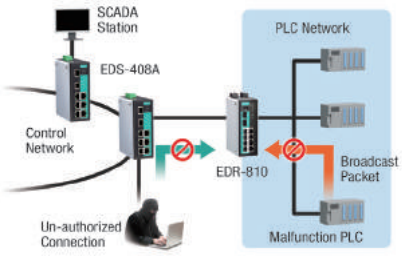


Secure VPN Tunnel for Remote Maintenance

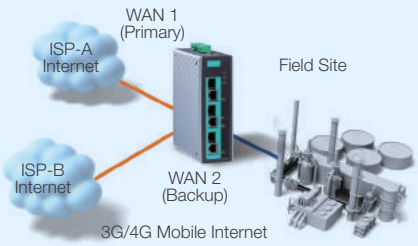
Firewalls for Critical Infrastructure Protection

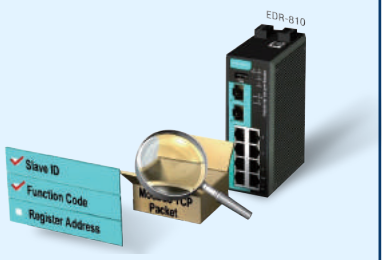
The EDR series provides firewall protection for critical network devices such as PLCs, RTUs, and DCSs, thereby enabling network isolation to avoid communications interruptions between devices.

The high-performance firewall prevents unauthorized connections from connecting to critical devices without compromising the network performance of legitimate traffic. In addition, the EDR series can protect and isolate the network when broadcast storm packets accumulate from a malfunctioning device.



Tailored Design for Industrial Applications





Wizard for configurable WAN/LAN interfaces on ports

Dual WANs for redundancy

Built-in PacketGuard™ for Modbus TCP packet inspection

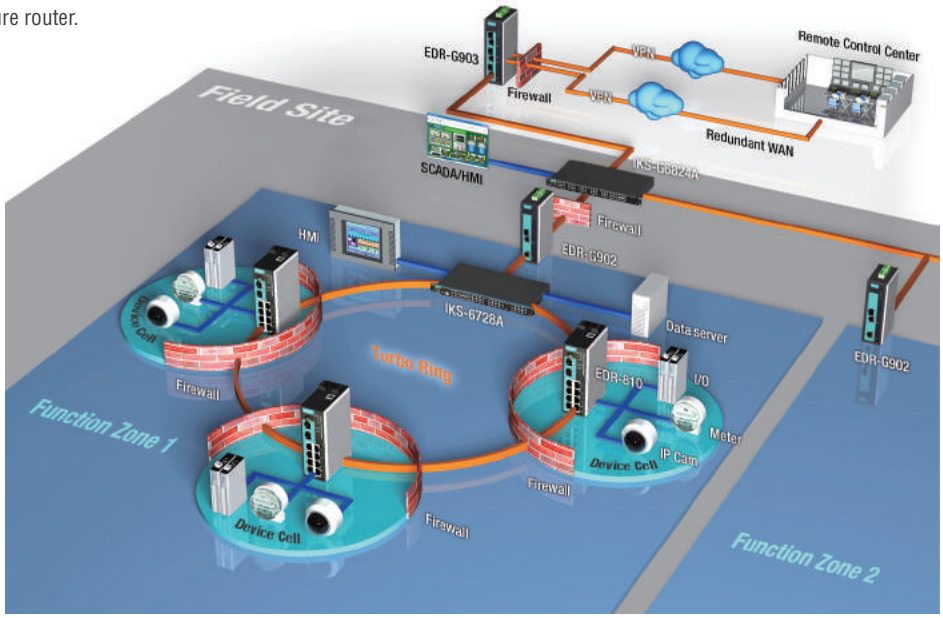
Layered Defense-in-Depth Cybersecurity for Automation

Recognizing the unique security challenges facing ICS networks, the American National Standards Institute (ANSI) and the International Society of Automation (ISA) have promulgated the ANSI/ISA-99 (IEC 62443) standards, which describe best practices for ICS security. Central to the IEC 62443 standard is the "zone and conduit" security model, which is implemented with a defense-in-depth strategy.

In the security model suggested by the IEC 62443 standard, ICS devices are segmented into independent zones composed of interconnected devices that work closely together to achieve a specific function. While communications within a zone are less restricted, different zones are required to communicate with each other through a single point called a conduit, which is usually protected by a secure router or firewall. The conduits are robustly protected to only allow the specific data that is needed to coordinate the functions of the different zones. Any communications that are irrelevant to the function of a certain zone, such as http traffic to a Modbus TCP zone, will be blocked by the secure router.

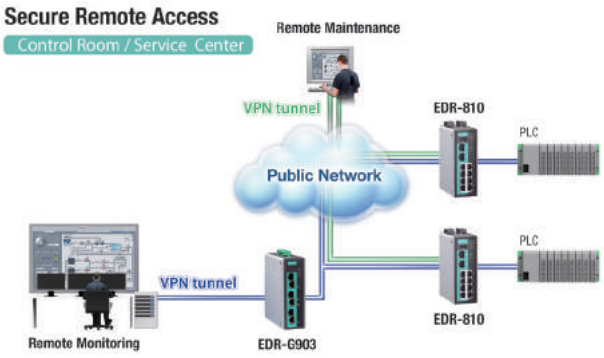
Moxa's portfolio of cybersecurity solutions includes: the EDR-G903, a high-performance secure router; the EDR-G902, a highly cost-effective secure router; and the EDR-810, an integrated router/switch solution. This complete portfolio allows you to deploy optimized cybersecurity coverage anywhere on the automation network at different locations such as:

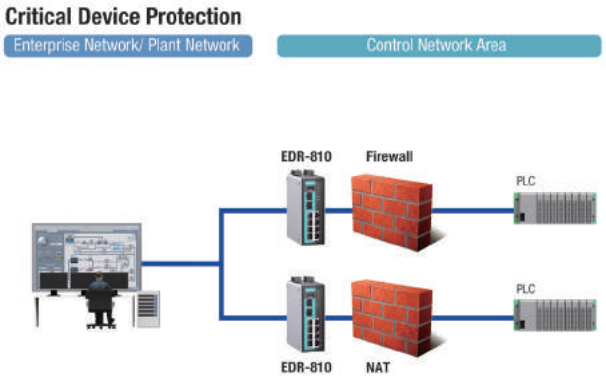
- **Factory Site:** Protecting the entire local site and securing remote data transmissions from the control centers.
- **Function Zone:** Protecting data transmissions from multiple device cells and critical devices.
- **Device Cell:** Protecting the data collected from multiple field devices, such as I/Os, meters, or IP cameras.



Secure Remote Access and Critical Device Protection

As an all-in-one firewall/NAT/VPN/router, the EDR series creates encrypted VPN tunnels between control rooms and remote sites. In addition, the built-in firewall/NAT functions prevent unauthorized access or broadcast storms, caused by malfunctioning devices, from damaging critical network devices, such as PLCs and DCS.





EDR-G902/G903 Series

Award-winning Product
TAIWAN EXCELLENCE 2011

Industrial secure routers with firewall/NAT/VPN

- Firewall/NAT/VPN/Router all-in-one
- Secure remote access tunnel with VPN
- Protect critical assets with stateful firewall
- Inspect industrial protocol with PacketGuard technology
- Easy network setup with address translation (NAT)
- Dual WAN redundant interfaces through public networks
- Support for VLANs in different interfaces
- -40 to 75°C operating temperature range (T model)
- ISA99 / IEC 62443 / NERC CIP compliance

IEC 61850-3 IEEE 1613 (EDR-G903) (EDR-G902)

Introduction

The EDR-G903/G902 series is a high-performance, industrial VPN server with a firewall/NAT all-in-one secure router. It is designed for Ethernet-based security applications in sensitive remote control or monitoring networks, and it provides an Electronic Security Perimeter for the protection of critical cyber assets such as pumping stations, DCS, PLC systems on oil rigs, and water treatment systems. The EDR-G902/G903 series includes the following cybersecurity features:

- Virtual Private Network (VPN): VPNs are designed to provide users with secure communication links when accessing a private network from the public Internet. They use IPSec (IP Security) server or client mode for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.
- Firewall: Controls network traffic between different trust zones. Network Address Translation (NAT), which shields the internal LAN from unauthorized activity from outside hosts, is included.

The EDR-G902/G903's Quick Automation Profile function supports most common fieldbus protocols, including EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, Modbus/TCP, and PROFINET. Users can easily create a secure Ethernet Fieldbus network from a user-friendly web UI with a single click. In addition, Moxa's PacketGuard technology (Deep Packet Inspection) helps to filter Modbus TCP commands at OSI layer 7. The wide temperature range models that are available operate reliably in hazardous, -40 to 75°C environments.

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 1000BaseX
Protocols: SNMPv1/v2c/v3, DHCP Server/Client, TFTP, NTP/SNTP server and client, HTTP, HTTPS, Telnet, SSH, Syslog, SMTP, LLDP, PPPoE, PPTP, Dynamic DNS, traffic prioritization
Routing: Static routing, RIP V1/V2, OSPF
Throughput:
• EDR-G902: Max. 25000 packets per second (or 300 Mbps)
• EDR-G903: Max. 40000 packets per second (or 500 Mbps)
Routing Redundancy: VRRP
VLAN: 5 VLANs per interfaces (VLAN ID: 1 to 4094)
Flow Control: IEEE 802.3x flow control, back pressure flow control

Security Functions

Firewall:
Features:
• Stateful inspection
• Router firewall and transparent (bridge) firewall
• Filter: IP and MAC address, ports, ICMP, Ethernet protocols
• Deep Packet Inspection: Modbus TCP/UDP
• Quick Automation Profiles: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS
Throughput:
• EDR-G902: Max. 25000 packet per second (or 300 Mbps)
• EDR-G903: Max. 40000 packet per second (or 500 Mbps)
DoS and DDoS Protection: Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, SYN/RST Scan, NEW-Without-SYN Scan, ICMP-Death, SYN-Flood, ARP-Flood
NAT: N-to-1, 1-to-1, bidirectional 1-to-1, and port forwarding

