ORing

Guidebook

Industrial Networking solution

EN 50155
EN 50121

IEC 60945
EN 60945

IEC61850

Class I Division II
Hazardous

IRIS
Certification

www.ORingnet.com

About ORing

Value Proposition

- Professional and excellent expertise in Industrial Ethernet network
- Wide selection of high quality and cost-effective products
- Customized solutions to meet customer's needs
- Superior technical support and service
- Trusted Long-term partnership
- Low TCO and high ROI

Core Value

- Customer-Oriented R&D
- Technology Innovation
- Premium Quality
- Proficiency, Reliability and Efficiency
- Swift Time-to-Market product development

Mission

- Satisfy specific needs of industrial networking customers
- Build up a trusted partnership and maximize customer value
- Become the best solution provider for new generation industrial networking
- Provide superior quality products and extraordinary services with reasonable price

Leading the Way for Industrial Networking

As an IRIS certificated company, ORing has played a leading role in the network industry, and has been devoted to the development of next-generation network communications products and innovative industrial solutions. ORing has developed a comprehensive product portfolio designed to meet customers' various needs.

ORing's products and solutions are characterized by 10 Gigabit-level bandwidth, industrial-grade ruggedness, high-power PoE+, POE++ up to 30W/90W support, advanced network redundancy abilities, multi-vendor compatibility, and visualized network management for ease of operation.

ORing has launched redundancy technologies and products to ensure fast recovery in the event of network failure such as the self-healing O-Ring and O-Chain (recovery time < 10 ms with up to 250 switches) technologies, active hardware-based hacker prevention (Device Binding), high compatibility with other vendors' products (Open-Ring), powerful network management software (Open-Vision, with Google map features) and centralized management controller (OCS-815).

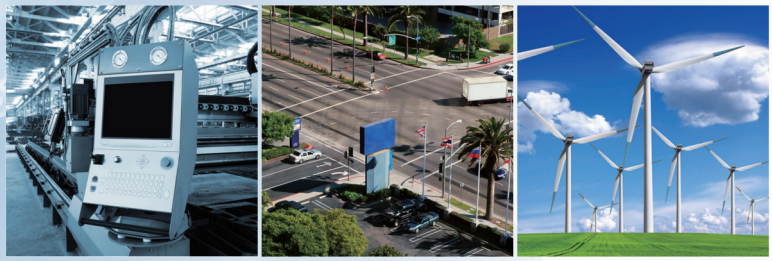
For wireless communications, ORing has developed industrial-grade products conforming to IEEE 802.11n and IEEE 802.11ac standards, X-Roaming technology (cross-AP wireless roaming handoff time < 60 ms), X-Mesh technology for large-scale redundant wireless networks and many more. Other products include industrial M2M gateways and 4G LTE cellular routers featuring link aggregation (load balancing) and redundancy technologies.

In addition to serial signals, DIDO, Ethernet interfaces and powerful VPN in the M2M gateway to collect data from the SCADA system, ORing has released new-generation 1/ 2/ 4/ 8/ 16-port serial device servers and Modbus gateways with innovative product function.

ORing's products have obtained various certifications, including CE/FCC, UL 60950-1/UL508/C1D2/ ATEX/IECEx, IEC-61850-3 for power utilities, EN50155/50121-4 for railway applications, and IEC-60945 for marine environments. All of ORing's products are covered by a warranty for up to 5 years.

Company Overview

- Founded in 2005 as a system design house known as Supercom
- Provides a wide selection of industrial Ethernet products
- Headquartered in Taiwan
- Products with ease of use, high quality, reliability, open architecture, and advanced network technology
- Rugged industrial-grade products designed for harsh environments
- Technical expertise in:
  - Ethernet, Protocols, and Internet
  - PoE Solutions
  - Wireless communications
  - Optical Fiber networks
  - Serial Communications
  - Network Management Software



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Company Information

Company Profile

Founded in 2005, ORing specializes in developing innovative own-branded products for industrial settings. Over the years, ORing has accumulated abundant experience in wired and wireless network communications industry. In line with the commercialization of 5G, ORing has stretched its arm into the IIoT field, helping customers realize all kinds of IIoT applications such as smart manufacturing, smart city, and industrial automation. With high product quality and best customer services in mind, ORing has continued to launch cutting-edge products catering to customer needs. ORing's products have been widely adopted in surveillance, rail transport, industrial automation, power substations, renewable energy, and marine industries with offices worldwide to address customer needs in real time. For more information, please contact us at sales_all@oringnet.com.

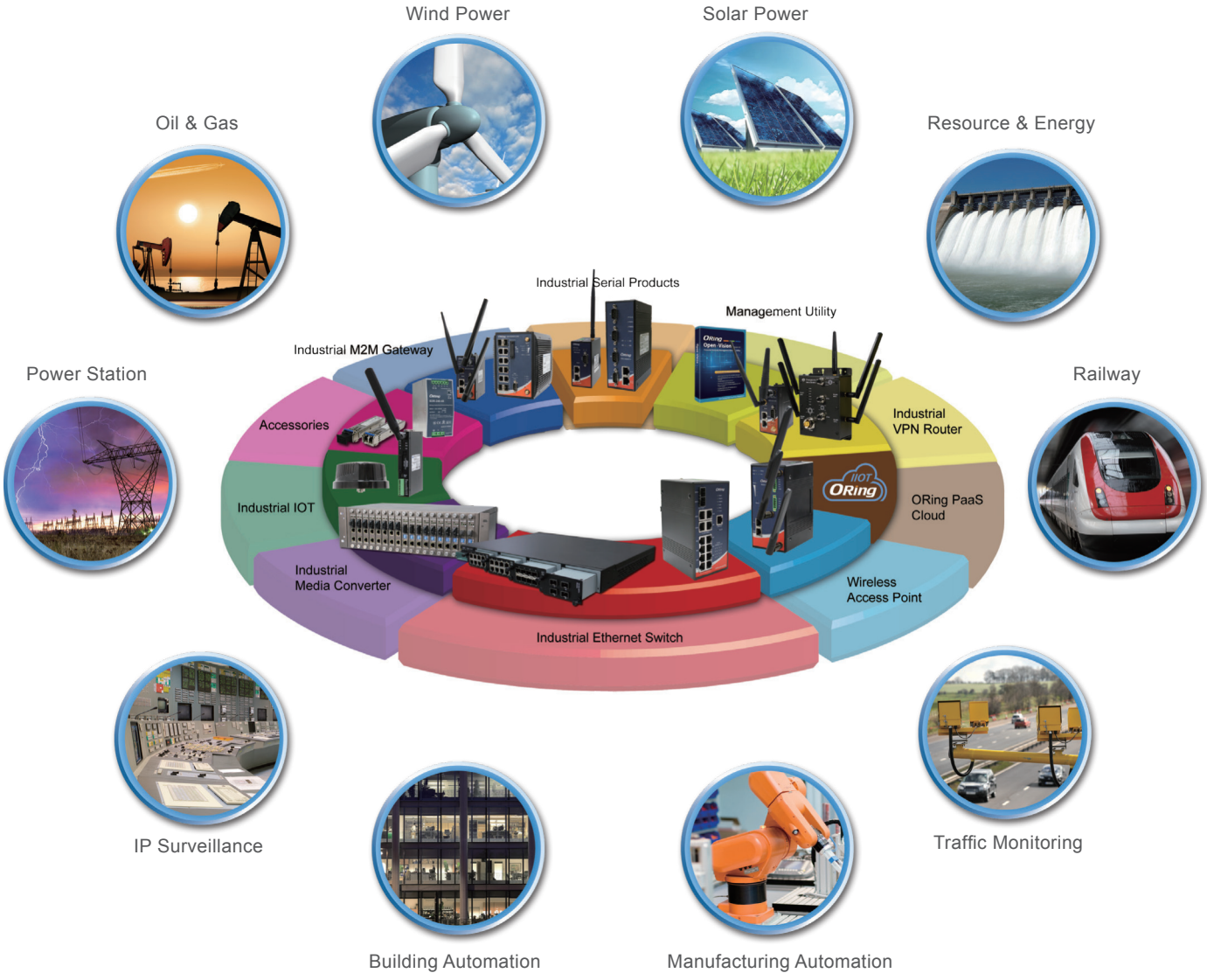
Milestone

2022	•Obtained 62443-1 certificate and passed 62443-2 VOC tests •Built strategic partnerships with ITRI to drive net-zero goals •Formed New Energy Group to expand in the energy marke
2021	•Joined ITxPT •Launched the first industrial WiFi 6 AP
2020	ORing has launched a work-from-home solution consisting of MagiCollect, MagiConnect, and ConnectGateway to help enterprises support their employees working at home.
2019	•Passed TAICS' IoT Cybersecurity Certification and launched KEMA-certified products •Weidmüller acquired a minor stake in ORing
2018	NB-IOT/CAT-M1 product release massive deployment with our IOT products
2017	ORIO + sensor passed NB-IoT testing conducted by Nokia/ Ericsson's lab Launched ORing's first cloud platform
2016	ORing Launched the First Onboard 2.5G/10G Ethernet Switch with Copper Interface and PoE Functions
2015	ORing passes IRIS Certification Launched Layer3 10G modular switches & din-rail switch with IEC-61850-3 compliance
2014	Reduced X-Roaming time to less than 60ms and launched IEC 60945 certified products for marine applications
2013	Passed C1D2 Certification in Q3 and integrated MRP and Modbus supporting into ORing switches.
2012	Launched IEC 61850-3 certified products for substations and introduced device servers supporting Windows 7 and 8.hes.

Product Coverage

ORing provides a wide variety of networking products and solutions to meet different needs and address various industrial usage scenarios. Our products range from industrial Ethernet switches to media converters, device servers, wireless access points, cellular VPN routers, network management utility, and IIoT products. We also provide vertical markets with high cost efficiency and one-stop shopping experience through comprehensive solutions.

With industrial-grade design, all of our products are proven to withstand various harsh conditions and can meet requirements for high network reliability and security. Our products come in different configuration to cater for individual needs. For example, you can choose by network speed (Gigabit, fast, etc.), mounting options (rack-mount, DIN-rail, wall-mount, as well as other special-installation types), types of data paths (regular Ethernet, weatherproof Ethernet, PoE, wireless LAN, USB, etc.), industry-specific applications (as shown below), and many more.



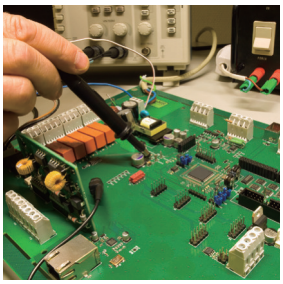
Product Development

ORing places a high value on product quality and reliability during product planning and development processes with an ultimate goal to improve availability, minimize costs, and maximize product life cycle. As a result, ORing has set up a strict and systematic product development procedure from idea generation to planning and analysis, research & design, trial and test, pilot run, and massive production, to ensure the compatibility of different vertical markets. During the initial stages, highly skilled design engineers and experienced project managers from different departments work closely on innovative product design catering to the customer's needs and identify possible problems in order to minimize project risks, reduce product development costs, and guarantees consistent product quality and performance. Once the prototype is developed, serious tests will be conducted. All products will be tested and improved before entering pilot run and massive production. With in-house design engineering and manufacturing, we can ensure quality consistency and minimized risks.

Idea Stage

Plan & Analysis

Research & Design



Trial & Test

Pilot Run

Massive Production

Customer-Oriented R&D Capability

ORing's innovations are geared to meet customers' needs. ORing's R&D team insists on developing stable, reliable, well-tested, and cost-effective industrial networking products. ORing R&D team accounts for one-third of the total workforce and has a vast knowledge and experience in the industry. ORing's R&D team work closely with project managers to develop innovative products based on customers' requirements. Apart from standard products, ORing's R&D team also conduct customized product design and in-house testing to ensure all products meet high quality requirements. Customers' feedback will be forwarded to our R&D team so they can make product improvements or develop new products that fulfill customers' expectations.

Quick Time-to-Market Product Solution

ORing has been known for its ability to provide products with a swift time-to-market as evidenced by the provisioning of the solution for the Beijing-Shanghai High-Speed Rail project, also known as the Jinghu High-Speed Rail, in 2010. The whole process from receiving the customer's requirements to product delivery took only three months. ORing's R&D team also possesses complete OEM/ODM capabilities and expertise in project planning, custom solution development, and technical support.

ODM Service

Besides own-brand products, ORing also offers ODM services to develop fully-customizable solutions for our customers. From design integration through prototyping to mass production, we apply our in-depth expertise on manufacturing, quality control, and new technology to provide the best, most reliable products for our partners.

