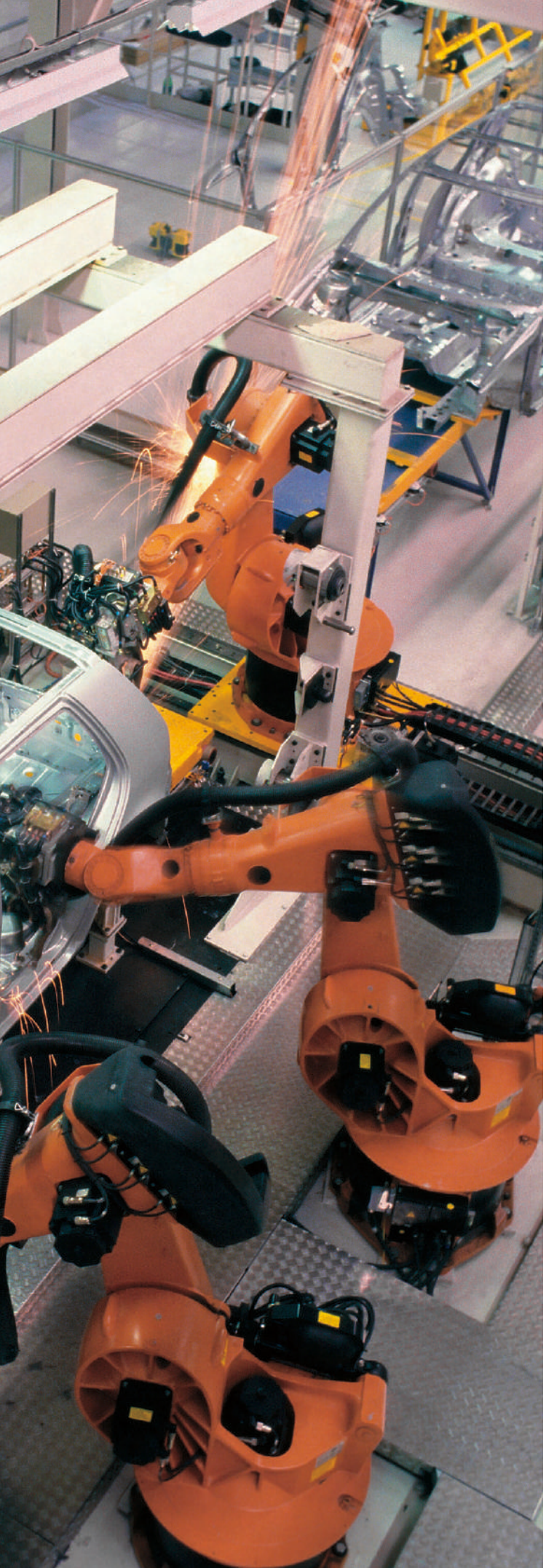
FIBERROAD

COMPANY BROCHURE

Fiberroad, the pioneering force in industrial Ethernet and optical fibre transmission products, brings together a dynamic fusion of software and hardware research and development.

www.fiberroad.com



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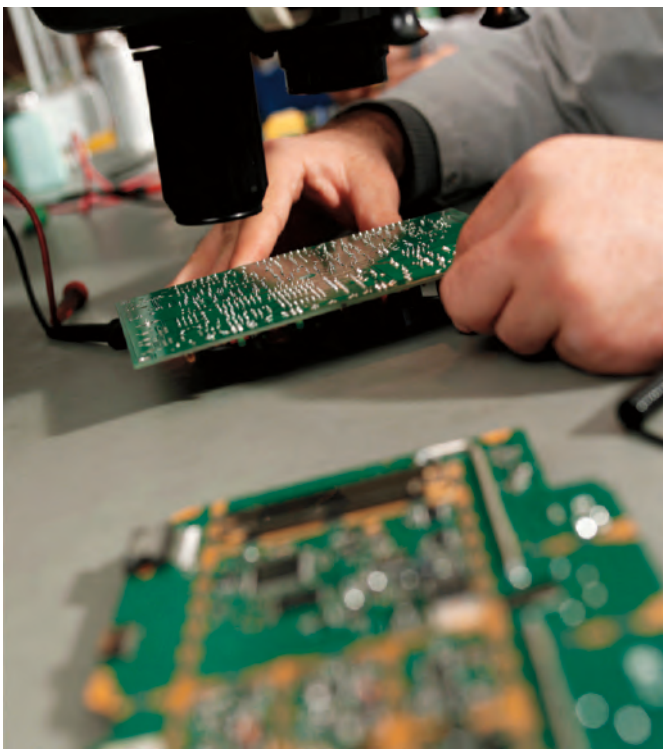
ABOUT US

Fiberroad Technology is dedicated to providing reliable network communication products and solutions. With rich practical experience and technology, we are qualified to provide stable and perfect network communication solutions, which are focused on the integration of Optical Fibre Technology, Industrial ethernet and Carrier Access Technology.

We have a wide range of products that can be used in various industries, such as railway, electric power, oil & gas, water treatment, mining, intelligent buildings, etc. Our products are characterized by high reliability and easy operation. They can meet the requirements of various applications and provide a solid foundation for the development of your business.

BRAND STORY



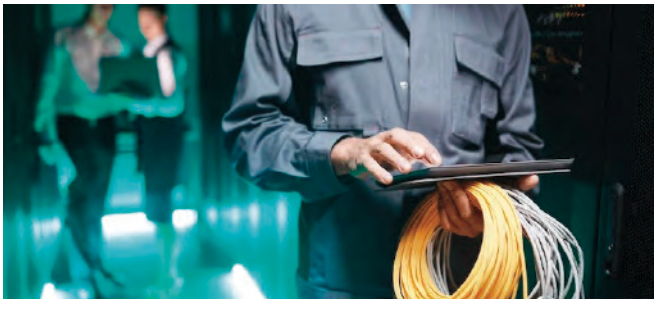
Fiberroad, the pioneering force in industrial Ethernet and optical fibre transmission products, brings together a dynamic fusion of software and hardware research and development. With an unwavering commitment to excellence, Fiberroad embodies innovation at every stage of the product lifecycle. From ideation to production and sales, this brand is redefining connectivity for businesses worldwide. But what sets Fiberroad apart is its relentless drive to meet customer needs with impeccable precision. It goes beyond just offering off-the-shelf solutions; it delves into the realm of bespoke design by providing customized product development tailored specifically for their clients.

COMPANY VALUE

At Fiberroad, our company culture thrives on innovation and cutting-edge solutions in network communication products. We are a team of passionate individuals who strive to revolutionize the way businesses connect and communicate. With our unwavering commitment to excellence, we have elevated ourselves as leaders in providing state-of-the-art network communication products and solutions. Our exciting journey involves collaborating with esteemed partners to develop advanced technologies that redefine connectivity possibilities. Each day, we challenge ourselves to think beyond conventional boundaries, pushing the limits of what is possible in this rapidly evolving industry.

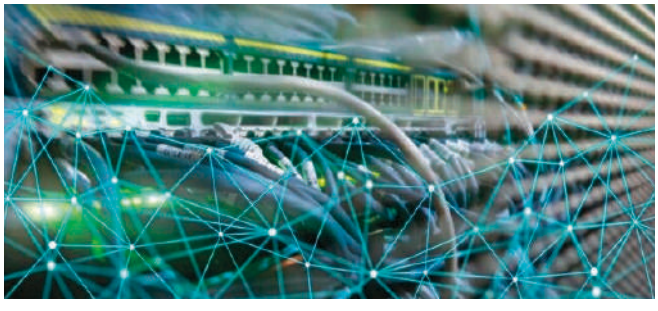
VISION

Our vision is to be the world's premier provider of network communication products and services. We will achieve this by continuing to innovate and deliver the highest quality products and services to our customers. We will also build strong relationships with our partners and employees, and work together to create a company that is truly different from any other.



MISSION

Our mission is to provide our customers with reliable and innovative fiberoptic network solutions that maximize their communication capabilities while providing them with a high-level of customer service. We strive to stay ahead of the curve in technology and to develop cutting-edge products and services that lead the industry forward.



SOLUTION

INDUSTRIAL AUTOMATION

Industrial automation is revolutionizing the manufacturing sector, and the advent of IIoT (Industrial Internet of Things) has further elevated its capabilities. The integration of IIoT in industrial automation brings about a seamless connection between machines, sensors, and systems, extracting valuable data to optimize processes like never before. With an array of interconnected devices communicating with each other in real-time, industries can achieve unprecedented levels of efficiency, productivity, and safety. From automated assembly lines to smart factories equipped with intelligent robots and autonomous vehicles, industrial automation powered by IIoT ensures precision in every step while minimizing human error. By leveraging advanced analytics and machine learning algorithms on the massive amount of data generated through IIoT devices, manufacturers gain actionable insights that enable predictive maintenance scheduling for equipment longevity and reduced downtime. Additionally, this technology allows remote monitoring and control over machinery operations from anywhere at any time—improving accessibility while enabling prompt response to potential issues or emergencies. Embracing IIoT-based industrial automation not only enhances productivity but also provides valuable opportunities for cost savings through optimized energy consumption and resource allocation—a significant advantage for businesses in today's competitive market landscape.

Mechines talk to one another

Everything is tracked in real time

Production lines can be altered & customised in a matter of seconds

Machines are repaired before they breakdown

The IIoT can provide numerous benefits to the actions in the manufacturing industry which can be understood by examining the core functionalities of the technology itself. IIoT is a group of networks that utilize networking technologies and standard Internet Protocol to connect machines, people, and processes, creating a cyber-physical system. There are lots of avenues IIoT is serving the manufacturing industry and assisting in solving challenges, the most common use cases in the industry are discussed here.

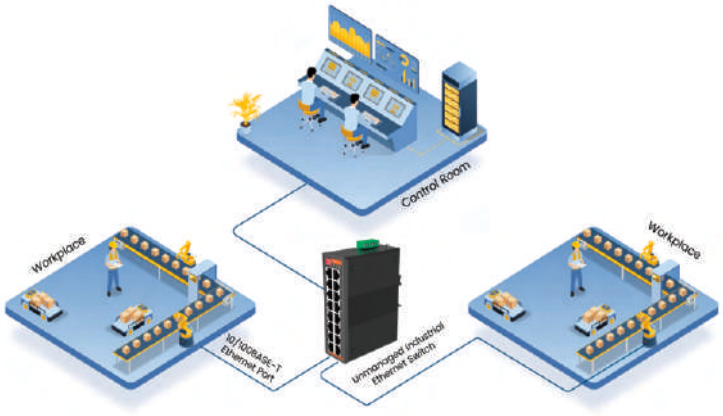
Revolutionizing Industrial Automation: Exploring the Benefits of Fiberroad Industrial Ethernet Solution

Availability and Reliability

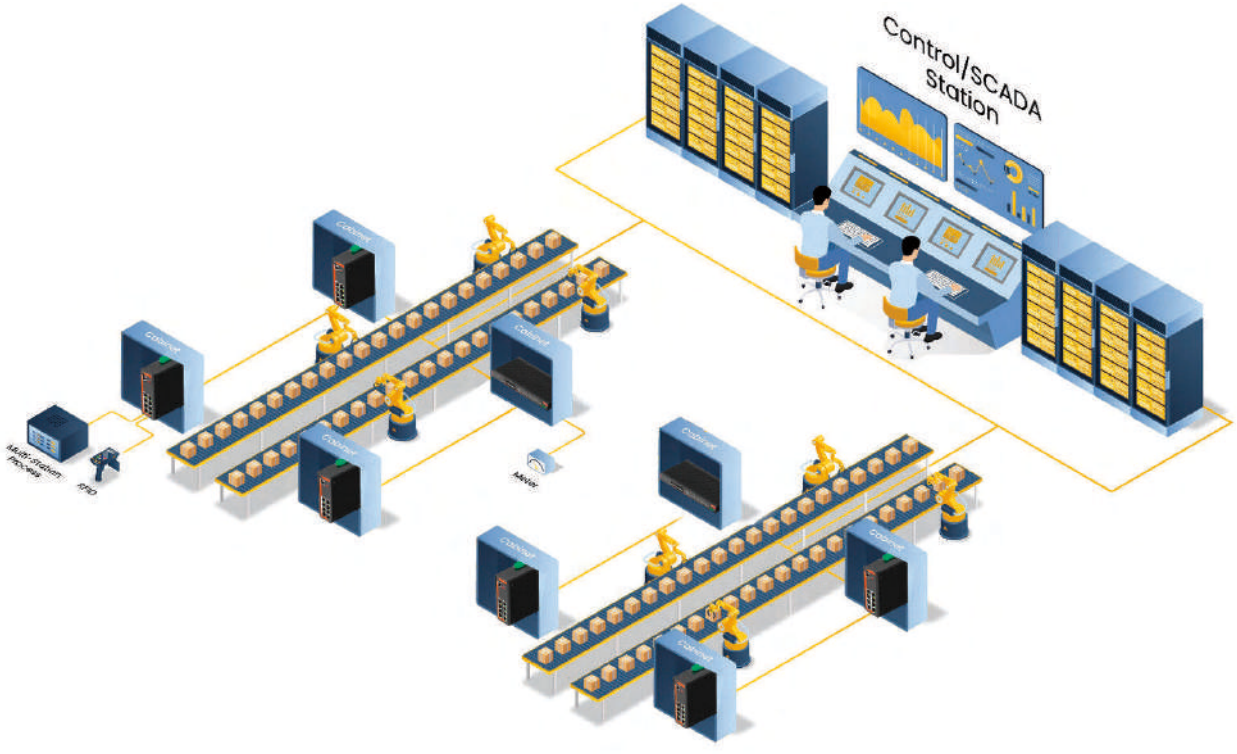
- -40 to 75 degree C operating temperature
- IP40 Rating
- High level EMI/EMC shielding
- High MTBF with no fan/heater needed
- Redundant power supply with isolated protection

High Performance

- DIP Switch supports Broadcast Storm Protection
- Up to 16x10/100Base-TX LAN port
- ≤7us switching latency
- Support 10K Jumbo Frame



The Fiberroad Unmanaged Industrial Ethernet Switch is a remarkable device specifically tailored to meet the requirements of industrial automation applications. With its unparalleled design and cutting-edge features, it has become an essential component in various industries. This switch offers a seamless connectivity solution with support for up to 16 port 10/100Base-T Ethernet Lan ports, enabling efficient data transmission across multiple devices within the network. Its robust build ensures reliable performance even in harsh industrial environments where stability is crucial. One notable feature of this switch is its Broadcast Storm Protection capability, which effectively prevents excessive flooding of broadcast packets that can potentially disrupt network communications. With this innovative safeguard in place, businesses can enjoy uninterrupted data flow and improved operational efficiency throughout their automation processes. The Fiberroad Unmanaged Industrial Ethernet Switch truly exemplifies excellence and reliability within the realm of industrial networking solutions.



Streamlining Operations with a Manageable Industrial Network

Demystifying the Challenges of Implementing Industrial Automation

Industrial automation is revolutionizing the way businesses operate, streamlining processes and increasing efficiency. However, despite its numerous benefits, implementing industrial automation can present challenges that need to be demystified. One of the main hurdles lies in technological integration. Integrating different systems and machines with diverse protocols and interfaces can be a complex task, requiring meticulous planning and expertise. Additionally, there may be resistance from employees who fear job displacement due to automation. Addressing this concern requires effective communication strategies that highlight how industrial automation enhances productivity rather than replacing human labor entirely. Another challenge is data management; with massive amounts of information generated by automated systems, it's crucial to develop robust analytics tools for collecting, analyzing, and utilizing this data effectively. Moreover, ensuring cybersecurity becomes paramount as interconnected devices increase vulnerability to cyber threats. By understanding these challenges associated with industrial automation implementation, organizations will be better equipped to overcome them and fully leverage the transformative potential of this technology

Increasing Efficiency and Productivity: How a Manageable Industrial Network Streamlines Operations

In today's rapidly evolving industrial landscape, the concept of streamlining operations has become more crucial than ever. Industrial automation presents a promising solution to this challenge by enabling businesses to optimize processes and enhance efficiency across their networks. One key aspect in achieving such optimization lies in establishing a manageable industrial network. By integrating advanced technologies like robotics, artificial intelligence, and Internet of Things (IoT), companies can create interconnected systems that facilitate real-time data exchange and seamless communication between various components on the factory floor. This allows for improved decision-making capabilities, predictive maintenance, and reduced downtime due to proactive troubleshooting. With an emphasis on scalability and flexibility, a well-designed industrial network provides businesses with the ability to adapt quickly to changing market demands while ensuring smooth operations around the clock. Moreover, it promotes comprehensive monitoring of production metrics which aids in identifying bottlenecks or inefficiencies that hinder productivity growth. Ultimately, embracing industrial automation empowers enterprises with newfound agility and competitiveness as they navigate through today's fast-paced global marketplace.

How Fiberroad Solution Streamlines Manageable Industrial Automation

High Standard Industrial Grade

- -40 to +75 degree C operating temperature
- IP40 Rating
- High level EMI/EMC shielding
- High MTBF with no fan/heater needed
- Redundant power supply with isolated protection
- Hardened for Vibration, Shock, Surge and Noise Immunity

Advance Network Feature

- Build a redundant network with STP/RSTRP/MSTP/ERPSv2
- Support the IPv4 and IPv6 multicast functions
- ACL Based on MAC, IP address
- Class of Service(Port-based, 802.1p, IP TOS Precedence, IP DSCP), Trusted QoS, Rate Limitation
- Flexible bandwidth control policies
- Layer 3 support OSPFv2, RIPv2 and static route

Secure and Simplified Access

- CLI(Console/Telnet(RFC854)), WebUI(HTTPS), SNMPv3
- HTTPS/SSLv2v3,TLSv1 RADIUS, TACACS+,AAA SSHv1/v2
- Support DHCP Snooping, Option 43/82, 802.1X security access
- Support user hierarchical management
- Support DOS, port-based MAC filtering/binding, MAC whitelist
- Support IPv4/IPv6 ACL

High Performance Network Management

- Web-based CloudMQTT to monitor the industrial Network anytime, anywhere.
- Command-line interface(CLI) and Firo WebGUI management for configuring major managed functions.
- SNMPv1/v2C/v3 for different levels of network management.
- FIRO Web-based NMS enable discovery and diagrams of Industrial Ethernet network topology