IPSec VPN:
Protocols:
• IPSec
• L2TP (server)
• PPTP (client)
Encryption:
• DES, 3DES, AES-128, AES-192, AES-256
Authentication:
• RSA (key size: 1024-bit, 2048-bit)
• X.509 v3 certificate
• MD5 and SHA (SHA-256)
Throughput:
• EDR-G902: Max. 60 Mbps (Condition: AES-246, SHA-256)
• EDR-G903: Max. 150 Mbps (Condition: AES-246, SHA-256)
Concurrent VPN Tunnels:
• EDR-G902: 50 IPSec VPN Tunnels (Max. 15 start in initial mode)
• EDR-G903: 100 IPSec VPN Tunnels (Max. 30 start in initial mode)
OpenVPN:
Protocols:
• OpenVPN (client and server), UDP and TCP
• Tunnel mode (routing) and TAP mode (bridge)
Encryption:
• Blowfish CBC, DES CBC, DES-EDE3 CBC, AES-128/192/256 CBC
Authentication:
• User password by MD5 and SHA1
Concurrent VPN Tunnels:
• Server mode: max. 5 external clients
• Client mode: max. 2 external servers
Real-Time Firewall / VPN Event Log:
• Event Type: Firewall Event, VPN Event, System Security Event
• Media: Local storage, Syslog server, and SNMP trap

Interface

WAN/WAN1: 1 RJ45/Fiber combo port
WAN2/DMZ: 1 RJ45/Fiber combo port
LAN:
EDR-G903: RJ45/SFP combo port
EDR-G902: RJ45
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
LED Indicators: PWR1, PWR2, FAULT, 10/100/1000M
Alarm Contact: One relay output with current-carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: 0.45 A @ 24 V
Overload Current Protection: Present
Connection: Removable terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP 30 protection
Dimensions: 51 x 152 x 131.1 mm (2.01 x 5.98 x 5.16 in)
Weight: 1250 g (2.82 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Power Automation: IEC 61850-3 (EDR-G903)
Marine: DNV (EDR-G902)
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 (mean time between failures)

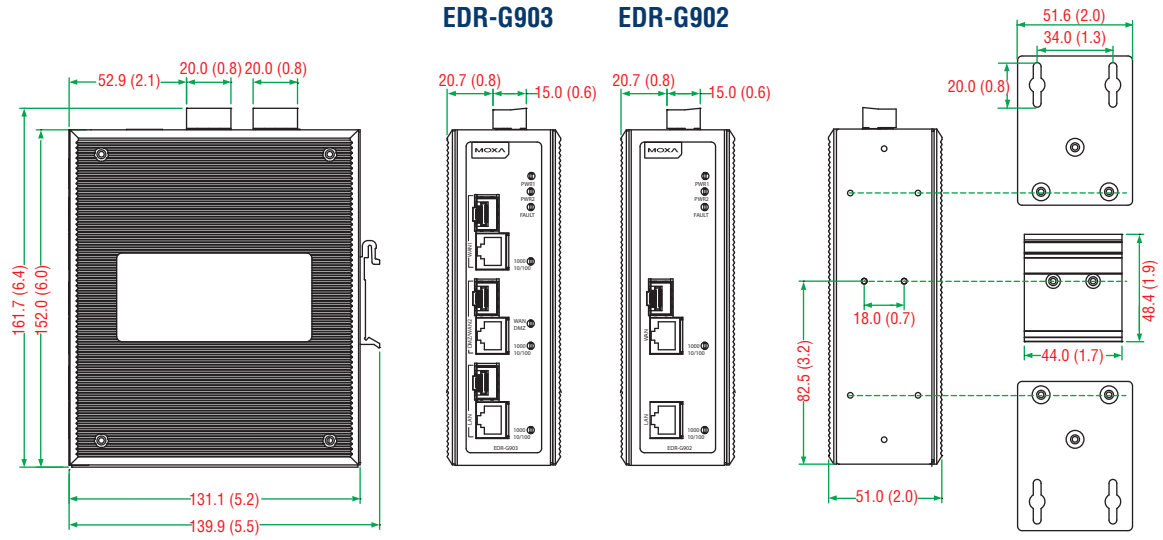
Time: 530,000 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models

EDR-G902: Industrial secure routers with 1 WAN, firewall/NAT/VPN, 0 to 60°C operating temperature
EDR-G902-T: Industrial secure routers with 1 WAN, firewall/NAT/VPN, -40 to 75°C operating temperature
EDR-G903: Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, 0 to 60°C operating temperature
EDR-G903-T: Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, -40 to 75°C operating temperature

Note: The EDR-G903/G902 series secure routers support 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for 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-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDR-G903/G902 secure router
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Award-winning Product

EDR-810 Series

8+2G multiport industrial secure router with switch/firewall/NAT/VPN

- 8+2G all-in-one firewall/NAT/VPN/router/switch
- Build up secure remote access tunnel with VPN
- Protect critical assets by stateful firewall
- Inspect industrial protocol with PacketGuard technology
- Easy network setup with network address translation (NAT)
- RSTP/Turbo Ring redundant protocol enhances network redundancy
- -40 to 75°C operating temperature range (T model)
- ISA99 / IEC 62443 / NERC CIP compliance
- Check firewall settings with intelligent SettingCheck feature

Introduction

The EDR-810 is a highly integrated industrial multiport secure router with firewall/NAT/VPN and managed Layer 2 switch functions. It is designed for Ethernet-based security applications in sensitive remote control or monitoring networks, and it provides an electronic security perimeter for the protection of critical cyber assets such as pumping/treatment systems in water stations, DCS systems in oil and gas applications, and PLC/SCADA systems in factory automation. The EDS-810 series includes the following cybersecurity features:

- **Firewall/NAT:** Firewall policies control network traffic between different trust zones, and Network Address Translation (NAT) shields the internal LAN from unauthorized activity by outside hosts.
- **VPN:** Virtual Private Networking (VPN) is designed to provide users with secure communication tunnels when accessing a private network from the public Internet. VPNs use IPSec (IP Security) server or client mode for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.

The EDR-810's "WAN Routing Quick Setting" provides an easy way for users to set up WAN and LAN ports to create a routing function in four steps. In addition, the EDR-810's "Quick Automation Profile" gives engineers a simple way to configure the firewall filtering function with general automation protocols, including EtherNet/IP, Modbus TCP, EtherCAT, FOUNDATION Fieldbus, and PROFINET. Users can easily create a secure Ethernet network from a user-friendly web UI with a single click, and the EDR-810 is capable of performing deep Modbus TCP packet inspection. Wide temperature range models that operate reliably in hazardous, -40 to 75°C environments are also available.

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.1Q for VLAN tagging
IEEE 802.3ad for port trunk
Protocols: SNMP v1/v2c/v3, DHCP server/client, TFTP, NTP/SNTP server/client, HTTP, HTTPS, Telnet, SSH, IPSec, L2TP, IGMP v1/v2/v3, QoS/CoS/ToS, Radius, RSTP/STP, LLDP, DDNS, Proxy ARP
Routing: Static routing, RIP V1/V2, OSPF
Throughput: 10000 packets per second (max. 100 Mbps)
Routing Redundancy: VRRP
Multicast Routing: Static, DVMRP, PIM-SM/SSM
Broadcast Forwarding: IP directed broadcast, broadcast forwarding
Redundancy: STP/RSTP, Turbo Ring V2, Ring Coupling, and Dual Homing
Flow Control: IEEE 802.3x flow control, back pressure flow control

Security Functions

Firewall:
Features:
• Stateful inspection
• Router firewall and transparent (bridge) firewall
• Filter: IP and MAC address, ports, ICMP, DDoS, Ethernet protocols
• Deep Packet Inspection: Modbus TCP/UDP
• Quick Automation Profiles: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS
Throughput: Max. 10000 packets per second (Max. 100 Mbps)
DoS and DDoS Protection: Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, SYN/RST Scan, NEW-Without-SYN Scan, ICMP-Death, SYN-Flood, ARP-Flood
NAT: N-to-1, 1-to-1, bidirectional 1-to-1, and port forwarding

IPSec VPN:
Protocols:
• IPSec
• L2TP (server)
• PPTP (client)
Encryption:
• DES, 3DES, AES-128, AES-192, AES-256
Authentication:
• RSA (key size: 1024-bit, 2048-bit)
• X.509 v3 certificate
• MD5 and SHA (SHA-256)
Throughput:
• Max. 17 Mbps (Conditions: AES-256, SHA-256)
Concurrent VPN Tunnels:
• Max. 10 IPSec VPN tunnels
OpenVPN:
Protocols:
• OpenVPN (client and server), UDP and TCP
• Tunnel mode (routing) and TAP mode (bridge)
Encryption:
• Blowfish CBC, DES CBC, DES-EDE3 CBC, AES-128/192/256 CBC
Authentication:
• User password by MD5 and SHA1
Throughput:
• Max. 5 Mbps
Concurrent VPN Tunnels:
• Server mode: max. 5 external clients
• Client mode: max. 2 external servers
Real-Time Firewall / VPN Event Log:
• Event Type: Firewall Event, VPN Event, System Security Event
• Media: Local storage, Syslog server, and SNMP trap

Switch Properties

Max. Number of VLANs: 16
VLAN ID Range: 1 to 4094
IGMP Groups: 256

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed
Fiber Ports: 1000BaseSFP slot
Console Port: Web/Telnet/SSH/CLI, and RS-232 serial console
RESET button: Reset to default settings
LED Indicators: STATE, PWR1, PWR2, FAULT, 10/100/1000M
Alarm Contact: One relay output with current-carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 2-contact terminal block
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements

Input Voltage: 12/24/48 VDC, redundant dual inputs
Input Current: 0.32 A @ 24 V
Overload Current Protection: Present
Connection: Removable terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
Dimensions: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight: 830 g (2.10 lb)
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)

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV
IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Rail Traffic: EN 50121-4
Transportation: NEMA TS2
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 (mean time between failures)