ORing has provided ODM services for several major projects including the Beijing-Shanghai High-speed Rail project in 2010 and the Beijing Subway Line 8 project, to name a few. These successful projects have demonstrated ORing's ability to lead large-scale ODM projects with high-efficiency and excellence.

Customer Feedback

ORing takes customer feedback very seriously. In fact, customer needs are ORing's first priority. Customer feedback serves as valuable reference for making improvement in existing products as well as inspiration for future product innovation. Therefore, we have built a continuous customer feedback loop throughout the product development cycle in which customer feedback is collected before, during, and after product development. We not only listen for customer feedback but also identify customers' unmet needs proactively by engaging them during new product development to validate their requirements.

Technical Support and Quality Assurance

Comprehensive quality assurance tests are performed on all ORing products throughout the product development cycle to make sure the products achieve high quality standards.We have SMT lines that run with high speed mounting and dedicated staff for different QA procedures such as stencil cleaning, automatic optical inspection, burn-in testing, and RoHS compliance testing.

All ORing products are covered by a warrant for up to five years. To provide real-time services to customers, ORing has sales offices and distributors around the globe. The OCE (ORing Certification Engineer) training program enables ORing and its distributors to provide professional services and support for ORing customers.

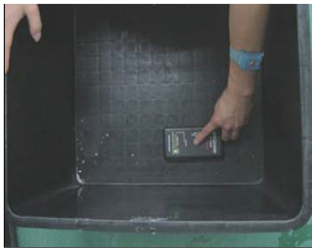
N2 Generator

SMT Line

Stencil Cleaner

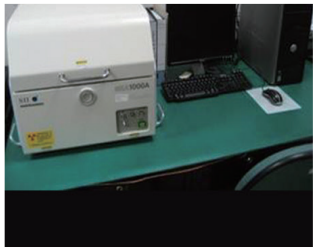
AOI Machine

Burning Room with temperature testing at 50 degrees Celsius



60 degrees Celsius Chamber

Micro Scope



RoHS X-ray Machine

Focused Vertical Markets with Industrial Grade Certifications

Over 100 models of ORing products have been deployed in a wide variety of applications and environments worldwide. Vertical markets have played a key role in ORing's business. As vertical markets adhere to standards and certification which can be complex, costly, and time-consuming, ORing has made sure all products are produced and tested in certificated labs and manufacturing stages. Also, ORing products are fully compliant with a variety of safety standards including EMC, IPv6, UL508, EN50155, and C1D2, indicating the ruggedness and durability of ORing products in harsh environments. To show our care for the environment, all of ORing's products are qualified with EU's WEEE and RoHS directives.

IRIS

IRIS (International Railway Industry Standard) is an extension of the internationally recognized ISO 9001 quality standard but is specific to the railway industry. The standard is developed by the UNIFE Group (the Association of the European Rail Industry) to attests to the quality and reliability of networks products and solutions for railway applications. ORing has been IRIS certified since 2015. ORing's partners and customers can rest assured that their ORing solutions meet the extremely rigorous requirements in the railway industry and that ORing will constantly improve its management, research, and development processes. The IRIS certification not only stands for topnotch quality, but also helps ORing partners save time and costs since they can directly use ORing's solutions to achieve higher safety, cost- effectiveness and quality of their railway appliances without undergoing additional qualifications. Optimal operational reliability and system availability can be guaranteed as comprehensive support ranging from development to production, servicing, and management will be provided.

EN50155

EN50155 is an international standard set for railway applications. EN50155 requires compliance with temperature, humidity, and electromagnetic interference. The standard guarantees the reliability of railway services by governing the operation, design, construction, and testing of electronic equipment.

EN50121-4

EN50121-4 is an European standard applies for emission and immunity of the signalling and telecommunications apparatus in railway applications. It specifies the limits of emission as well as immunity, and identifies products that can operate despite the extreme surge and emissions hazards of railway environments.

EN 45545

EN 45545 is a European standard that specifies the fire protection requirements for materials and products used on railway vehicles. EN 45545-1 includes regulations regarding the classification of rail vehicles in operational and design categories, as well as fire safety objectives. EN 45545-2, which will become mandatory in all European countries in 2016, defines the requirements for the fire behavior of materials and components.

EN 60945

EN60945 is a standard that specifies the use of maritime navigation and radio communication equipment on a ship. All such equipment must undergo various tests such as temperature, vibration, humidity, corrosion, water immersion, and electromagnetic emissions to prove their abilities to withstand severe conditions found across the world's oceans.

C1D2/ATEX/IECEx

C1D2, ATEX, and IECEx are three standards for equipment used in hazardous areas such as oil & gas, mining, energy detection systems. C1D2 is a US standard referring to situations in which ignitable concentrations of gases, vapors or liquids are present, but are contained. ATEX is a European standard that consists of two EU directives describing what equipment and working environment is allowed in a space with an explosive atmosphere. IECEx is an international standard regulating the use of electrical equipment and components in potentially explosive areas.

IEC/UL/EN 60950-1/UL 508

IEC/UL/EN 60950-1 are standards for the safety of mains-powered or battery-powered information technology equipment, including electrical business equipment and associated equipment, with a RATED VOLTAGE not exceeding 600 V and designed to be installed in accordance with the National Electrical Code, NFPA 70. UL 508 is the Underwriters laboratories (UL) safety standard for industrial control panels and internal components. Requirements of this standard cover devices rated 1500 volts.

IEEE 1613

IEEE-1613 is the IEEE standard specifying ratings, environmental performance, and testing requirements for communications networking devices installed in electric power substations. Within the standard, two classes (Class 1; Class2) of devices are defined, based on the outcome of a specific set of potentially destructive EMI type tests (EMI stress) designed to stimulate EMI phenomena in the substation.

IEC 61850-3

IEC 61850 is a standard for the design of electrical substation automation while "-3" signifies general requirements. Abstract data models defined in IEC 61850 can be mapped to a number of protocols that run over TCP/IP networks or substation LANs using high speed switched Ethernet to obtain the necessary response times below four milliseconds for protective relaying.

E-mark

E-mark is a European standard specifying the safety requirements of vehicles and their components. To obtain an e-mark, the products must be tested by a Technical Service appointed by the VCA (Vehicle Certification Agency), which will issue the certificate and approval number to be marked on the product. E-mark is a mandatory requirement and all products installed on a vehicle must have an e-mark to be sold legally in Europe.

PTCRB

PTCRB is a US standard that ensures mobile devices are compliant with cellular network standards within the operators' networks so that operators can be sure the mobile devices will not harm their networks. Cellular devices to be sold in North America are required to have a PTCRB certificate because it is a requirement for launching cellular devices on the US operators such as AT&T, Verizon, etc.

RCM

Regulatory Compliance Mark is used to indicate the compliance of radio-communication, electrical and electronic equipment that are subject to the EMC arrangement, and equipment required to meet EME standards. Earlier this year (March 1st, 2013), RCM has been confirmed as the single compliance mark for all arrangements, including previous labels such as A-Tick and C-Tick.

ANATEL

ANATEL, created by the General Telecommunication Law in 1997, is the telecommunications sector regulator in Brazil. Anatel is responsible for implementing the national telecommunication policy; regulating, authorizing and enforcing operators on the provision of telecommunication services; Defining standards to be accomplished by operators on the provision of telecom services.

TELEC

TELEC is a series of technical standards regulated by the Ministry of Internal Affairs and Communications of Japan. TELEC engages in the technical regulations conformity certification service for all kinds of specified radio equipment. It provides polished and professional services in a neutral and fair manner for the customers..

CE

The CE marking is a mandatory European conformity marking for certain products sold within, manufactured in, or targeted at the European Economic Area (EEA) since 1993. It is consists of the CE-Logo and, if applicable, the four digit identification number of the notified body involved in the conformity assessment procedure. The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives.

RoHS

The RoHS directive aims to restrict certain dangerous substances commonly used in electronic and electronic equipment. Any RoHS compliant component follows EU Directive 2011/65/EC and 2015/863/EU, with respect to the following six substances: Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBB), Polybrominaed Diphenyl Ethers (PBDE).

FCC

The FCC Declaration of Conformity or the FCC label or the FCC mark is a certification mark employed on electronic products manufactured or sold in the United States which certifies that the electromagnetic interference from the device is under limits approved by the Federal Communications Commission

Compliant Standards and Regulations

・IPv6

・IPv6

・ISO 9001:2015

・IRIS

Global Sales Offices and Services

ORing-USA

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Headquartered in Taiwan, ORing has established branches across the world, including the US, China, Europe, and India to address worldwide customers' needs more efficiently. ORing has also built long-term partnerships with regional distributors to provide products, customer services, and technical support in real time. Besides a solid understanding of our offerings and applications, ORing's well-trained sales representatives and channel partners have constantly stayed on top of the latest market industry trends. Therefore, we can help users make the most out of ORing's products and solutions to address their current and future needs. With the support of the internal R&D team, our sales team can help customers with technical problems related to a product or service immediately.

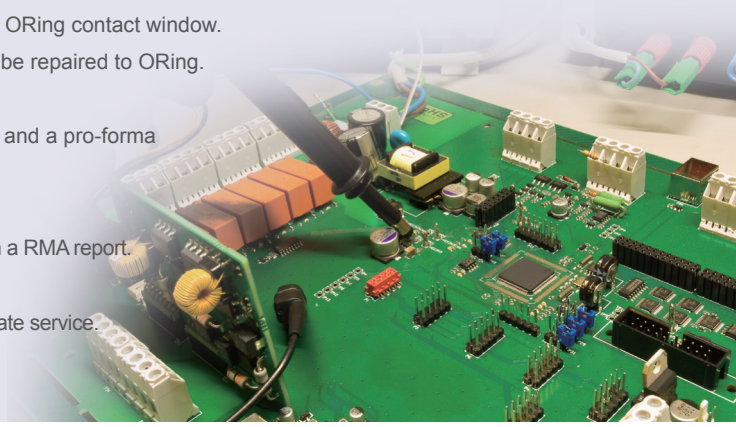
For more information, please contact ORing directly by email at sales@oring-networking.com or through our worldwide distributors. You can also visit ORing's website at www.oringnet.com

RMA Service

ORing provides maintenance and repair services for both warranty and out-of-warranty products. RMA items to be repaired or replaced will be defined in the following procedures:

1) The customer completes the RMA request form and submits to an ORing contact window.
2) Upon receiving a RMA number, the customer ships the product to be repaired to ORing.
3) ORing checks the product and identify the problem.
4) A service charge will be requested if the product is out of warranty and a pro-forma invoice will be issued to the customer.
5) ORing repairs or replaces the product.
6) The repaired or replaced product is shipped back to the customer with a RMA report.
7) ORing marks the RMA request as closed.

We are available at any time to provide you the most friendly and immediate service.



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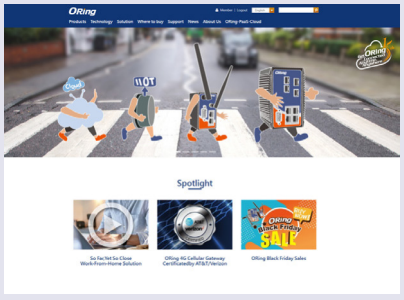
Product Warranty

ORing products are provided with a warranty for up to five years.

Get Connected Anytime, Anywhere



ORing members are able to access the monthly forum to learn about the latest product information, application solutions, and events. Please visit ORing website and register now!