Product Recommendation

Layer 2+ Industrial Ethernet Switch

FR-7M3008

8x10/100/1000Base-T RJ45 Ports

FR-7M3420S

- 20x10/100/1000BASE-T RJ45
- 4x100/1000BASE-X SFP
- 4xRS232/422/485 Serial Port

Layer 3 Industrial Ethernet Switch

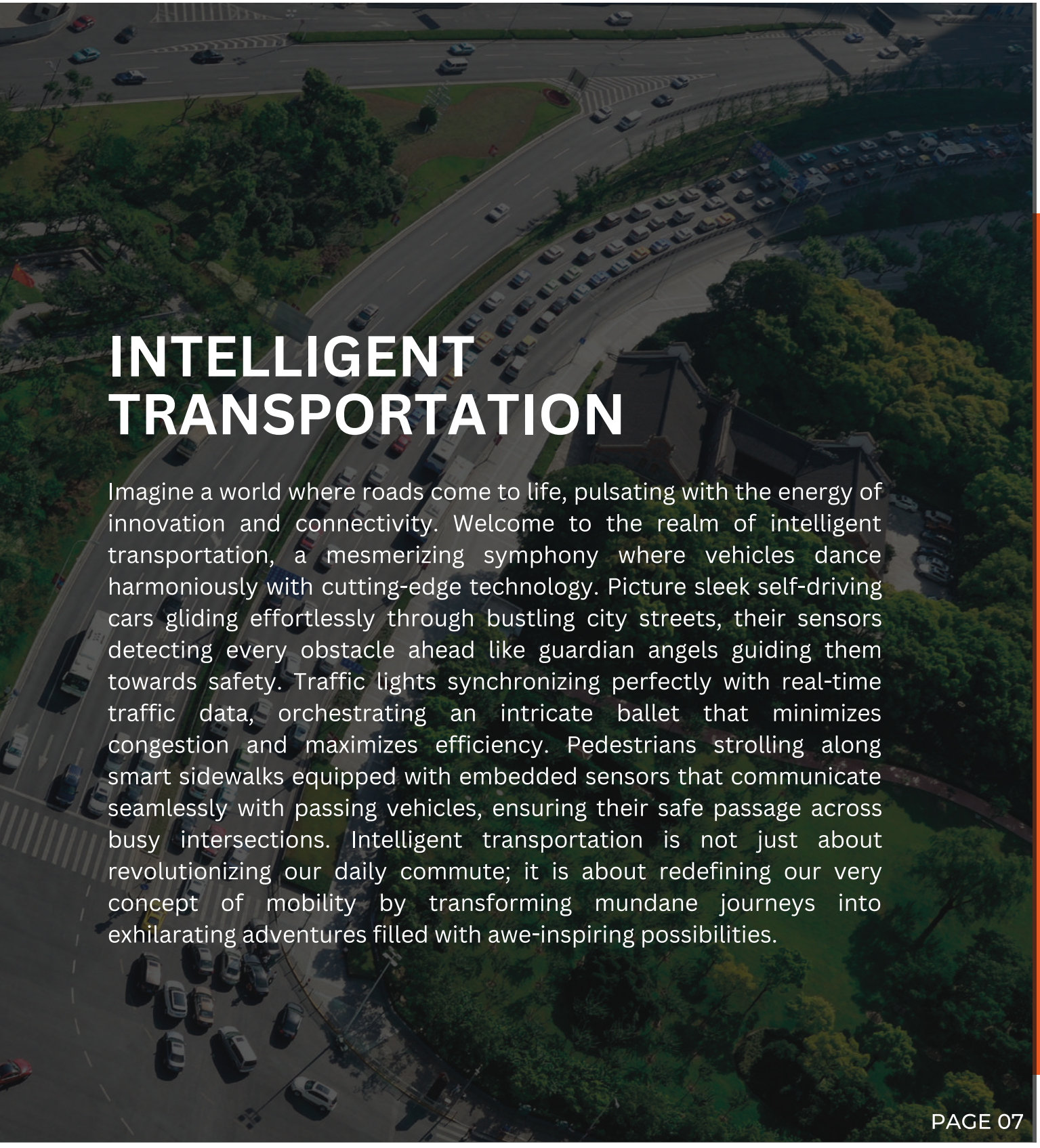
FR-7T4408

- 8×10/100/1000BASE-T RJ45
- 2×1.25G/10G SFP/SFP+
- 2×1.25G/2.5G/10G SFP/SFP+

FR-9T4424

24×10/100/1000BASE-T
4x10Gb SFP+ Uplink

SOLUTION



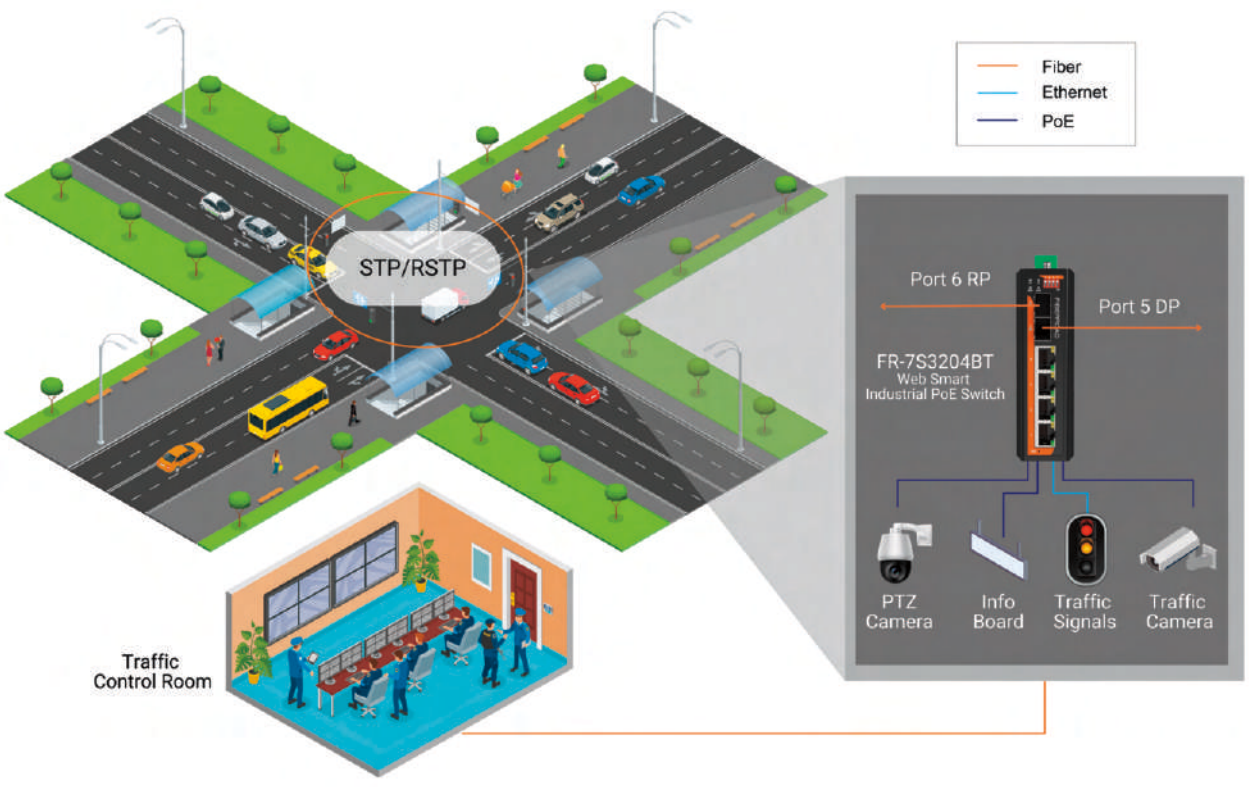
INTELLIGENT TRANSPORTATION

Imagine a world where roads come to life, pulsating with the energy of innovation and connectivity. Welcome to the realm of intelligent transportation, a mesmerizing symphony where vehicles dance harmoniously with cutting-edge technology. Picture sleek self-driving cars gliding effortlessly through bustling city streets, their sensors detecting every obstacle ahead like guardian angels guiding them towards safety. Traffic lights synchronizing perfectly with real-time traffic data, orchestrating an intricate ballet that minimizes congestion and maximizes efficiency. Pedestrians strolling along smart sidewalks equipped with embedded sensors that communicate seamlessly with passing vehicles, ensuring their safe passage across busy intersections. Intelligent transportation is not just about revolutionizing our daily commute; it is about redefining our very concept of mobility by transforming mundane journeys into exhilarating adventures filled with awe-inspiring possibilities.

The advent of the Industrial Internet of Things (IIoT) has revolutionized various industries, and one area that has seen a significant transformation is intelligent transportation. The integration of IIoT connectivity in this sector has sparked an exciting wave of innovation and efficiency. Imagine a bustling city with smart traffic lights seamlessly communicating with vehicles equipped with sensors and Ethernet technology. These interconnected systems analyze real-time traffic data, predict congestion patterns, and dynamically adjust signal timings to ensure smooth flow on the roads. Intelligent transportation construction now involves not just physical infrastructure but also cutting-edge technologies that optimize traffic management. With IIoT connectivity, roadways are no longer mere concrete structures; they become intelligent networks that enhance safety, reduce travel time, and minimize carbon emissions. Sensors embedded in bridges can monitor structural health remotely while cameras along highways capture live footage for instant analysis by AI-powered algorithms detecting accidents or congestion hotspots in real-time—enabling immediate response from emergency services or rerouting options for commuters through mobile applications. This exciting convergence of technology brings us closer to a future where our daily commute becomes less frustrating and more seamless – thanks to the power of IIoT connectivity in intelligent transportation construction!

The Role of Industrial Ethernet Switches in Revolutionizing Intelligent Transportation

The role of Industrial Ethernet switches in revolutionizing intelligent transportation cannot be overstated. These highly advanced and robust devices play a crucial role in ensuring seamless communication, data transfer, and control within the complex infrastructure of modern transportation systems. Designed to withstand harsh environmental conditions and operate reliably over extended periods, industrial Ethernet switches provide the backbone for efficient traffic management, vehicle tracking, surveillance systems, and more. By seamlessly connecting various components such as traffic lights, sensors, cameras, signaling devices, and control centers through a unified network infrastructure, these switches enable real-time monitoring and centralized control of transportation operations. They facilitate quick decision-making based on accurate data analysis while improving safety measures by enabling prompt response to emergencies or abnormal situations. Moreover, with their enhanced cybersecurity features like port security mechanisms and access controls protocols that protect against unauthorized access or data breaches; industrial Ethernet switches ensure the integrity and privacy of critical information transmitted across connected devices.



Smart Traffic Light

Smart traffic lights are becoming increasingly popular in urban areas as a way to improve traffic flow and reduce congestion. There are a number of benefits that come with implementing smart traffic lights, including:
-**Improved Traffic Flow**: Smart traffic lights use sensors to detect the amount of traffic on a road and adjust the timing of the lights accordingly. This can help to keep traffic moving smoothly, even during peak times.
-**Reduced Congestion**: By improving the flow of traffic, smart traffic lights can also help to reduce congestion. This is especially beneficial in areas with high levels of pedestrian and vehicle traffic.
-**Fewer Accidents**: By reducing the need for drivers to make sudden stops or start-and-go maneuvers, smart traffic lights can help to decrease the number of accidents on the road.
-**Lower Emissions**: By helping to reduce congestion and improve traffic flow, smart traffic lights can also lead to lower emissions from vehicles stuck in idling or stop-and-go conditions.

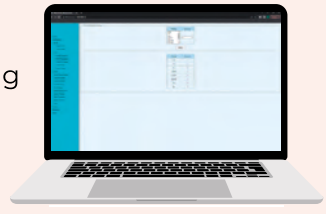
Product Recommendation

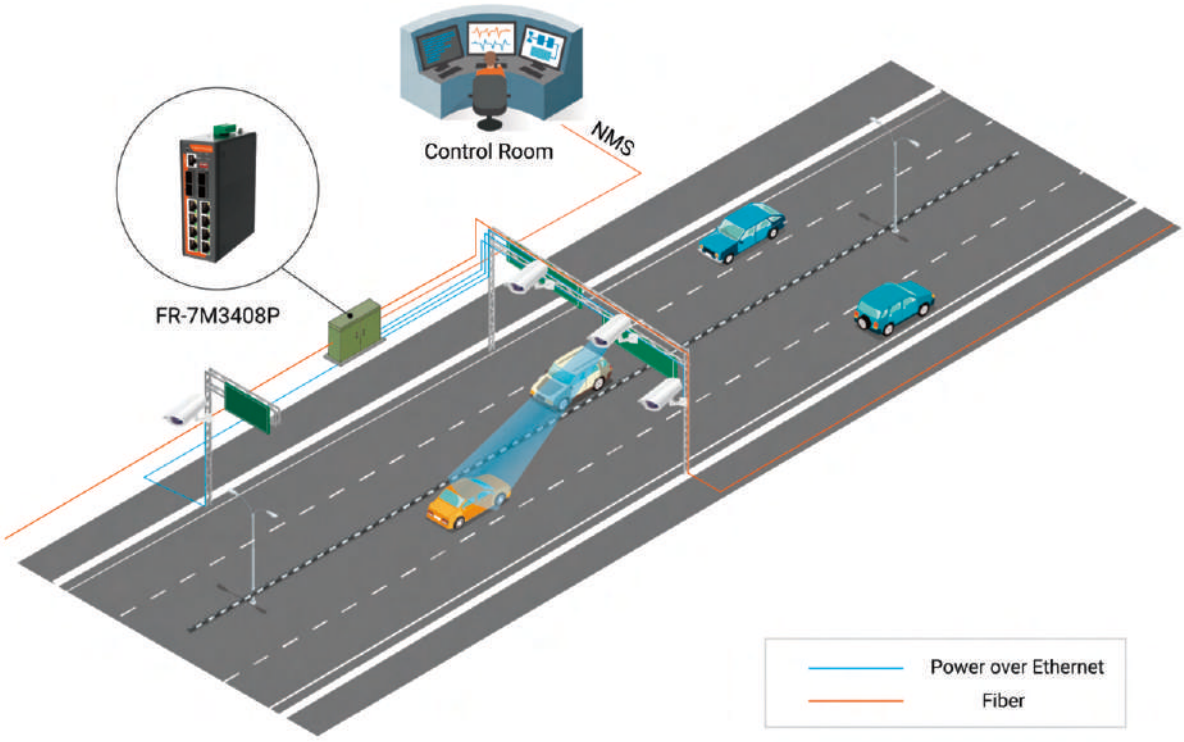
FR-7S3204BT

- 4×10/100/1000Base-T RJ45 ports+2×100/1000Base-X SFP ports
- Support IEEE802.3bt per Lan port
- One Click RSTP Ring Topology
- -40 to +75℃ Operating Temperature
- Electric 8kV Surge Protection
- IP40 Aluminum case, no fan design

Web Smart Management

- Bandwidth Control
- VLAN Setting
- Trunk Group Setting
- QoS Priority
- IGMP Setting
- Firmware Upgrade





Intelligent Highway

Highway Intelligent Digital Security with PoE Technology revolutionizes the way we perceive and manage highway surveillance systems. This cutting-edge solution encompasses an all-in-one support **IP Surveillance System**, **License Plate Recognition**, **Object Tracking**, and **Car Counting** features to ensure a comprehensive level of security. The implementation of PoE (Power over Ethernet) technology further enhances efficiency by eliminating the need for separate power sources, thereby reducing clutter and streamlining installation processes. With Highway Intelligent Digital Security, monitoring stretches of highways becomes a seamless endeavor as it seamlessly captures high-definition footage in real-time while intelligently recognizing license plates for efficient tracking purposes. Moreover, its advanced object tracking capabilities allow for swift identification and monitoring of suspicious activities along the highway. Additionally, this intelligent system enables accurate car counting to facilitate traffic management initiatives effectively. By incorporating state-of-the-art technologies into one cohesive system, Highway Intelligent Digital Security redefines safety measures on our roads while catering to the increasing demands of our modern society.

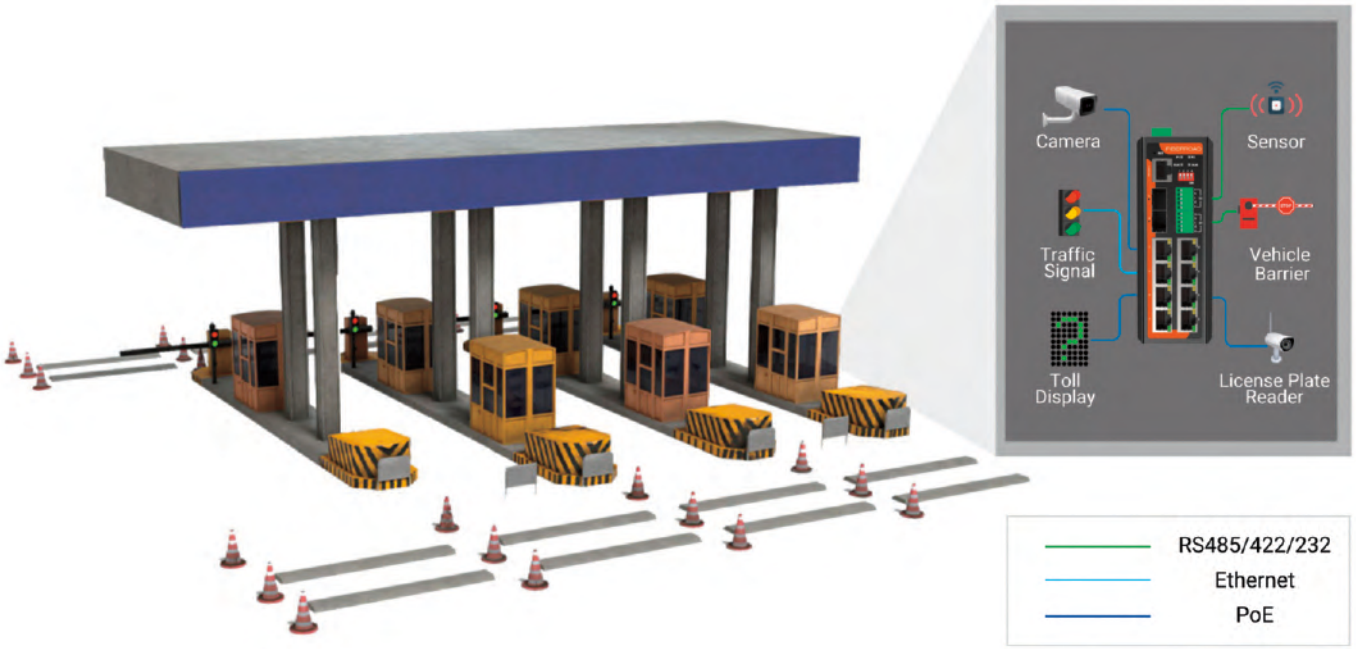
Product Recommendation

FR-7T4408P

- 8×10/100/1000Base-T RJ45 ports+4×1G/2.5G/10G SFP ports
- Support IEEE802.3at per Lan port
- Layer 3 Network Features
- -40 to +75℃ Operating Temperature
- Electric 8kV Surge Protection
- IP40 Aluminum case, no fan design

Surveillance VLAN Supported

A Surveillance VLAN is a virtual local area network built specifically for the user's video data streams, assuring the integrity of video traffic when it is broadcast with other traffic. That is to say, if other services (data, voice, etc.) are simultaneously delivered, a surveillance VLAN will be prioritized and broadcast with a higher forwarding priority in both Security and Bandwidth Availability.



Smart Toll Station

A Smart Toll Station based on Industrial Power over Ethernet (PoE) is revolutionizing the way toll collection systems operate. This innovative technology combines the efficiency of PoE with intelligent monitoring and control capabilities, transforming a traditional toll station into a smart and connected hub. With this system in place, toll stations can effortlessly manage various operations such as vehicle detection, license plate recognition, and automated payment processing. The integration of industrial-grade PoE ensures reliable power supply to all devices at the toll station, eliminating the need for multiple power sources and reducing installation costs significantly. Moreover, this centralized power distribution not only improves operational reliability but also simplifies maintenance procedures by providing remote access to monitor energy consumption and detect faults promptly. As a result, traffic management authorities benefit from enhanced accuracy in revenue collection while drivers experience seamless passage through these efficiently managed Smart Toll Stations.

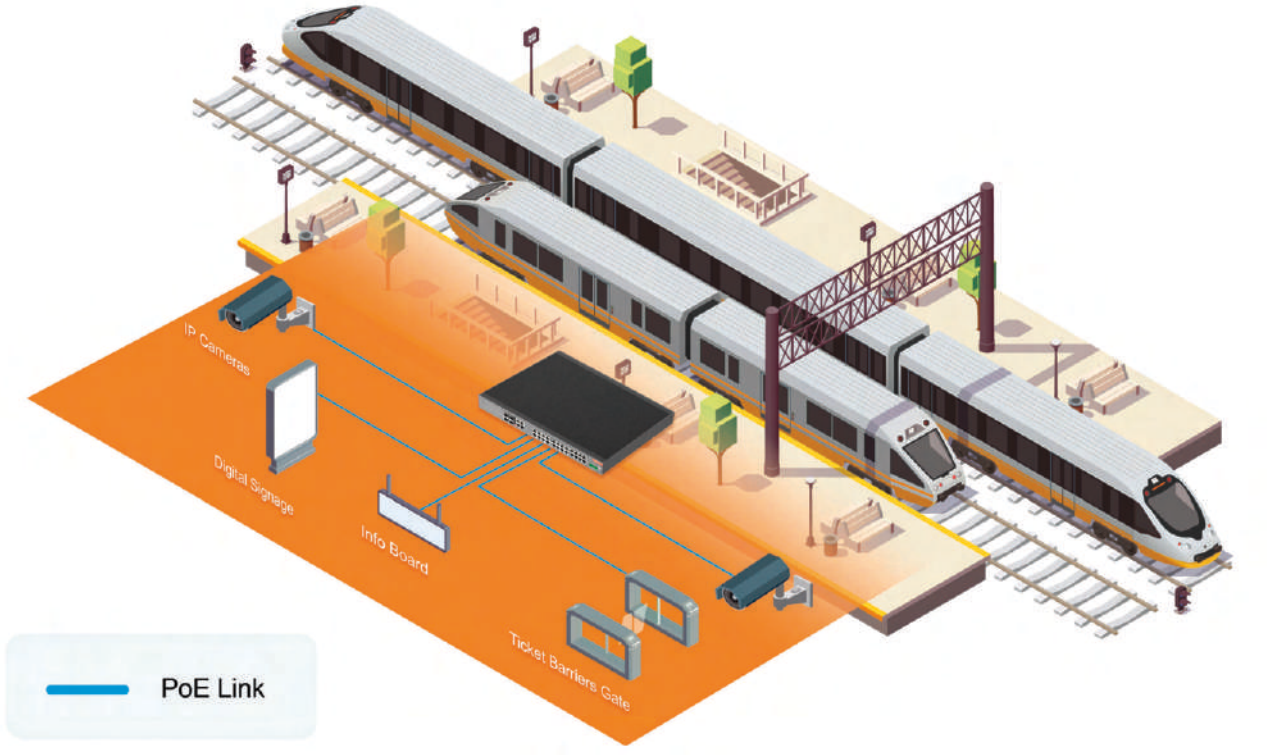
Product Recommendation

FR-7M3208SP

- 8×10/100/1000Base-TX RJ45 ports+2×100/1000Base-X SFP ports
- 2 x RS485/422/232
- Support IEEE802.3at per Lan port
- -40 to +75℃ Operating Temperature
- Electric 8kV Surge Protection
- IP40 Aluminum case, no fan design

Layer 2 Plus Network Features

- Web/CLI/NMS/Cloud Network Management
- Advanced PoE management functions : PoE output setting, Smart PoE, PoE scheduling and PoE Budget Management.
- RADIUS, SNMPv3, IEEE 802.1x, HTTPs, SSHv2 and sticky MAC address to enhance network security
- Build up a redundant network with RSTP/ MSTP /ERPSv2.
- Integration of Modbus TCP and Modbus RTU/ASCII networks



Smart Train Station

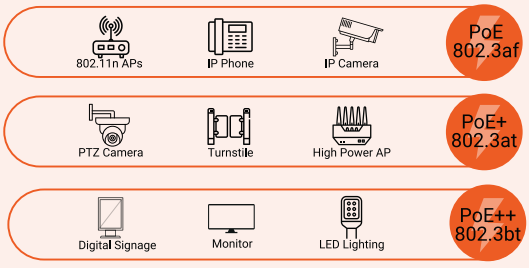
As you step foot into the station, smart sensors detect your presence and activate a personalized digital display guiding you to the appropriate platform. The entire station is equipped with PoE-powered LED lighting systems that automatically adjust their brightness based on natural light levels, creating a pleasant ambiance while conserving energy. With real-time occupancy monitoring using PoE-enabled cameras, commuters can effortlessly find available seats or standing space in crowded trains. Moreover, the platforms are equipped with high-speed wireless charging stations powered by PoE technology - allowing travelers to power up their devices without needing cumbersome cables or searching for outlets amidst bustling crowds. A centralized control system manages all aspects of the Smart Train Station through a single interface powered by PoE switches – from train schedules and announcements displayed on interactive digital signage to surveillance cameras ensuring passenger safety at all times.

Product Recommendation

FR-9M3424BT

- 4xCombo Gigabit +24xGigabit RJ45
- Delivering up to 90W power per port
- Priority system for PoE Port, it will supply power to the high priority level port first when the power budget is insufficient.

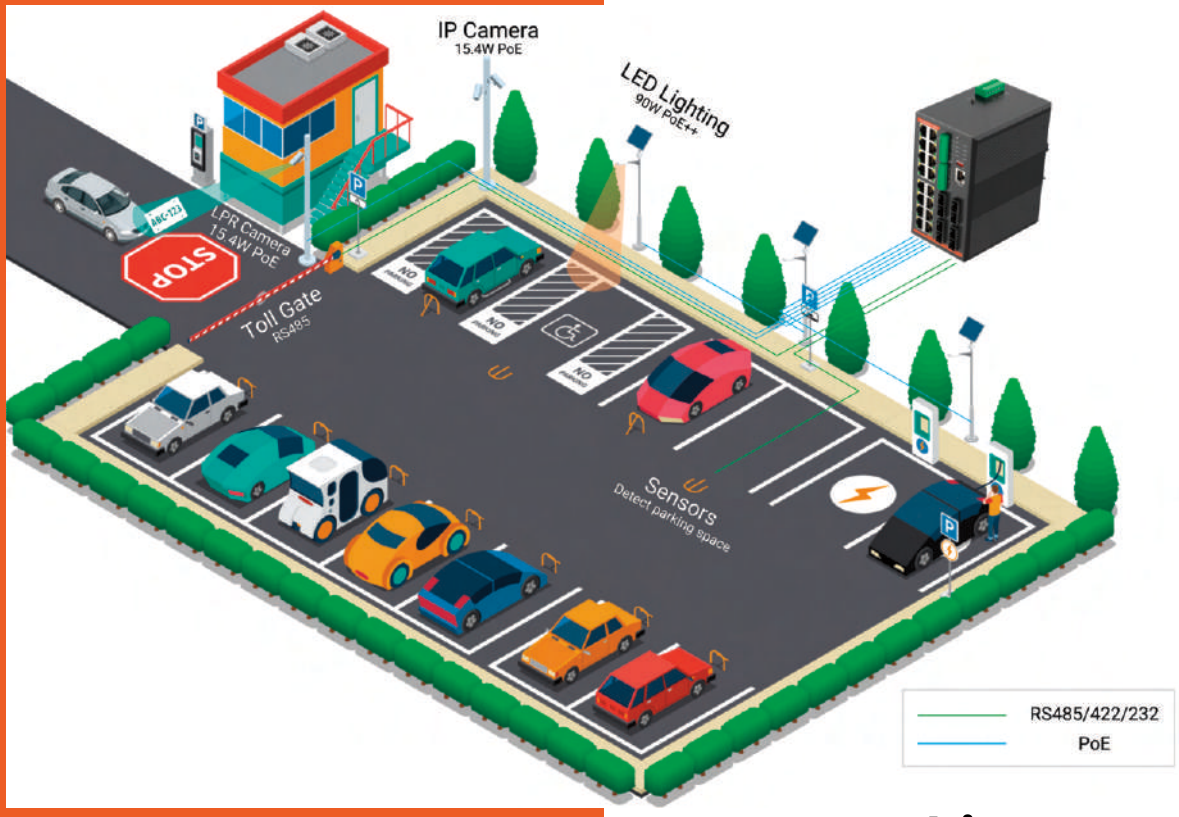
All-in-One PoE Solution



SOLUTION

SMART CITY

A Smart City is a cutting-edge urban environment that utilizes advanced technologies and data-driven solutions to enhance the quality of life for its residents. In such cities, smart sensors are embedded in infrastructure, enabling real-time monitoring and management of various aspects like traffic flow, energy consumption, waste management, and public safety. These interconnected systems collaborate seamlessly to optimize resource allocation, reduce pollution levels, and improve overall efficiency. For instance, intelligent transportation systems can dynamically adjust traffic signals based on congestion levels or reroute vehicles to minimize travel time. Additionally, citizens can benefit from interactive platforms that provide information about available parking spaces or suggest the fastest routes using public transit options. Furthermore, Smart Cities prioritize sustainability by promoting renewable energy sources through smart grid integration and implementing eco-friendly practices like water conservation and recycling programs. The use of technology also extends to healthcare services with telemedicine applications allowing remote consultations or wearables continuously monitoring vital signs for early detection of health issues. In conclusion, a Smart City leverages innovation to create an efficient ecosystem where connectivity empowers citizens while simultaneously addressing urban challenges in a more sustainable manner.