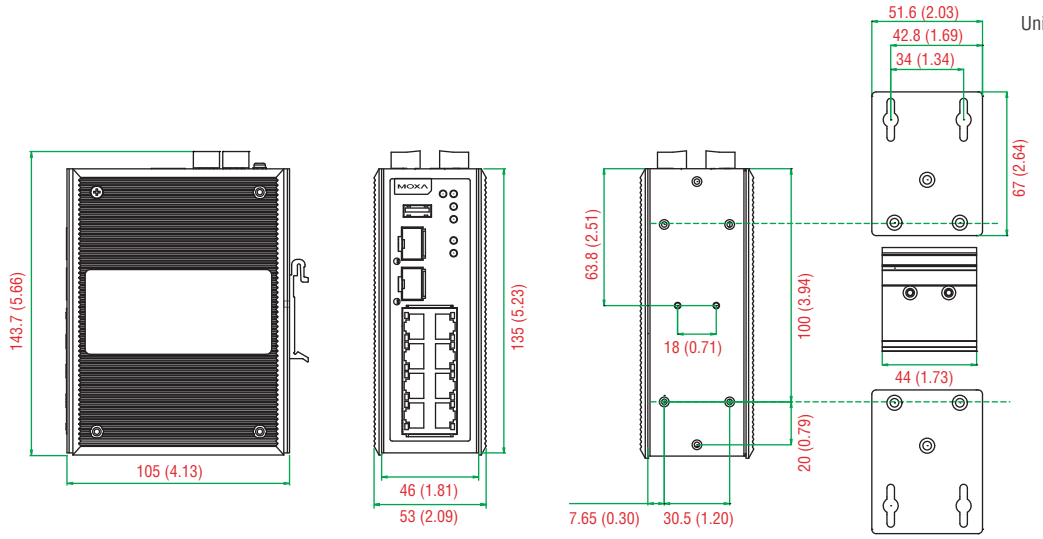
Time: 981,954 hrs
Standard: Telcordia (Bellcore), GB

Warranty

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

Dimensions

Unit: mm (inch)



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

Ordering Information

Available Models

EDR-810-2GSFP: 8+2G-port industrial multiport secure router with firewall/NAT, -10 to 60°C operating temperature
EDR-810-2GSFP-T: 8+2G-port industrial multiport secure router with firewall/NAT, -40 to 75°C operating temperature
EDR-810-VPN-2GSFP: 8+2G-port industrial multiport secure router with firewall/NAT/VPN, -10 to 60°C operating temperature
EDR-810-VPN-2GSFP-T: 8+2G-port industrial multiport secure router with firewall/NAT/VPN, -40 to 75°C operating temperature

Note: The EDR-810 series supports 1000BaseSFP slots. See the SFP-1G series Gigabit Ethernet SFP module product datasheet for more information.

Optional Accessories (can be purchased separately)

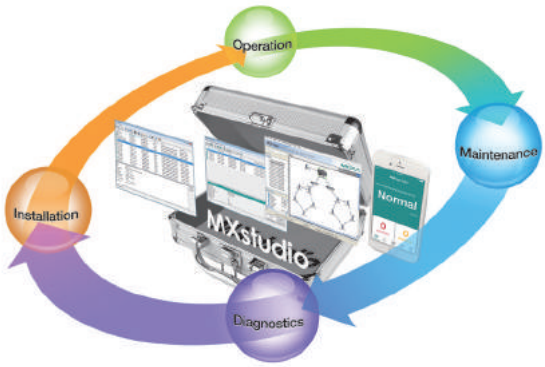
ABC-02-USB: Automatic Backup Configurator
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDR-810 industrial secure router
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

Introduction to Industrial Network Management

Every industrial network has a life cycle consisting of four basic stages: installation, operation, maintenance, and diagnostics. Even with careful network planning and design, network management throughout all four stages of the industrial network life cycle can still present many challenges for integrators and operators. To optimize network efficiency and minimize the total cost of ownership, industrial automation networks need user-centric software tools for efficient network deployment, monitoring, management, maintenance, and troubleshooting.



Automation-Friendly Software Throughout the Network Life Cycle

Installation

Challenge:
Initial configuration of network devices is generally done one at a time manually, which can require many hours of labor.

Solution:
Moxa's MXconfig, a network configuration tool, can mass-configure every device on the network, including IP settings, redundancy protocols, VLAN, and related managed functions, to significantly reduce the time required for configuration. With MXconfig, you can make configuration 10 times faster.

Operation

Challenge:
Without effective network management software, industrial operators are unable to monitor, identify, and react to network issues immediately, which can result in production losses and safety concerns.

Solution:
Moxa's MXview industrial network management software is a graphical platform that allows engineers to easily monitor and manage up to 2000 nodes in real time. MXview also supports a mobile monitoring app, called MXview ToGo, which allows you to remotely check network status and keep informed of any changes to the network—anytime, anywhere.

Maintenance

Challenge:
Changes to device settings can cause unexpected network issues. When this happens, backup files will need to be restored to a previous state. For a large-scale network, this task is extremely time-consuming and can lead to extended system downtimes.

Solution:
Moxa's MXview allows network operators to select a group of devices and export their configuration files simultaneously for backup, saving a significant amount of time.

Diagnostics

Challenge:
Without knowing where to look and what to actually look for, maintenance engineers can spend hours troubleshooting the network and still fail to find a solution.

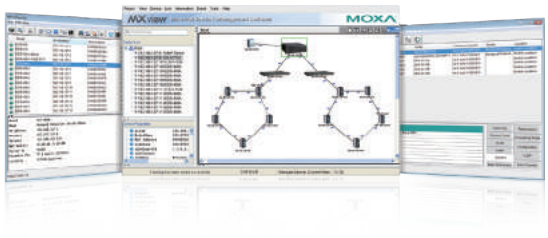
Solution:
Moxa's MXview offers a highly intuitive event playback feature that can record network events and replay past network incidents in the order they occurred. In addition, N-Snap industrial network snapshot tool can help collect device information. By comparing abnormal network data with healthy network data, N-Snap can help you troubleshoot the network more efficiently.

Integration with SCADA and Third-Party NMS

Moxa's industrial network management solutions support a built-in SNMP OPC server, which can convert SNMP information into OPC tags that can be seamlessly integrated into OPC-compatible HMI/SCADA systems. Moreover, Moxa's network management solutions can collaborate with third-party network management software, making it easier to monitor and maintain the high availability of larger-scale automation systems.

MXstudio

Industrial network management suite for installation, operation, maintenance, and diagnostics



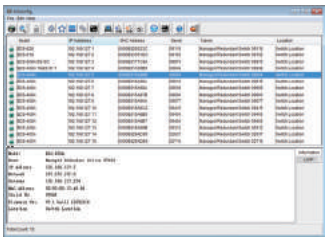
- An all-in-one toolset for installation, operation, maintenance, and diagnostics stages of the network's life cycle
- MXconfig, MXview, and N-Snap for easy and quick industrial network management
- MXview ToGo mobile app for remote monitoring—anytime, anywhere
- Maximized productivity with Moxa industrial Ethernet solutions

Introduction

Moxa's MXstudio industrial network management suite combines all the tools you need throughout the network's life cycle into one toolbox, including MXview industrial management software, MXconfig industrial network configuration tool, and N-Snap industrial network snapshot tool. Whether it is for configuration, monitoring, maintenance, or troubleshooting, the all-in-one MXstudio software suite has a tool for every task. In addition, MXstudio's three key benefits, easy configuration, smart visualization, and quick troubleshooting, are designed to meet the demands of industrial automation networks.

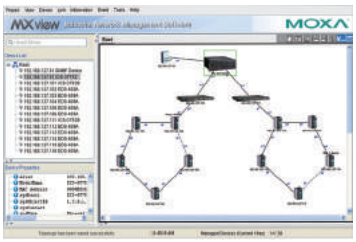
MXstudio's Offerings

MXconfig Industrial Network Configuration Tool



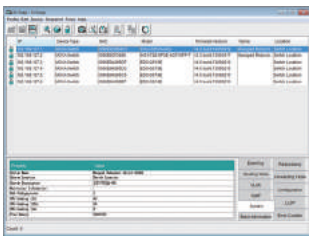
- Mass configuration function to reduce setup time
- Topology analysis to eliminate manual setting errors
- Configuration overview for efficient management

MXview Industrial Network Management Software



- Auto discovery of network devices and physical connections
- Event playback for quick troubleshooting
- Color-coded VLAN/IGMP groups and other visualized network data
- Supports MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere

N-Snap Industrial Network Snapshot Tool



- A stand-alone data collection tool to take network snapshots for quick troubleshooting
- Compare network and device data, and highlight the differences

System Requirements

CPU	2 GHz or faster dual-core CPU
RAM	2 GB
Hard Disk Space	10 GB
OS	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Ordering Information

A free version is now available for download at Moxa's website.

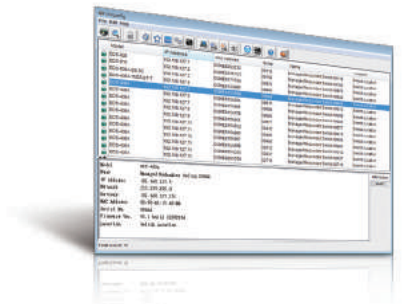
Supported Devices

Detailed model names are available in each product datasheet. Check Moxa's website for the most up-to-date information.

Award-winning Product

MXconfig

Industrial network configuration tool



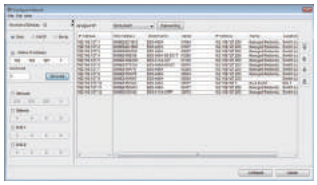
- Mass managed function configuration increases deployment efficiency and reduces setup time
- Mass configuration duplication reduces installation costs
- Link sequence detection eliminates manual setting errors
- Configuration overview and documentation for easy status review and management
- Three user privilege levels enhance security and management flexibility

Introduction

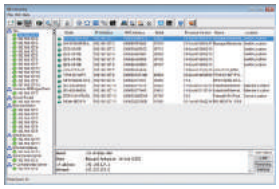
Moxa's MXconfig is a comprehensive Windows-based utility that is used to install, configure, and maintain multiple Moxa devices on industrial networks. This suite of useful tools helps users set the IP addresses of multiple devices with one click, configure the redundant protocols and VLAN settings, modify multiple network configurations of multiple Moxa devices, upload firmware to multiple devices, export/import configuration files, copy configuration settings across devices, easily link to web and Telnet consoles, and test device connectivity. MXconfig gives device installers and control engineers a powerful and easy way to mass configure devices, and it effectively reduces the setup and maintenance cost.