Product Overview

• ndustrial Ethernet Switch

- Rack-Mount (Non-PoE)
- DIN-Rail Gigabit (DIN-Rail / Wall-Mount, Non-PoE)
- DIN-Rail Fast (DIN-Rail / Wall-Mount, Non-PoE)
- PoE (Rack-Mount / DIN-Rail / Wall-Mount)
- IP-67
- PCI/PCIe-Card
- EN50155
- C1D2
- Optical & PoE Network Accessories

• Industrial Media Converter

- Rack-Mount Ethernet-To-Fiber
- DIN-Rail Ethernet-To-Fiber (DIN-Rail / Wall-Mount)
- PoE Ethernet-To-Fiber (DIN-Rail / Wall-Mount)
- USB-To-Serial
- Serial-To-Serial

• Industrial Device Server

- Industrial Device Server
- Industrial Slim Type Device Server
- Industrial EN50155 Device Server
- Industrial Rack-Mount Device Server

• Industrial Wireless Access Point

- WLAN Access Point (DIN-Rail)
- WLANIP-67 Access Point
- EN50155 WLAN Access Point

• Industrial Cellular VPN Router

- Industrial DIN-Rail VPN Router
- Industrial DIN-Rail 4G LTE WLAN Cellular VPN Router
- Industrial EN50155 4G WLAN Cellular VPN Router

• Industrial M2M Gateway

- Industrial DIN-Rail M2M Gateway
- Industrial Dual 4G LTE M2M IoT Gateway

• Network Management Software & Device

- Open-Vision v4.0
- Device Configuration Backup Unit

• Accessories

- RF Antenna, RF/ Optical Fiber Patch Cord/ M-Series Cables, Power Supplies
- Gigabit / Fast Ethernet SFP/ BIDI-SFP modules

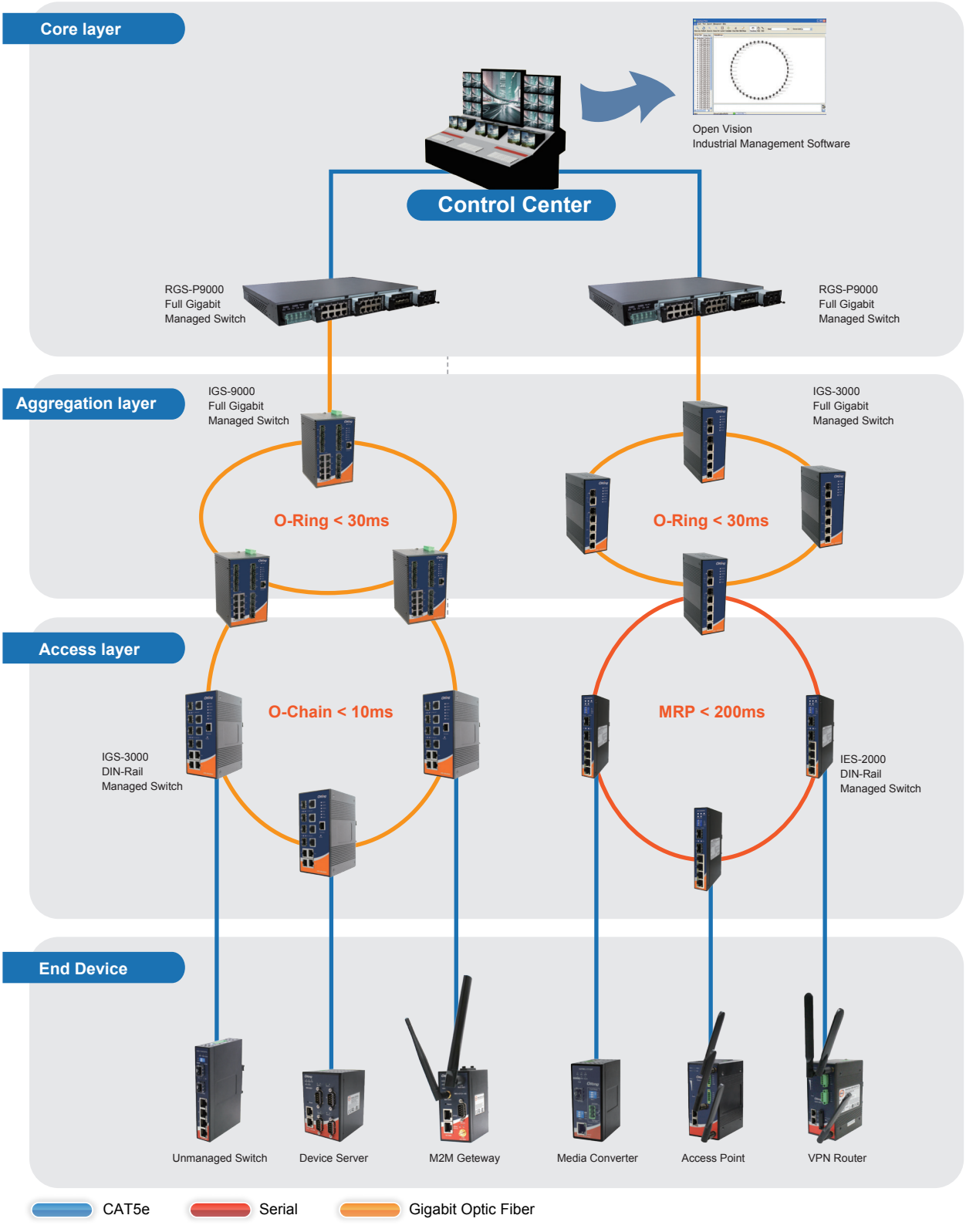
• Industrial IOT Product

- Wireless Remote I/O (ORIO)
- Smart Meter (ORGate)
- Street Light Controller (Zigbee/LoRa/NB-IoT/CMS 1.0)

• ORing Cloud

- ORing PaaS Products
- ORing SaaS Product

ORing Product Topology



Vertical Market Applications

Intelligent Transportation System

Building Secure Surveillance Systems with Gigabit backbone Network

Intelligent transportation systems must handle massive real-time transportation video and statistics data to ensure effective management of public transportation, traffic signals, freeways, tunnels, and parking lots. Therefore, the backbone network must be reliable In order to be dependable long distance high-bandwidth data transmission under tough outdoor conditions would be industrial-grade Gigabit Ethernet backbone network infrastructure along with fiber-optics, wired, and/or wireless networks. With such networks, traffic control centers can benefit from vastly improved timeliness and accuracy of real-time traffic information. ORing, with many years of experience of industrial Ethernet networking know-how and innovative network management technologies, provides rugged and durable industrial Gigabit networking products ,the most suitable for intelligent transportation systems.

Key Products

IGPS-1080-24V

Industrial 8-port Unmanaged Gigabit PoE Ethernet Switch

- Supports 8x10/100/1000Base-T(X) PoE (P.S.E.) ports; up to 30 watts per port
- Rigid IP-30 housing design
- -40° to 70°C operating temperature range

IGPS-9084GP

Industrial 12-port Managed Gigabit PoE Ethernet Switch

- 8 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports IEEE 1588v2 clock synchronization
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function

IGPS-9084GP-LA-24V

Industrial Slim 12-port managed Gigabit PoE Ethernet switch

- 8 port P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 Watts per port
- Support PoE on/off scheduled configuration
- Support PoE alive check and auto reboot fuction

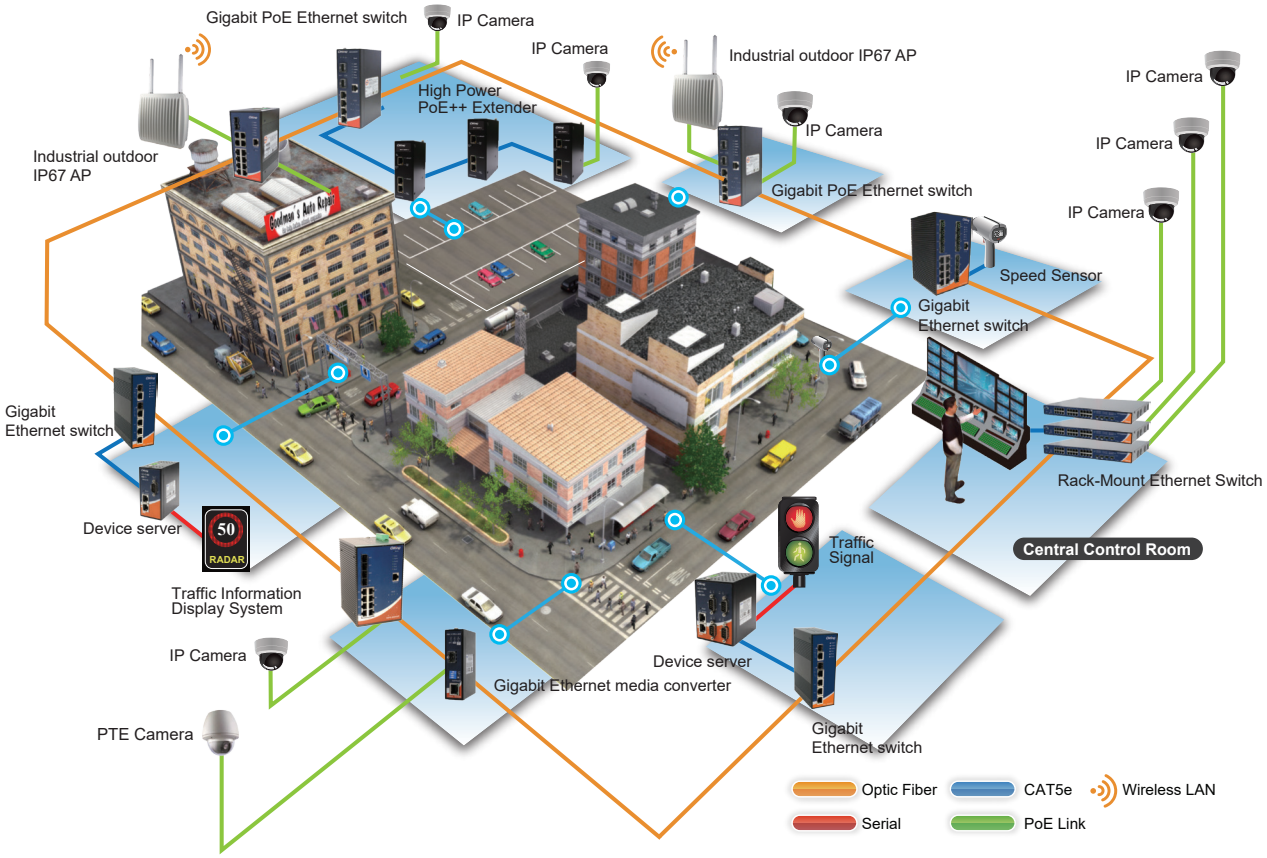
IGAP-W99110GP+

Industrial Dual Wi-Fi 6 wireless access point

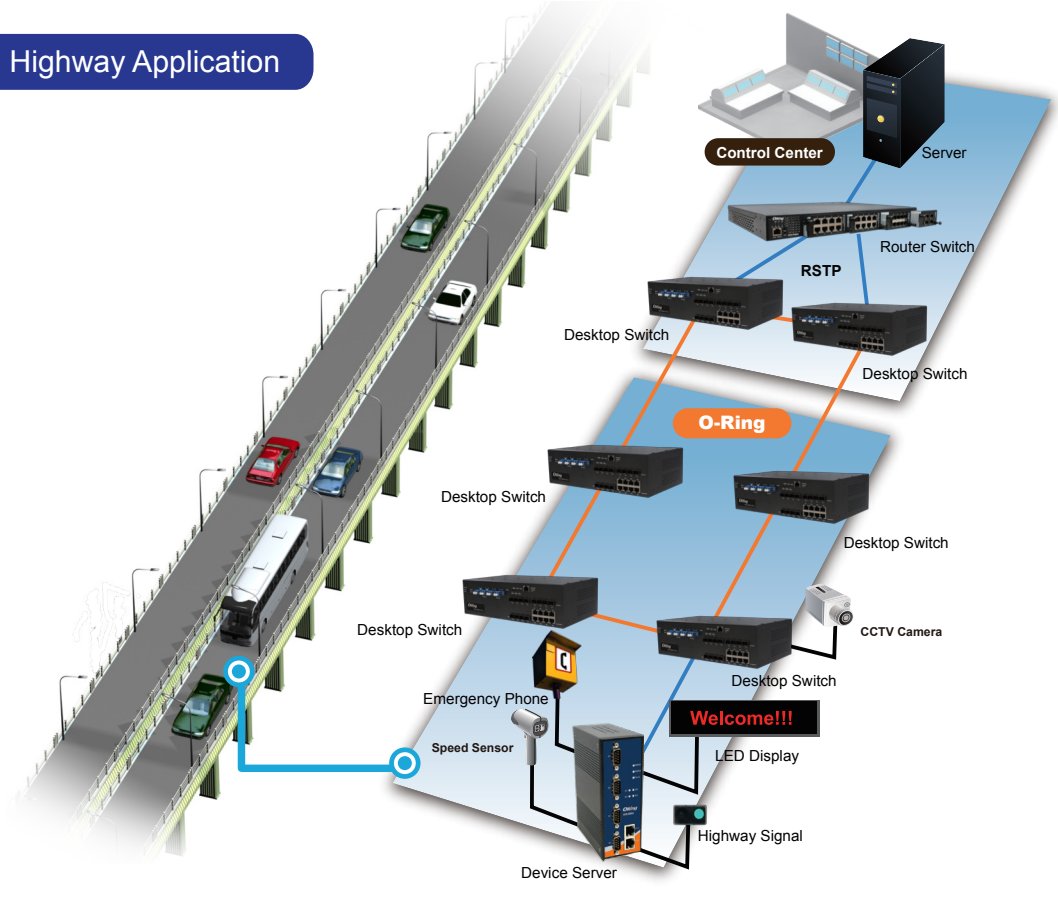
- High Speed Air Connectivity:WLAN interface support up to 2400Mbps link speed
- Dual-Band Dual-Radio IEEE802.11ax with 4 spatial streams
- Support wireless load balance

***NOTE: This function is available by request only**

Intelligent Transportation System



Highway Application



City Surveillance

Improve City Safety with ORing's Advanced Network Technologies

To help the law enforcement to fight against criminal activities and to help the emergency personnel to respond swiftly to emergency situations, city surveillance is an indispensible aid of modern city. With the rapid digitization of video surveillance systems, video quality has vastly improved with capability of long distance transmission without quality degradation. However, in relaying such critical video information, the network connections involved need to stay uninterrupted in critical situations and to have the toughest security features to guard against hacker attacking. For these purposes, ORing's PoE+, Gigabit and Optical Ethernet switches would ensure continuous and well-protected surveillance video network traffic at all times. Additionally, secure industrial-grade ORing wireless APs can be used for venues where implementation of network cables would be difficult and/or costly.