Smart Parking Lot

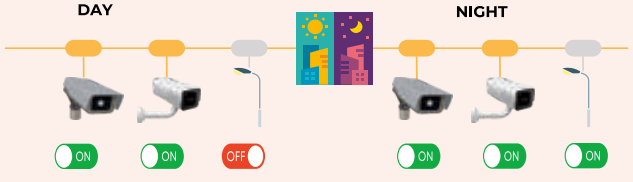
The introduction of the Smart Parking Lot solution with an industrial PoE Switch has revolutionized the way parking lots function. This cutting-edge technology combines the power and reliability of an industrial-grade PoE Switch with intelligent parking management systems, creating a seamless experience for both drivers and lot operators. The industrial PoE Switch acts as the backbone of this system, providing reliable connectivity and power to various devices such as surveillance cameras, sensors, and access control systems. With its robust design and high-quality components, the switch ensures uninterrupted data transmission even in harsh outdoor environments. Its wide operating temperature range allows it to withstand extreme weather conditions while maintaining optimal performance. Furthermore, this innovative solution optimizes parking spaces by utilizing real-time data from sensors to direct drivers towards available spots efficiently, reducing congestion and maximizing occupancy rates. Additionally, integrated surveillance cameras enhance security measures by monitoring activity within the parking lot premises in real-time.

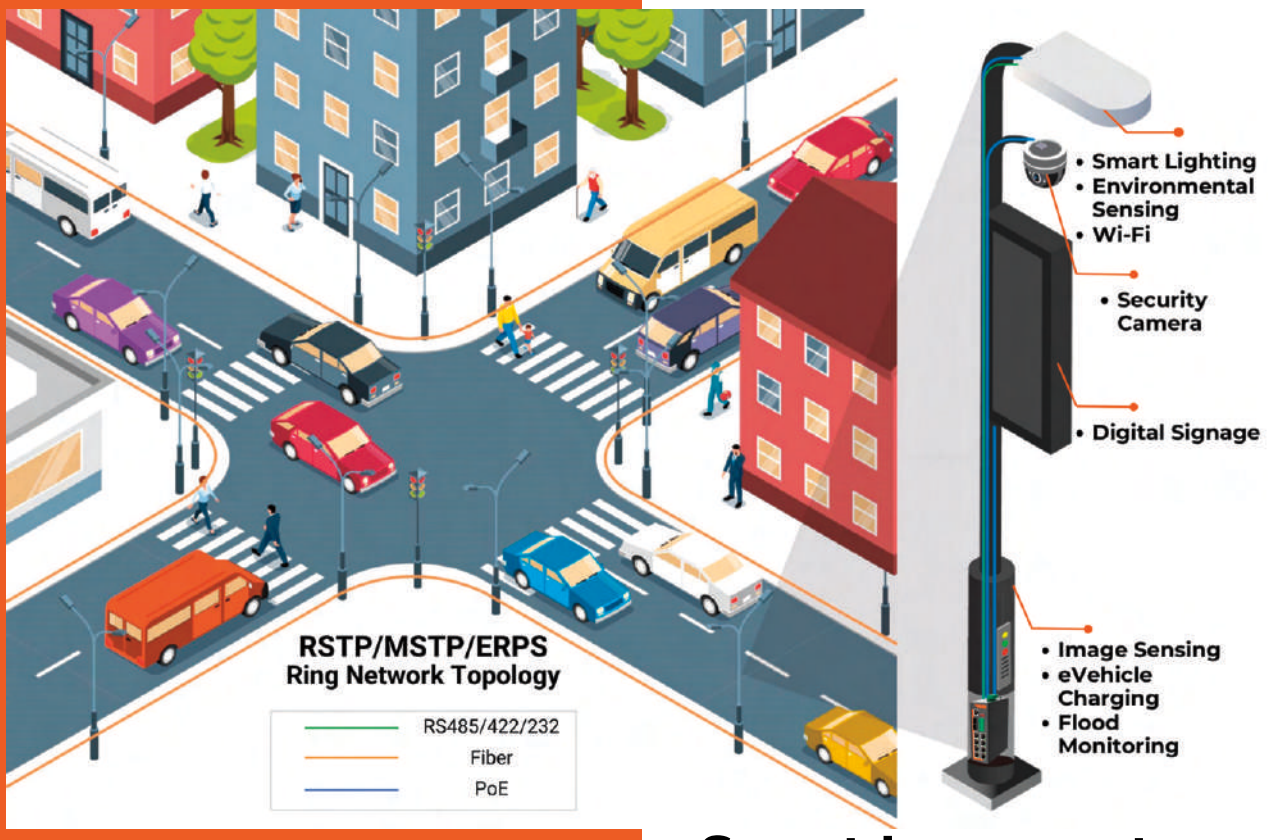
Product Recommendation

FR-7M3420SP

- 20x10/100/1000BASE-T RJ45
- 4x100/1000BASE-X SFP
- 4xRS232/422/485 Serial Port
- Support IEEE802.3at per Lan port
- -40 to +75℃ Operating Temperature
- Electric 8kV Surge Protection
- IP40 Aluminum case, no fan design
- Web/CLI/NMS/Cloud Network Management

PoE Scheduling Features





Smart Lampposts

The Fiberroad Industrial PoE Switch with RS232/422/485 communication is an exceptional solution tailor-made for Smart Lampposts. Designed to withstand the harsh conditions of industrial environments, this switch combines power over Ethernet (PoE) technology with versatile serial communication capabilities. The rugged construction ensures reliability amidst extreme temperatures, vibrations, and electromagnetic interference commonly found in outdoor settings. With its RS232/422/485 interfaces, the switch enables seamless integration with various intelligent lamppost components such as sensors, cameras, or control systems. This allows for real-time data acquisition and analysis, enabling efficient monitoring and management of smart lighting infrastructure. Additionally, the PoE functionality eliminates the need for separate power supplies by delivering both data and electrical power through a single Ethernet cable; simplifying installation while reducing clutter. Whether it's remotely controlling lighting schedules or gathering data on energy consumption patterns, the Fiberroad Industrial PoE Switch provides a robust and flexible solution for modernizing urban lighting networks.

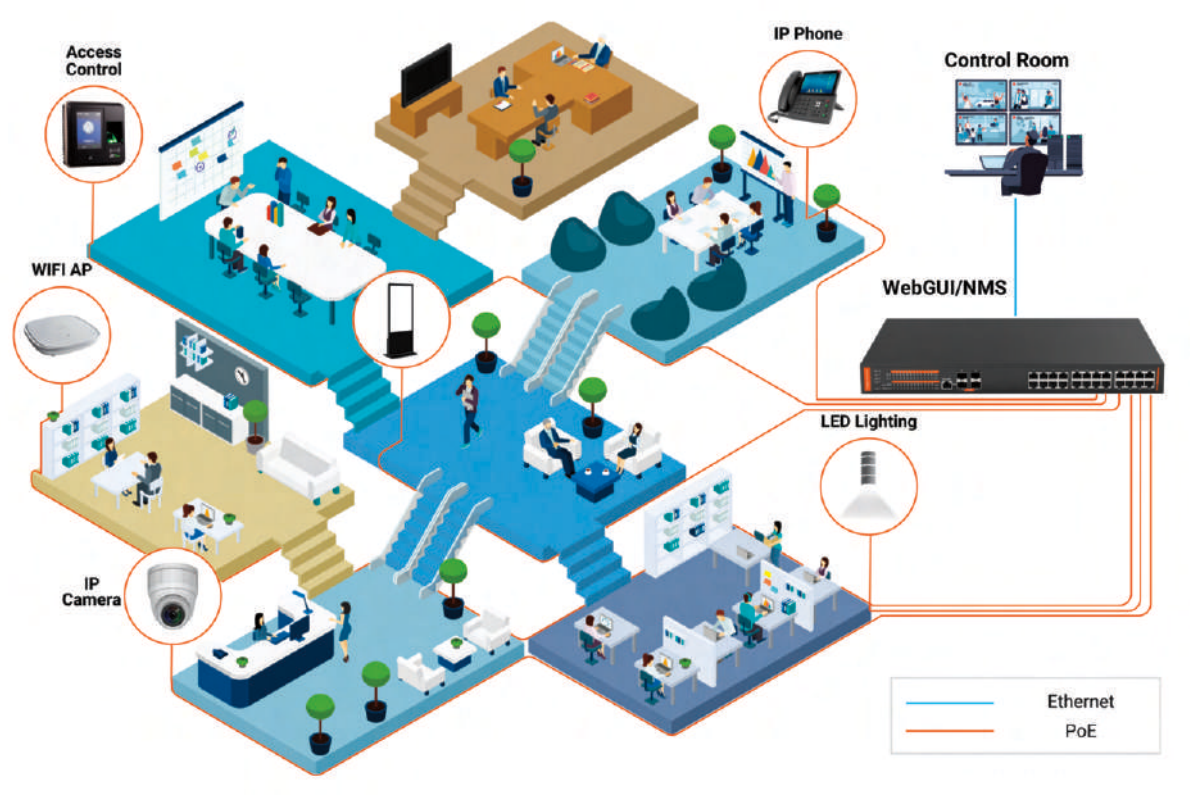
Product Recommendation

FR-7M3208SBT

- 8×10/100/1000Base-T RJ45 ports+2×100/1000Base-X SFP ports
- 2 x RS485/422/232
- Support IEEE802.3bt per Lan port
- -40 to +75℃ Operating Temperature
- Electric 8kV Surge Protection

All-in-One IIoT Solution

- Power over Ethernet
- Serial over Ethernet
- Ethernet over Fiber
- Ethernet over MQTT
- Modbus over MQTT



Smart Building

A smart building solution with a managed PoE switch is the perfect combination of technological innovation and efficient management. The advent of Internet of Things (IoT) has revolutionized how buildings are operated, and a managed PoE switch plays a crucial role in this transformation. With its advanced capabilities, this intelligent network device not only provides power to various IoT devices but also allows for seamless communication between them. Its "managed" feature enables centralized control and monitoring, ensuring optimal performance and security throughout the building's infrastructure. This means that administrators can remotely configure settings, troubleshoot issues, and even prioritize power allocation based on specific requirements. Moreover, these switches offer enhanced energy efficiency by automatically detecting idle or inactive ports and adjusting power consumption accordingly. Overall, incorporating a managed PoE switch into a smart building solution guarantees streamlined operations, cost-effectiveness, improved productivity, and sustainability all at once

Product Recommendation

FR-5T4424P

- 4x10 Gigabit SFP+ +24xGigabit RJ45
- Delivering up to 90W power per port
- Priority system for PoE Port, it will supply power to the high priority level port first when the power budget is insufficient.
- Web/CLI/NMS/Cloud Network Management

Key Features

Voice VLAN
Surveillance VLAN

LLDP-MED

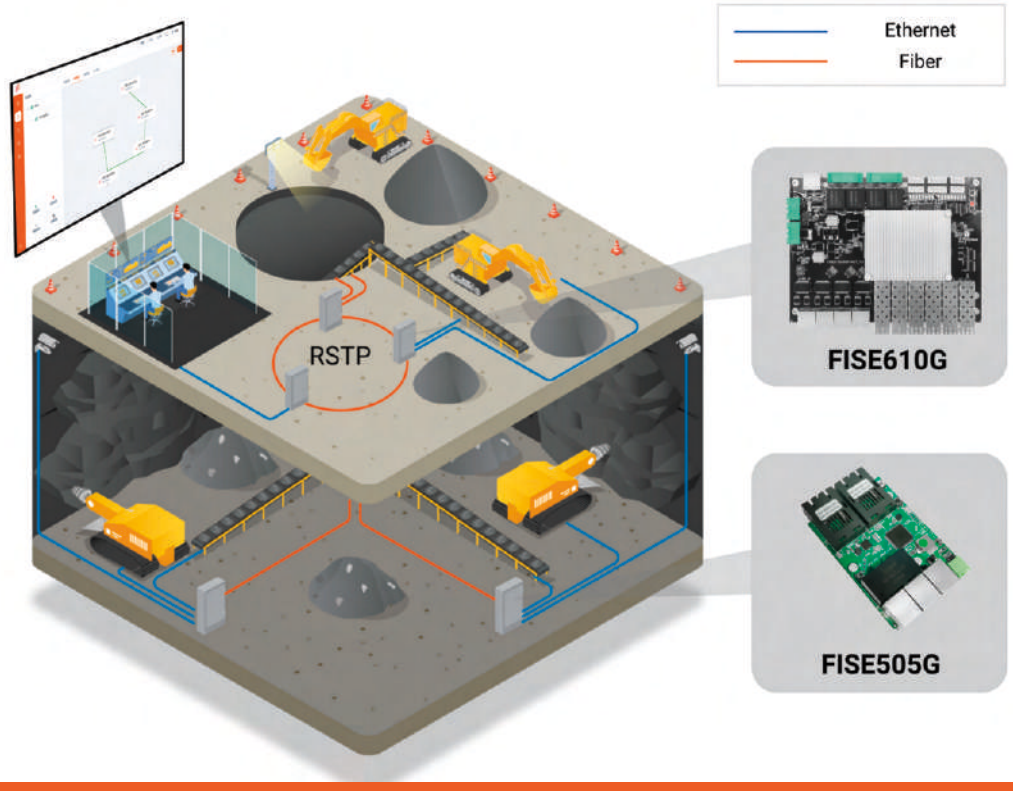
SOLUTION

SMART MINING

Smart mining is a revolutionary concept that has leveraged the power of Internet of Things (IoT) to transform traditional mining operations into highly efficient and sustainable endeavors. Through the integration of various cutting-edge technologies, Smart Mining has brought about unprecedented improvements in safety, productivity, and environmental impact within the mining industry. By embedding sensors and connectivity devices throughout mining sites, real-time data from machines, vehicles, and personnel can be captured and analyzed instantaneously. This enables proactive monitoring of equipment conditions, ensuring timely maintenance to prevent breakdowns and optimize operational efficiency. Additionally, IoT-based smart mining systems enable remote monitoring of underground environments without risking human lives by utilizing drones or autonomous robots equipped with advanced imaging capabilities. This not only enhances safety but also improves decision-making processes by providing accurate geological information for ore extraction planning. Moreover, IoT applications facilitate optimized energy usage through intelligent control systems that manage power consumption based on real-time demand patterns in different areas across the mine site. Overall, Smart Mining holds immense potential to revolutionize an age-old industry by fostering sustainability while maximizing profitability through enhanced automation and data-driven insights.

The Global Mining Industry is Under Pressure

The global mining industry, a vital component of the world's economy, is currently facing immense pressure from various factors. Mining companies have long been at the forefront of extracting valuable resources from deep within the Earth's crust to meet demands for minerals and metals across industries. However, as society becomes increasingly conscious of sustainability and environmental impact, mining operations are being scrutinized like never before. The extraction process itself poses significant challenges, with miners having to navigate treacherous underground tunnels or strip vast landscapes in open-pit mines. Moreover, concerns about labor conditions and worker safety persist in this physically demanding profession. Additionally, governments worldwide are imposing stricter regulations on mining practices to minimize ecological harm caused by pollutants such as toxic tailings or excessive water usage. These regulations often necessitate substantial investments in advanced technologies and infrastructure upgrades to adhere to sustainable practices while maintaining productivity levels. Furthermore, fluctuations in commodity prices can significantly affect profit margins for mining companies that heavily rely on market demand for their products like coal or precious metals. Amidst these mounting pressures, stakeholders within the global mining industry must adapt swiftly by embracing innovative solutions that prioritize both profitability and environmental responsibility while ensuring the well-being of their workforce remains paramount as they dig deeper into unexplored territories seeking valuable resources needed by modern societies worldwide.



Taking Smart Mining to the Next Level with Fiberroad Intrinsically Safe Industrial Ethernet Switches

Intrinsic Safety

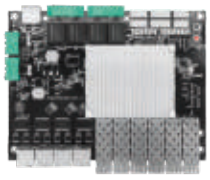
Industrial Ethernet

Temperature Resistance

Multiservice Access

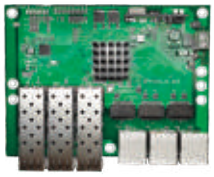
In the ever-evolving world of mining, where safety and efficiency are paramount concerns, Fiberroad Intrinsically Safe Industrial Ethernet Switch emerges as a groundbreaking solution to boost smart mining connectivity. This cutting-edge technology offers a seamless and reliable communication network that ensures uninterrupted data transmission even in the harshest environments. Designed specifically for hazardous locations prone to explosive gases and dust, this industrial switch complies with stringent safety regulations to eliminate any potential ignition source. Its robust construction includes ruggedized housing, advanced surge protection mechanisms, and specialized connectors that can withstand extreme temperatures, vibrations, and electromagnetic interference. With its high-speed performance and large capacity backbone architecture, this switch facilitates real-time monitoring of critical parameters such as equipment status, air quality levels, worker location tracking systems – all contributing towards enhanced operational effectiveness and proactive maintenance strategies. Furthermore, the fiber-optic capability allows for long-distance transmissions without signal degradation or latency issues while providing immunity against electromagnetic interference – vital features in underground mines where signal attenuation is common. By incorporating Fiberroad Intrinsically Safe Industrial Ethernet Switch into their infrastructure framework, mining operations can embrace digitalization with confidence while ensuring utmost safety standards for their workforce working in challenging environments.

PRODUCT RECOMMENDATION



FISE610G

- 4x10/100/1000BASE-T 6x100/1000BASE-X SFP
- 2x Isolated RS485 and CAN
- RSTP/MSTP/ERPS
- Layer 2+ Managed
- Dual DC9-36V Power Input



FISE306G

- 3x10/100/1000BASE-T 3x100/1000BASE-X SFP
- EMC protection, surge protection, 6000V lightning protection
- Plug and Play

FISE505G

- 3x10/100/1000BASE-T 2x1000ASE-X 1x9
- STP/RSTP Redundancy
- WebSmart Management
- Fanless and low power consumption

FISE205

- 3x10/100BASE-T 2x100ASE-X 1x9
- -40℃ to +75 ℃ Operating temperature
- Plug and Play
- Support power supply slow start function

What is Intrinsic Safety?

Intrinsic Safety is a concept that ensures the utmost safety in hazardous environments by preventing electrical equipment from causing sparks, which could potentially ignite flammable substances or cause explosions. It involves carefully designing and engineering devices so that they operate within safe limits of energy, minimizing any possible risk. Intrinsic Safety standards are established to guarantee that electronic devices are incapable of generating enough heat or energy to trigger an explosion, even under fault conditions. By incorporating protective mechanisms such as current limiting resistors and diodes, along with rigorous testing and certification processes, intrinsic safety creates a secure working environment in industries like oil refineries, chemical plants, mining operations, and many more. Employing this principle allows workers to confidently use electrically powered tools without fear of igniting dangerous atmospheres or endangering their own lives.

Intrinsically Safe Industrial Ethernet Switches

Intrinsic safety is a critical aspect in industries that deal with potentially explosive environments, such as oil and gas, chemical plants, or mining sites. In these hazardous locations, the use of Intrinsically Safe Industrial Ethernet Switches becomes imperative for ensuring the utmost safety and preventing any potential ignition sources. These specialized switches are designed to operate within strict parameters to minimize energy output and heat generation. They are engineered with robust protective features like reinforced enclosures, overcurrent protection circuits, galvanic isolation barriers, and surge suppression mechanisms to prevent any electrical sparks or arcs that could trigger an explosion.

CASE STUDY

PORTUGAL

Revolutionizing Public Transportation in Portugal with Smart Buses and Fiberroad Industrial PoE Switch

As part of “Smart Portugal”, a Portugal public bus contractor deployed Fiberroad Industrial PoE Switch into their “Smart Bus”. With the growth of the urban population and the overall trend of population ageing, the bus is becoming one of the primary transportation means and such issues as preventing collision and congestion, facilitating mobility, providing infotainment (internet access to passengers), security (vehicle IP-surveillance), fleet management, vehicle tracking, navigation, emergency connectivity, and remote control are urging Departments of Transport develop concepts of Smart Bus ecosystems and implement Smart Bus networks.