Device Discovery and Fast Group Configuration

- Easy broadcast search of the network for all supported Moxa managed Ethernet devices
- Mass network setting (such as IP addresses, gateway, and DNS) deployment reduces setup time
- Deployment of mass managed functions increases configuration efficiency
- Multiple grouping for easy classification
- User-friendly port selection panel provides physical port descriptions
- VLAN Quick-Add Panel speeds up setup time
- Deploy multiple devices with one click using CLI execution



Network Setting



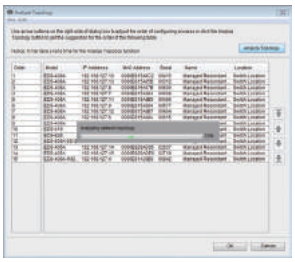
Multiple Grouping

Fast Configuration Deployment

- Quick configuration: copy a specific setting to multiple devices and change IP addresses with one click

Link Sequence Detection

- Link sequence detection eliminates manual configuration errors and avoids disconnections, especially when configuring redundancy protocols or VLAN settings for a network in a daisy chain topology (line topology).
- Link Sequence IP setting (LSIP) prioritizes devices and configures IP addresses by link sequence to enhance deployment efficiency, especially in a daisy chain topology (line topology).



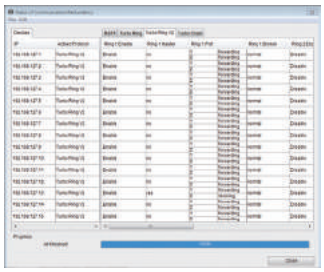
Analyze Topology

Unlock Devices and User Privileges

- Mass device unlocking and password file export for quick unlocks.
- Three user privilege levels to enhance management flexibility and security: Admin, Supervisor, and Operator.

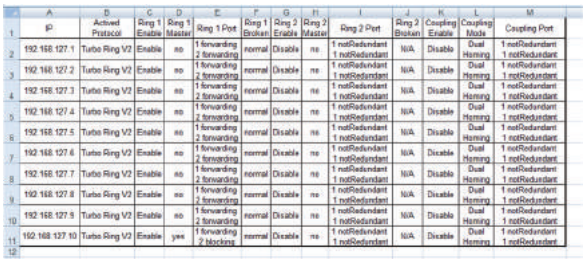
Configuration Overview and Documentation

- Useful mass status overview and configuration check for each managed function.
- Generate reports on each managed function for multiple devices in the network.



Status Overview

- Export multiple configuration files with flexible filenames and import multiple configuration files to multiple devices.
- Export device list for easy backup, and import device list for quick searching.



File Export

System Requirements

CPU	2 GHz or faster dual core CPU
RAM	256 MB
Hard Disk Space	1 GB
Operating System	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Supported Devices

MXconfig V2.3 supports the following devices:

Series	Model Name	Firmware
AWK Series	AWK-1121	V1.4
	AWK-1127	V1.4
	AWK-3121	V1.10
	AWK-3121-SSC-RTG	V1.4
	AWK-3121-M12-RTG	V1.4
	AWK-3131	V1.2
	AWK-3131-M12-RCC	V1.0
	AWK-4121	V1.10
	AWK-4131	V1.2
	AWK-5222	V1.7
	AWK-5232	V1.3
	AWK-6222	V1.7
	AWK-6232	V1.3
EDR Series	EDR-810	V3.2
EDS Series	EDS-405A/408A	V3.1
	EDS-405A/408A-EIP	V3.1
	EDS-405A/408A-PN	V3.1
	EDS-405A-PTP	V3.3
	EDS-505A/508A/516A	V3.1
	EDS-510A	V3.1
	EDS-518A	V3.1
	EDS-510E/518E	V4.0
	EDS-G508E/G512E/G516E	V4.0
	EDS-G512E-8PoE	V4.0
	EDS-608/611/616/619	V3.1
	EDS-728	V3.1
	EDS-828	V3.1
	EDS-G509	V3.1
	EDS-P510	V3.1
	EDS-P510A-8PoE	V3.1
	EDS-P506A-4PoE	V3.1

Series	Model Name	Firmware
ICS Series	ICS-G7526/G7528	V3.1
	ICS-G7826/G7828	V3.1
	ICS-G7748/G7750/G7752	V3.1
	ICS-G7848/G7850/G7852	V3.1
	ICS-G7526A/G7528A	V4.0
	ICS-G7826A/G7828A	V4.0
	ICS-G7748A/G7750A/G7752A	V4.0
	ICS-G7848A/G7850A/G7852A	V4.0
IEX Series	IEX-402-SHDSL	V1.0
	IEX-402-VDSL2	V1.0
IKS Series	IKS-6726/6728	V3.1
	IKS-G6524	V3.1
	IKS-G6824	V3.1
	IKS-6728-8PoE	V3.1
	IKS-6726A/6728A	V4.0
	IKS-G6524A	V4.0
	IKS-G6824A	V4.0
	IKS-6728A-8PoE	V4.0
MGate Series	MGate MB3170	V1.0
	MGate MB3180	V1.0
	MGate MB3270	V1.0
	MGate MB3280	V1.0
	MGate MB3480	V1.0
	MGate MB3660	V1.0
	MGate EIP3170	V1.0
	MGate EIP3270	V1.0
	MGate 5101-PBM-MN	V1.1
	MGate 5102-PBM-PN	V1.1
	MGate 5105-MB-EIP	V1.0
	MGate W5108	V1.2
	MGate W5208	V1.2

Series	Model Name	Firmware
NPort Series	NPort S8455	V1.4
	NPort S8458	V1.4
PT Series	PT-7528	V3.1
	PT-7710	V3.1
	PT-7728	V3.1
	PT-7828/7828-PTP	V3.1
	PT-G7509	V3.1
	PT-508/510	V3.1
TN Series	TN-5508/5510	V3.1
	TN-5516/5518	V3.1
	TN-5508-4PoE	V3.1
	TN-5510-PoE	V3.1
	TN-5516-8PoE	V3.1
	TN-5518-PoE	V3.1
VPort Series	VPort 26A-1MP	V1.2
	VPort 36-1MP	V1.1
	VPort P06-1MP-M12	V2.2

Note:

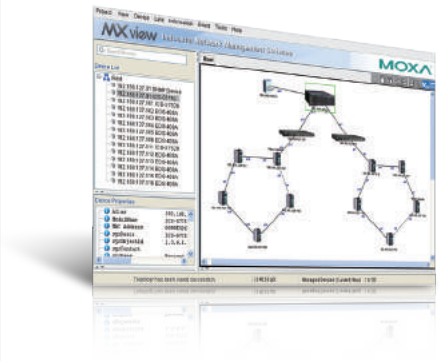
- MXconfig supports the listed and higher firmware versions.
- Additional model names will be added as MXconfig is updated. Check Moxa's website for the most up-to-date information.

MXview

Award-winning Product

TAIWAN EXCELLENCE 2010

Industrial network management software designed for converged automation networks



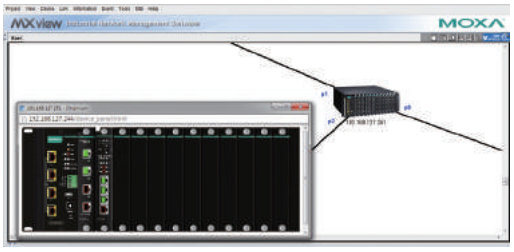
- Event Playback records network events and replays past network incidents
- Discovers and visualizes network devices and physical connections automatically
- Central management of configurations and firmware for Moxa devices
- Flexible events and notifications with self-defined threshold and duration
- Supports third-party devices with MIB compiler and MIB browser
- Comprehensive reports, including inventory, traffic, and availability reports
- Generates OPC 2.0 compliant tags automatically to integrate with SCADA/HMI applications
- Provides a virtual demonstration network that lets you experience the software without connecting any devices
- Supports MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere

Introduction

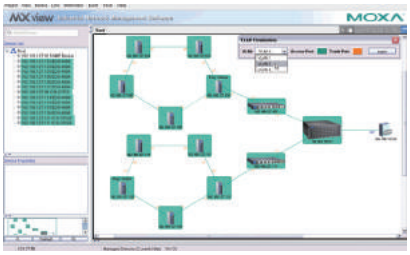
Moxa's MXview network management software is designed for configuring, monitoring, and diagnosing networking devices in industrial networks. MXview provides an integrated management platform that can discover networking devices and SNMP/IP devices installed on subnets. All selected network components can be managed via a web browser from both local and remote sites—anytime and anywhere.

Visualization

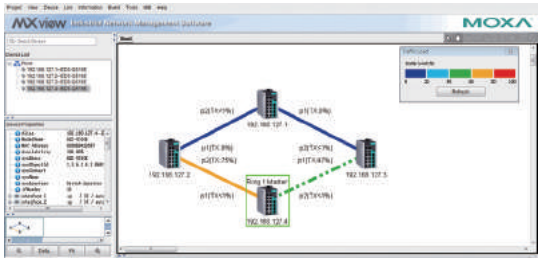
- Discovers up to 2,000 Moxa devices and SNMP/ICMP devices within scan range
- Visualization of redundant link status and device roles of network redundancy protocols
- Visualization of graphic VLAN groups and IGMP snooping roles
- Visualization of network traffic loading with color-coded links
- Device front panel visualization, including ports and LED indicators
- Visualization of managed PoE device power consumption
- Displays third-party device icons



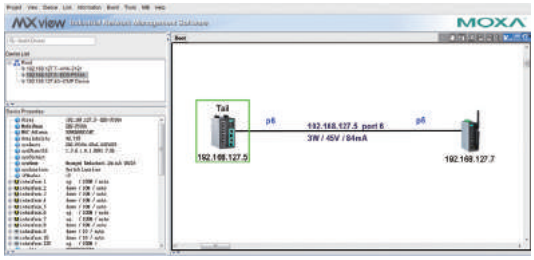
Virtual Device Panel



VLAN Visualization



Traffic Load Visualization

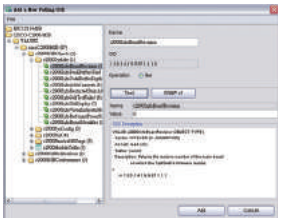


PoE Visualization

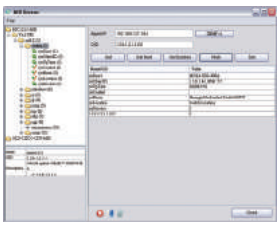
Network Diagnostics and Event Notification