Key Products

RGS-PR9000

Industrial Layer-3 IEC 61850-3 Modular Rack Mount Managed Gigabit Ethernet Switch with 4 Slots

- Design for power substation and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- Modular design makes network planning easy
- Supports Layer 3 static routing, RIP and VRRP function
- Supports GRE (Generic Routing Encapsulation) tunneling protocol

IGPS-9084GP-LA-24V

Industrial Slim 12-port managed Gigabit PoE Ethernet switch

- 8 port P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 Watts per port
- Support PoE on/off scheduled configuration
- Support PoE alive check and auto reboot fuction

RGPS-92222GCP-NP-P

Industrial 26-port Rack-Mount Managed Gigabit PoE Ethernet Switch

- Supports P.S.E. based on IEEE 802.3at standard
- Supports IPv6 new Internet protocol version
- Supports Modbus TCP protocol
- Supports IEEE 802.3az energy-efficient Ethernet technology

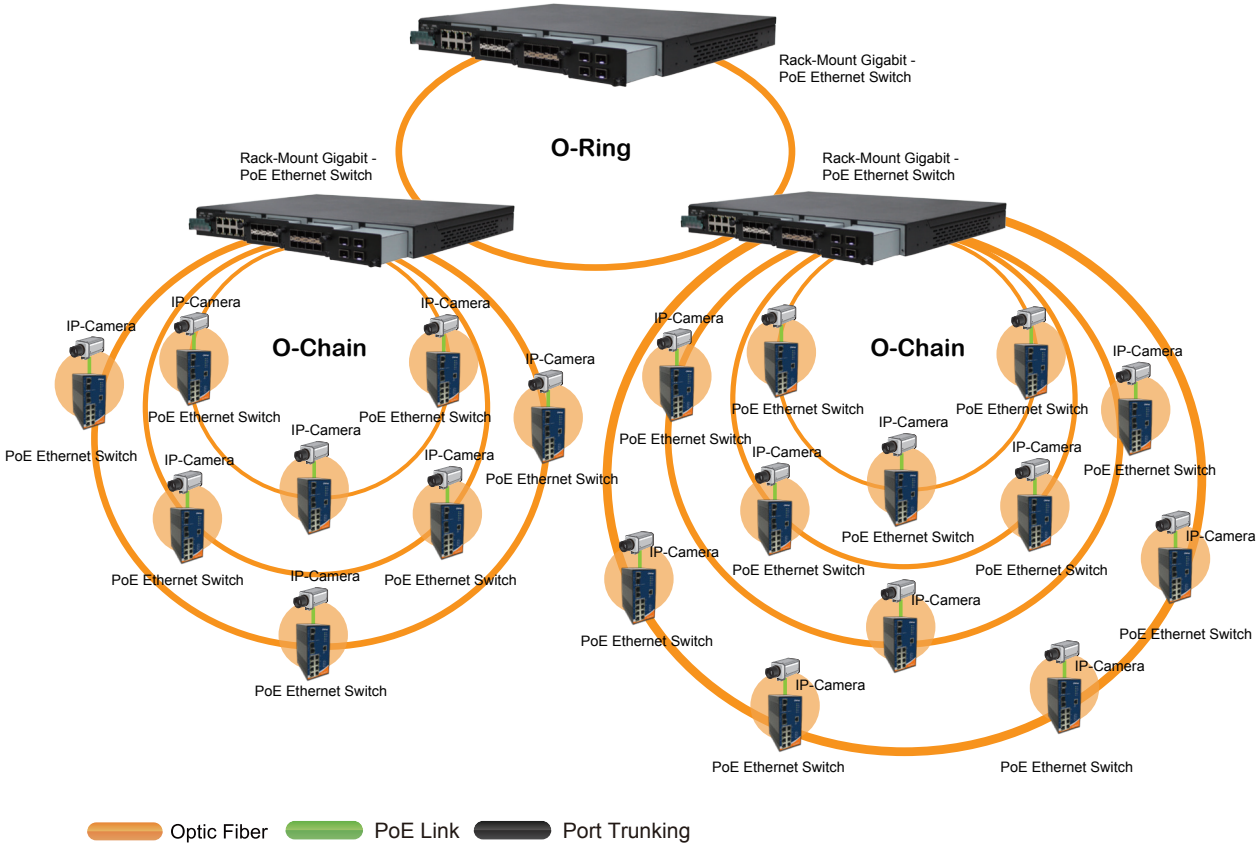
IGPS-9842GTP-24V

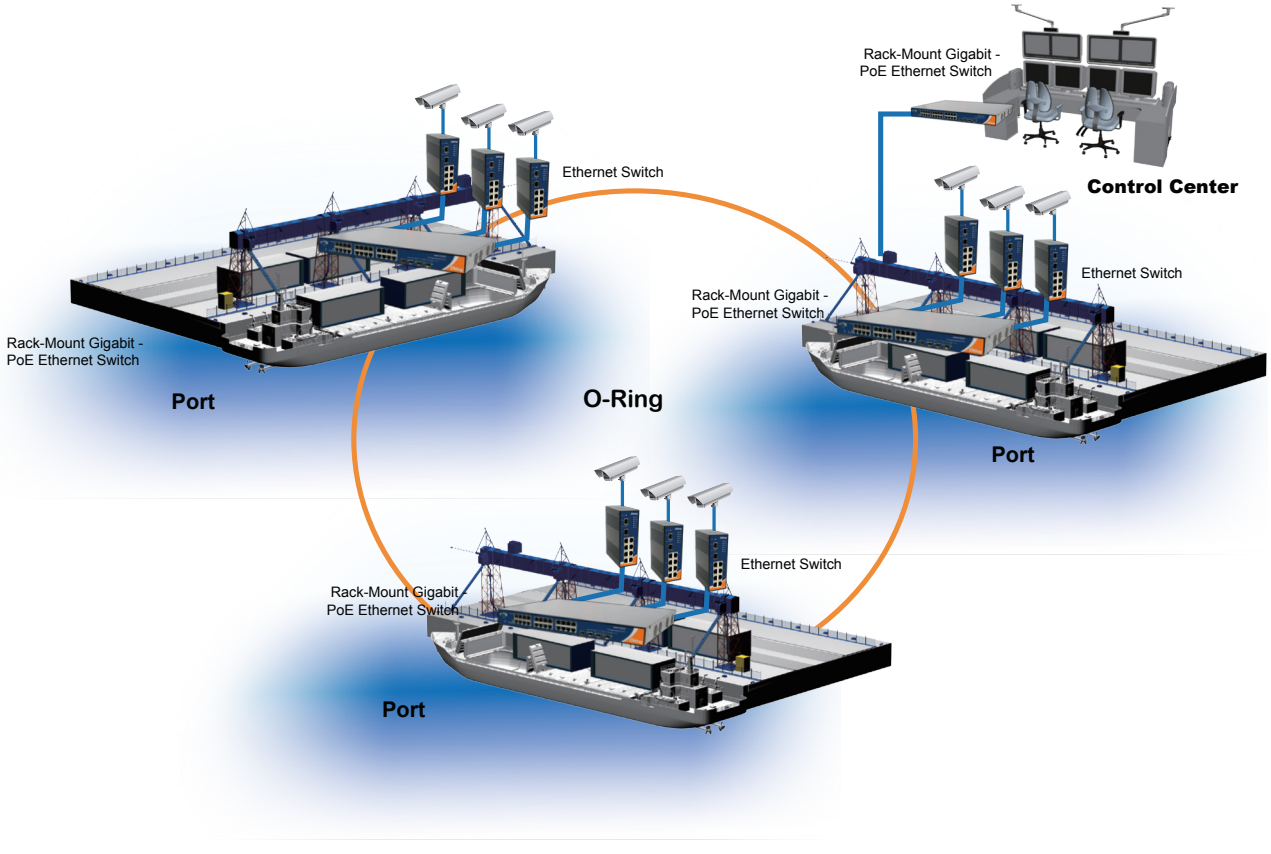
Industrial 14-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- Supports IEEE 802.3at compliant PoE with maximum 30 watts per port
- Supports PoE schedule configuration and PoE alive check function

***NOTE: This function is available by request only**

City Surveillance





Railway

Establish Robust and Secure Railway Networking Solutions

Rolling stock, including trains, high-speed rail, and community trains, is the most important transport between cities and towns. These vehicles not only connect people in different places, but also bring convenience and efficiency to our life. With such important rolling stock industry, dependable safety management of railway traffic is absolutely necessary, calling for the need of rugged networking capable of handling massive real-time traffic information accurately without interruptions. As a leading network solution provider for rolling stock, ORing has developed the complete railway network solutions featuring PoE, outdoors and bypass function with EN50155/50121-4/IRIS compliance. The devices are perfect for complex and distributed railway applications.

Key Products

IGPS-9084GP

Industrial 12-port Managed Gigabit PoE Ethernet Switch

- 8 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports IEEE 1588v2 clock synchronization
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function

RGPS-R9244GP+-P

Industrial Layer-3 28-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- 24 port P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports PoE scheduled configuration and PoE auto-ping check function

TPS-3162GT-M12X-BP1-MV

Industrial EN50155 18-port Managed PoE Ethernet Switch

- Leading EN50155-compliant Ethernet switch for rolling stock application
- 16 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 Watts per port
- World's fastest Redundant Ethernet Ring: O-Ring (recovery time < 10ms over 250 units of connection)
- HW Bypass with two Gigabit ports

TGAR-2062+-4GS-M12

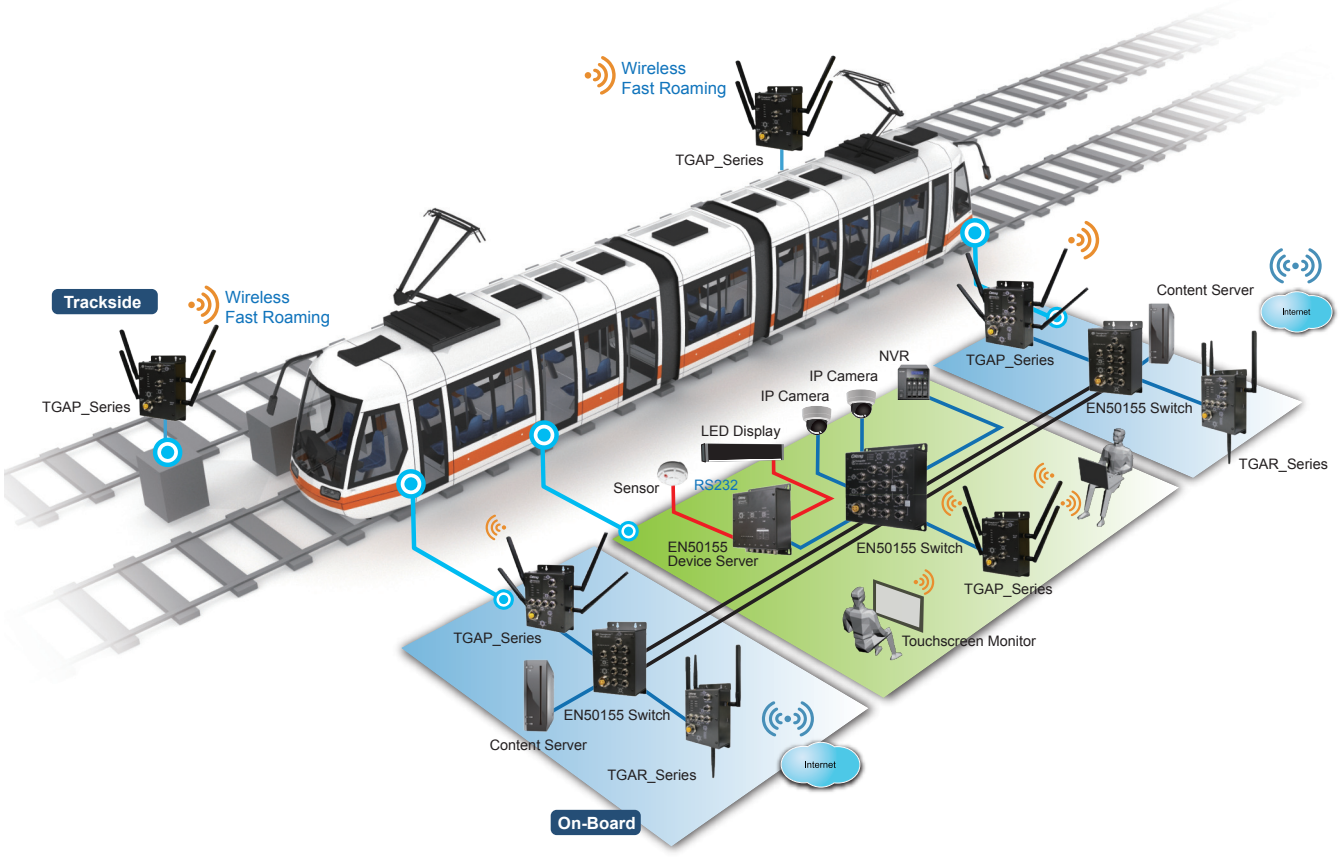
Industrial EN50155 IEEE 802.11 a/b/g/n 4G LTE Cellular GPS Router