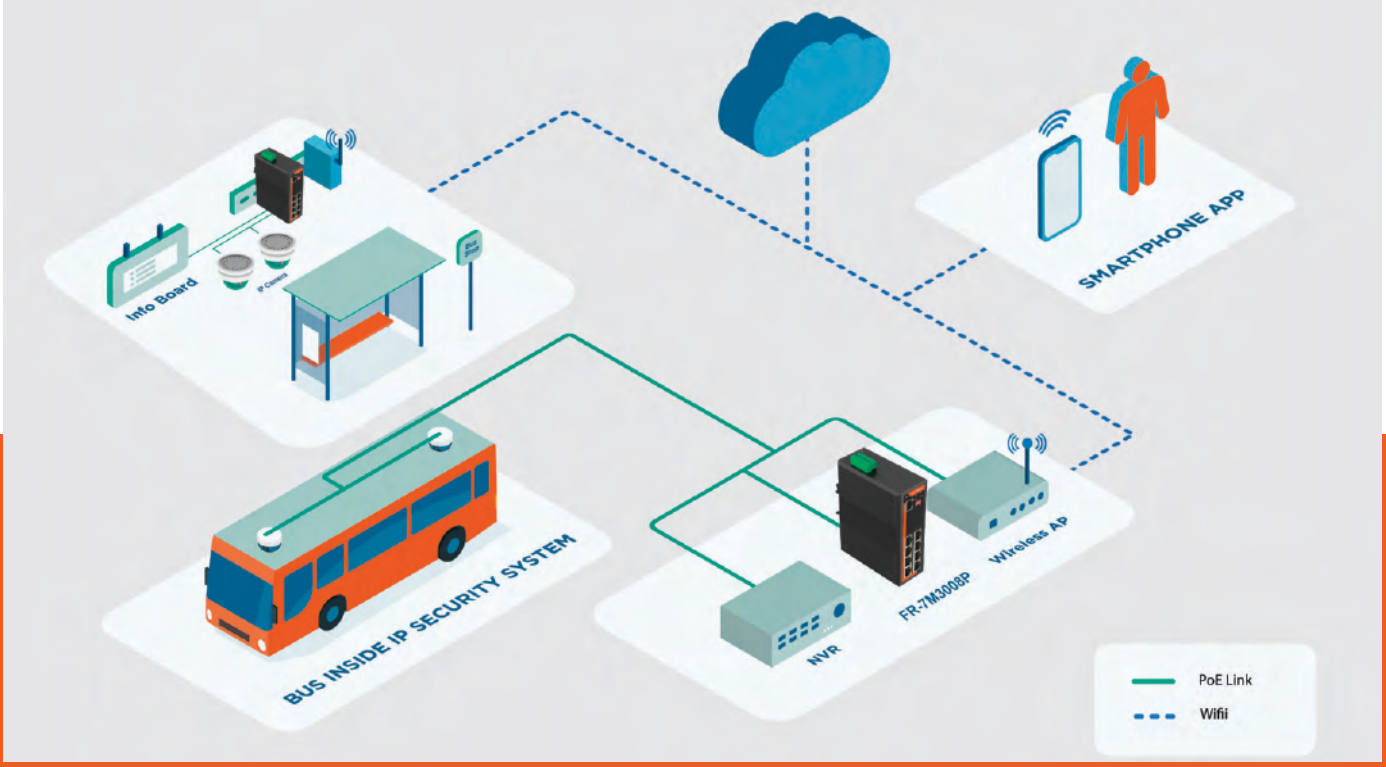
Improving Efficiency and Safety: How Smart Bus Solutions are Transforming Urban Mobility

The rapid urbanization and increasing population in cities have led to a surge in transportation demands, resulting in congested roads and compromised safety. However, with the advent of technology, innovative solutions like IoT-based Smart Bus Solutions have emerged as a promising remedy for these challenges. By integrating various intelligent features such as real-time tracking systems, automated fare collection mechanisms, and advanced passenger information systems, these smart bus solutions are transforming urban mobility like never before. Through the utilization of sensors and connectivity enabled by the Internet of Things (IoT), buses can now communicate seamlessly with each other and with centralized control centers. This allows for optimized route planning based on real-time traffic conditions, reducing travel time while also minimizing fuel consumption and emissions. . Additionally, IoT-based Smart Bus Solutions enhance safety by providing surveillance cameras that monitor onboard activities to prevent incidents such as theft or unruly behavior.

Navigating the Deployment Challenges of IoT in Smart Bus Solutions

The integration of IoT in Smart Bus Solutions has brought about a multitude of benefits, transforming the way we navigate public transportation. However, it is not without its fair share of deployment challenges that need to be carefully addressed. One such challenge lies in ensuring seamless connectivity within the bus fleet and with external systems. With numerous devices and sensors communicating simultaneously, there is an inherent complexity in managing data flows efficiently and securely. Additionally, deploying IoT solutions requires substantial infrastructure investments to support real-time monitoring and control systems onboard each bus. This necessitates close collaboration between technology providers, transport authorities, and other stakeholders to ensure a robust network infrastructure that can handle high volumes of data transmission without interruptions or delays. Furthermore, privacy concerns related to passenger data collected by these smart buses must be adequately addressed through comprehensive security measures.

CASE STUDY PORTUGAL



Challenges

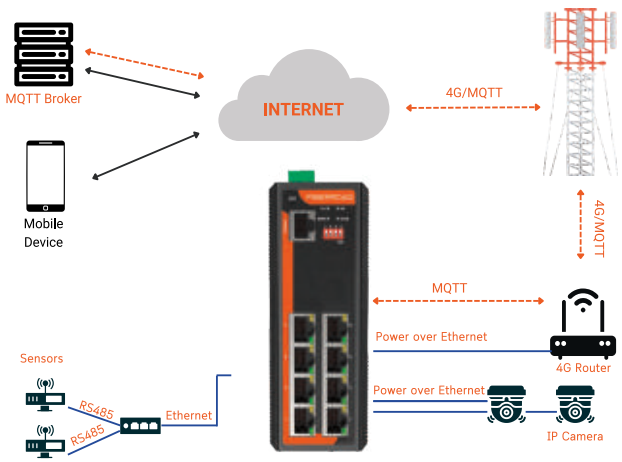
- The network devices placed in buses often operate in a harsh environments where vibration is common when vehicles are moving.
- Passenger services and safety are enhanced on buses by networking devices, such as 4G WiFi routers, information display systems, IP surveillance cameras, etc.
- Remote management and device connection states via wireless.
- Power sources are limited on buses.

Solution

- Cost-effective and Space-saving, combined with Industrial Ethernet Switch Standard, -40 ℃ ~+75 ℃ operation temperature, IP40 rating housing, 8kV Surge Protection, etc.
- 8xRJ45 ports support IEEE802.3at/af PoE Standard.
- Power input: 24VDC for bus environment.
- Remote PoE Switch management via Fiberroad Clound management and Fiberroad NMS.
- Layer 2+ Industrial switch with QoS, VLAN, IGMP Snoopingv3, 802.1X security access, Modbus TCP, etc.

Results

Equipped with advanced Industrial Ethernet Technology, and MQTT Cloud Management Protocol, Smart Buses can be monitored and coordinated meticulously to ensure bus services are performing within standards. In addition, real-time live surveillance and video analytics of bus fleets can be implemented to respond to emergency events and ensure the security and safety of drivers and passengers. Furthermore, smart buses can monitor and collect data such as driving behaviour and passenger flows, giving bus operators insights into their fleet operation and allowing them to make service improvements or timetable rearrangements when necessary.



CASE STUDY

CHILE

Chile Telecom Chooses Fiberrod Managed Industrial PoE Switch for their IoT-Based Smart Cell Tower

As Chile looks to 5G to further its digital transformation goals, the country's largest telecommunications operator has deployed Fiberroad's Managed Industrial PoE Switch at 5G cell sites across the nation. The industrial poe switch provides critical power and data connectivity for the cell sites, and its robust design ensures reliable operation in Chile's harsh climate. The deployment of Fiberroad's Managed Industrial PoE Switch is a key part of the telecom operator's 5G strategy, and it is already seeing benefits in terms of enhanced network performance and reliability. The Industrial Managed PoE Switch has been instrumental in helping the operators meet their 5G objectives, and they are planning to continue expanding their use of Fiberroad products in the future.

Taking advantage of the 5G network as an important factor for IoT

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. IoT has been identified as the next big thing in technology and it's not hard to see why. With the advent of 5G networks, we are now able to connect more devices than ever before – and at much faster speeds. This means that the potential applications for IoT are virtually limitless. From smart homes and connected cars, to industrial applications and city infrastructure, 5G is set to enable a new era of IoT innovation.The 5G network is the key factor for IoT because it provides the high-speed, low-latency connections that are necessary for real-time data collection and analysis. 5G also has the ability to connect a large number of devices at once, which is essential for IoT applications.

How PoE Technology Accelerates the Deployment of Smart Cell Towers

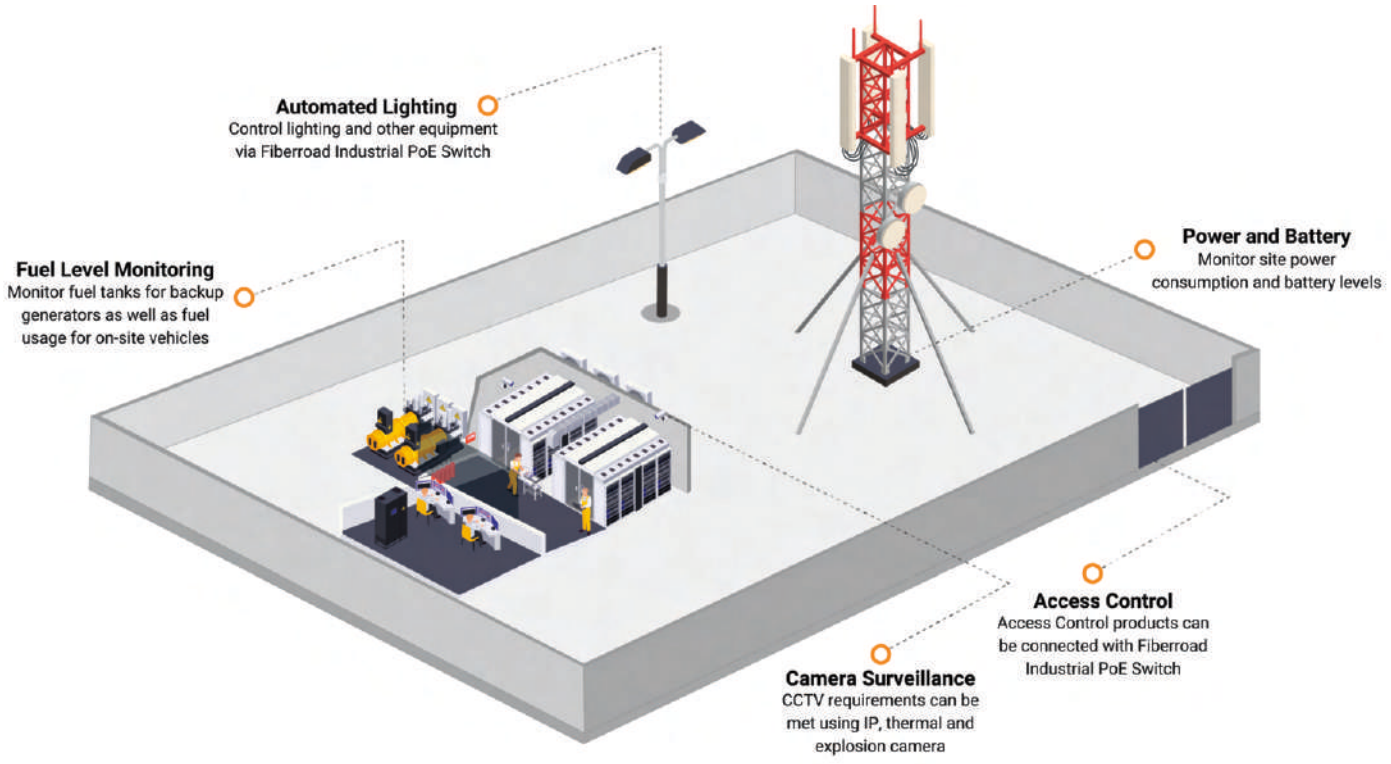
5G cell base stations are being deployed at a rapid pace to keep up with the increasing demand for data services. However, the deployment process can be quite time-consuming and expensive. One way to speed up the process is to use Power over Ethernet (PoE) technology.

In addition, PoE technology can also provide a number of other benefits, such as:

- Reduced cabling requirements – PoE only requires a single cable for both power and data, which can simplify the cabling infrastructure.
- Increased flexibility – PoE can be used with a variety of different equipment types, making it ideal for use in a wide range of applications.
- Improved scalability – PoE-enabled devices can be added or removed from the network without having to reconfigure the power infrastructure. If you're looking to deploy 5G small cell base stations, then using PoE technology is a great way to speed up the process and save on installation and Maintenance.

CASE STUDY

CHILE



Why Chile Telecoms Operator Chosen Fiberroad's Managed Industrial PoE Switch

An Industrial PoE switch is a specialized Ethernet switch that delivers Power over Ethernet (PoE) and is designed for use in harsh, industrial environments. Fiberroad's Managed Industrial PoE Switch is a rugged, reliable, and feature-rich solution that is perfect for deployment in chile telecommunications applications. The switch offers 8×10/100/1000Base-T ports with IEEE 802.3af/at PoE+ and 2xSFP slots for 100/1000Base-X fiber connectivity. It also features an integrated web management interface for easy configuration and monitoring. Additionally, the switch supports SNMPv1/v2c/v3 and MQTT, making it compatible with a wide range of network management systems. The Managed Industrial PoE Switch also includes a number of advanced features that make it ideal for deployment in demanding environments.

FR-7M3208P

Smart PoE Technology

Visualized Network Management

Smart Powering

Smart Powering ensures all devices are powered up properly, accommodating even non-standard devices.

PoE Management

Smart Power Management features auto power output cutoff, power scheduling, and PoE warning events to ensure system reliability and optimized system power load.

Power Diagnostics

Smart Power Diagnostics can monitor powered device (PD) status, detect failures, initiate auto reboot of PDs, and suggest the best PoE port configuration for effortless installation and troubleshooting.

CASE STUDY EASTEN EUROPE

Enhancing Connectivity on Long-Distance Trains: How Fiberroad Industrial Ethernet Switches Revolutionize Eastern Europe's Railways

In a striking move that highlights their commitment to innovation and cutting-edge technology, a country in Eastern Europe has wholeheartedly embraced the transformative power of Industrial Ethernet Switches. Embracing the future with open arms, they have selected Fiberroad's exceptional industrial Ethernet switches to revolutionize their long-distance passenger train network. Embarking on this thrilling journey, these trains are now bejeweled with state-of-the-art networking solutions that guarantee unparalleled performance and reliability. As passengers step aboard these marvels of modern engineering, they will be transported not only physically but also into a realm where connectivity knows no boundaries. With Fiberroad's industrial Ethernet switches at the helm, seamless communication between various systems and devices is realized effortlessly. The digital heartbeat pulsating within each switch ensures uninterrupted data transmission throughout the entire network; it is as if every carriage becomes an interconnected hub of limitless possibilities. No longer confined by traditional boundaries, this Eastern European nation propels itself forward into an electrifying era where progress intertwines seamlessly with comfort and convenience for its cherished travelers.

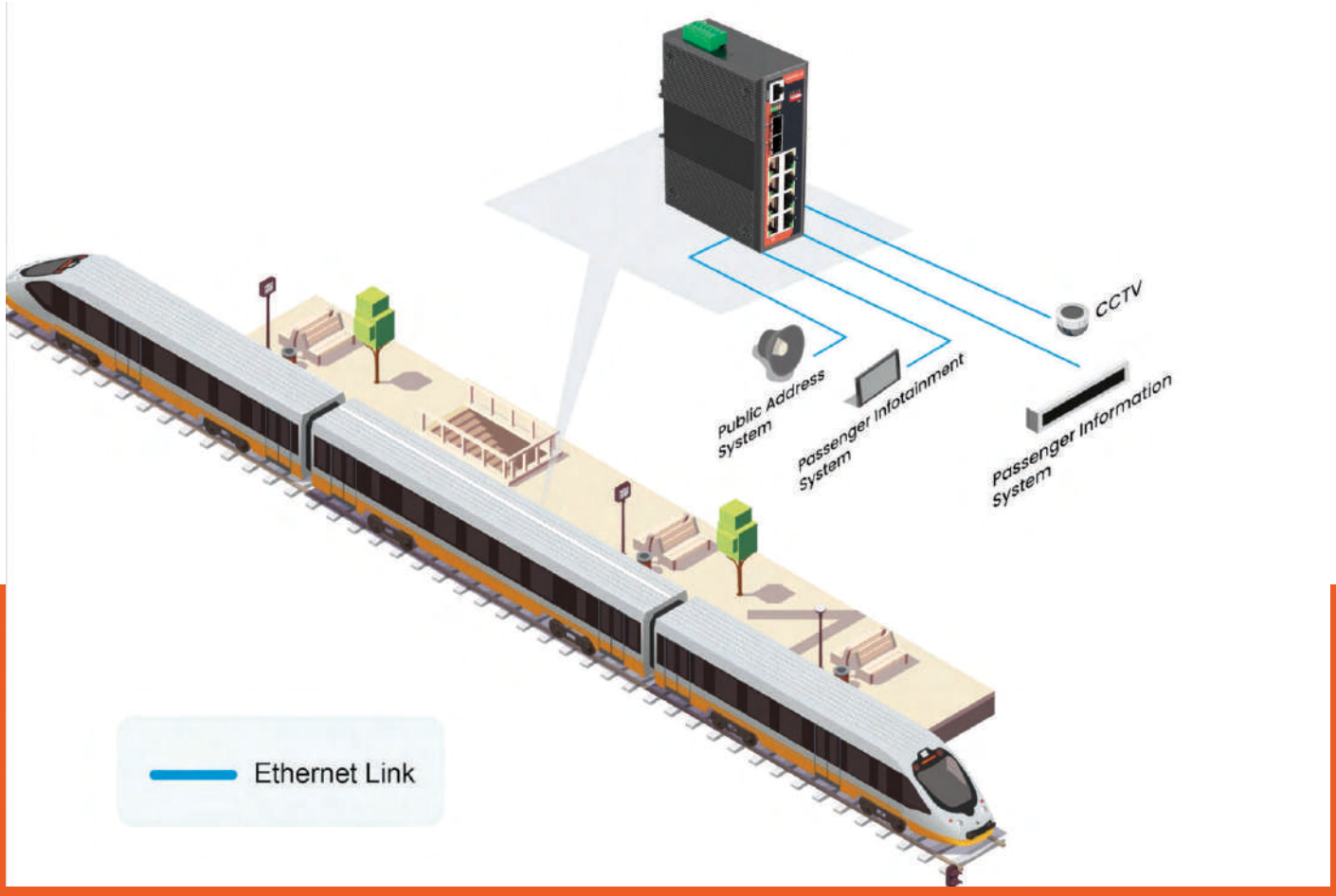
Enhancing Train Carriage Connectivity: Exploring the Benefits of Industrial Ethernet Switch

The ever-growing demand for seamless connectivity in train carriages has led to the development of advanced technology solutions, one being the Fiberroad Industrial Ethernet Switch. This cutting-edge device is specifically designed to enhance and optimize communication within train carriages, revolutionizing the passenger experience. The Industrial Ethernet Switch serves as a crucial link between various systems on board, such as entertainment screens, ticketing machines, surveillance cameras, and Wi-Fi routers. By seamlessly integrating these components into a single network infrastructure with high bandwidth capabilities, this switch ensures uninterrupted data transmission and superior performance throughout the journey.

Featuring robust industrial-grade hardware built to withstand harsh environments like constant vibrations and extreme temperatures, the Fiberroad Industrial Ethernet Switch guarantees reliable functionality even under challenging conditions. Its compact size allows easy installation in limited space inside train carriages without compromising its effectiveness.

CASE STUDY

EASTEN EUROPE



System Requirements

One crucial aspect is the Public Address System, which ensures clear and audible announcements throughout the train, providing passengers with information about upcoming stations or any emergency situations. Alongside this, the Passenger Infotainment System offers entertainment options like movies, music, or news updates for a more enjoyable journey. To ensure safety and security on board, a Surveillance System monitors all areas of the train carriage through strategically placed cameras. This system acts as a deterrent against potential incidents while allowing real-time monitoring by staff. Additionally, the Passenger Information System provides timely updates regarding delays or schedule changes to keep travelers informed and minimize confusion during their commute. Lastly, high integration connectivity and interconnection requirements are vital to enable seamless communication between these systems. It ensures smooth data exchange among different components without disruptions or lagging issues in interconnected functionalities such as audio broadcast or video streaming services onboard trains.

Product Highlights

FR-7M3208L Layer2+ Managed Industrial PoE Switch

- Up 10 Gigabit Ethernet Port, 20G Backplane Bandwidth for multi-services interconnection.
- L2+ network management, easy to manage the train network by CLI/WebGUI/NMS.
- RADIUS, IEEE 802.1X,SNMPv3, HTTPs and SSH to enhance network security.
- Bandwidth management prevents unpredictable network status with ”Lock Port” to restrict access to authorized MAC addresses.
- ·QoS, Priority mode based on 802.1P, Port & DSCP, queue scheduling algorithm including SP, WRR&SP+WRR
- DIN Rail and wall mountable – quick to install and remove for maintenance
- All-aluminum Case, Compact and Fanless Design, IP40 Rating

CASE STUDY

CHILE

Unleashing the Power of Connectivity: Enhancing Chile's Clean Energy Infrastructure with Fiberroad Industrial Ethernet Solution

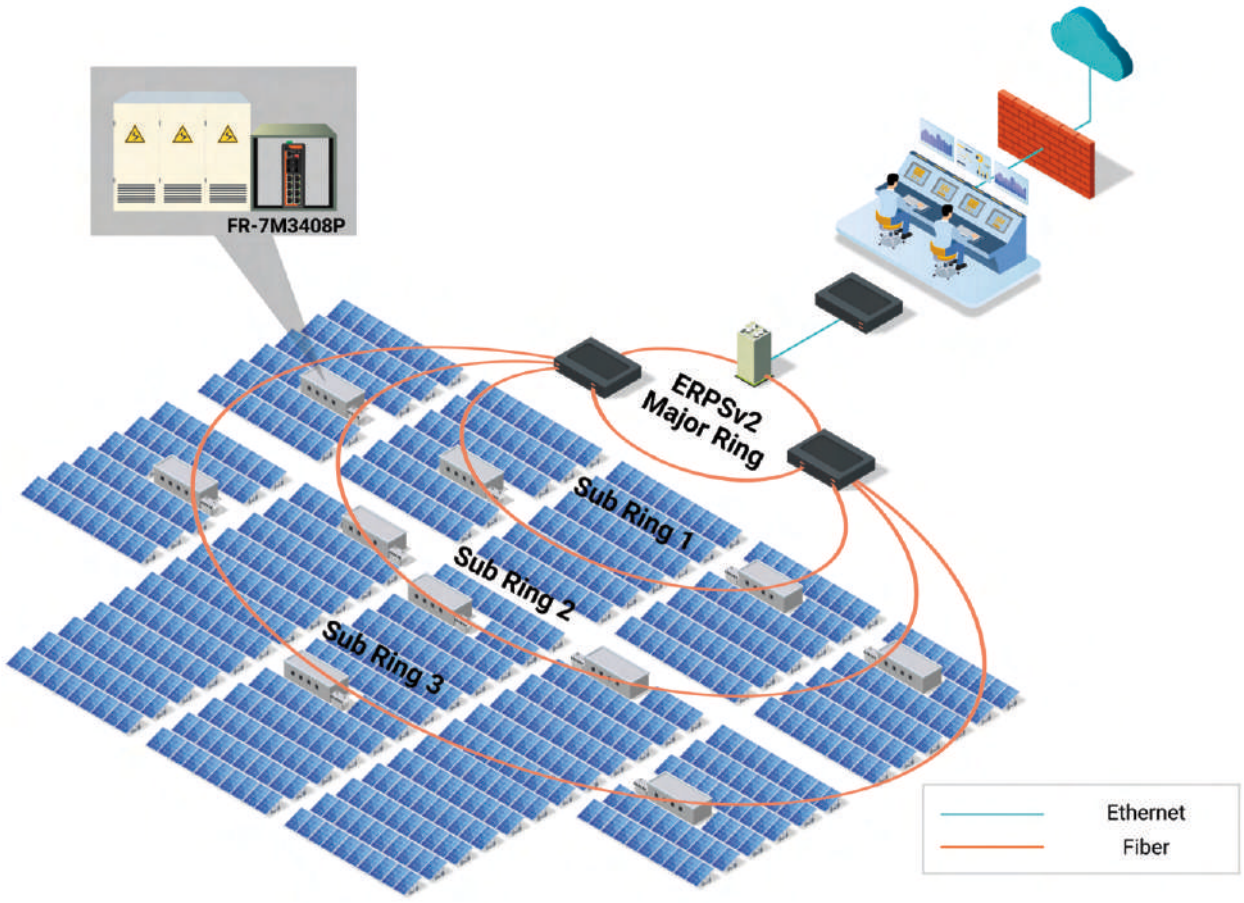
Chile, a country known for its diverse natural landscapes and abundant renewable resources, has set ambitious targets to meet its growing energy demands through sustainable means. The Chilean government has recognized the importance of transitioning towards renewable energy sources and has laid out clear objectives in their renewable energy targets. These goals aim to increase the share of clean energy in Chile's power mix by a substantial margin over the coming years. By harnessing their rich solar potential in northern regions, tapping into strong winds along coastal areas, and leveraging geothermal resources throughout the country, Chile intends to significantly reduce its reliance on fossil fuels. To achieve this vision, comprehensive plans have been put in place to attract investment in renewable projects while ensuring that adequate infrastructure is developed to support integration into the national grid. As part of these efforts, favorable policies and incentives are being implemented to encourage private sector participation alongside public initiatives. Through these targeted actions and their commitment towards sustainability, Chile is poised not only to meet but also surpass their renewable energy targets - setting an inspiring example for other nations striving towards a greener future.