- Detect problems in real-time with SNMP trap/inform, or periodic polling
- Generate trend graphs to track bandwidth utilization and error packet rate statistics, accurate to four decimal points
- Event Playback records network events, and replays past network incidents
- Flexible events and notifications with self-defined threshold and duration
- Supports Syslog server for centralized message management
- Configurable event notification alarms sent through SMS, email, and SNMP trap, or locally through program notification, message box, and audio alerts
- Generates OPC 2.0 compliant tags automatically to integrate with SCADA/HMI applications
- Group health OPC tag represents entire network status
- Real-time device availability monitoring
- Supports third-party devices with MIB compiler and MIB browser
- Collaborates with third-party NMS through SNMP traps

Traffic Monitoring



MIB Compiler

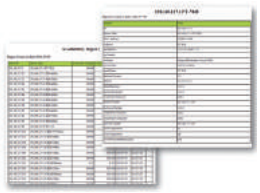


MIB Browser

Event Playback

Comprehensive Reports

- Maintains device availability reports and records for up to 90 days
- Generates an inventory report for each device in the network
- Compiles comprehensive device properties report
- Generates network traffic trend reports



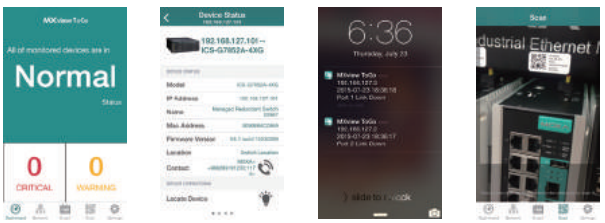
Availability and Inventory Report

Centralized Configuration and Firmware Management

- Bulk deployment of device configurations and firmware
- In one click, back up the entire MXview database in one click, including topology, job scheduling, events, and device properties
- Scheduling for periodic configuration backup
- Save history of configuration changes
- Comparison tool for checking differences between 2 configurations

Mobile APP for Network Monitoring

- MXview ToGo mobile app for remote monitoring and notification—anytime, anywhere
- Smart Device Identification with QR Code enhances operational efficiency
- Device Locator with mobile app reduces searching time at field sites



System Requirements

CPU	2 GHz or faster dual-core CPU
RAM	2 GB
Hard Disk Space	10 GB
OS	Windows XP Professional, Windows 7 (32/64-bit), Windows 8 (32/64-bit), Windows 10 (32/64-bit), Windows Server 2008 (32/64-bit), Windows Server 2012 (32/64-bit)

Ordering Information

Commercial Versions

MXview-2000: Industrial network management software with a license for 2000 nodes (by IP address)
MXview-1000: Industrial network management software with a license for 1000 nodes (by IP address)
MXview-500: Industrial network management software with a license for 500 nodes (by IP address)
MXview-250: Industrial network management software with a license for 250 nodes (by IP address)
MXview-100: Industrial network management software with a license for 100 nodes (by IP address)
MXview-50: Industrial network management software with a license for 50 nodes (by IP address)

Package Checklist

- MXview CD (includes the MXview software and related documents)
- License card

License Upgrade

MXview Upgrade-50: License expansion of MXview industrial network management software by 50 nodes (by IP address)

Trial Version

MXview Trial Version: A free trial version of MXview is available for download from Moxa's website

Supported Devices

MXview v2.6 supports the following devices by default.

Series	Model Name	Firmware
AWK Series	AWK-1121	V1.4
	AWK-1127	V1.4
	AWK-3121	V1.6
	AWK-3131	V1.1
	AWK-4121	V1.6
	AWK-4131	V1.1
EDR Series	EDR-G903	V2.1
	EDR-G902	V1.0
	EDR-810	V3.2
EDS Series	EDS-405A/408A	V2.6
	EDS-405A/408A-EIP	V3.0
	EDS-405A/408A-PN	V3.1
	EDS-405A-PTP	V3.3
	EDS-505A/508A/516A	V2.6
	EDS-510A	V2.6
	EDS-518A	V2.6
	EDS-510E/518E	V4.0
	EDS-G508E/G512E/G516E	V4.0
	EDS-G512E-8PoE	V4.0
	EDS-608/611/616/619	V1.1
	EDS-728	V2.6
	EDS-828	V2.6
	EDS-G509	V2.6
	EDS-P510	V2.6
	EDS-P510A-8PoE	V3.1
	EDS-P506A-4PoE	V2.6
EOM Series	EOM-104/104-FO	V1.2
ICS Series	ICS-G7526/G7528	V1.0
	ICS-G7826/G7828	V1.1
	ICS-G7748/G7750/G7752	V1.2
	ICS-G7848/G7850/G7852	V1.2
	ICS-G7526A/G7528A	V4.0
	ICS-G7826A/G7828A	V4.0
	ICS-G7748A/G7750A/G7752A	V4.0
	ICS-G7848A/G7850A/G7852A	V4.0

Series	Model Name	Firmware
IEX Series	IEX-402-SHDSL	V1.0
	IEX-402-VDSL2	V1.0
IKS Series	IKS-6726/6728	V2.6
	IKS-6524/6526	V2.6
	IKS-G6524	V1.0
	IKS-G6824	V1.1
	IKS-6728-8PoE	V3.1
	IKS-6726A/6728A	V4.0
	IKS-G6524A	V4.0
	IKS-G6824A	V4.0
	IKS-6728A-8PoE	V4.0
ioLogik Series	ioLogik E2210	V3.7
	ioLogik E2212	V3.7
	ioLogik E2214	V3.7
	ioLogik E2240	V3.7
	ioLogik E2242	V3.7
	ioLogik E2260	V3.7
	ioLogik E2262	V3.7
	ioLogik W5312	V1.7
	ioLogik W5340	V1.8
MGate Series	MGate MB3170	V1.0
	MGate MB3180	V1.0
	MGate MB3270	V1.0
	MGate MB3280	V1.0
	MGate MB3480	V1.0
	MGate MB3660	V1.0
	MGate EIP3170	V1.0
	MGate EIP3270	V1.0
	MGate 5101-PBM-MN	V1.1
	MGate 5102-PBM-PN	V1.1
	MGate 5105-MB-EIP	V1.0
	MGate W5108	V1.2
	MGate W5208	V1.2

Series	Model Name	Firmware
NPort Series	NPort S8455	V1.3
	NPort S8458	V1.3
	NPort 5110	V2.4
	NPort 5130/5150	V3.4
	NPort 5210/5230/5232	V2.6
	NPort 5410/5430/5450	V3.9
	NPort 5600-8-DT/5650-8-DT	V2.2
	NPort 5600	V3.5
	NPort 5610-8-DTL/5650-8-DTL	V1.1
	NPort 5110A/5130A/5150A	V1.1
	NPort 5210A/5230A/5250A	V1.1
	NPort IA5150/IA5250	V1.4
	NPort IA5150A/IA5250A	V1.1
	NPort IA5450A	V1.2
	NPort 6150/6250/6450	V1.9
	NPort 6610-8/6610-16/6610-32	V1.9
	NPort 6650-8/6650-16/6650-32	V1.9
	NPort 5150AI-M12	V1.0
	NPort 5250AI-M12	V1.0
	NPort 5450AI-M12	V1.0
PT Series	PT-7528	V3.0
	PT-7710	V1.2
	PT-7728	V2.6
	PT-7828	V2.6
	PT-G7509	V1.1
	PT-508/510	V3.0
	PT-G503-PHR-PTP	V4.0
TN Series	TN-5508/5510	V1.1
	TN-5516/5518	V1.2
	TN-5508-4PoE	V2.6
	TN-5516-8PoE	V2.6
VPort Series	VPort 26A-1MP	V1.2
	VPort 36-1MP	V1.1
	VPort P06-1MP-M12	V2.2

Note: MXview supports the listed or higher firmware versions.
Note: Additional model names will be added as MXview is updated. Check Moxa's website for the most up-to-date information.

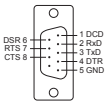
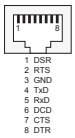
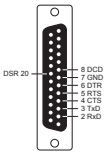
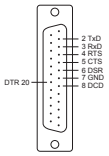
Accessories

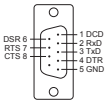
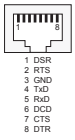
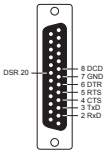
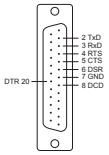
Serial Connection Options

Serial Board Connection Box/Cable Usage Chart

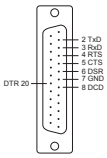
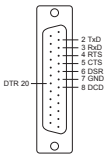
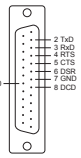
Serial Board Model Name	Connection Boxes						Connection Cables													
	8-port						8-port						4-port						2-port	
	OPT8-M9	OPT8-RJ45	OPT8A/B/S	OPT8-M9+	OPT8A+/B+/S+	OPT8-RJ45+	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M78M25x8-100	CBL-M78M9x8-100	CBL-M44M9x4-50	CBL-M44M9x4-50(POS)	CBL-M44M25x4-50	CBL-M37M9x4-30 (OPT4C)	CBL-M37M9x4-30 (OPT4D)	CBL-F40M25x4-50	CBL-M25M9x2-50	CBL-F20M25x2-50
C218Turbo Series	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
C104H Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–
CI-134 Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–
CP-118U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-138U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-168U	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
C168H Series	✓	✓	✓	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–	–	–
CP-104UL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-134U Series	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114UL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114UL-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-104EL-A	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114EL	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-114EL-I	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	✓	–	–	–	–	–
CP-112UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-112UL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132UL Series	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-102UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-102EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132EL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-132EL-I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–
CP-118EL-A	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-168EL-A	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–
CP-118U-I	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–
CP-138U-I	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	–
POS-104UL	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–	–
CA-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-108	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CB-134I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-104	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–
CA-132	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓
CA-132I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓

8-port RS-232 Connection Boxes

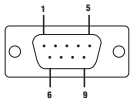
Model Name	OPT8-M9	OPT8-RJ45	OPT8A/S	OPT8B
Accessories Image				
Pin Assignment				
Board-Side Connector	DB62 male x 1			
Device-Side Connector	DB9 male x 8	8-pin RJ45 x 8	DB25 female x 8	DB25 male x 8
LEDs	TxD, RxD indicators for each device-side port	–	TxD, RxD indicators for each device-side port	
Baudrate	–	–	50 bps to 921.6 kbps	
Dimensions	90 x 111 x 27.5 mm (3.5 x 4.3 x 1 in)	152.8 x 32.8 x 32 mm (6 x 1.29 x 1.25 in)	247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)	
Protection	–	–	25 kV ESD, 2 kV EFT surge protection (OPT8S only)	–
Connnection Cable	DB62 male to DB62 female 150 cm connection cable for connecting to the serial board	–	DB62 male to DB62 male 150 cm connection cable for connecting to the serial board	
Related Products	See page A-2 for details			