- EN50155-compliant wireless access point for rolling stock application
- High Speed Air Connectivity: WLAN interface support up to 300Mbps link speed
- GPS model supports GPS function
- Secured Management by HTTPs

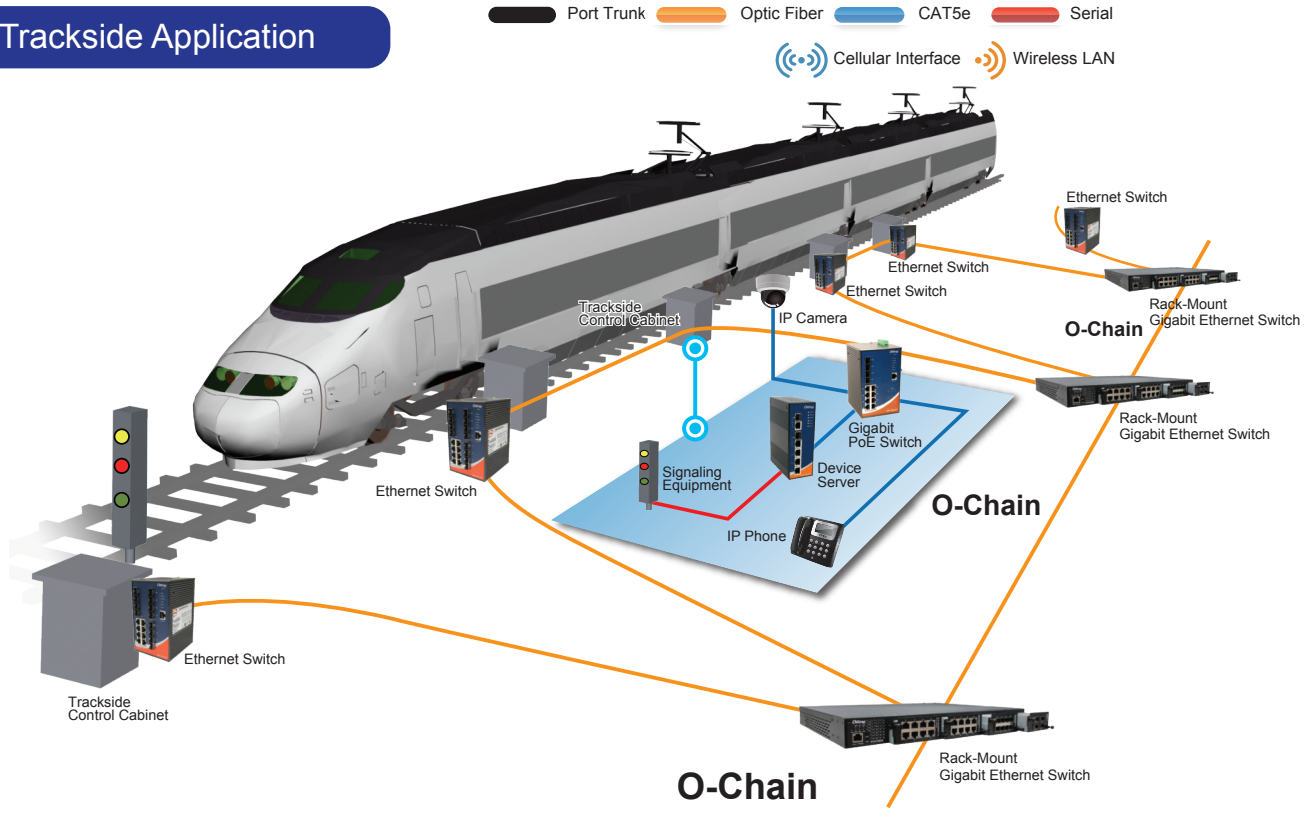
***NOTE: This function is available by request only**

Railway Application

IRIS Certification EN50121 EN50155 Transporter Series



Trackside Application



In-Vehicle Surveillance

Construct Reliable & Efficient Network Monitoring Systems

IP surveillance technologies are on the rise in the video surveillance industry, thanks to convenience and cost-effectiveness of Ethernet networks. Hence IP surveillance systems can be implemented on buses for passenger safety, bus fleet management, or traffic monitoring, allowing the driver and the transportation control center to get real-time driving status at any time. Additionally, wireless AP can be implemented on buses to provide passengers with wireless internet service. For use on moving vehicles, networking equipment must adapt to tough conditions on moving vehicles. ORing products, with ruggedized design and industrial-grade wide temperature tolerance, ensure vehicle network reliability and thus are the best choice for vehicle surveillance and network systems.

Key Products

IGPS-1080-24V

Industrial 8-port Unmanaged Gigabit PoE Ethernet Switch

- 8x10/100/1000Base-T(X) PoE (P.S.E.) ports; up to 30 watts per port and totally 120 watts; dual 24~36 VDC power inputs
- Rigid IP-30 housing design
- -40~70°C operating temperature range

IAR-142+-4G

IEEE 802.11 b/g/n 4G LTE Cellular Router

- High Speed Air Connectivity: WLAN interface support up to 150Mbps link speed
- Provide 2 port 10/100Base-T(X) port and 1 sim card slot
- 4G LTE Modem dial up included
- Provide HNAT enhance LAN to WAN routing performance

IGAP-W612H+

Industrial outdoor IEEE 802.11 a/b/g/n wireless access point with 10/100/1000Base-T(X) PoE P.D., IP-67 grade

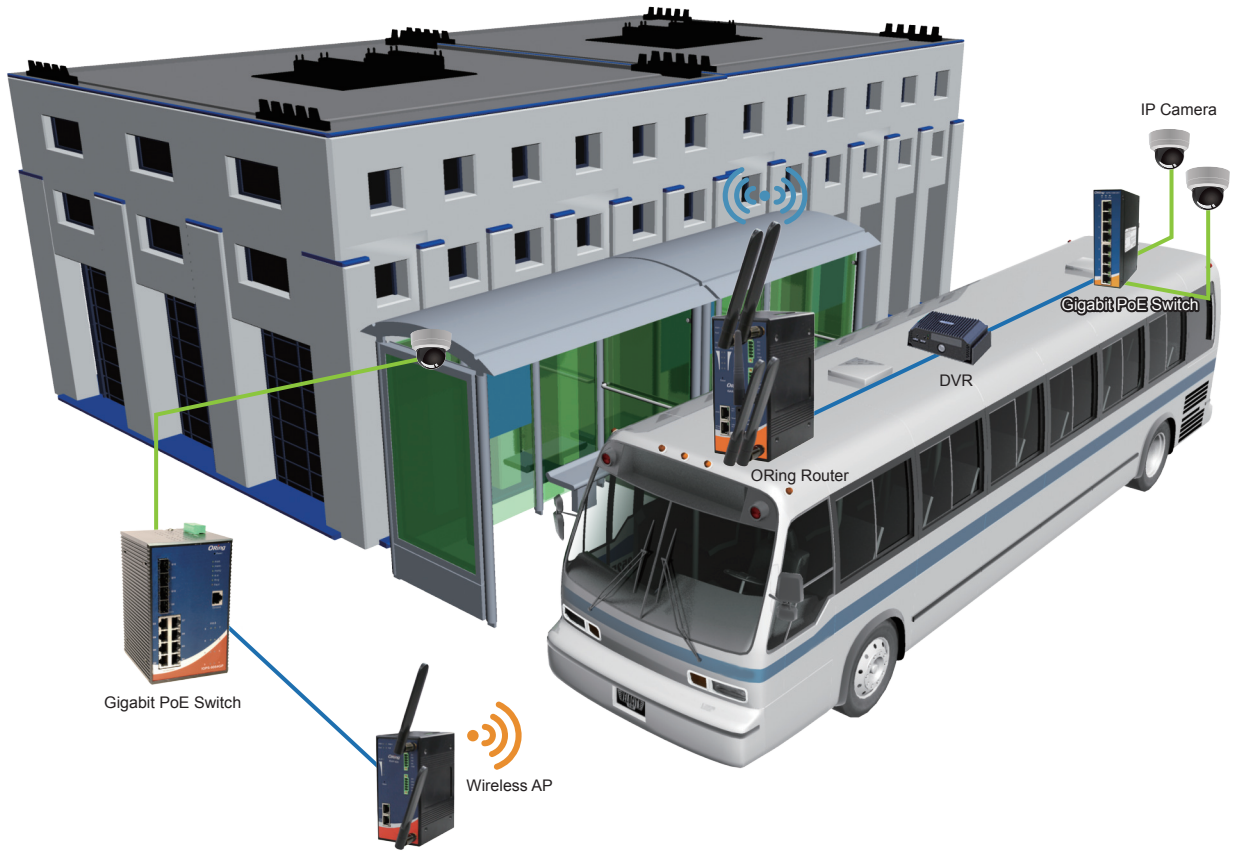
- High data throughput with HT40 2x2 MIMO
- High transmission power(27 dBm Max.)
- Support X-Roaming < 100 ms

IGPS-9084GP-LA-24V

Industrial Slim 12-port managed Gigabit PoE Ethernet switch

- 8 port P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 Watts per port
- Support PoE on/off scheduled configuration
- Support PoE alive check and auto reboot fuction

In-Vehicle Surveillance



CAT5e PoE Link Cellular Interface Wireless LAN

Building Automation

Strengthen BA Systems with ORing Advanced Network Technologies

Rapid development of digital contents and networks, building surveillance systems also have evolved as intelligent digital active surveillance systems. As a result, overall video surveillance quality has vastly improved while labor and security costs are minimized. Therefore digital networks are used in important public buildings – airports, train stations, office buildings, banks, etc. – to provide connections for door access control, temperature control, lighting monitoring, security system, etc. With ORing Gigabit Ethernet switches and ORing optical Fiber Switches, high quality surveillance video can be transmitted from high-resolution IP surveillance cameras to applicable surveillance systems reliably and securely without interruptions. Additionally, secure industrial-grade ORing wireless APs can be used for building locations where implementation of network cables would be difficult and/or costly.

Key Products

IGS-150B

Industrial 5-port Mini Type Unmanaged Gigabit Ethernet Switch

- Supports auto-negotiation and auto-MDI/MDI-X
- Supports Jumbo frame up to 9.6 K bytes
- Supports store-and-forward transmission
- Supports flow control

IGAP-610H+

IIndustrial IEEE 802.11 a/b/g/n high power wireless AP

- High Speed Air Connectivity: Dual Band in IEEE 802.11 a/b/g/n and b/g/n WLAN interface selectable and support up to 300Mbps link speed
- 12~48VDC power input on terminal block
- 1 Gigabit Ethernet ports with 2KV isolation for PoE P.D.