Revolutionizing Renewable Energy Systems: How IIoT-Based Solutions are Driving Innovation

Renewable energy has emerged as a crucial aspect of our world's sustainable future, and "Revolutionizing Renewable Energy Systems: How IIoT-Based Solutions are Driving Innovation" delves into the groundbreaking advancements that are pushing this sector forward. This in-depth exploration showcases how Industrial Internet of Things (IIoT) technologies have paved the way for unprecedented innovation within renewable energy systems. By harnessing the power of interconnected devices, sensors, and data analytics, these solutions ensure optimal efficiency and productivity while minimizing environmental impact. The article highlights real-world examples where IIoT-based solutions have transformed traditional energy production methods, such as wind turbines equipped with smart sensors that constantly monitor performance metrics to maximize output and detect potential issues before they arise. Moreover, it emphasizes how predictive maintenance enabled by IIoT can significantly reduce downtime and maintenance costs in solar farms through proactive fault detection. As we navigate toward a greener future, this insightful piece underscores the pivotal role that IIoT-driven solutions play in revolutionizing renewable energy systems worldwide.

CASE STUDY

CHILE



Challenges

- Creating standardized protocols and interfaces to ensure system-wide compatibility.
- Securing data in IIoT devices requires strong encryption, secure authentication, and constant network monitoring to prevent cyber-attacks and protect sensitive information.
- The challenge lies in making these systems scalable to meet rising energy demands while maintaining efficiency and reliability.
- Ensuring the resilience of IIoT networks against natural disasters or physical damages becomes vital for uninterrupted operation under adverse conditions.

Solution

- Fiberroad's solution tackles this head-on, providing reliable data transfer capabilities even in extreme temperatures, high humidity levels, or areas prone to electrical interference.
- With its flexible architecture and modular design options, Fiberroad's solution allows for easy expansion as demand grows or new installations are added to the network infrastructure.
- By incorporating advanced ethernet security encryption, Fiberroad helps safeguard the integrity of renewable energy systems from potential breaches or attacks.

Product Highlights

FR-7M3408P

- 8×10/100/1000BASE-TX RJ45, 4×100/1000BASE-X SFP
- IP40 Rating, -40 to 75℃ operating temperature, 8kV surge Protection
- DC9-56V redundant power input

FR-9M34F8

- 8×10/100/1000BASE-TX RJ45
- 16×100/1000BASE-X SFP
- RSTP/MSTP/ERPSv2
- RADIUS, SNMPv3, IEEE 802.1x, HTTPs, SSHv2 to enhance network security

CASE STUDY

CHINA

Enhancing Power Substation Efficiency: State Grid Corporation and China Southern Power Grid Choose Fiberroad Technology's Industrial Switches

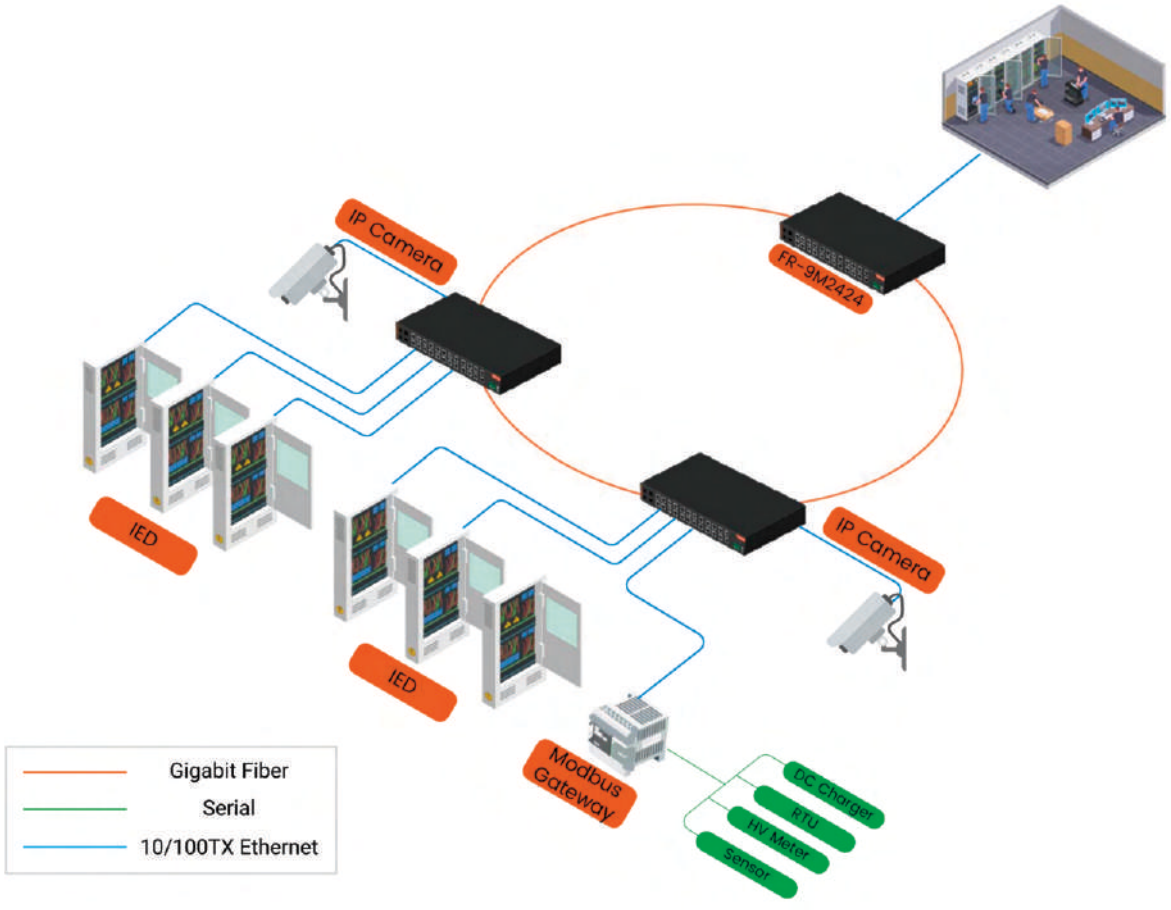
Power Substations are the lifeblood of our modern society, silently humming with electricity and keeping the world powered up. But behind their unassuming exteriors lies a dynamic network of complex machinery and intricate systems that demand efficiency to keep up with our ever-growing energy needs. In this electrifying quest for optimization, two giants of the power industry have chosen Fiberroad Technology's Industrial Switches as their trusted allies - State Grid Corporation and China Southern Power Grid. These powerhouses recognize the unrivaled potential unleashed by Fiberroad's cutting-edge technology, which breathes new life into these vital substations. With Fiberroad's industrial switches seamlessly integrating into their infrastructure, every watt is harnessed with unprecedented precision and utilized to its fullest potential. The once mundane world of power substations is now infused with an exhilarating buzz as these robust machines work tirelessly, driven by fiber-optic veins pulsating at lightning speed through Fiberroad's advanced switches. Efficiency has reached new heights as every kilowatt-hour finds its purpose in powering homes, businesses, and industries alike. Prepare to be awed as this remarkable union between technology and electricity propels us towards a future where power substations become catalysts for even greater advancements in our electrified world!

Unleashing the Power of IIoT in Substation Management: A Game-Changer for Efficiency

The advent of the IIoT has revolutionized the way we manage and optimize substation operations, paving the way for unprecedented levels of efficiency. By integrating advanced sensors, devices, and software applications into traditional substations, this technological powerhouse enables real-time monitoring and control like never before. With IIoT in place, substations become intelligent hubs capable of gathering vast amounts of data on power distribution, equipment performance, energy consumption patterns, environmental conditions – all in a secure and reliable manner. This wealth of information allows operators to make data-driven decisions promptly and proactively address potential issues before they escalate. The interconnectedness provided by IIoT not only enhances operational safety but also unlocks new possibilities for predictive maintenance strategies that reduce downtime and extend asset lifespan. Moreover, harnessing IIoT empowers utilities with comprehensive insights into power grid dynamics which can be leveraged to enhance grid resiliency while optimizing energy distribution across diverse end-users. Overall, embracing the power of IIoT in substation management is an absolute game-changer that propels efficiency to unparalleled heights in our quest for a smarter electrical infrastructure.

CASE STUDY

CHINA



Challenges

- Ensuring cybersecurity is paramount in protecting against potential cyber threats that could jeopardize the entire grid system.
- Complex networks of sensors, meters, switches, relays, and other equipment must function harmoniously to monitor voltage levels, detect faults or failures promptly, and facilitate efficient energy management
- Power substations often operate in remote or harsh environments that subject them to extreme weather conditions like high temperatures or heavy rains.

Solution

Fiberroad Managed Industrial Ethernet Switch is a cutting-edge solution that has been specifically designed to cater to the unique requirements of power substations. With its robust and reliable performance, this advanced switch ensures seamless communication and data transfer within the power substation network. Equipped with industry-leading features, it offers exceptional reliability even in harsh environmental conditions commonly found in power substations. The switch supports a wide range of protocols, making it compatible with various devices used in power substations such as intelligent electronic devices (IEDs), protection relays, and control systems.

Product Highlights

FR-9M2424

- 24×10/100BASE-TX RJ45 + 4×100/1000BASE-X SFP
- RSTP/MSTP/ERPSv2 Network Redundant Protocol
- RADIUS, SNMPv3, IEEE 802.1x, HTTPs, SSHv2 to enhance network security
- -40 to +75℃ operating Temperature, IP40 Rating
- Fiber optic transmission and unique port isolation design offers the benefits of greater EMI shielding

PRODUCT SELECTION GUIDE

Fiber Media Converter Series
Ethernet Switch Series

Product Lines

1 Product Layer & Network Management

Fiberroad Technology is a world leader in providing a wide range of product layer solutions, from AI unmanaged, smart Layer 2 management ,Layer 2+ management to Layer 3 management. With over 15 years of experience, our team of experts can help you find the perfect solution for your needs. We pride ourselves on our customer service and support, and we're always here to help you get the most out of your Fiberroad products.

2 Fiber Media Converter Series

Fiberroad Technology is a world leading manufacturer of fiber media converters and other fiber optic products. We offer a wide range of commercial and industrial grade Ethernet Converters, managed and unmanaged series, as well as Power over Ethernet options. Our products are designed to provide the highest quality and reliability, at an affordable price.

5 Accessories

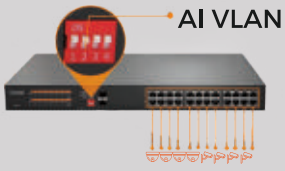
Fiberroad provides a variety of accessory products to support our solutions.
These include standard items such as mounting kits and racks, as well as specialized devices such as surge protectors, SFP transceivers, and an innovative backup solution.

1 Product Layer & Network Management

AI Unmanaged Functions

As the number of IoT and video surveillance applications continues to grow, the need for switches that can provide VLAN, QoS, and intelligent PoE functions is also increasing. Traditional non- management switches are not able to meet these demands, but Fiberroad Technology has introduced a new type of switch that does not require network management and can be configured using DIP switches. This makes it much easier for applications to take advantage of all the features and benefits that these switches have to offer.

Support Model: FR-5A Series, FR-7N(Partial Model)



Isolation for Ports 1-24

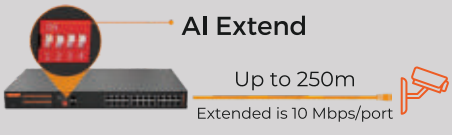
All PoE ports can only communicate with the uplinks when this mode is enabled.Using this also improves network security and data transmission.

Priority Guaranteed for Ports 1-8

Quality of sensitive applications like video and VoIP in critical business areas is guaranteed by offering higher priority options for ports 1-8 when AI QoS mode is enabled.

1.Not passing traffic for a certain amount of time

2.The switch will reset power on the specific port



1 Product Layer & Network Management

Managed Media Converter Management Platform

Web-Management Interface

EMS Management Interface

Support 100M-10G Fiber to Copper Ethernet Media Converter
Support 100M-40G Optical Fiber Media Converter

- Supporting network device auto-sensing and adding
- Complete system information can be set up and displayed, including the name of the chassis, terrain information, related information of IP, constant operating time and the versions of the hardware and soft ware
- Real time display of voltage and temperature on the cards of the media converters, temperature of chassis and report fault in time
- Supporting SFP/XFP, CWDM SFP/XFP and DWDM SFP/XFP, and it can show the SFP/XFP information and digital diagnosis function
- Remote power off alarming, precisely distinguish remote failure
- Supporting LFP, quickly locates the failure
- Equipment restart, system or module restart by management software, set-up information on each module will be stored spontaneously when power off
- Reset to factory set up or dip switch status are optional
- Each port at local or remote devices can be set up or tracked, including the connecting status, connecting speed, half/full duplex, port locked and LFP etc.
- Supporting Loopback and PRBS, precisely locating the failure, convenient for link test
- Supporting management within bandwidth, managing remote equipments conveniently
- Powerful historical alarming and operating log information tracking and management function
- Supporting FTP online upgrading

1 Product Layer & Network Management

Smart Layer 2 Ethernet Switch Management

Web-Management Interface

Smart Layer 2 Ethernet Switch Management sometimes called smart switches or Web managed switches—have become a popular option for mid-sized networks that require management. They offer access to switch management features such as port monitoring, VLAN, and QoS a simple Web interface via an embedded Web browser. What these switches generally do not have is SNMP management capabilities or a CLI. Web-smart switches must usually be managed individually rather than in groups.

Although the management features found in a Web-smart switch are less extensive than those found in a fully managed switch, these switches are becoming smarter, now offering many of the features of a fully managed switch.

Support Model: FR-6S,FR-7S Series

Port Setting

Speed/Duplex
Flow Control
Bandwidth Control
Port Isolation

VLAN & QoS

VLAN Setting
Trunk Group Setting
QoS Priority Selection
QoS DSCP Remapping

STP & PoE

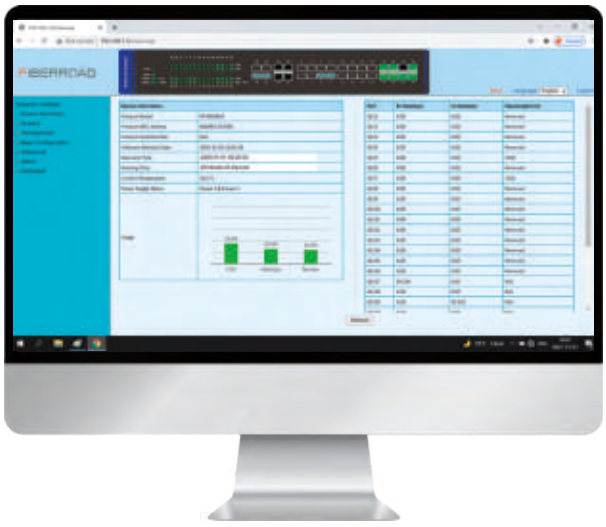
STP Setting
STP Information
PoE Mode Setting
PoE State

Others

User Management
IGMP Setting
Security MAC Address
Firmware Upgrade

1 Product Layer & Network Management

Layer 2+ Ethernet Switch Management



Web-Management Interface

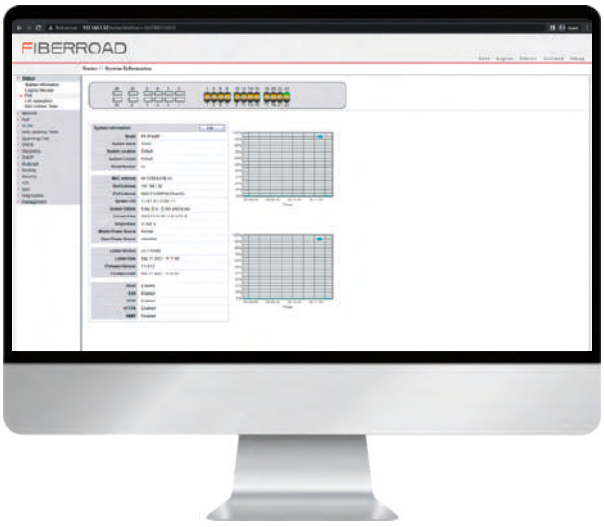
Layer 2+ Ethernet switch solutions from Fiberroad are some of the most advanced and comprehensive on the market today. With features like CLI, PoE control, IP static routing, access control lists, VLANs, IGMP snooping, QoS, RMON, SNMP trap, and syslog for monitoring, these switches offer unmatched flexibility and integration into just about any network. Whether you need a managed switch for a small office or enterprise-level network, Fiberroad has a solution that will fit your needs perfectly. And with their premier customer support and service, you can be sure that your investment is in good hands.

Support Commercial and Industrial Grade Layer 2+ Ethernet Switch

Software Features	
Redundancy Protocols	Support STP/RSTP/MSTP/ERPSv2, Link Aggregation
Multicast Support	Support IGMP Snooping V1/V2/V3,Support GMRP, GVMP,802.1Q
VLAN	Support IEEE 802.1Q 4K VLAN, Support QINQ, Double VLAN,
Time Management	SNTP
QOS	Flow-based redirection Flow-based rate limiting Flow-based packet filtering 8*Output queues of each port 802.1p/DSCP priority mapping Diff-Serv QoS, Priority Mark/Remark Queue Scheduling Algorithm (SP, WRR, SP+WRR)
ACL	Port-based Issuing ACL ACL based on port and VLAN L2 to L4 packet filtering, matching first 80 bytes message. Provide ACL based on MAC, Destination MAC address, IP Source, Destination IP, IP Protocol Type, TCP/UDP Port, TCP/UDP Port Range, and VLAN, etc
POE Management	Total power limit of PoE power supply PoE output power allocation PoE output priority configuration PoE working status Scheduling of PoE operation
Diagnostic Maintenance	Support port mirroring, Syslog, Ping
Management Function	Support CLI、WEB、SNMPv1/v2/v3，Telnet server for management, EEE, LLDP, DHCP Server/Client(IPv4/IPv6), Cloud/MQTT
Alarm Management	Support 1 way relay alarm output, RMON, TRAP
Security	Broadcast Storm Protection, HTTPS/SSLv3,RADIUS, SSH2.0 Support DHCP Snooping, Option 82，802.1X security access, Support user hierarchical management, ACL access control list, Support DDOS，port-based MAC filtering / binding, MAC black holes, IP source protection, Port isolation, ARP message speed limit
Advance Layer 2+ Features	IPv4/IPv6 Management Static Route

1 Product Layer & Network Management

Layer 3 Ethernet Switch Management



Web-Management Interface

Fiberroad's L3 switch solutions offer the most advanced and thorough networking-managed switch features available. Included premier managed switch features can include CLI, PoE control, OSPF, RIP, access control lists, VLAN, IGMP snooping, QoS, RMON, SNMP trap, and syslog for monitoring and flexible network integration. Advance security features: TACACS+, AAA provide unparalleled protection for your network. With Fiberroad's L3 switches you'll have the peace of mind knowing that your Ethernet switch is running at peak efficiency and performance.

Support Commercial and Industrial Grade Layer 3 Ethernet Switch

Software Features	
Management Interface	CLI(Console/Telnet(RFC854)), WebUI(HTTPS), SNMPv3
Management	ARP, Flow Control, DDM, DHCP Server/Client, IPv4/IPv6, LLDP, LLDP-MED, UDLD, Port Mirror, RMON, SNMPv1/v2c/v3, Syslog, Telnet,
File Management	Firmware Upgrade/Backup, Dual Images, Configuration Download/Backup, Multiple Configuration, TFTP(RFC783), HTTP, UART
Management Access	Management VLAN, Management ACL(256)
Filter	802.1Q, GMRP, GVRP, IGMP Snooping v1/v2/v3, IGMP Querier V2/V3 QinQ VLAN
Redundant Network	Link Aggregation, STP/RSTP/MSTP/ERPSv2, Auto Edge Port, BPDU Filtering, Self Loop Detection
VLAN	Support IEEE 802.1Q 4K VLAN, QINQ, Double VLAN, Voice LAN, Surveillance VLAN(Auto/Manual), Multicast VLAN Registration(MVR)
Time Management	Local, SNTP, NTP
Unicast Routing	OSPFv2, RIPv1/v2, Static Route
QOS	Support Queue Scheduling(WRR, WFQ, Strict Priority , Hybrid(WRR+SP or WFQ+SP); Priority Queue(8 queues/port); Class of Service(Port-based, 802.1p, IP TOS Precedence, IP DSCP), Trusted QoS, Rate Limitation
ACL Type	L2/L3/L4, MAC-based, IPv4-based, IPv6-based
Diagnostic Maintenance	Support port mirroring, Syslog, Ping
POE Management	PoE working status Scheduling of PoE operation
Security	Broadcast Storm Control, HTTPS/SSLv2v3,TLSv1 RADIUS, TACACS+,AAA SSHv1/v2,Support DHCP Snooping, Option 43/82, 802.1X security access, Support user hierarchical management, ACL access control list, Support DOS, port-based MAC filtering/binding, MAC whitelist
MIB	Ethernet-like MIB, MIB-II, MIB-I, Bridge MIB, Bridge MIB extensions, RMON MIB(1,2,3 & 9 groups, RFC2737 Entity, RFC2863 Interface Group, SNMP-Community-MIB

1 Product Layer & Network Management

Web-Based Network Management System

Fiberroad's FIRO Web-based Network Management System (WBNMS) enables easy access through the Internet (Browser User Interface GUI) to your Network Management System. Regardless of its location, Fiberroad virtually makes any authorized laptop an operational and maintenance (O&M) workstation. The WBNMS provides a comprehensive view of your network and its resources, allowing you to manage your network effectively. The system also allows you to troubleshoot problems quickly and efficiently, thereby reducing downtime and ensuring optimal performance of your network.