Model Name	OPT8-M9+	OPT8-RJ45+	OPT8A+/S+	OPT8B+
Accessories Image				
Pin Assignment				
Board-Side Connector	VHDCI 68 x 1			
Device-Side Connector	DB9 male x 8	8-pin RJ45 x 8	DB25 female x 8	DB25 male x 8
LEDs	TxD, RxD indicators for each device-side port	–	TxD, RxD indicators for each device-side port	
Baudrate	–	–	50 bps to 921.6 kbps	
Dimensions	90 x 111 x 27.5 mm (3.5 x 4.3 x 1 in)	152.8 x 32.8 x 32 mm (6 x 1.29 x 1.25 in)	247 x 108 x 35 mm (9.7 x 4.3 x 1.4 in)	
Protection	–	–	25 kV ESD, 2 kV EFT surge protection (OPT8S only)	–
Connnection Cable	DB68 male to DB62 female 150 cm connection cable for connecting to the serial board	–	DB68 male to DB62 male 150 cm connection cable for the connecting to the serial board	
Related Products	See page A-2 for details			

8-port RS-232 Connection Cables

Model Name	CBL-M62M25x8-100 (OPT8C)	CBL-M62M9x8-100 (OPT8D)	CBL-M68M25x8-100 (OPT8C+)	CBL-M68M9x8-100 (OPT8D+)	CBL-M78M25x8-100	CBL-M78M9x8-100
Accessories Image						
Pin Assignment						
Board-Side Connector	DB62 male x 1		VHDCI 68 x 1		DB78 male x 1	
Device-Side Connector	DB25 male x 8	DB9 male x 8	DB25 male x 8	DB9 male x 8	DB25 male x 8	DB9 male x 8
Cable Length	100 cm (39.37 in)					
Related Products	See page A-2 for details					

2-port Connection Cables

Model Name	CBL-M25M9x2-50
Accessories Image	
Pin Assignment	
Description	DB25 male to DB9 male x 2
Cable Length	50 cm (19.69 in)
Related Products	See page A-2 for details

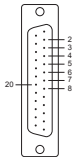
PIN	RS-232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

4-port Connection Cables

Model Name	CBL-M44M9x4-50	CBL-M44M25x4-50
Accessories Image		
Description	DB44 male to DB9 male x4	DB44 male to DB25 male x4
Cable Length	50 cm (19.69 in)	
Related Products	See page A-2 for details	

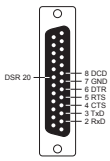
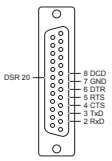
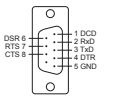
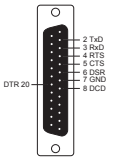
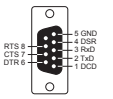
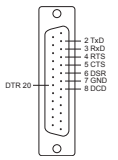
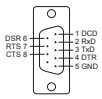
Pin Assignment

PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
1	DCD	TxD-(A)	TxD-(A)	–
2	RxD	TxD+(B)	TxD+(B)	–
3	TxD	RxD+(B)	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	RxD-(A)	Data-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
9	–	–	–	–

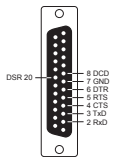
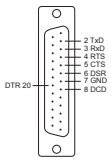
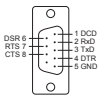
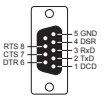


PIN	RS-232	RS-422	RS-485-4w	RS-485-2w
2	TxD	RxD+(B)	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	TxD+(B)	–
4	RTS	–	–	–
5	CTS	–	–	–
6	DSR	–	–	–
7	GND	GND	GND	GND
8	DCD	TxD-(A)	TxD-(A)	–
20	DTR	RxD-(A)	RxD-(A)	Data-(A)
22	–	–	–	–

8-pin RJ45 to DB9/DB25 Connection Cables

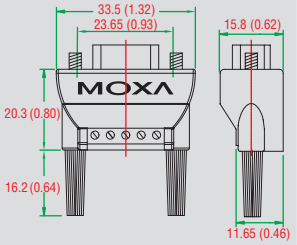
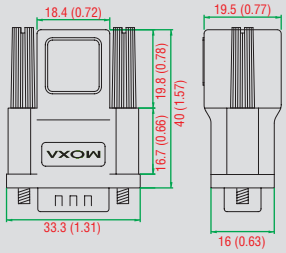
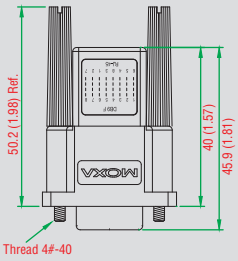
Model Name	CBL-RJ45F25-150	CBL-RJ45F9-150	CBL-RJ45M25-150	CBL-RJ45M9-150	CBL-RJ45SF25-150	CBL-RJ45SF9-150	CBL-RJ45SM25-150	CBL-RJ45SM9-150
Accessories Image								
Pin Assignment								
Cable Type	-	-	-	-	Shielded			
Board-Side Connector	8-pin RJ45 x 1							
Device-Side Connector	DB25 female x 1	DB9 female x 1	DB25 male x 1	DB9 male x 1	DB25 female x 1	DB9 female x 1	DB25 male x 1	DB9 male x 1
Cable Length	150 cm (59.06 in)							
Related Products	CP-104JU, OPT8-RJ45, NPort 5210, NPort 5600, NPort 6600, CN2510/2600							

10-pin RJ45 to DB9/DB25 Connection Cables

Model Name	CN20030	CN20040	CN20060	CN20070
Accessories Image				
Pin Assignment				
Board-Side Connector	10-pin RJ45 x 1			
Device-Side Connector	DB25 female x 1	DB25 male x 1	DB9 male x 1	DB9 female x 1
Cable Length	150 cm (59.06 in)			
Related Products	C320Turbo Series, A52, A53			

Wiring Kits

Model Name	TB-M9	TB-F9	TB-M25	TB-F25
Accessories Image				
Type	DB9 male DIN-rail wiring terminal	DB9 female DIN-rail wiring terminal	DM25 male DIN-rail wiring terminal	DB25 female DIN-rail wiring terminal
Connector	DB9 male	DB9 female	DB25 male	DB25 female
Rating	300 V, 20 A (IEC250V 10A)			
Operating Temperature	-40 to 105°C (-40 to 221°F)			
Suitable Wiring	24-12 AWG (IEC 0.5-2.5 mm²)			
Dimensions	77.5 x 45 x 51 mm (3.05 x 1.77 x 2.01 in)		77.5 x 90 x 51 mm (3.05 x 3.54 x 2.01 in)	

Model Name	Mini DB9F-to-TB	ADP-RJ458P-DB9M	ADP-RJ458P-DB9F	A-ADP-RJ458P-DB9F-ABC01
Accessories Image				
Pin Assignment	DB9-F / TB 1 / 2 2 / 1 3 / 3 4 / 4 5 / 5	DB9-M / RJ45 1 / 6 2 / 5 3 / 4 4 / 8 5 / 3 6 / 1 7 / 2 8 / 7	DB9-F / RJ45 1 / 6 2 / 4 3 / 5 4 / 1 5 / 3 6 / 8 7 / 7 8 / 2	DB9 / RJ45 1 / 6 2 / 5 3 / 4 4 / 8 5 / 7 6 / 1 7 / 2 8 / 7
Description	DB9 female to terminal block adapter for RS- 422/485 applications	RJ45-toDB9 male adapter	RJ45-toDB9 female adapter	RJ45-toDB9 female adapter
Operating Temperature	0 to 70°C (32 to 158°F)	-15 to 70°C (5 to 158°F)	-15 to 70°C (5 to 158°F)	0 to 70°C (32 to 158°F)
Dimensions				

Power Accessories

AC Power Supplies

Locking barrel plugs, 12 VDC 0.5 A, 100-240 VAC (Switch-Mode)

Model Name	PWR-12050-WPUSJP-S1	PWR-12050-WPEU-S1	PWR-12050-WPUK-S1	PWR-12050-WPAU-S1	PWR-12050-WPCN-S1
					
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC
Output Plug					
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	64 x 40.5 x 47.5 mm (2.52 x 1.59 x 1.87 in)	64 x 40.5 x 68.7 mm (2.52 x 1.59 x 2.71 in)	64 x 40.5 x 56.2 mm (2.52 x 1.59 x 2.21 in)	64 x 40.5 x 58.5 mm (2.52 x 1.59 x 2.30 in)	64 x 40.5 x 46.5 mm (2.52 x 1.59 x 1.83 in)
Packaged Dimensions (L x W x H)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)
Weight	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)
Cord Length	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)	1530±100 mm (60.24±3.94 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC	CE/FCC/UL/GS/PSE/RCM/CCC
Related Products					
Related Products	NPort 5110A, NPort 5130A, NPort 5150A, NPort 5210A, NPort 5230A, NPort 5250A, NPort Z2150/Z3150, NPort W2150A/W2250A, NPort P5110A				

DC Power Cord

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

AC Power Supplies

Locking barrel plugs, 12 VDC, 3 A 100-240 VAC (Switch-Mode)

Model Name	PWR-12300-WPUSJP-S1	PWR-12300-WPEU-S1	PWR-12300-WPUK-S1	PWR-12300-WPAU-S1	PWR-12300-WPCN-S1
					
Input Rating					
I/P	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz	100-240 VAC 50-60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC	3 A @ 12 VDC
Output Plug					
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	74 x 43.5 x 52.3 mm (2.91 x 1.71 x 2.06 in)	74 x 43.5 x 73.5 mm (2.91 x 1.71 x 2.89 in)	74 x 43.5 x 61 mm (2.91 x 1.71 x 2.40 in)	74 x 43.5 x 63.3 mm (2.91 x 1.71 x 2.49 in)	74 x 43.5 x 51.3 mm (2.91 x 1.71 x 2.02 in)
Packaged Dimensions (L x W x H)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)
Weight	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)	163 g (0.36 lb)
Cord Length	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)	1530±200 mm (60.24±7.87 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)
Regulatory Approvals					
Safety	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE	FCC/CE/UL/GS/CCC/RCM/PSE
Related Products					
Related Products	UPort 204, UPort 207, UPort 404, UPort 407				