RGPS-92222GCP-NP-P

Industrial 26-port Rack-Mount Managed Gigabit PoE Ethernet Switch

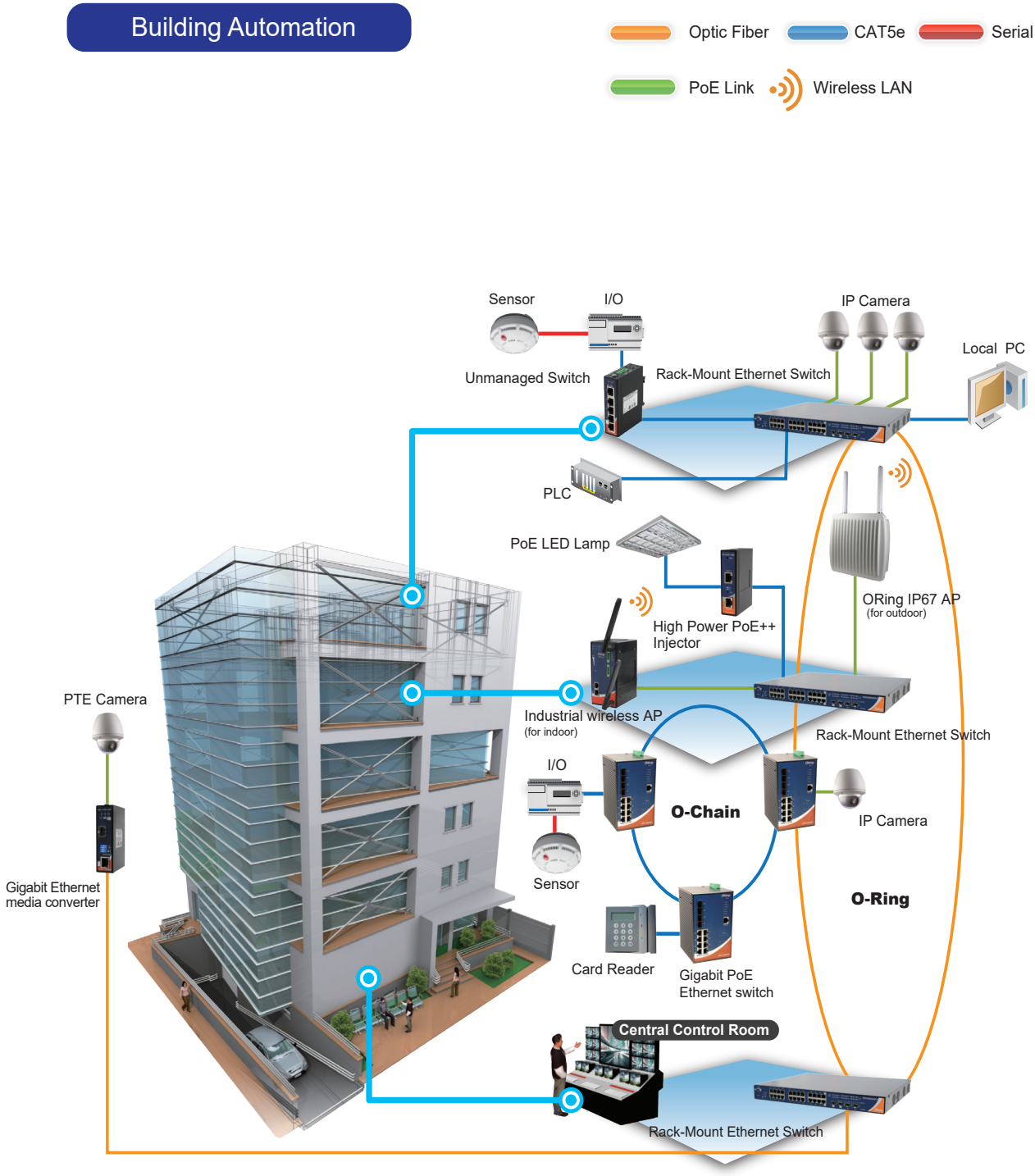
- Supports P.S.E. based on IEEE 802.3at standard
- Supports IPv6 new Internet protocol version
- Supports Modbus TCP protocol
- Supports IEEE 802.3az energy-efficient Ethernet technology

IGAP-W612H+

Industrial outdoor IEEE 802.11 a/b/g/n wireless access point with 10/100/1000Base-T(X) PoE P.D., IP-67 grade

- High data throughput with HT40 2x2 MIMO
- High transmission power(27 dBm Max.)
- Support X-Roaming < 100 ms

Building Automation



Power Substation Solution

Fully compliant with IEC 61850-3

ORing's industrial Ethernet managed switches offer users possibility to draw maximum benefits from IEC 61850-3. Our products both meet IEC 61850-3 and IEEE 1613. Many of ORing products are tailor-made for applying in substation automation system and also support the IEEE 1588v2 standard (PTPv2). The IEC 61850-3 standard is not just the Ethernet-based substation automation protocol but serving the whole solution of power networks. ORing's commitment from developing the standard and implementing the products into solutions are the key reasons why brings users to next stage of reliability and efficiency.

Key Products

RGS-PR9000 Series

Industrial Layer-3 IEC 61850-3 Modular Rack Mount Managed Gigabit Ethernet Switch with 4 slots

- Design for power substation and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- Modular design makes network planning easy
- Supports Layer 3 static routing, RIP and VRRP function

IGS-P9164GF Series

Industrial IEC 61850-3 20-port Managed Gigabit Ethernet Switch

- Supports O-Ring (recovery time < 30ms over 250 units of connection) and MSTP(RSTP/STP compatible) for Ethernet Redundancy
- Design for power substation / railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- Supports Device Binding security function

IGS-P9812GP Series

Industrial IEC 61850-3 20-port Managed Gigabit Ethernet Switch

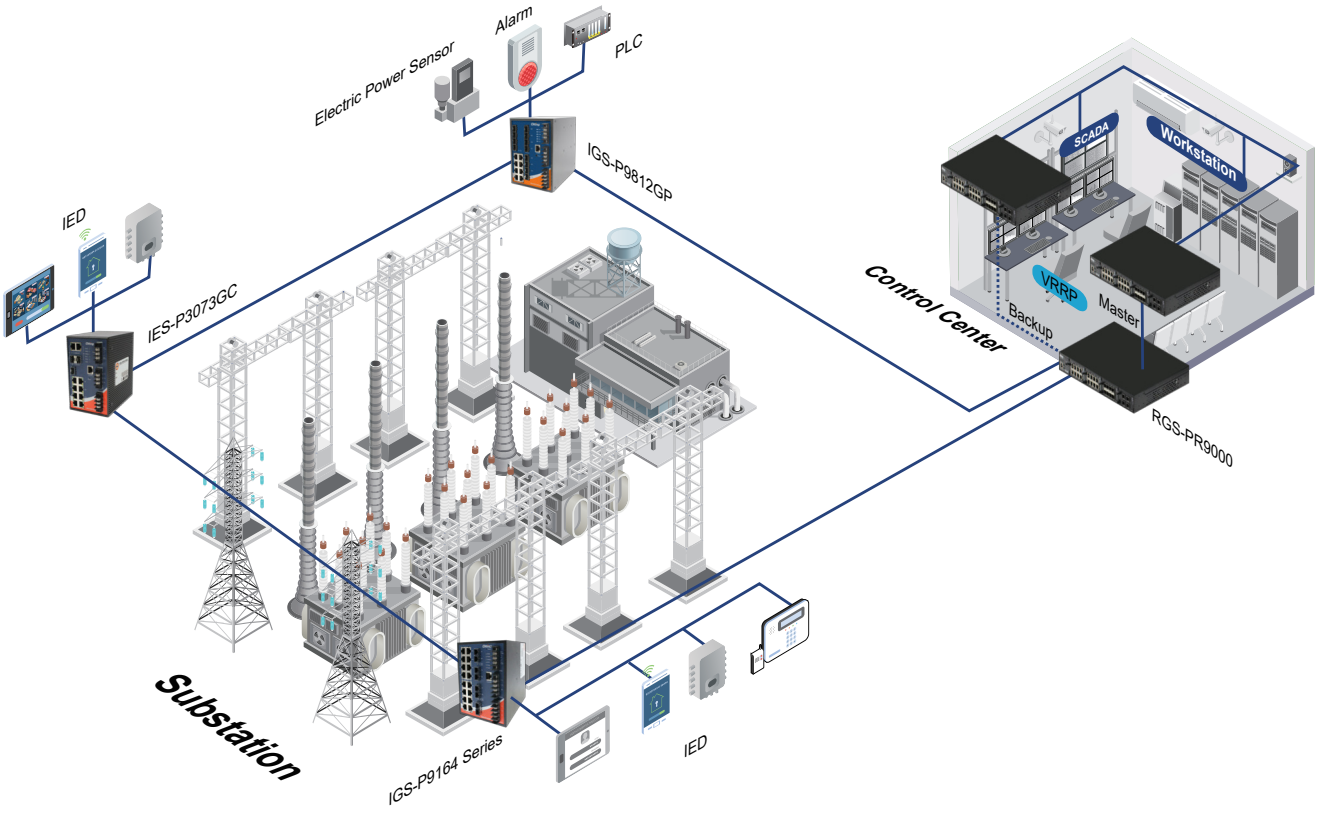
- Design for power substation / railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- EN50155-compliant Ethernet switch for rolling stock application
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function

IES-P3073GC Series

Industrial IEC 61850-3 10-port managed Ethernet switch

- Designed for power substation / Railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- World's fastest Redundant Ethernet Ring: O-Ring (recovery time < 10ms over 250 units of connection)
- Open-Ring support the other vendor's ring technology in open architecture

Power Substation



Natural Resources & Energy

ORing Empowers You with Rugged Excellence

If we ever pay attention to natural energy cultivation,we may notice that they are often exposed in tough environments of great dangers. To ensure industrial safety, ORing Corp. has come up with series of industrial-grade networking products that operate flexibly in wide temperatures and harsh environments. With ruggedized designs and reliable certifications, ORing's surveillance systems and information network are presented as dustproof, waterproof, and shockproof. Benefit from such high-end products, supervisors or control centers can get timely work data and communicate effectively on high-bandwidth and reliable industrial networks through the process of energy acquisition and production. ORing's products are the best choice that proves to be beneficial for energy production and large-scale network applications: mining, oil & gas, power plants, steel factory, power management system, etc.

Key Products

IGPS-R9084GP

Industrial Layer-3 12-port Managed Gigabit PoE Ethernet Switch

- Supports Layer 3 static routing, RIP and VRRP function
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- 8 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port

RGPS-R9244GP+-P

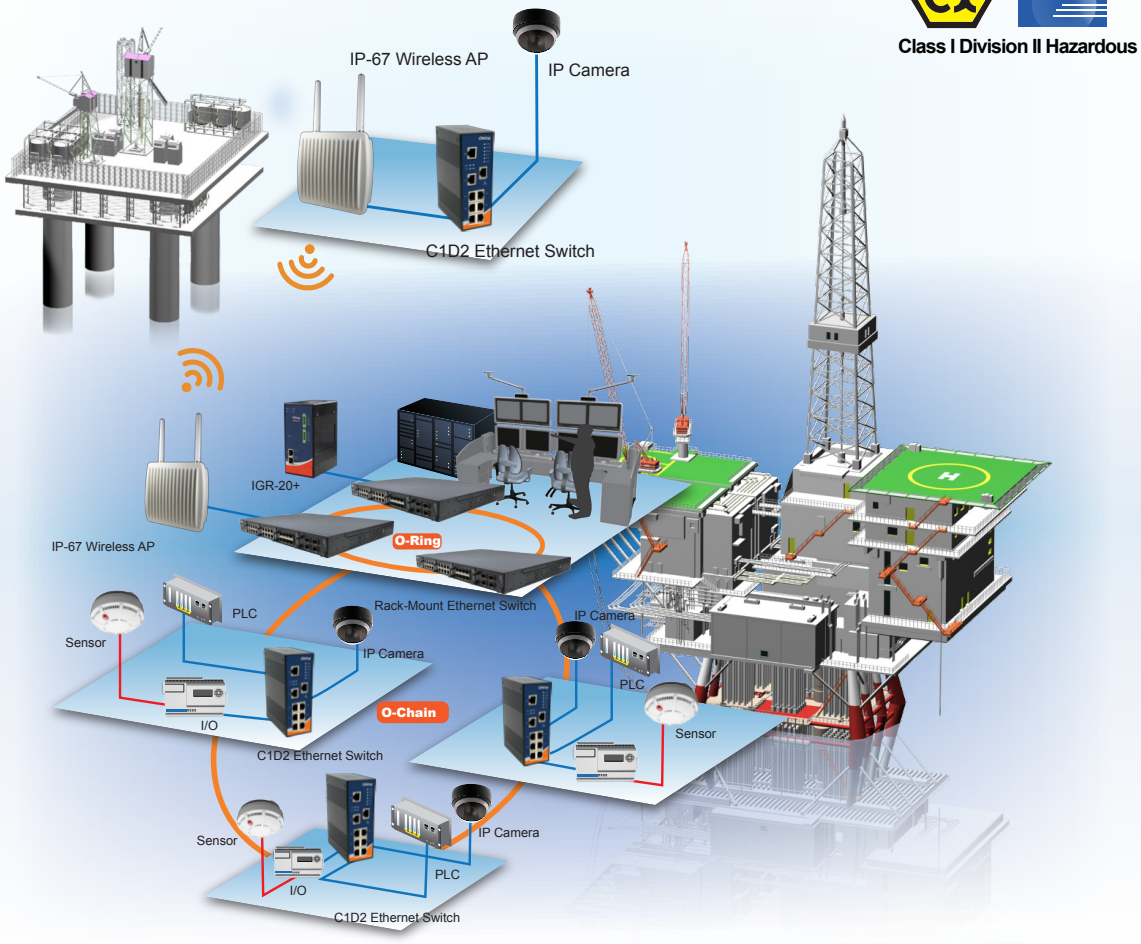
Industrial Layer-3 28-port Managed Gigabit PoE Ethernet Switch