- High compatibility and reliability, supporting the mainstream browsers.
- Support all Fiberroad IP-based hardware & extension of third-party devices.
- Automatically discovers and diagrams network topology.
- Dynamic Connectivity Indication – PoE, Ring.
- Real-time monitoring.
- Make network administration more effective and efficient.

1 Product Layer & Network Management

Cloud Network Management

Introducing the Firo Cloud Management Platform, your go-to for intelligent, secure and reliable cloud management. Our platform is based on the industry standard OASIS MQTT protocol, providing you with the most advanced technology to monitor your IoT and IIoT networks from any time and any location. With robust features like automated tracking and analysis of data, real-time alerts, secure authentication and authorization, this platform offers an unparalleled level of control over your network. As an engineer, take advantage of this cutting edge cloud management technology to ensure that your network is protected against threats and running as efficiently as possible.

Control unlimited devices remotely with a web browser.

Ability to configure the network settings and behaviour of each device.

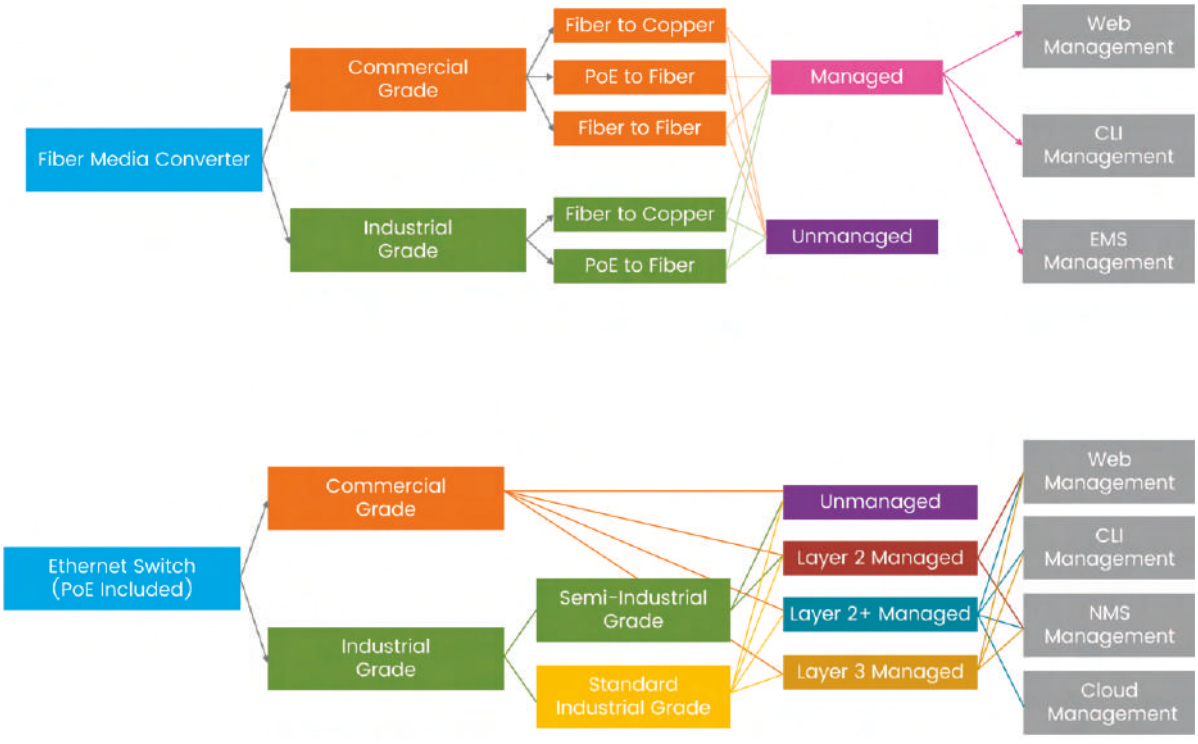
View and manage the PoE usage of all connected devices in one place.

Monitor device status in real-time and receive notifications when it goes offline.

Program customized motion & alarm rules for each device.

1 Product Layer & Network Management

Product Mind Map



The internet of things (IoT) is rapidly revolutionizing the way we live and work, with connected devices becoming increasingly commonplace in homes and businesses alike. As the IoT continues to grow, so too does the need for reliable and high-speed networking solutions that can handle the vast amount of data being generated by these devices.

One key component of an effective IoT network is a fiber media converter, which helps to connect different types of media across a network. FMCs are used in a variety of applications, from telecommunications and data centers to industrial Ethernet and security systems.

Ethernet switches are also crucial for building an effective IoT network. These switches provide the necessary connectivity between devices, allowing them to communicate with each other and exchange data. There are many different types of Ethernet switches available on the market, so it's important to choose one that meets the specific needs of your IoT applications.

Both fiber media converters and Ethernet switches play a vital role in ensuring that an IoT network runs smoothly and efficiently. By investing in quality products from reputable manufacturers, you can be sure that your IoT network will be able to handle even the most demanding applications.

2 Fiber Media Converter Series

FR-2000 Series

12 Slots Unmanaged Fiber Media Converter Chassis			
Product Type	Rack Chassis	**Number of Slots**	12
Input Power	AC 100-240V, or DC-V48V 1.5-3.0A,50/60Hz	**Output Power**	DC 12V Per Slot, 5A
Power Consumption	120W Max	**Case Material**	Iron
Dimensions (HxWxD)	44.5x485x270mm	**Weight**	3.2kg Approx
MTBF	100,000 Hours	**Fan Numbers**	2
Cooling	Brushless DC Fan	**Operating Temperature**	0℃ to 50 ℃
Rack Space	1U	**Storage Temperature**	-20 ℃ to 70℃

FR-6000 Series

17 Slots Managed Fiber Media Converter Chassis			
Product Type	Rack Chassis	**Number of Slots**	17
Input Power	AC 100-240V, or DC-V48V 1.5-3.0A,50/60Hz	**Output Power**	DC 5V Per Slot
Power Consumption	160W 250W(10/40G)	**Case Material**	Iron
Dimensions (HxWxD)	90x425x310mm	**Weight**	7kg Approx
MTBF	100,000 Hours	**Fan Numbers**	3
Cooling	Brushless DC Fan	**Operating Temperature**	0℃ to 50 ℃
Rack Space	2U	**Storage Temperature**	-20 ℃ to 70℃

FR-6000 Series

9 Slots Managed Fiber Media Converter Chassis			
Product Type	Rack Chassis	**Number of Slots**	9
Input Power	AC 100-240V, or DC-V48V 1.5-3.0A,50/60Hz	**Output Power**	DC 5V Per Slot
Power Consumption	80W 130W(10/40G)	**Case Material**	Iron
Dimensions (HxWxD)	45x440x330mm	**Weight**	3.5kg Approx
MTBF	100,000 Hours	**Fan Numbers**	2
Cooling	Brushless DC Fan	**Operating Temperature**	0℃ to 50 ℃
Rack Space	1U	**Storage Temperature**	-20 ℃ to 70℃

Managed Fiber Media Converter Case			
Product Type	Standalone /Desktop	**Number of Slots**	1
Input Power	AC 100-240V, or DC-V48V	**Dimensions (HxWxD)**	32x160x130mm

2 Fiber Media Converter Series

Unmanaged Fiber Media Converter					
Model	**FR-2201**	**FR-2203**	**FR-2206**	**FR-2222**	**FR-2212**
					
Ports	1 x 100M SFP/1x9 Port 1 x10/100/1000M RJ45 (Auto MDI/MDIX)	1 x 1000M SFP/1x9 Port 1 x10/100/1000M RJ45 (Auto MDI/MDIX)	1 x 1000MSFP Port 2x10/100/1000M RJ45 (Auto MDI/MDIX)	1x100M/1G/2.5G/5G/ 10GBase-T RJ45 1x 10GBase-X SFP+	2 x SFP/ 2x SFP+ Slots
Standard and Protocols	IEEE 802.3i IEEE 802.3u	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.3z IEEE 802.3x		IEEE 802.3u IEEE 802.3ab IEEE 802.3bz IEEE 802.3an IEEE 802.3ae IEEE 802.3x	IEEE802.3an, IEEE802.3ae
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm				
Cable Type(Copper)	Cat5/5e/6/6a/7				
Jumbo Frame	12K Bytes		9K Bytes	16K Bytes	
Operation Mode	10/100Mbps for Half/Full duplex 1000Mbps for Full Duplex			\	\
LED Indicators	TP/LNK, SPD, FX/LNK, PWR	TP/LNK, 1000M, FX/LNK, PWR	TP1/LNK, TP2/LNK, FX/LNK, PWR	TP/LNK, SPD, FX/LNK, PWR	SFP1, Loop, SFP2, PWR
DIP Switch	LFP/ALS/FX Reset/FX Speed Set		Jumbo Frame/Port Isolation/FX Speed Set	LFP/ ALS/Media Converter Model	Loopback/LFP/ALS
Input Power	DC 5-12V				
External Power	AC 100V—240V				
Power Consumption	Full-load<2W	Full-load<3W	Full-load<3W	Full-load<5W	Full-load<5W
Hosing	Metal				
Dimensions	90x60x20 mm				
Weight	0.12kg/0.26lb(Bare Hardware)				
MTBF	>50,000Hrs				
Operating Temperature	0°C to 50°C				
Storage Temperature	-10°C to 70°C				
Installation	Desktop, Wall Mount, Rack(*require optional rack)				

Notes:
1. LFP: Link fault pass through, When enabled, the UTP receiver is passed to the fibre transmitter to make the media converter appear transparent to the connected end devices. It uses link fault pass-through to indicate when far-end fault issues occur. If a fault occurs, the end device indicates a failure for troubleshooting.
2. ALS: Automatic laser shutdown is a procedure to automatically shut down the laser when there is no input light and stop emitting optical signals.
3. FX: Optical Fiber Port
4, FX Reset: When enabled, the PoE will restart if there is no data input to the UTP receiver.
5, Loop: When enabled, run a loop back test to check the interconnection between two media converter devices.

2 Fiber Media Converter Series

Unmanaged Industrial Fiber Media Converter			
Model	**FR-2703**	**FR-6N3101**	**FR-7N3101**
			
Ports	1 x 1000M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)		
Standard and Protocols	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.3z IEEE 802.3x		
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm		
Cable Type(Copper)	Cat5/5e/6		
Jumbo Frame	12K Bytes		
Operation Mode	10/100Mbps for Half/Full duplex 1000Mbps for Full Duplex		
LED Indicators	FX/SPD, FX/LINK, PWR, LINK/ACT, SPD	PWR/LINK/ACT	PWR/LINK/ACT
DIP Switch	LFP/ALS/FX Reset/FX Speed	\	\
Input Power	DC 9-56V		
External Power	AC 100V—240V		
Power Consumption	Full-load<3W		
Hosing	Aluminum case		
IP Rating	IP 40		
Dimensions	118mmx39mmx26mm	120mm x 90mm x35mm	120mmx90mmx35mm
Weight		350g	350g
MTBF	2,573,692 Hours (Standard: Telcordia SR-332 GF 30℃)		
Operating Temperature	-40℃~75℃ (-40 to 167 ℉)	-20℃~70℃ (-5 to 158 ℉)	-40℃~75℃ (-40 to 167 ℉)
StorageTemperature	-40℃~85℃ (-40 to 185 ℉)		
Installation	Desktop or Wall Mounting	DIN Rail or Wall Mounting	

FAQs

1. **What is the differences between FR-6N3101 and FR-7N3101?**
   Our FR-6N series represent Semi-industrial grade, whereas our FR-7N series represents high-standard industrial grade. The FR-7N Series has a wider temperature range than the FR-6N Series, with FR-7N Series working at -40 °C to +75°C. Additionally, FR-7N series has strong anti-electromagnetic interference capabilities.

2 Fiber Media Converter Series

Unmanaged PoE Media Converter						
Model	**FR-POE231**	**FR-POE232**	**FR-POE233**	**FR-POE331**	**FR-POE332**	**FR-7N3101P**
						
Ports	1 x 100M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP Port 2x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 100M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)	
Ethernet Standard and Protocols	IEEE 802.3i IEEE 802.3u	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.3z IEEE 802.3x		IEEE 802.3i IEEE 802.3u	IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.3z IEEE 802.3x	
PoE Standard	IEEE 802.3af:15.4W IEEE 802.3at:30W					
Power Pin Assignment	End-Span,1/2(+),3/6(-)					
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm					
Cable Type(Copper)	Cat5/5e/6					
Jumbo Frame	9K Bytes					
Operation Mode	10/100Mbps for Half/Full duplex 1000Mbps for Full Duplex					
LED Indicators	Power SFP/1x9 Link/Activity RJ45 Link/Activity RJ45 Speed RJ45 Duplex PoE		Power SFP/1x9 Link/Activity RJ45 Link/Activity RJ45 Speed RJ45 Duplex PoE1 PoE2	Power SFP Link/Activity RJ45 Link/Activity RJ45 Speed RJ45 Duplex PoE		Power SFP Link/Activity RJ45 Link/Activity RJ45 Speed RJ45 Duplex
DIP Switch	LFP/ALS/FX Reset/FX Speed Set		Jumbo Frame/VLAN/FX100M	LFP/ ALS/FX Reset/AI PoE		\
Input Power	DC 48-56V			AC 100V—240V		DC 9-56V
External Power	AC 100V—240V			\		\
Power Consumption	af mode: 20W at mode: 35W		af mode: 40W at mode: 70W	af mode: 20W at mode: 35W		
Hosing	Metal					Aluminum
Dimensions	94mm×71mm×26mm(W x D x H)			140mm×110mm×40mm(W x D x H)		120mm*90mm*35 mm
Weight	0.2kg/0.44lb(Bare Hardware)			0.5kg/1.10lb(Bare Hardware)		0.35kg/0.77lb(Bare Hardware)
MTBF	100,819 Hours@Telcordia SR-332 GB 25℃					2,332,497 Hours @Standard: Telcordia SR-332 GF 30℃
Operating Temperature	0°C to 50°C					-40℃~75℃ (-40 to 167 ℉)
Storage Temperature	-20°C to 70°C					-40℃~85℃ (-40 to 185 ℉)
Installation	Desktop, Wall Mount					DIN Rail Wall Mount

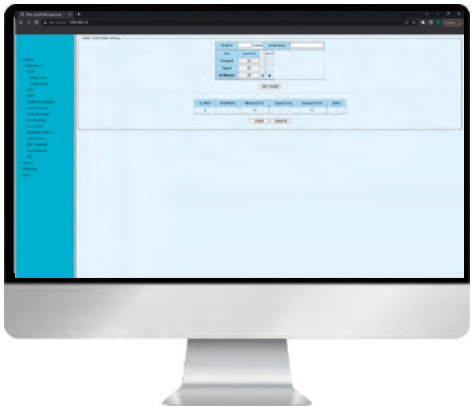
Commercial Grade

Industrial Grade

2 Fiber Media Converter Series

Managed Fiber Media Converter (Centralized Network Management)					
Model	**FR-6101**	**FR-6102**	**FR-6103**	**FR-6104**	**FR-6601**
					
Ports	1 x 100M SFP/1x9 Port 1 x10/100M RJ45 Port (Auto MDI/MDIX)	1 x 100M SFP/1x9 Port 2 x10/100M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP Port 1x10/100/1000M RJ45 (Auto MDI/MDIX)	1 x 1000M SFP/1x9 Port 2 x10/100/1000M RJ45 (Auto MDI/MDIX)	1x10G SFP+ 1x10GBASE-T RJ45
Ethernet Standard and Protocols	IEEE 802.3i IEEE 802.3u IEEE 802.3ah		IEEE 802.3 IEEE 802.3u IEEE 802.3ab IEEE 802.3z IEEE 802.3x IEEE 802.3ah		IEEE802.3an, IEEE802.3ae
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm				
Cable Type(Copper)	Cat5/5e/6/6a/7				
Jumbo Frame	2046 Bytes	2046 Bytes	9K Bytes	9K Bytes	10K Bytes
Operation Mode	10/100Mbps for Half/Full duplex 1000Mbps for Full Duplex				\
LED Indicators	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed RJ45 Duplex	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed RJ45 Duplex	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed	Power, FX-Link, FX Duplex, TX-SPD, TX-Duplex, TX-Link
Input Power	DC 5V				
External Power	AC 220V/DC -48V(With Standalone Case)				
Power Consumption	Full-load<3W				Full Load<5W
Hosing	Metal(With Standalone Case)				
Dimensions	120mm*90mm*22mm				
Weight	150g				200g
MTBF	65,000Hours@Telcordia SR-332 GB 25℃				
Operating Temperature	0°C to 50°C				
Storage Temperature	-20°C to 70°C				
Installation	Card Type, It can be inserted into Chassis or Standalone Case				
Management Features					
	Rate Limitation/LFP/Remote Dying Gasp/Flow Control Support Transparent QinQ double tagged frame Support IEEE 802.1Q Tag VLAN Pass Through				LFP/ALS/Loopback /Dying Gasp

2 Fiber Media Converter Series



The Web Smart OAM/IP managed Fiber Media Converter Series provides both Gigabit Ethernet and 10 Gigabit Ethernet connection, which provide simple control and setting function on each Ethernet port through in-band network via a Web browser. The user-friendly web interface offers an easy way to configure, monitor and troubleshoot the media converter. The series is an ideal solution for applications that require high-speed data transmission and secure network management.

Web Smart Managed Fiber Media Converter				
Model	**FR-MC22M**	**FR-MC12M**	**FR-6103I**	**FR-MC52M-SFP+**
				
Ports	1 x 1000M SFP Port 1x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP Port 2x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1 x 1000M SFP/1x9 Port 1 x10/100/1000M RJ45 Port (Auto MDI/MDIX)	1x10G SFP+ 1x10GBASE-T RJ45
Ethernet Standard and Protocols	IEEE 802.3,IEEE 802.3u,IEEE 802.3ab,IEEE 802.3z,IEEE 802.3x,IEEE 802.3ah			IEEE802.3an, IEEE802.3ae
Jumbo Frame	9K Bytes			
Operation Mode	10/100Mbps for Half/Full duplex 1000Mbps for Full Duplex			\
LED Indicators	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed RJ45 Duplex	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed RJ45 Duplex	Power FX Link/Acticity RJ45 Link/Activity RJ45 Speed	Power, FX-Link, FX Duplex, TX-SPD, TX-Duplex, TX-Link
Input Power	AC 220V		DC 9-56V	AC 220V
Power Consumption	Full-load<3W			Full Load＜6W
Hosing	Metal		Aluminum	Metal
Dimensions	160mmx130mmx32mm		120mm*90mm*35mm	172mm*105mm*32mm
Weight	800g		350g	1000g
Operating Temperature	0°C to 50°C		-40°C~75°C	0°C to 50°C
Storage Temperature	-20°C to 70°C		-40°C~85°C	-20°C to 70°C
Installation	Desktop/Wall Mount		DIN Rail / Wall Mount	Desktop/Wall Mount
Management Features				
	Rate Limitation/LFP/Remote Dying Gasp/Ingress or Egress Bandwidth Control Support Transparent QinQ double tagged frame Support IEEE 802.1Q Tag VLAN Pass Through Support SNMPv1			DOM SFP Support

Commercial Grade Industrial Grade

2 Fiber Media Converter Series

Managed Optical Transponder							
Model	**FR-6502**	**FR-6302**	**FR-6201**	**FR-6202**	**FR-6603**	**FR-6604**	**FR-6606**
							
Name	2.5G TMUX	Fiber Protection Converter	2.5G Transponder	4.25G Transponder	10G Transponder (1R)	10G Transponder (3R)	40G Transponder
Data Rate	2x1G to 2.5G	1000M	125M to 2.5Gbps	125M to 4.25Gbps	1.25M to 10Gbps	8.5G 10Gbps	40Gbps
Ports	3 x SFP	1x10/100/1000M RJ45 Port (Auto MDI/MDIX) 2xSFP	2 x SFP	2 x SFP	2 x XFP	2 x SFP+	2 x QSFP
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm Distance: MM 550m,2km, SM20/40/80km WDM:20/40/80km						
Transport Mode	Transparency Mode						
LED Indicators	Power REMO LINK SFP1/2/3 Link/Activity	Power REMO LINK RJ45 Speed/Duplex SFP1/2/3 Link/Activity	Power SFP1/2 Link/Activity	Power SFP1/2 Link/Activity Loop	Power XFP1/2 Link/Activity Loop	Power SFP+1/2 Link/Activity Loop SFP1/2	Power QSFP1/2 Link/Activity Loop
Input Power	DC 5V						
External Power	AC 220V/DC -48V(With Standalone Case)						
Power Consumption	Full-load<3W				Full Load<5W		Full Load<8W
Hosing	Metal(With Standalone Case)						
Dimensions	120mm*90mm*22mm						
Weight	150g				200g		
MTBF	65,000Hours@Telcordia SR-332 GB 25℃						
Operating Temperature	0°C to 50°C						
Storage Temperature	-20°C to 70°C						
Installation	Card Type, It can be inserted into Chassis or Standalone Case						

3 Ethernet Switch Series

Industrial Ethernet Switch vs Regular Ethernet Switch: Understanding the Key Differences

When it comes to Ethernet switches, there are two main types: industrial Ethernet switches and regular Ethernet switches. While both types of switches serve the same basic purpose—to connect devices on a network—there are some key differences between them that you should be aware of. Here's a look at the major differences between industrial and regular Ethernet switches:

Operating Environment
One of the biggest differences between industrial and regular Ethernet switches is the operating environment. Industrial Ethernet switches are designed to operate in harsh conditions, including extreme temperatures, vibrations, and dust. Regular Ethernet switches, on the other hand, are not typically designed to withstand these conditions and may malfunction or fail completely if exposed to them.

Electromagnetic environment
The electromagnetic environment of an industrial Ethernet switch is different from that of a regular Ethernet switch. An industrial Ethernet switch is designed to operate in environments with high levels of electromagnetic interference (EMI). This means that the switch must be able to withstand higher levels of EMI than a regular Ethernet switch. The switch must also be able to filter out EMI so that it does not interfere with the operation of the switch.

Operating Voltage
Industrial Ethernet switches have a wide operating voltage range, while regular switches require higher voltages.