DC Power Cord

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

AC Power Supplies

Non-locking barrel plugs, 12 VDC 0.5 A, 100-240 VAC (Switch-Mode)

Model Name	PWR-12050-WPUSJP-S2	PWR-12050-WPEU-S2	PWR-12050-WPUK-S2	PWR-12050-WPAU-S2	PWR-12050-WPCN-S2
					
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC	0.5 A @ 12 VDC
Output Plug					
Connector Type	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Chracteristics					
Dimensions (L x W x H)	64 x 40.5 x 30 mm (2.52 x 1.59 x 1.18 in)	64 x 40.5 x 68.7 mm (2.52 x 1.59 x 2.71 in)	64 x 40.5 x 56.2 mm (2.52 x 1.59 x 2.21 in)	64 x 40.5 x 58.5 mm (2.52 x 1.59 x 2.30 in)	64 x 40.5 x 46.5 mm (2.52 x 1.59 x 1.83 in)
Packaged Dimensions (L x W x H)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)	83 x 50 x 70 mm (3.27 x 1.97 x 2.76 in)
Weight	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)	70 g (0.15 lb)
Cord Length	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)	1830±100 mm (72.05±3.94 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC	CE/FCC/UL/RMC/PSE/CCC
Regulatory Products					
Related Products	NPort 5110, NPort 5130, NPort 5150, NPort 5210, NPort 5230, NPort 5232, NPort 5232I, MGate MB3180, MGate MB3280, DE-211, DE-311, A52, A53, MiiNePort E1-ST				

DC Power Cord

Non-locking barrel plug to bare wires

CBL-PJTB-10

Cable Length: 100±20 mm (3.94±0.79 in)

AC Power Supplies

Non-locking barrel plugs, 12 VDC 1.25/1.5 A, 100-240 VAC

Model Name	PWR-12125-USJP-S1	PWR-12150-EU-S2	PWR-12150-UK-S2	PWR-12150-AU-S2	PWR-12150-CN-S1
					
Input Rating					
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	1.25 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC	1.5 A @ 12 VDC
Output Plug					
Connector Type	L-Type 5.5/2.1/9.5	L-Type 5.5/2.1/9.0	S-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0	L-Type 5.5/2.1/9.0
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	74 x 43.5 x 52.5 mm (2.91 x 1.71 x 2.07 in)	70 x 45 x 66.5 mm (2.76 x 1.77 x 2.62 in)	70 x 48 x 60 mm (2.76 x 1.89 x 2.36 in)	70 x 55 x 56 mm (2.76 x 2.17 x 2.21 in)	70 x 45 x 54 mm (2.76 x 1.77 x 2.13 in)
Packaged Dimensions (L x W x H)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)	100 x 60 x 90 mm (3.94 x 2.36 x 3.54 in)
Weight	108 g (0.24 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1530±100 mm (60.24±3.84 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)	1800±200 mm (70.87±7.87 in)
Environmental Limits					
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)	-20 to 70°C (-4 to 158°F)
Regulatory Approvals					
Safety	CE/FCC/UL/RMC/PSE/GS	CE/GS	CE	RMC	CCC
Related Products					
Related Products	NPort 5410, NPort 5430, NPort 5430I, NPort 5450, NPort 5450I, MGate MB3480				

DC Power Cord

Non-locking barrel plug to bare wires

CBL-PJTB-10

Cable Length: 100±20 mm (3.94±0.79 in)

AC Power Supplies

Desktop type power adapters

Model Name	PWR-12200-DT-S1	PWR-12125-DT-S2
		
Input Rating		
I/P	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input Plug		
Plug Type	Desktop	Desktop
Output Rating		
O/P	2 A @ 12 VDC	1.25 A @ 12 VDC
Output Plug		
Connector Type	S-Type 5.5/2.1/7.5	S-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics		
Dimensions (L x W x H)	110.8 x 51.8 x 32 mm (4.36 x 2.04 x 1.26 in)	75 x 47.5 x 27.3 mm (2.95 x 1.87 x 1.07 in)
Packaged Dimensions (L x W x H)	135 x 75 x 35 mm (5.31 x 2.95 x 1.38 in)	100 x 70 x 51.5 mm (3.94 x 2.76 x 2.03 in)
Weight	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1800±200 mm (70.87±7.87 in)	1530±100 mm (60.24±3.84 in)
Environmental Limits		
Operating Temperature	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)	-10 to 70°C (14 to 158°F)
Regulatory Approvals		
Safety	Efficiency Level 5: CE/FCC/UL/PSE/RCM/CCC Efficiency Level 6: CE/FCC/UL/PSE	CE/FCC/UL/PSE/GS
Related Products		
Related Products	NPort 5610-8-DT, NPort 5610-8-DT-J, NPort 5650-8-DT, NPort 5650-8-DT-J, NPort 5650I-8-DT, NPort 5610-8-DTL, NPort 5650-8-DTL, NPort 5650I-DTL	NPort 6150, NPort 6250-M-SC, NPort 6250, NPort 6250-S-SC, NPort 6450, UPort 1250I, UPort 1450, UPort 1450I, UPort 1610-8, UPort 1650-8

Note: PWR-12200-DT-S1and PWR-12125-DT-S2 not included with power cord

Model Name	PWC-C13US-3B-183	PWC-C-13EU-3B-183 (CEE 7/7 to IEC C13)	PWC-C13UK-3B-183	PWC-C13JP-3B-183	PWC-C13AU-3B-183	PWC-C13CN-3B-183
						
Region	US	EU	UK	JP	AU	CN
Voltage	125 V	250 V	250 V	125 V	250 V	250 V
Thickness	6.3±0.2 mm (0.25±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	7.0±0.2 mm (0.28±0.01 in)	6.7±0.2 mm (0.26±0.01 in)	6.7±0.2 mm (0.26±0.01 in)
Max. Current	10 A	10 A	10 A	7 A	10 A	10 A
Length	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)	1830±30 mm (72.05±1.18 in)
Related Products	CN2500 Series, NPort 6600 Series, NPort 5600 Series, PWR-12200-DT-S1					

Model Name	PWC-C7US-2B-183	PWC-C7EU-2B-183	PWC-C7UK-2B-183	PWC-C7JP-2B-183	PWC-C7AU-2B-183	PWC-C7CN-2B-183
						
Region	US	EU	UK	JP	AU	CN
Length	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)	1830±200 mm (72.05±7.87 in)
Related Products	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2	PWR-12125-DT-S2

Locking barrel plug to bare wires

CBL-PJ21NOPEN-BK-30

Cable Length: 300±20 mm (11.81±0.79 in)

Wide Temperature AC Power Supplies

Locking barrel plug, 12VDC 1.5A, 100-240VAC (Switch-Mode)

Model Name	PWR-12150-USJP-SA-T	PWR-12150-EU-SA-T	PWR-12150-UK-SA-T	PWR-12150-AU-SA-T	PWR-12150-CN-SA-T
Accessories Image					
Input Rating					
I/P	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz
Input Plug					
Plug Type	US/JP	EU	UK	AU	CN
Output Rating					
O/P	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC	1.5A @ 12VDC
Protection Requirements					
Protection	Over current protection/ Over voltage protecction				
Output Plug					
Connector Type	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5	L-Type 5.5/2.1/7.5
Outer Diameter	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)	5.5±0.1 mm (0.22±0.004 in)
Inner Diameter	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)	2.1±0.1 mm (0.08±0.004 in)
Physical Characteristics					
Dimensions (L x W x H)	32 x 70.3 x 88 mm (1.26 x 2.77 x 3.46 in)	32 x 85.3 x 88 mm (1.26 x 3.36 x 3.46 in)	50 x 91 x 82.5 mm (1.97 x 3.58 x 2.25 in)	41 x 73.9 x 89.5 mm (1.61 x 2.91 x 3.52 in)	32 x 60 x 88 mm (1.26 x 2.36 x 3.46 in)
Weight	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)	200 g (0.44 lb)
Cord Length	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)	1500±200 mm (59.06±7.87 in)
Environmental Limits					
Operating Temperature	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)	-40 to 75°C (-40 to 167°F)
Regulatory Approvals					
Safty	FCC/UL/PSE	TUV/CE/GS	CE	RCM	CCC
Related Products					
Related Products	NPort 5110-T, NPort 5450-T,NPort 5450I-T, NPort 5110A-T, NPort 5610-8-DTL-T, NPort 5650-8-DTL-T, NPort 5650I-8-DTL-T, NPort 5130A-T, NPort 5150A-T, NPort 5210A-T, NPort 5230A-T, NPort 5250A-T, NPort 6100-T, NPort 6200-T, NPort 6400-T				