- Supports Layer 3 static routing, RIP and VRRP function
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- 24 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports PoE schedule configuration and PoE auto-ping check function

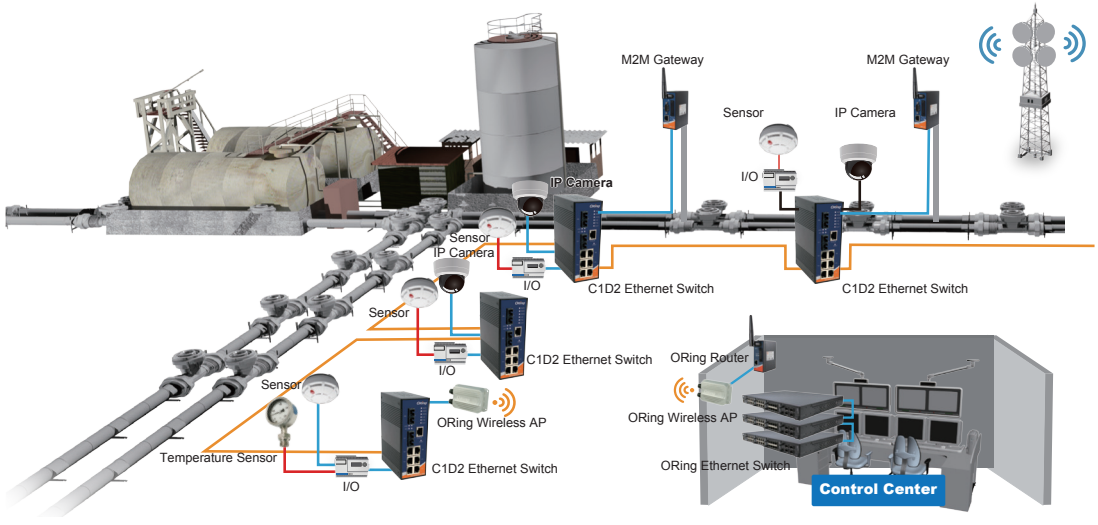
*NOTE: This function is available by request only

Oil Field Application

Class I Division II Hazardous



Oil Pipe Application



Renewable Energy

Featuring Reliable Performance with Non-Stop Connectivity

With global warming, green energy development and energy conservation have become the global trend. ORing, with industry-leading expertise of industrial networking, has significantly contributed to this green movement by helping PV solar electricity and wind electricity power plants to set up complete industrial-grade long-range Ethernet communication systems for green power production surveillance. Certified by rigorous industrial-grade tests, ORing products can withstand tough outdoor conditions while providing outstanding network performance reliably at all times, ensuring stable and uninterrupted data transmission of real-time information to and from the control center. Also, industrial Ethernet networks are easily expandable without sacrificing ruggedness, saving time and cost in the long run. Together with many governments and corporations, ORing is helping the world in the fight against global warming.

Key Products

IDS-322

Industrial 2 Secure Serial Ports to Ethernet Device Server

- Operating Modes: Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
- NAT-pass through: user can manage IDS-322 through NAT router
- Event Warning by Syslog, Email, SNMP trap, Relay

IMC-121FB

Industrial mini type Ethernet to fiber media converter

- Support 2 ports 10/100Base-T(X) auto-negotiation and auto-MDI/MDI-X
- 2x10/100 Base-T(X) ports to save the usage of copper ports
- High reliability and rigid IP-30 metal housing

IGPS-9842GTP

Industrial 14-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- Supports IEEE 802.3at compliant PoE with maximum 30 watts per port
- Supports PoE schedule configuration and PoE auto-ping check function

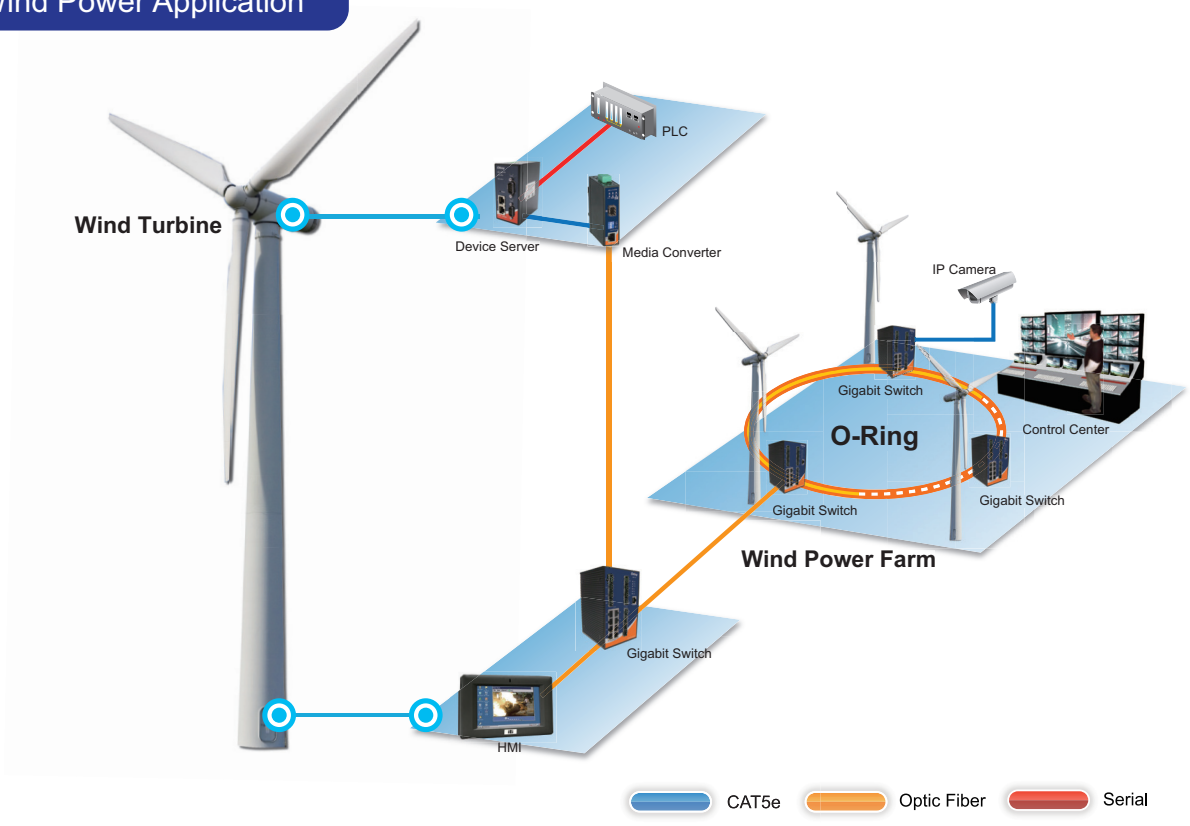
RGS-P9000

Industrial IEC 61850-3 Modular Rack Mount Managed Gigabit Ethernet Switch

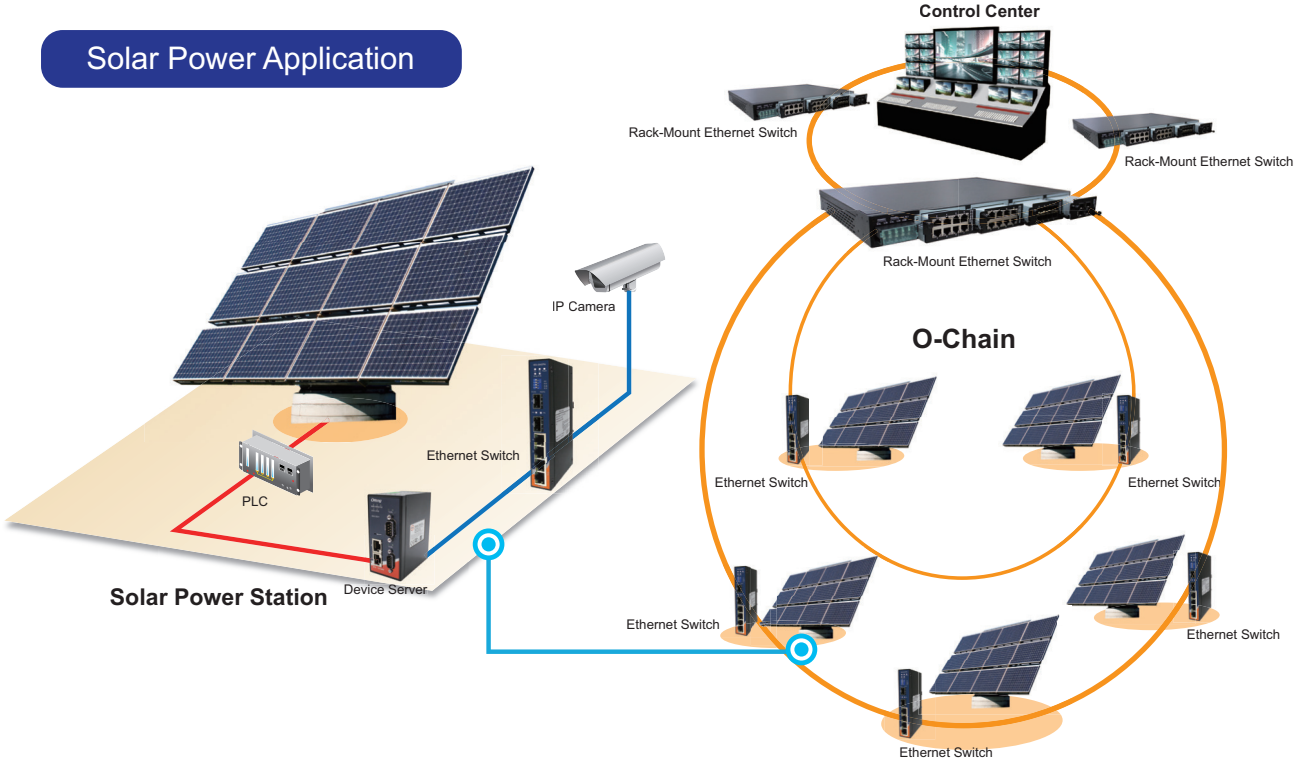
- Design for power substation / railway applications and fully compliant with the requirements of IEC 61850-3 and IEEE 1613
- Modular design makes network planning easy
- Supports IEEE 1588v2 clock synchronization

***NOTE: This function is available by request only**

Wind Power Application



Solar Power Application



Mountain Surveillance

Ensure Reliable Data Transmission of IP Surveillance Systems for Mountainous Areas

Mountainous areas are prone to landslides, usually caused by torrential rain or earthquakes, posing serious threats to people's life. Although natural disasters are unavoidable, the consequences can be significantly reduced through preventive measures such as rainfall monitoring and alert systems. Furthermore, tunnels built in the mountains must be monitored at all times for rescue operations to be carried out efficiently when accidents occur. For this reason, mountainous areas must be furnished with a video surveillance system to help the remote control room keep an eye on these places and take action immediately whenever needed. Due to the harsh environment in the mountains, stable and secure data transmission is the top priority for surveillance systems. This is why ORing's reliable and cost-effective industrial solutions come into play.