Installation Method
Industrial Ethernet switches can be installed in DIN rails and racks. Regular switches are usually rack and desktop.

Cooling Method
Industrial Ethernet switches generally use a fanless case to dissipate heat, while ordinary switches use a fan to dissipate heat.

What is the differences between Semi Industrial Grade and High Standard Industrial Grade Switch?
Fiberroad FR-6N series represent Semi-industrial grade, whereas FR-7N/7M/7S/9T/9M series represents high-standard industrial grade. The High-Standard Industrial Switch has a wider temperature range than the Semi-Industrial Grade Series, with working at -40 °C to +75°C. The Semi-Industrial Switch contrastively support -20℃ to +70℃. Additionally, High Standard Industrial Switch series has strong anti-electromagnetic interference capabilities.

3 Ethernet Switch Series

Unmanaged Semi-Industrial Switch						
Model	**FR-6N1005**	**FR-6N1104**	**FR-6N1008**	**FR-6N3005**	**FR-6N3104**	**FR-6N3008**
						
Ports	5x10/100BASE-TX,RJ45	4x10/100BASE-TX,RJ45 1x100BASE-X SFP/1X9	8x10/100BASE-TX,RJ45	5x10/100/1000BASE-T,RJ45	4x10/100/1000BASE-T,RJ45 1x1000BASE-X SFP/1X9	8x10/100/1000BASE-T,RJ45
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection					
Switching Capacity	1.25 Gbps		2 Gbps	12 Gbps		20 Gbps
Ethernet Standard	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX			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		
MAC Address	4K		8K	4K		
Packet Buffer	512Kbits		1Mbits	1Mbits		2Mbits
Jumbo Frame	9K		10K	10K		9K
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm					
Cable Type(Copper)	Cat5/5e/6					
LED Indicators	PWR/LINK/ACT					
Input Power	DC 9-56V					
Connector	5 PIN Phoenix Contact					
Power Reverse	Support					
Power Consumption	Full Load<2W	Full Load<3W	Full Load<3W	Full Load<3W	Full Load<4W	Full Load<5W
Enclosure	IP 40 Aluminum case					
Fan Number	Fanless					
Dimensions	120 x 90 x35 mm		100 x 78 x 40 mm	120 x 90 x35 mm		100 x 78 x 40 mm
Weight	320g	350g	300g	320g	350g	300g
Operating Temperature	-20℃~70℃ (-5 to 158 ℉)					
Storage Temperature	-40℃~85℃ (-40 to 185 ℉)					
Installation	DIN Rail or Wall Mounting					

3 Ethernet Switch Series

Unmanaged Industrial (PoE) Ethernet Switch				
Model	**FR-7N1005/P/BT**	**FR-7N1104/P/BT**	**FR-7N1005/P/BT**	**FR-7N3104/P/BT**
				
Ports	5x10/100BASE-TX,RJ45	4x10/100BASE-TX,RJ45 1x100BASE-X SFP/1X9	5x10/100/1000BASE-T,RJ45	4x10/100/1000BASE-T,RJ45 1x1000BASE-X SFP/1X9
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	1.25 Gbps		12 Gbps	
Ethernet Standard	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX		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	
MAC Address	4K		8K	
Packet Buffer	512Kbits		1Mbits	
Jumbo Frame	9K		10K	
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
LED Indicators	PWR/LINK/ACT			
Input Power	DC 9-56V			
Connector	6 PIN Phoenix Contact			
Power Reverse	Support			
Power Consumption	Full Load<3W(Without PoE)			
Enclosure	IP 40 Aluminum case			
Fan Number	Fanless			
Dimensions	120 x 90 x35 mm			
Weight	350g	400g	350g	400g
Operating Temperature	-40 to 75°C (-40 to 167°F)			
Storage Temperature	-40°C to 85°C (-40 to 185 °F)			
Installation	DIN Rail or Wall Mounting			
PoE & Power Supply				
Model	FR-7N1005P/3005P/1104P/3104P		FR-7N1005BT/3005BT/1104BT/3104BT	
PoE Ports	Port 1 to 4 IEEE802.3af/at @PoE+		Port 1 to 4 IEEE802.3af/at/bt @PoE++	
Power Supply Pin	Default: 1/2(+), 3/6(-)		Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-)	
Max Power Per Port	30W		90W	
Total PWR /Input Voltage	120W(DC48-56V) (Model dependent)		360W(DC52-56V) (Model dependent)	
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)			

3 Ethernet Switch Series

Unmanaged Industrial (PoE) Ethernet Switch						
Model	**FR-7N3008/P/BT**	**FR-7N3208/P/BT**	**FR-7N3224/P/BT**	**FR-7N3808**	**FR-7N3016**	**FR-7N3216**
						
Ports	8x10/100/1000BASE-T RJ45	8x10/100/1000BASE-T,RJ45, 2x1000BASE-X SFP/1X9	24x10/100/1000BASE-T RJ45, 2x1000BASE-X SFP/1X9	8x10/100/1000BASE-T RJ45, 8x1000BASE-X SFP	16x10/100/1000BASE-T RJ45	16x10/100/1000BASE-T RJ45, 2x1000BASE-X SFP
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection					
Switching Capacity	20 Gbps		52 Gbps			
Ethernet Standard	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					
MAC Address	4K		8K			
Packet Buffer	2Mbits		4Mbits			
Jumbo Frame	9K		10K			
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm					
Cable Type(Copper)	Cat5/5e/6					
LED Indicators	PWR/LINK/ACT					
DIP Switch	\		AI VLAN/AI Extend/AI QoS/AI PoE	\	\	\
Input Power	DC 9-56V					
Connector	6 PIN Phoenix Contact			5 PIN Phoenix Contact		
Power Reverse	Support					
Power Consumption	<10W(Without PoE)		<24W (Without PoE)	<18W (Without PoE)		
Enclosure	IP 40 Aluminum case					
Fan Number	Fanless					
Dimensions	138 x 108 x49 mm		155mmx128mmx88mm	160mmx132mmx70mm		
Weight	680g	680g	1350g	1200g		
Operating Temperature	-40 to 75℃ (-40 to 167℉)					
Storage Temperature	-40℃ to 85℃ (-40 to 185 ℉)					
Installation	DIN Rail or Wall Mounting					
PoE & Power Supply						
Model	**FR-7N3008P/FR-7N3208P/FR-7N3224P**			**FR-7N3008BT/FR-7N3208BT/FR-7N3224BT**		
PoE Ports	Port 1 to 8 IEEE802.3af/at @PoE+ (FR-7N3008P/FR-7N3208P) Port 1 to 16 IEEE802.3af/at @PoE+ (FR-7N3016P/FR-7N3216P) Port 1 to 24 IEEE802.3af/at @PoE+ (FR-7N3224P)			Port 1 to 8 IEEE802.3bt @PoE++ (FR-7N3008P/FR-7N3208P) Port 1 to 24 IEEE802.3bt @PoE++ (FR-7N3224BT)		
Power Supply Pin	Default: 1/2(+), 3/6(-)			Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-)		
Max Power Per Port	30W			90W		
Total PWR /Input Voltage	240W(FR-7N3008P/FR-7N3208P/FR-7N3808P) 360W(FR-7N3016P/FR-7N3216P) 480W(FR-7N3224P)			480W((FR-7N3008BT/FR-7N3208BT/FR-7N3808BT) 720W (FR-7N3016/FR-7N3216P/FR-7N3224BT)		
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)					

3 Ethernet Switch Series

Unmanaged Industrial Ethernet Switch			
Model	**FR-7A1005**	**FR-7A1008**	**FR-7A1006**
			
Ports	5x10/100BASE-TX RJ45	8x10/100BASE-TX RJ45	16x10/100BASE-TX RJ45
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection		
Switching Capacity	1.25 Gbps	1.6 Gbps	3.2 Gbps
Ethernet Standard	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT		
MAC Address	1K		2K
Packet Buffer	512K	1M	
Jumbo Frame	9K	10K	
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm		
Cable Type(Copper)	Cat5/5e		
LED Indicators	PWR/LINK/ACT		
DIP Switch	#1 Broadcast Storm Protection		
Input Power	DC 9-72V		
Connector	6 PIN Phoenix Contact		
Power Reverse	Support		
Power Consumption	<2W	<3W	<5W
Enclosure	IP 40 Aluminum case		
Fan Number	Fanless		
Dimensions	100mmx78mmx40mm		138mmx108mmx49mm
Weight	300g	300g	680g
Operating Temperature	-40 to 75°C (-40 to 167°F)		
Storage Temperature	-40°C to 85°C (-40 to 185 °F)		
Installation	DIN Rail or Wall Mounting		

3 Ethernet Switch Series

Web Smart Layer 2 Industrial (PoE) Ethernet Switch				
Model	**FR-6S3204**	**FR-6S3208**	**FR-7S3204/P/BT**	**FR-7S3208L**
				
Ports	4×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	8×10/100/1000BASE-T RJ45, 2×1000BASE-X SFP	4×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	8×10/100/1000BASE-T RJ45, 2×1000BASE-X SFP
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	12 Gbps	20 Gbps	12 Gbps	24 Gbps
Ethernet Standard	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			
MAC Address	4K			
Packet Buffer	2Mbits			
Jumbo Frame	9K			
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
LED Indicators	PWR/LINK/ACT			
DIP Switch	\		RSTP/VLAN/FX Speed	
Input Power	DC 9-56V			
Connector	5 PIN Phoenix Contact		6 PIN Phoenix Contact	
Power Reverse	Support			
Power Consumption	<3W(Without PoE)	<10W(Without PoE)	<3W(Without PoE)	<10W(Without PoE)
Enclosure	IP 40 Aluminum case			
Fan Number	Fanless			
Dimensions	120mm x 90mm x 35mm	100 x 78 x 40 mm	120mm x 90mm x 35mm	138 x 108 x49 mm
Weight	350g	680g	350g	680g
Operating Temperature	-20°C~70°C (-5 to 158 °F)		-40 to 75°C (-40 to 167°F)	
Storage Temperature	-40°C~85°C (-40 to 185 °F)		-40°C to 85°C (-40 to 185 °F)	
Installation	DIN Rail or Wall Mounting			
Management Features				
Redundancy Protocol	Support STP/RSTP			
Multicast Support	Support IGMP Snooping V1			
VLAN	Support IEEE 802.1Q 4K VLAN, Port Isolation, Trunk Group Setting			
QOS	Support Port, 1Q, ACL, DSCP, CVLAN, SVLAN, DA, SA, Port Priority, Queue Weight			
Diagnostic Maintenance	Support port mirroring, Port Statistics, Cable Diagnostic			
Management Function	WEB、SNMPv1, EEE, Green Ethernet			
Security	Broadcast/Multicast Storm Protection, MAC filtering, MAC Constraint			
Advance Functions	Bandwidth Control, Jumbo Frame, Firmware Online Upgrade, Configuration Backup, PoE Management			
PoE & Power Supply				
Model	**FR-7S3204P**		**FR-7S3204BT**	
PoE Ports	Port 1 to 4 IEEE802.3af/at @PoE++		Port 1 to 4 IEEE802.3af/at/bt @PoE++	
Power Supply Pin	Default: 1/2(+), 3/6(-)		Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-)	
Max Power Per Port	30W		90W	
Total PWR / Input Voltage	120W(DC48-56V)		200W(DC52-56V)	
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)			

Semi-Industrial Grade Industrial Grade

3 Ethernet Switch Series

Managed Layer 2+ Industrial (PoE) Ethernet Switch						
Model	**FR-7M3208L**	**FR-7M3408/P/BT**	**FR-7M3808/P/BT**	**FR-7M3016/P/BT**	**FR-7M3416/P/BT**	**FR-7M3816/P/BT**
						
Ports	8×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	8×10/100/1000BASE-T RJ45 4×1000BASE-X SFP	8×10/100/1000BASE-T RJ45 8×1000BASE-X SFP	16×10/100/1000BASE-T RJ45	16×10/100/1000BASE-T RJ45 4×1000BASE-X SFP	16×10/100/1000BASE-T RJ45 8×1000BASE-X SFP
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection					
Switching Capacity	24 Gbps		52 Gbps			
Ethernet Standard	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					
MAC Address	4K		8K			
Packet Buffer	4Mbits		4Mbits			
Jumbo Frame	10K		10K			
LED Indicators	PWR/RUN/LINK/ACT					
Input Power	DC 9-56V					
Connector	6 PIN Phoenix Contact		5 PIN Phoenix Contact			
Power Reverse	Support					
Power Consumption	Full Load<10W(Without PoE)		<20W(Without PoE)		<25W(Without PoE)	
Enclosure	IP 40 Aluminum case					
Fan Number	Fanless					
Dimensions	138mm x 108mm x49mm		160mmx132mmx70mm			
Weight	680g		1200g			
Operating Temperature	-40 to 75°C (-40 to 167°F)					
Storage Temperature	-40°C to 85°C (-40 to 185 °F)					
Installation	DIN Rail or Wall Mounting					
Management Features						
Layer 2+ Web Management	Support, Please Refer to Page 38					
CLI Management	Support					
NMS	Support, Please Refer to Page 40					
Cloud	Support, Please Refer to Page 41					
PoE & Power Supply						
Model	**FR-7M3408P/FR-7M3808P/FR-7M3016P/ FR-7M3416P/FR-7M3816P**			**FR-7M3408BT/FR-7M3808BT/FR-7M3016BT/FR-7M3416BT /FR-7M3816BT**		
PoE Ports	Port 1 to 8 IEEE802.3af/at @PoE+(FR-7M3408P/FR 7M3808P) Port 1 to 16 IEEE802.3af/at @PoE+(FR-7M3016P/FR-7M3416P/FR-7M3816P)			Port 1 to 8 IEEE802.3bt @PoE++(FR-7M3408BT/FR-7M3808BT) Port 1 to 16 IEEE802.3bt @PoE++(FR-7M3016BT/FR-7M3416BT/FR-7M3816BT)		
Power Supply Pin	Default: 1/2(+), 3/6(-)			Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-)		
Max Power Per Port	30W			90W		
Total PWR /Input Voltage	240W(FR-7M3408P/FR-7M3808P) 360W(FR-7M3016P/FR-7M3416P/FR-7M3816P)			480W(FR-7M3408P/FR-7M3808P) 720W (FR-7M3016P/FR-7M3416P/FR-7M3816P)		
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)					

3 Ethernet Switch Series

Managed Layer 2+ Industrial (PoE) Ethernet Switch			
Model	**FR-7M3208S/SP/SBT**	**FR-7M3208F/FP/FBT**	**FR-7M3408F/FP/FBT**
			
Ports	8×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	8×10/100/1000BASE-T RJ45	8×10/100/1000BASE-T RJ45 2×1000BASE-X SFP
Integrated Port	2x RS485/422/232(5-pin Contact)	2x1000Base-X Optical Fiber Bypass(SC/FC/ST)	2x1000Base-X Optical Fiber Bypass(SC/FC/ST)
Integrated Port Specifications	RS-232: a:TXD、b:RXD、c:Na、d:Na、e:GND RS-422: a:T+、b:T-、c:R+、d:R-、e:GND RS-485：a:Na、b:Na、c:D+、d:D-、e:GND Baud Rate: 2400–115200bps	Bypass Insertion Loss: Typical: 1.0dB; Max: 1.5dB Bypass Switching Time: < 8ms	
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection		
Switching Capacity	24 Gbps		
Ethernet Standard	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		
MAC Address	8K		
Packet Buffer	4Mbits		
Jumbo Frame	10K		
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm		
Cable Type(Copper)	Cat5/5e/6		
LED Indicators	PWR/LINK/ACT		
DIP Switch	RSTP/VLAN/FX Speed		
Input Power	DC 9-56V		
Connector	6 PIN Phoenix Contact		
Power Consumption	<12W(Without PoE)		
Enclosure	IP 40 Aluminum case		
Fan Number	Fanless		
Dimensions	138 x 108 x49 mm		
Weight	680g		
Operating Temperature	-40 to 75°C (-40 to 167°F)		
Storage Temperature	-40°C to 85°C (-40 to 185 °F)		
Installation	DIN Rail or Wall Mounting		
Management Features			
Layer 2+ Web Management	Support, Please Refer to Page 38		
CLI Management	Support		
NMS	Support, Please Refer to Page 40		
Cloud	Support, Please Refer to Page 41		
PoE & Power Supply			
Model	**FR-7M3208SP/FR-7M3408FP/FR-7M3208FP**	**FR-7M3208SBT/FR-7M3408FBT/FR-7M3208FBT**	
PoE Ports	Port 1 to 8 IEEE802.3af/at @PoE++	Port 1 to 8 IEEE802.3af/at/bt @PoE++	
Power Supply Pin	Default: 1/2(+), 3/6(-)	Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-)	
Max Power Per Port	30W	90W	
Total PWR /Input Voltage	240W(DC48-56V)	480W(DC52-56V)	
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)		

3 Ethernet Switch Series

Managed Layer 2+ Industrial (PoE) Ethernet Switch					
Model	**FR-7M3424/P/BT**	**FR-7M348F/P/BT**	**FR-9M3424/P/BT**	**FR-9M348F/P/BT**	**FR-9M34F8/P/BT**
					
Ports	24×10/100/1000BASE-T RJ45 4×100/1000BASE-X SFP	16×10/100/1000BASE-T RJ45 12×100/1000BASE-X SFP	24×10/100/1000BASE-T RJ45 4×Gigabit Combo Port (SFP and RJ45)	16×10/100/1000BASE-T RJ45 8×100/1000BASE-X SFP 4×Gigabit Combo Port (SFP and RJ45)	8×10/100/1000BASE-T RJ45 16×100/1000BASE-X SFP 4×Gigabit Combo Port (SFP and RJ45)
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection				
Switching Capacity	52 Gbps				
Ethernet Standard	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				
MAC Address	8K				
Packet Buffer	4Mbits				
Jumbo Frame	10K				
LED Indicators	PWR/RUN/LINK/ACT/FAIL(PoE)/MAX(PoE)/R.O./RING/RJ45 Port Speed/ALM				
DIP Switch	RSTP/VLAN/FX Speed		\		
Input Power	DC 9-56V				
Connector	6 PIN Phoenix Contact		5 PIN Phoenix Contact		
Power Consumption	<25W(Without PoE)			<30W(Without PoE)	
Enclosure	IP 40 Aluminum case				
Fan Number	Fanless				
Dimensions	155mmx128mmx88mm		400mmx300mmx45mm		
Weight	1.35kg		2.6kg		
Operating Temperature	-40 to 75℃ (-40 to 167℉)				
Storage Temperature	-40℃ to 85℃ (-40 to 185 ℉)				
Installation	DIN Rail or Wall Mounting		Rack Mounting		
Management Features					
Layer 2+ Web Management	Support, Please Refer to Page 38				
CLI	Support				
NMS	Support, Please Refer to Page 40				
Cloud	Support, Please Refer to Page 41				
PoE & Power Supply					
Model	**FR-7M3424P /FR-9M3424P**	**FR-7M348FP /FR-9M348FP**	**FR-9M34F8P**	**FR-7M3424BT /FR-9M3424BT**	**FR-7M348FBT /FR-9M348FBT**	**FR-9M34F8BT**
PoE Ports	Port 1 to 24 IEEE802.3af/at @PoE+	Port 9 to 24 IEEE802.3af/at @PoE+	Port 17 to 24 IEEE802.3af/at @PoE+	Port 1 to 24 IEEE802.3af/at/bt @PoE++	Port 9 to 24 IEEE802.3af/at/bt @PoE++	Port 17 to 24 IEEE802.3af/at/bt @PoE++
Power Supply Pin	Default: 1/2(+), 3/6(-)			Default: 1/2(+), 3/6(-) ,4/5(+), 7/8(-)		
Max Power Per Port	30W			90W		
Total PWR /Input Voltage	480W(DC48-56V)			720W(DC48-56V)		
Operating Voltage	30W PoE Mode: 48-56VDC 90W PoE Mode: 52-56VDC(IEEE802.3bt model)					

TIME SENSITIVE NETWORKING
INDUSTRIAL ETHERNET SWITCH

FR-7T4412

- IEEE 1588 PTPv2
- IEEE 802.1Qbv
- IEEE 802.1Qav
- IEEE 802.1Qcc
- IEEE 802.1AS
- Cyber Security

3 Ethernet Switch Series

TSN Layer 3 Managed Industrial Ethernet Switch	
Model	**TSN-7T4412**
	
Ports	12×10/100/1000BASE-T RJ45 4×1.25G/2.5G/10G SFP/SFP+
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection
Switching Capacity	52 Gbps
Ethernet Standard	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 802.3bz for 2.5G Ethernet IEEE 802.3ae for 10 Gigabit Ethernet IEEE 802.3x for flow control
MAC Address	8K
Packet Buffer	4Mbits
Jumbo Frame	10K
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm
Cable Type(Copper)	Cat5/5e/6
LED Indicators	PWR/RUN/LINK/ACT/ALM/RJ45 Port Speed/ALM
Input Power	DC 9-56V
Connector	6 PIN Phoenix Contact
Power Reverse	Support
Power Consumption	<20W
Enclosure	IP 40 Aluminum case
Fan Number	Fanless
Dimensions	160mmx132mmx70mm
Weight	1200g
Operating Temperature	-40 to 75℃ (-40 to 167℉)
Storage Temperature	-40℃ to 85℃ (-40 to 185 ℉)
Installation	DIN Rail or Wall Mounting
Management Features	
Layer 3 Web Management	Support, Please Refer to Page 39
CLI Management	Support
NMS	Support, Please Refer to Page 40
Time Management	SNTP/NTP Client, IEEE1588
TSN Protocol	IEEE 802.1AS, IEEE 802.1Qbv, IEEE 802.1Qcc, IEEE 802.1Qav

3 Ethernet Switch Series

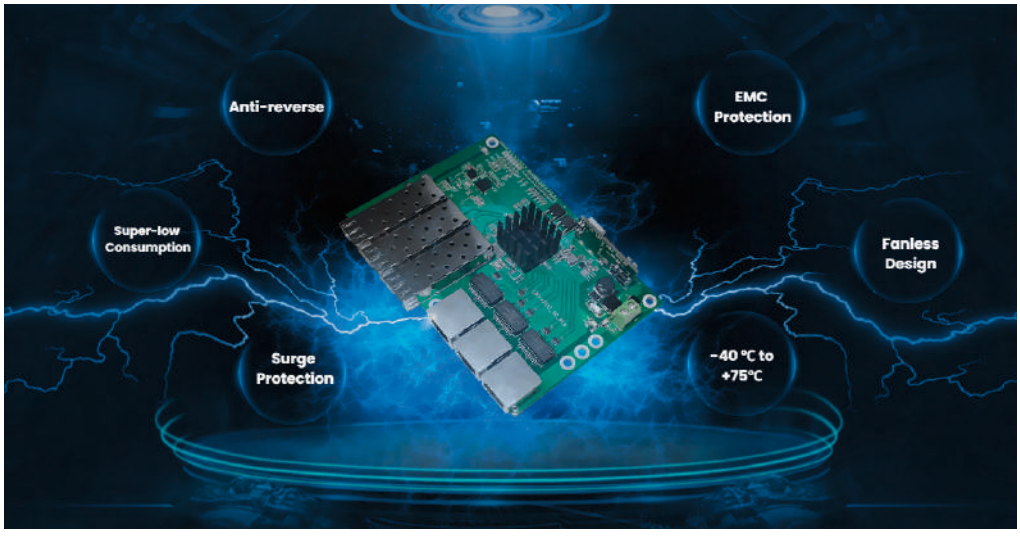
Industrial Ethernet Switch For Power Substation			
Model	**FR-9N2224**	**FR-9N2024F**	**FR-9M2424**
			