Power Supplies

24/48 VDC power supplies for installation on a DIN rail

	24 VDC DIN-Rail Power Supplies					48 VDC DIN-Rail Power Supplies			
Model Name	DR-4524	DR-75-24	DR-120-24	MDR-40-24	MDR-60-24	DR-75-48	DR-120-48	DRP-240-48	SDR-480P-48
Accessories Image									
Physical Characteristics and Temperature Limits									
Dimensions	78 x 67 x 93 mm (3.07 x 2.64 x 3.66 in)	55.5 x 100 x 125.2 mm (2.19 x 3.94 x 4.93 in)	65.5 x 100 x 125.2 mm (2.58 x 3.94 x 4.93 in)	40 x 90 x 100 mm (1.57 x 3.54 x 3.94 in)	40 x 90 x 100 mm (1.57 x 3.54 x 3.94 in)	55.5 x 100 x 125.2 mm (2.19 x 3.94 x 4.93 in)	65.5 x 100 x 125.2 mm (2.58 x 3.94 x 4.93 in)	125.5 x 125.5 x 100 mm (4.94 x 4.94 x 3.94 in)	85.5 x 125.2 x 128.5 mm (3.37 x 4.93 x 5.06 in)
Weight	400 g (0.88 lb)	550 g (1.21 lb)	650 g (1.43 lb)	260 g (0.57 lb)	280 g (0.62 lb)	550 g (1.21 lb)	650 g (1.43 lb)	1.2 kg (2.65 lb)	1.6 kg (3.53 lb)
Operating Temperature	-10 to 50°C (14 to 122°F)	-10 to 60°C (14 to 140°F)		-20 to 70°C (-4 to 158°F)		-10 to 60°C (14 to 140°F)		-10 to 70°C (14 to 158°F)	-25 to 70°C (-13 to 158°F)
Relative Humidity	20 to 90% RH	20 to 90% RH		20 to 90% RH		20 to 90% RH			10 to 95% RH
Power Requirements									
Wattage	45 W	75 W	120 W	40 W	60 W	75 W	120 W	240 W	480 W (current sharing up to 3840 W)
Input Voltage	85-264 VAC (47-63 Hz), or 120-370 VDC		88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC		85-264 VAC (27-63 Hz) or 120-370 VDC	88-132 VAC, or 176-264 VAC (47-63 Hz) by switch, or 248-370 VDC	85-264 VAC (47-63 Hz) or 120-370 VDC	90 to 264 VAC or 127 to 370 VDC
Output Power	48 W (24 VDC @ 0-2 A)	76.8 W (24 VDC @ 0-3.2 A)	120 W (24 VDC @ 0-5 A)	40 W (24 VDC @ 0-1.7 A)	60 W (24 VDC @ 0-2.5 A)	76.8 W (48 VDC @ 0-1.6 A)	120 W (48 VDC @ 0-2.5 A)	240 W (48 VDC @ 0-5 A)	480 W (48 VDC @ 0-10 A)
Over-voltage Protection	27.6 to 32.4 V	29 to 33 V		31.2 to 36 V		58 to 65 V		54 to 60 V	56-65 V
Overload Protection	105-150%								110-150%
Type	Constant Current Limiting								
Reset	Auto Recovery								
Inrush Current	30 A and 115 V, or 60 A and 230 V								40 A/115 VAC or 80 A/230 VAC
Reliability									
Safety Standards	EN 60950-1, UL 508 approved								
EMC Standards	EN 55022 Class B, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, EN 61000-3-2, EN 50082-2								
Warranty	3 years (see www.moxa.com/warranty)								

Fiber Accessories

Fiber Optic Adapters

SC male to ST female duplex adapters

These SC male to ST female duplex adapters are provided as an optional accessory to give users of Moxa industrial Ethernet switches more fiber optic connection options. Simply plug the adapters directly into the SC connector of any Moxa industrial Ethernet switch to convert the original SC connector into an ST connector. This allows you to use an ST connector with any MOXA industrial Ethernet switch, but without the need for an extra patchcord.

ADP-SCm-STf-S

SC male to ST female duplex adapter for single-mode fiber

Single-mode: 9/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Blue
Insertion Loss: 0.5/1.1 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

ADP-SCm-STf-M

SC male to ST female duplex adapter for multi-mode fiber

Multi-mode: 62.5/125 µm
Ferrules and Sleeves: Zirconia Ceramic
Body Color: Gray
Insertion Loss: 0.1/0.3 (TYP/MAX)
SC-side Connector: SC male
ST-side Connector: ST female

Caps

Model Name	A-CAP-M12M-M	A-CAP-M12F-M	A-CAP-N-M	A-CAP-M30M-MIP67	A-CAP-WPRJ45-MC
Accessories Image					
Description	Metal cap to cover M12-male connector	Metal cap to cover M12-female connector	Metal cap to cover N-type connector	Metal cap to cover M30 connector	Metal cap with chain for RJ45 connector
Related Products	Power cap for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12 DI/O cap for the AWK-4131-M12 AWK-6232-M12 PM-7200-4M12 TN Series	DI/O cap for the AWK-4121 AWK-6222 LAN cap for the AWK-3121-M12-RTG AWK-3131-M12-RCC AWK-5232-M12-RCC AWK-4131-M12 AWK-6232-M12 TN Series	Antenna cap for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	SFP cap for the AWK-4131-M12	Console & LAN caps for the AWK-4121 AWK-6222 Console cap for the AWK-4131-M12 AWK-6232-M12

Connectors

Model Name	CBL-M12(FF5P)/ OPEN-100 IP67	CBL-M12D(MM4P)/ RJ45-100 IP67	CBL-M23(FF6P)/ OPEN-BK-100 IP67	M12A-5P-IP68	M12A-8PMM-IP68	CBL-M12DFF4PRJ45-BK-10-IP67	CBL-M12MM8PRJ45-BK-100-IP67	M12A-8PFF-IP67
Accessories Image								
Description	1-meter M12-to-5-pin power cable with IP67-rated 5-pin female A-coded M12 connector	1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with IP67-rated 4-pin male D-coded M12 connector	1-meter M23-to-6-pin power cable with IP-67-rated female 6-pin M23 connector	Field-installation A-coded M12 screw-in 5-pin connector, female connector female pins	Field-installation A-coded M12 screw-in 8-pin connector, male connector male PIN	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated female 4-pin D-coded M12 connector	M12-to-RJ45 Cat-5E UTP Ethernet cable with IP67-rated male 8-pin A-coded M12 connector	Field-installation A-coded M12 screw-in 8-pin connector, female connector female PIN
Cable Length	1 m (39.37 in)	–	–	–	–	10 m (393.70 in)	1 m (39.37 in)	–
Related Products	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	TN Series ioPAC 8000 Series	TN Series TAP-6226-TC	Power connector for the AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	DI/O connector for the AWK-4121 AWK-6222 LAN connector for the AWK-4131-M12 AWK-6232-M12	AWK-4121 AWK-6222	AWK-4131-M12 AWK-6232-M12	DI/DO connector for the AWK-4131-M12 AWK-6232-M12

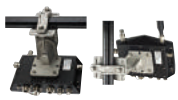
	Field-Installation Connectors	
Model Name	A-PLG-WPM30IP67-01	A-PLG-WPRJ
Accessories Image		
Description	Field-Installation for M30 plug	Field-installation RJ-type plug
Related Products	SFP LAN connector for the AWK-4131-M12	LAN connector for the AWK-4121 AWK-6222

Mounting Kits

	Wall-Mounting Kits							
Model Name	WK-30	WK-32	WK-35-01	WK-35-02	WK-36-02	WK-44-01	WK-45-01	WK-46
Accessories Image								
Dimensions	40 x 30 x 1 mm (1.57 x 1.18 x 0.04 in)	30.3 x 140 x 12.3 mm (1.19 x 5.51 x 0.48 in)	35 x 44 x 2.5 mm (1.38 x 1.73 x 0.10 in)	35 x 24 x 1.2 mm (1.38 x 0.94 x 0.05 in)	36 x 67 x 2 mm (1.42 x 2.64 x 0.08 in)	44 x 57.5 x 1.6 mm (1.73 x 2.26 x 0.06 in)	45 x 57 x 2.5 mm (1.77 x 2.24 x 0.10 in)	51.6 x 66.8 x 1 mm (2.03 x 2.63 x 0.04 in)
Related Products	EDS-205A Series EDS-G205 Series EDS-G205A-4PoE Series ICF-1170I Series	EDS-828 Series EDS-728 Series	NPort 6450, UPort 1410, UPort 1450, UPort 1450I	NPort 6150/6250 Series UPort 404 UPort 407	NPort IA5150A Series NPort IA5250A Series MGate 4101-MB-PBS MGate 4101I-MB-PBS	NPort 6600-8 Series NPort 6600-16 Series NPort 6600-32 Series UPort 1600-16 Series	NPort 5600-8 Series NPort 5600-16 Series NPort 5650-8-HV-T NPort 5650-16-HV-T CN2600-8 Series CN2600-16 Series CN2600-8-2AC Series CN2600-16-2AC Series	EDS-208A Series EDS-300 Series EDS-400A Series EDS-500A Series EDS-G308 Series EDS-G509 Series EDS-P206A-4PoE Series EDS-P308 Series EDS-P510 Series OBU-102 Series IMC-101G/101 Series PT-500 Series VPort 354 Series VPort 364A Series VPort 461A Series NPort S8455I-MM-SC NPort S8455I-MM-SC-T NPort S8455I-SS-SC NPort S8455I-SS-SC-T NPort S8458-4S-SC-T

	Wall-Mounting Kits				
Model Name	WK-51-01	WK-55	WK-75	WK-90	WK-195
Accessories Image					
Dimensions	55 x 67 x 1 mm (2.17 x 2.64 x 0.04 in)	55 x 34.5 x 2.5 mm (2.17 x 1.36 x 0.10 in)	75 x 90 x 2.5 mm (2.95 x 3.54 x 0.10 in)	99 x 62 x 2.5 mm (3.90 x 2.44 x 0.10 in)	195 x 17.5 x 52.5 mm (7.68 x 0.69 x 2.07 in)
Related Products	AWK-1000 Series AWK-3000 Series AWK-5222 Series AWK-1000A Series AWK-3000A Series OnCell 5104-HSPA OnCell G3470A-LTE WDR-3124A WAC-1001 EDR-G902 Series EDR-G903 Series EDS-P506A-4PoE Series EDS-316 Series IMC-101/IMC-P101 Series PTC-101 Series NPort IA5450A Series ioPAC 5500 Series	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12	EDS-600 Series ioPAC 8000 Series	ioLogik E1500 Series	PT-7710 Series

Mounting Kits

	DIN-Rail Mounting Kits					Pole-Mounting Kit
Model Name	DK-DC50131	DK-TN-5308	DK-M12-305	DK-25-01	DK-35A	PK-DC2DOF
Accessories Image						
Dimensions	50 x 131 x 1 mm (1.97 x 5.16 x 0.05 in)	66 x 174 x 12.8 mm (2.60 x 6.85 x 0.50 in)	60 x 125 x 12.8 mm (2.36 x 4.92 x 0.50 in)	25 x 48.3 mm (0.98 x 1.90 in)	42.5 x 10 x 19.34 mm (1.67 x 0.39 x 0.76 in)	–
Related Products	TN-5500 Series AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12 ioPAC 5500 Series ioPAC 8000 Series ioLogik E1500 Series MxNVR-MO4 Series	TN-5308 Series	TN-5305 Series	UPort 404 UPort 407	MGate™ 3x80 Series NPort Express DE-211 NPort Express DE-311 NPort 5100 Series NPort 5100A Series NPort 5200 Series NPort 5200A Series NPort 5400 Series NPort 6150/6250/6450 NPort W2x50A UPort 1150I UPort 404/407 UPort 1250/1250I TCF-142 Series TCC-100/100I TCC-120/120I	AWK-4121 AWK-4131-M12 AWK-6222 AWK-6232-M12

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