Ports	24×10/100BASE-TX RJ45 2×1000BASE-X SFP	24×100BASE-FX 1x9 4×1000BASE-X SFP	24×10/100BASE-TX RJ45 4×1000BASE-X SFP
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection		
Switching Capacity	10.4 Gbps		
Ethernet Standard	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX		
MAC Address	16K		
Packet Buffer	4M		
Jumbo Frame	10K		
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm		
Cable Type(Copper)	Cat5/5e/6		
LED Indicators	PWR/RUN/LINK/ACT/RJ45 Port Speed/ALM		
Input Power	Dual DC 9-56V or AC220V		
Connector	5 PIN Phoenix Contact		
Power Reverse	Support		
Power Consumption	<30W	<45W	<35W
Enclosure	IP 40 Aluminum case		
Fan Number	Fanless		
Dimensions	400mmx300mmx45mm		
Weight	2600g		
Operating Temperature	-40 to 75°C (-40 to 167°F)		
Storage Temperature	-40°C to 85°C (-40 to 185 °F)		
Installation	Rack Mounting		
Management Features			
Layer 2+ Web Management	\	\	Support, Please Refer to Page 38
CLI Management	\	\	Support
NMS	\	\	Support, Please Refer to Page 40

Manageable Unmanageable

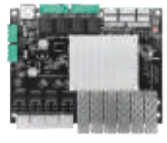
3 Ethernet Switch Series

Managed Layer 3 Industrial (PoE) Ethernet Switch				
Model	**FR-7T4408/P**	**FR-9T4424/P**	**FR-9T44F8**	**FR-9T448F**
				
Ports	8×10/100/1000BASE-T RJ45 2×1.25G/10G SFP/SFP+ 2×1.25G/2.5G/10G SFP/SFP+	24×1000MBASE-T RJ45 4x10Gb SFP+	16×1000MBASE-X SFP 8×Gigabit Combo Port (SFP and RJ45) 4x10Gb SFP+ Uplink	16×10/100/1000BASE-T RJ45 8×Gigabit Combo Port (SFP and RJ45) 4x10Gb SFP+ Uplink
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	128 Gbps			
Ethernet Standard	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 802.3bz for 2.5G Ethernet IEEE 802.3ae for 10 Gigabit Ethernet IEEE 802.3x for flow control			
MAC Address	16K			
Packet Buffer	12Mbits			
Jumbo Frame	10K			
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
LED Indicators	PWR/RUN/LINK/ACT/RJ45 Port Speed/ALM	PWR/RUN/LINK/ACT/FAIL(PoE)/MAX(PoE)/R.O./RING/RJ45 Port Speed/ALM		
Input Power	DC 9-56V			
Connector	6 PIN Phoenix Contact	5 PIN Phoenix Contact		
Power Reverse	Support			
Power Consumption	<24W(Without PoE)	<30W(Without PoE)		
Enclosure	IP 40 Aluminum case			
Fan Number	Fanless			
Dimensions	138mmx108mmx49mm	400mmx300mmx45mm		
Weight	680g	2.8kg		
Operating Temperature	-40 to 75°C (-40 to 167°F)			
Storage Temperature	-40°C to 85°C (-40 to 185 °F)			
Installation	DIN Rail or Wall Mounting	Rack Mounting		
Management Features				
Layer 3 Web Management	Support, Please Refer to Page 39			
CLI Management	Support			
NMS	Support, Please Refer to Page 40			
PoE & Power Supply				
Model	**FR-7T4408P**	**FR-9T4424P**		
PoE Ports	Port 1 to 8 IEEE802.3af/at @PoE+	Port 1 to 24 IEEE802.3af/at @PoE+		
Power Supply Pin	Default: 1/2(+), 3/6(-)	Default: 1/2(+), 3/6(-)		
Max Power Per Port	30W	30W		
Total PWR /Input Voltage	240W(DC48-56V)	480W(DC48-56V)		
Operating Voltage	Non-PoE Mode: 9-56VDC 30W PoE Mode: 48-56VDC			

3 Ethernet Switch Series



Intrinsically Safe Industrial Ethernet Switch from Fiberroad are widely used in mining automation, such as video surveillance systems, coal mine power monitoring systems, mine safety monitoring systems, and coal mine personnel positioning systems. In addition to adapting to low and high temperatures environments, it has strong anti-electromagnetic interference, anti-salt spray, anti-vibration and anti-shake features to meet the harsh working conditions of industrial sites.

Embedded Industrial Ethernet Switch				
Model	**FISE205**	**FISE306G**	**FISE505G**	**FISE610G**
				
Ports	3×10/100BASE-TX RJ45 2×100BASE-X 1x9	3×10/100/1000BASE-T RJ45 3×100/1000BASE-X SFP	3×10/100/1000BASE-T RJ45 2×100/1000BASE-X 1x9	4x10/100/1000BASE-T 6x100/1000BASE-X SFP 2xIsolated RS485 2xIsolated CAN Bus
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	1.25 Gbps	20 Gbps	12 Gbps	52 Gbps
Ethernet Standard	802.3x、802.3u、802.3z、802.1D、802.1Q、802.1p、802.1ab		IEEE802.3、IEEE802.3u、IEEE802.3z、IEEE802.3x、IEEE802.1p、IEEE802.1Q、IEEE802.1d/w	
MAC Address	4K	4K	4K	8K
Packet Buffer	512K	1M		2M
Jumbo Frame	9K	10K		10K
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
Input Power	DC9-36V			
Dimensions	106mm×66mm×17mm		120mm×90mm×17mm	180mmx135mmx18mm
Operating Temperature	-40 to 75℃ (-40 to 167℉)			
Storage Temperature	-40℃ to 85℃ (-40 to 185 ℉)			
Installation	Positioning hole installation			
Management Features				
Layer 2 Web Smart	\	\	Support, Refer to Page 37	\
Layer 2+ Web Management	\	\	\	Support, Refer to Page 38
NMS	\	\	\	Support, Refer to Page 40

Manageable Unmanageable

3 Ethernet Switch Series

Commercial Grade Unmanaged PoE Network Switch				
Model	**FR-5A3208P/BT**	**FR-5A3010P/BT**	**FR-5A3216P/BT**	**FR-5A3224P/BT**
				
Ports	8×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	10×10/100/1000BASE-T RJ45	16×10/100/1000BASE-TX RJ45 2×1000BASE-X SFP	24×10/100/1000BASE-TX RJ45 2×1000BASE-X SFP
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	20 Gbps		52 Gbps	
Ethernet Standard	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			
MAC Address	4K		8K	
Packet Buffer	2M		4M	
Jumbo Frame	9K		10K	
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
LED Indicators	PWR/LINK/SPD		PWR/PoE/LINK/SPD	
DIP Switch	AI PoE/AI Extend/AI QoS/AI VLAN			
Input Power	DC 48-56V		AC 100V-240V	
PoE Port	Port 1 to 8 IEEE802.3af/at @PoE+ (FR-5A3208P/FR-5A3010P) Port 1 to 8 IEEE802.3af/at/bt @PoE++ (FR-5A3208BT/FR-5A3010BT)		Port 1 to 16/24 IEEE802.3af/at @PoE+ (FR-5A3216P/FR-5A3224P) Port 1 to 16/24 IEEE802.3af/at/bt @PoE++ (FR-5A3216BT/FR-5A3224BT)	
Max Power Per Port	30W @PoE+ Model 90W @PoE++ Model			
Power Supply Pin	Default: 1/2(+), 3/6(-) @PoE+ Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-) @PoE++			
Enclosure	IP 30 Metal case			
Fan Number	Fanless			
Dimensions	220mmx108mmx28 mm		400mmx300mmx45mm	
Weight	680g		3800g	
Operating Temperature	0°C~50°C (32to 122 °F)			
Storage Temperature	-20°C~70°C (-4 to 158 °F)			
Installation	Desktop or Rack Mounting			

3 Ethernet Switch Series

Commercial Grade Managed PoE Network Switch				
Model	**FR-5M3208P/BT**	**FR-5M3224P/BT**	**FR-5M3424P/BT**	**FR-5T4424P**
				
Ports	8×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	24×10/100/1000BASE-T RJ45 2×1000BASE-X SFP	24×10/100/1000BASE-T RJ45 4×Gigabit Combo Port (SFP and RJ45)	24×10/100/1000BASE-T RJ45 4x10Gb SFP+ Uplink
Port Mode	Auto Negotiation Speed Full/Half Duplex Mode Auto MDI/MDI-X Connection			
Switching Capacity	20 Gbps	52 Gbps		
Ethernet Standard	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			
MAC Address	8K	8K		16K
Packet Buffer	2M	4M		12M
Jumbo Frame	10K	10K		10K
Cable Type(Fiber)	Multimode 50/125μm, 62.5/125μm Single-mode 9/125μm			
Cable Type(Copper)	Cat5/5e/6			
LED Indicators	PWR/RUN/LINK/ACT/FAIL(PoE)/MAX(PoE)/R.O./RING/RJ45 Port Speed/ALM			
Input Power	AC 100V- 240V			
PoE Port	Port 1 to 8 IEEE802.3af/at @PoE+ (FR-5M3208P) Port 1 to 24 IEEE802.3af/at @PoE++ (FR-5M3224P/FR-5M3424P/FR-5T4424P)		Port 1 to 8 IEEE802.3af/at @PoE+ (FR-5M3208BT) Port 1 to 24 IEEE802.3af/at/bt @PoE++ (FR-5M3224BT/FR-5M3424BT)	
Max Power Per Port	30W @PoE+ Model 90W @PoE++ Model			
Power Supply Pin	Default: 1/2(+), 3/6(-) @PoE+ Default: 1/2(+), 3/6(-) or 4/5(+), 7/8(-) @PoE++			
Enclosure	IP 30 Metal case			
Fan Number	Fanless			
Dimensions	208mm*140mm*45mm	400mmx300mmx45mm		
Weight	1200g	4000g		
Operating Temperature	0℃~50℃ (32to 122 ℉)			
Storage Temperature	-20℃~70℃ (-4 to 158 ℉)			
Installation	Rack Mounting			
Management Features				
Layer 2+ Web	Support, Please Refer to Page 38			\
Layer 3 Web	\			Support, Please Refer to Page 39
CLI	Support			Support
NMS	Support, Please Refer to Page 40			Support, Please Refer to Page 40
Cloud	Support, Please Refer to Page 41			\

Layer 2+ Management Layer 3 Management

4 Smart IoT Surveillance Box

Fiberroad Technology's Smart IoT Surveillance Controller Box is an exciting new product that allows you ton control your surveillance cameras using your smartphone or other internet-connected device. This product is perfect for those who want to keep an eye on their property while away from home, or for business owners who want to monitor their premises remotely. The Smart IoT Surveillance Controller Box is easy to set up and use, and it provides a high level of security for your camera system

Wiring

There are few cable interfaces in the equipment box, and the wiring is standardized, Clean and tidy interior and reduce failure nodes.

High-integration

Integrates with various IoT devices such as cameras, sensors, and alarms to create a comprehensive surveillance network.

Modularization

The power module and the information collection fault diagnosis network transmission module are configured accordingly.

Automation

An automatic temperature control system provides a different working environment for the regular operation of equipment.

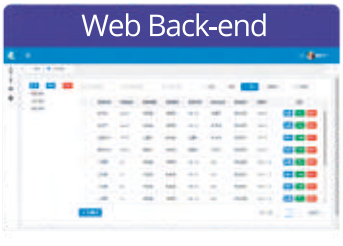
Connectionless

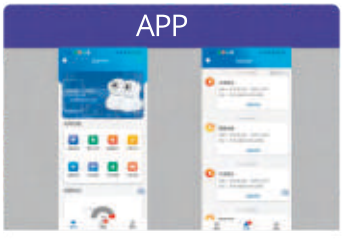
The connection between modules is through the motherboard circuit, which reduces the number of failures caused by the ageing.

Scalable

Modular design, establishing a front-end device access platform for later system upgrade to reduce investment.

Intelligent operations management platform equipped to manage intelligent video monitoring equipment boxes, cameras and related equipment, video monitoring system and the system used in a variety of equipment running status and alarm information and fault information system - pipe buried, operation monitoring, alarm management, data query, order processing, statistical analysis software platform, rights





4 Smart IoT Surveillance Box

Model	E Series	F Series	K Series	H Series
				
Ethernet Switch Module	**4×10/100BASE-TX RJ45 1×100BASE-X FC**	**8×10/100/1000BASE-TX RJ45 2×1000BASE-X SFP**	**16×10/100/1000BASE-TX RJ45 8×1000BASE-X SFP**	**4×10/100BASE-TX RJ45 1×100BASE-X FC**

Smart Box Specification		
Power Supply	**Standard**	1x AC220V (Both 2-Prong and 3-Prong Sockets)
	Standard	4 x AC220V Load Output
	Optional	2 x AC24V Load Output
	Standard	2 x DC12V Load Output
	Optional	Supports a maximum of 10 load outputs
Remote Control	**Standard**	Supports four remote control channels for AC 220V load output and independent control for each group
	Optional	Supports two remote control AC 24V load outputs and independent control for each group
	Standard	Supports two 12V DC load outputs and independent control for each group
	Optional	Supports up to 10 load outputs and independent control for each group
Electric Quantity Gauge	**Standard**	The power consumption can be measured by power supply output, and the power consumption can be measured by monthly, quarterly, annual, and total.
Automatic temperature control	**Standard**	Supports the function of setting temperature thresholds and controlling fan startup and stop. Supports the function of detecting fan running status
Intelligent controller	**Standard**	4x AC220V , 2xDC12V
	Standard	Each group of load output has overcurrent, short circuit protection
	Standard	Each load output has integrated lightning protection:1.2/50μs 6KV(2Ω)
	Standard	Each group of load output poles adopts output terminals with center spacing not less than 9.5MM
	Standard	Each group of load output has current and voltage detection function
Power Supply Modular	**Standard**	DC 12V-60W
	Optional	DC 12V-200W
	Optional	DC48-56V 480W (For PoE Switch)
Automatic reclosing	**Standard**	Rated voltage :AC 220V/50HZ, rated current :16A, operation time :≤0.05S
	Standard	Support remote management function, with undervoltage, overvoltage, leakage and short circuit protection
	Optional	Rated voltage :AC 220V/50HZ, rated current :63A, operation time :≤0.05S
Air Switch	**Standard**	2P 63A
Power Surge Arrester	**Standard**	Rated flow capacity In (8/20μs):20kA, maximum flow capacity Imax(8/20μs):40kA
Network lightning protection	**Standard**	Built-in network port integration, ITU-TK21:10/700μs 6KV(40Ω)
Expansion Port	**Standard**	2 x RS485/422/232
	Standard	1x analog input/output interface
	Standard	1 x switch input/output interface
Others	Optional	Support Bluetooth authorization open door and one button to remove the alarm function
	Optional	Supports the flood monitoring function
	Optional	Supports the smoke monitoring function
	Optional	Supports the lightning monitoring function
	Optional	Support vibration monitoring function
	Optional	Support the sound and light alarm function in the box
	Optional	Support box waterproof three-color working status indicator
	Optional	Support PoE
	Optional	Support GPS Modular
	Optional	Support NB Modular

4 Smart IoT Surveillance Box

APP	Optional	Support mobile phone APP, which can report point position information, view status information, receive fault work order, fault report, fault location and navigation, and view statistical data.
Optical fiber fusion box	**Standard**	Supports built-in optical fiber fusion box
Material	**Standard**	Oxide sheet/galvanized sheet
	Optional	201 or 304 stainless steel plate
Material thickness (mm)	**Standard**	1.2mm
Box spray color	**Standard**	RAL 9016
	Optional	Optional other colors or stainless steel
Dimensions	**Standard**	(Including brim) : 580mm×440mm×261mm (height x width x depth)
	Optional	It can be designed according to actual requirements
Input power cable	/	BVR2.5~BVR4mm² (copper core) is recommended.
Installation Mode	**Standard**	Hanging rod/wall mounting, not including hoop fittings
IP Rating	**Standard**	IP55
	Optional	IP65
Operating Environment	/	Operating temperature -20~75℃, humidity 10% ~ 90%
Operating Voltage		AC100V-AC240V

5 Accessories

Power Adapter

- High efficiency up to 94%
- Universal AC input / Full range(FR-75/120/240/480DR)； AC input 180 – 264 VAC only (FR-960DR)
- Protections: Short circuit / overload / over voltage / over temperature.
- Cooling by free air convection
- Installed on DIN rail
- 3 years warranty

AC/DC DIN Rail Type Series Adapter						
Model		**FR-75DR**	**FR-120DR**	**FR-240DR**	**FR-480DR**	**FR-960DR**
AC Input Voltage Range		88-264VAC; 124-370VDC			90-264VAC; 127-370VDC	180-260VAC;254-370VDC
AC inrush current(MAX.)		Cold Start,50A at 230VAC	Cold Start,70A at 230VAC	Cold Start,55A at 230VAC	Cold Start,80A at 230VAC	Cold Start,50A at 230VAC
DC adjustment Range		12V: 12-14V （Only for FR-75DR/120), 24V: 24-28V, 48V:48-55V				
Overload Protection		Normally works within 110%-150% rated output power for 3 seconds and then shut down output voltage with auto-recovery(re-power on to recover for FR-75DR)				Normally works within 105% - 130% rated output power for 3 seconds and then shutdown o/p voltage with auto-recovery after 30 seconds if the peak load condition is removed.
		>150% rated power or short circuit, constant current limiting with auto-recovery within 2 seconds and may cause to shut down if over 2 second.				Constant current limiting within 130%-150% rated output power for more than 3 seconds and then shut down o/p voltage, re-power on to recover.
Over voltage Protection	**Range**	14 -17V for 12V model(FR-75DR/120DR),29-33V for 24V model, 56-65V for 48V model				
	Type	Shut down o/p voltage, repower on to recover		Shut down o/p voltage with auto-recovery, or re-power on to recover		
Over Temperature Protection		Re-power on to recover	Recover automatically after temperature goes down.			
Withstand Voltage		I/P – O/P:3kVAC, I/P-FG:1.5kVAC, O/P-FG:0.5kVAC, O/P-DC OK:0.5kVAC(except for FR-I-75)				
Working Temperature		-30 to +70℃	-25 to +70℃(refer to output derating curve)			-30 to +70 ℃
Connection (screw DIN terminal)		I/P: 3 poles, O/P: 4 poles		I/P: 3 poles, O/P: 6 poles	I/P: 3 poles, O/P: 8 poles	I/P: 3 poles, O/P: 6 poles
Dimension (WxHxD) (mm)		32x125.2x102	40x125.2x113.5	63x125.2x113.5	85.5x125.2x128.5	110x125.2x150

5 Accessories

Power Adapter

- Universal AC in put / Full range
- No load power consumption ＜0.075 – 0.15W by model
- -30 to + 70℃ wide range working temperature
- Protections: Short circuit / overload / over voltage / over temperature.(except for FR-40DT)
- Fully enclosed plastic case
- LED indicator for power on
- 3 years warranty

AC/DC Desktop Type Series Adapter					
Model		**FR-40DT**	**FR-60DT**	**FR-90DT**	**FR-120DT**
AC Input Voltage Range		90 – 264VAC; 127 – 370VDC			85 – 264VAC; 120 – 370VDC
AC inrush current(MAX.)		Cold Start,65A at 230VAC		Cold Start,70A at 230VAC	
DC adjustment Range		5V-48V	5V-48V	12V-48V	12V-48V
Overload Protection	**Range**	105% -150% rated output voltage		110% - 150%	105% - 160%
	Type	Hiccup mode, auto-recovery			
Withstand Voltage		I/P – O/P:3kVAC, I/P-FG:2kVAC, O/P-FG:0.5kVAC			I/P – FG:3kVAC
Working Temperature		-30 to +70℃			

Mounting Kits

19” Rack Mounting Kit

For FR-5M3208P

Wall Mounting Bracket

For FR-2000 Mini Fiber Media Converter

5 Accessories

Optical Transceiver

- Wide distance supported from 2km to 120km
- Digital diagnostic optional
- Metal enclosure for lower EMI, single +3.3V power supply
- Comply with SFP MSA, IEEE 802.3
- Support working temperature either 0 – 70 ℃ or -40℃ to +85℃

SFP Optical Transceiver					
Part No.	**Description**	**Wavelength**	**Distance**	**Rate**	**Working Temperature**
FRSX-DL1P2C/-I	SFP SX	850nm	2km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL311C/-I	SFP LX	1310nm	10km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL341C/-I	SFP EX	1310nm	40km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL541C/-I	SFP EX	1550nm	40km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL5X1C/-I	SFP EX/ZX	1550nm	80/120/160km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL35X3C/-I	BIDI SFP	1310nm	20/40km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-DL45X3C/-I	BIDI SFP	1490nm	80/120/160km	155Mb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L311C/-I	SFP LX	1310nm	10km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L341L/-I	SFP EX	1310nm	40km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L5X1C/-I	SFP EX/ZX	1550nm	40/80/100/100km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L5X1C/-I	SFP ZX	1550nm	120km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L3513/5313C/-I	BIDI SFP	1310nm/1550nm	10km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L3523/5323C/-I	BIDI SFP	1330nm/1550nm	20km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-1L45/54XX3C/-I	BIDI SFP	1490nm/1550nm	40/80/100/120km	1.25Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L1P2C/-I	SFP SX	850nm	550m	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L311C/-I	SFP LX	1310nm	10km	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L341C/-I	SFP EX	1310nm	40km	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L581C/-I	SFP EX	1550nm	80km	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L3XX3C/-I	BIDI SFP	1310nm/1550nm	20/40km	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-2L4583C/-I	BIDI SFP	1490nm/1550nm	20/40km	2.5Gb/s	0 – 70 ℃ or -40℃ to +85℃
SFP + Optical Transceiver					
FRSX-AL1N2C	SFP+ SR	850nm	300m	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL3Q1C	SFP+ IR	1310nm	2km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL311C	SFP+ LR	1310nm	10km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL341C	SFP+ ER	1310nm	40km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL541C	SFP+ ER	1550nm	40km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL581C	SFP+ ZR	1550nm	80km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL8613C	SFP+ BIDI	1330nm	10km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL8643C	SFP+ BIDI	1330nm	40km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL8663C	SFP+ BIDI	1330nm	60km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃
FRSX-AL5483C	SFP+ BIDI	1550nm	80km	10Gb/s	0 – 70 ℃ or -40℃ to +85℃

FIBERROAD

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