Key Products

IAR-142+-4G

IEEE 802.11 b/g/n 4G LTE Cellular Router with 2x10/100Base-T(X)

- High Speed Air Connectivity: WLAN interface support up to 150Mbps link speed
- Provide 2 port 10/100Base-T(X) port and 1 sim card slot
- 4G LTE Modem dial up included

RGPS-92222GCP-NP-P

Industrial 26-port Rack-Mount Managed Gigabit PoE Ethernet Switch

- Supports P.S.E. based on IEEE 802.3at standard
- Supports IPv6 new Internet protocol version
- Supports Modbus TCP protocol
- Supports IEEE 802.3az energy-efficient Ethernet technology

IGPS-9842GTP

Industrial 14-port Managed Gigabit PoE Ethernet Switch

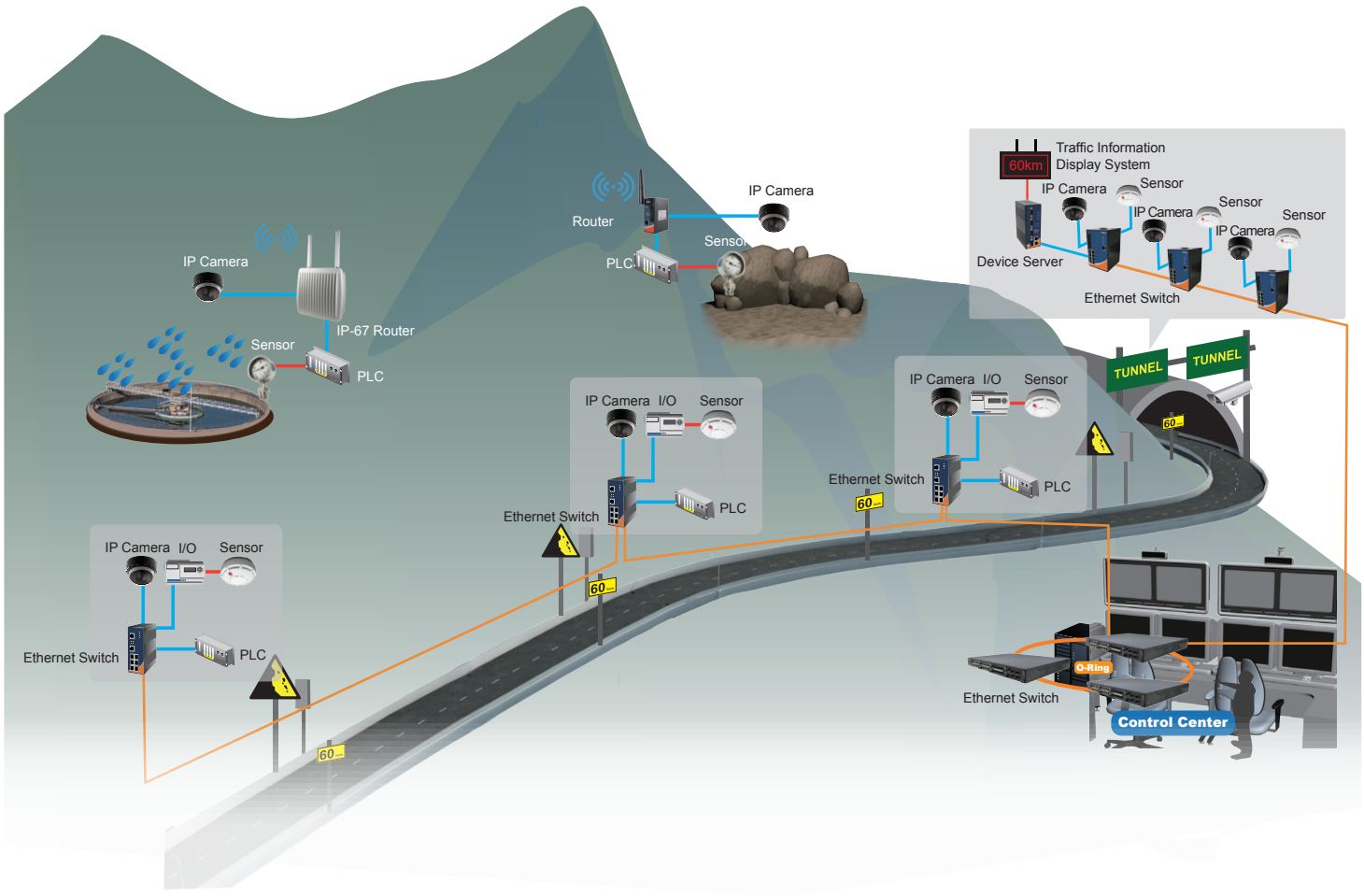
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- Supports IEEE 802.3at compliant PoE with maximum 30 watts per port
- Supports PoE schedule configuration and PoE auto-ping check function

IBS-102FX

Industrial 2-port Optical Bypass Switch for Fiber Optical Network with 4xLC Duplex Connector

- Supports 100M/1G/10G optical bypass function of 2-port duplex or 4-port simplex fiber connection
- Different models support multi-mode or single-mode optical-fiber
- Throughput will not be affected and no extra delay

Mountain Surveillance



Optic Fiber CAT5e Serial

PoE Link Wireless LAN

Manufacturing Automation

Advance Industrial Communication into the Next Generation

For factory automation, it is necessary to have accurate real-time information of automated production-line at all times. Traditionally radio and serial connections are used for factory communications, but the integration of Ethernet and SCADA automation systems can make such communications even more effective. ORing has the right products for industrial network communications – e.g. PoE Ethernet Switch and Device Server – allowing traditional serial devices (including RS485 type) to be connected to more robust Ethernet networks. With such upgrade, factory supervisors can get real-time production data much faster and much more reliably, thanks to much higher data bandwidth along with stable and swift redundant ring backup protection. The overall result would be vastly improved work efficiency and lower costs.

Key Products

IDS-4312D+

Industrial 1 secure serial port to IEEE 802.11 b/g/n wireless device server

- High Speed Air Connectivity: WLAN interface
- Support up to 150 Mbps link speed
- Support 2x 10/100Base-T(x) Ethernet ports Support 1x DI and 1x DO

IGAP-610H+

IIndustrial IEEE 802.11 a/b/g/n high power wireless AP

- High Speed Air Connectivity: Dual Band in IEEE 802.11 a/b/g/n and b/g/n WLAN interface selectable and support up to 300Mbps link speed
- 12~48VDC power input on terminal block
- 1 Gigabit Ethernet ports with 2KV isolation for PoE P.D.

IAR-142+-4G

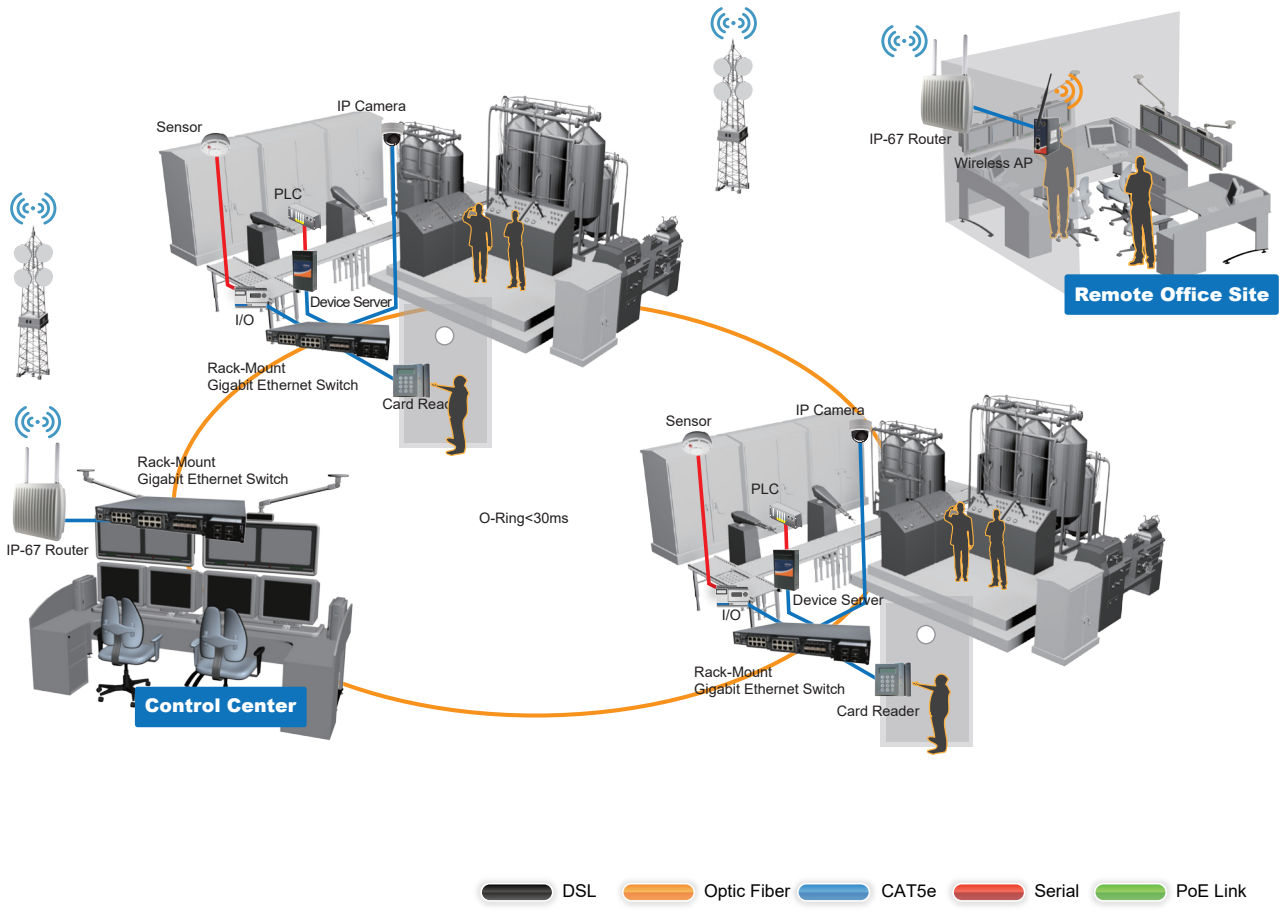
IEEE 802.11 b/g/n 4G LTE Cellular Router with 2x10/100Base-T(X)

- High Speed Air Connectivity: WLAN interface support up to 150Mbps link speed
- Provide 2 port 10/100Base-T(X) port and 1 sim card slot
- 4G LTE Modem dial up included

RGPS-R9244GP+-P

Industrial Layer-3 28-port Managed Gigabit PoE Ethernet Switch

- Supports Layer 3 static routing, RIP and VRRP function
- Supports standard IEC 62439-2 MRP*NOTE (Media Redundancy Protocol) function
- 24 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports PoE schedule configuration and PoE auto-ping check function


IP Camera
Sensor
PLC
Device Server
I/O
Rack-Mount
Gigabit Ethernet Switch
Card Read
IP-67 Router
Wireless AP
Remote Office Site
Rack-Mount
Gigabit Ethernet Switch
IP-67 Router
Control Center
O-Ring<30ms
Sensor
IP Camera
PLC
Device Server
I/O
Rack-Mount
Gigabit Ethernet Switch
Card Reader
DSL
Optic Fiber
CAT5e
Serial
PoE Link
Cellular Interface
Wireless LAN

Smart City

Upgrade Your City with Our IIoT Solution

From the forecast of Strategy Analytics 2015, urban living will contain 86% of the developed countries and 64% of developing countries by 2020.

The circumstance of global population shifting to urban centers is stimulating the development of “Smart Cities” which is to maximize the eciency of crucial resources such as utilities, water supply and transportation services and so on. These cities in the future will combine and leverage Internet of Things (IoT) and Information and Communications (ICT).

From the forecast of Strategy Analytics 2015, urban living will contain 86% of the developed countries and 64% of developing countries. It makes resource allocation me more critical for global development, especially in ICT and relative integrated IoT system. According to the report of “The Future of Smart Cities- Opportunities, solution and Players,” ICT revenues from urban living will reach $977 Billion by 2022. End to end systems such as cloud computing and data collection mechanism becomes essential to sustainably urban living in terms of how to make proper use of energy and further increase service quality of public infrastructure.

Key Products

OL-N2 Series

Lighting system, corresponding with LPWAN technology NBIoT/CATM1 communication protocol

- Designed and optimized by Low Power Wide Area Network (LPWAN) with NBIoT/CATM1 network technology
- Smart Control function (ON/OFF/Dimming)
- Supporting Logic Signal Input (LSI)

OL-Z-NB Series

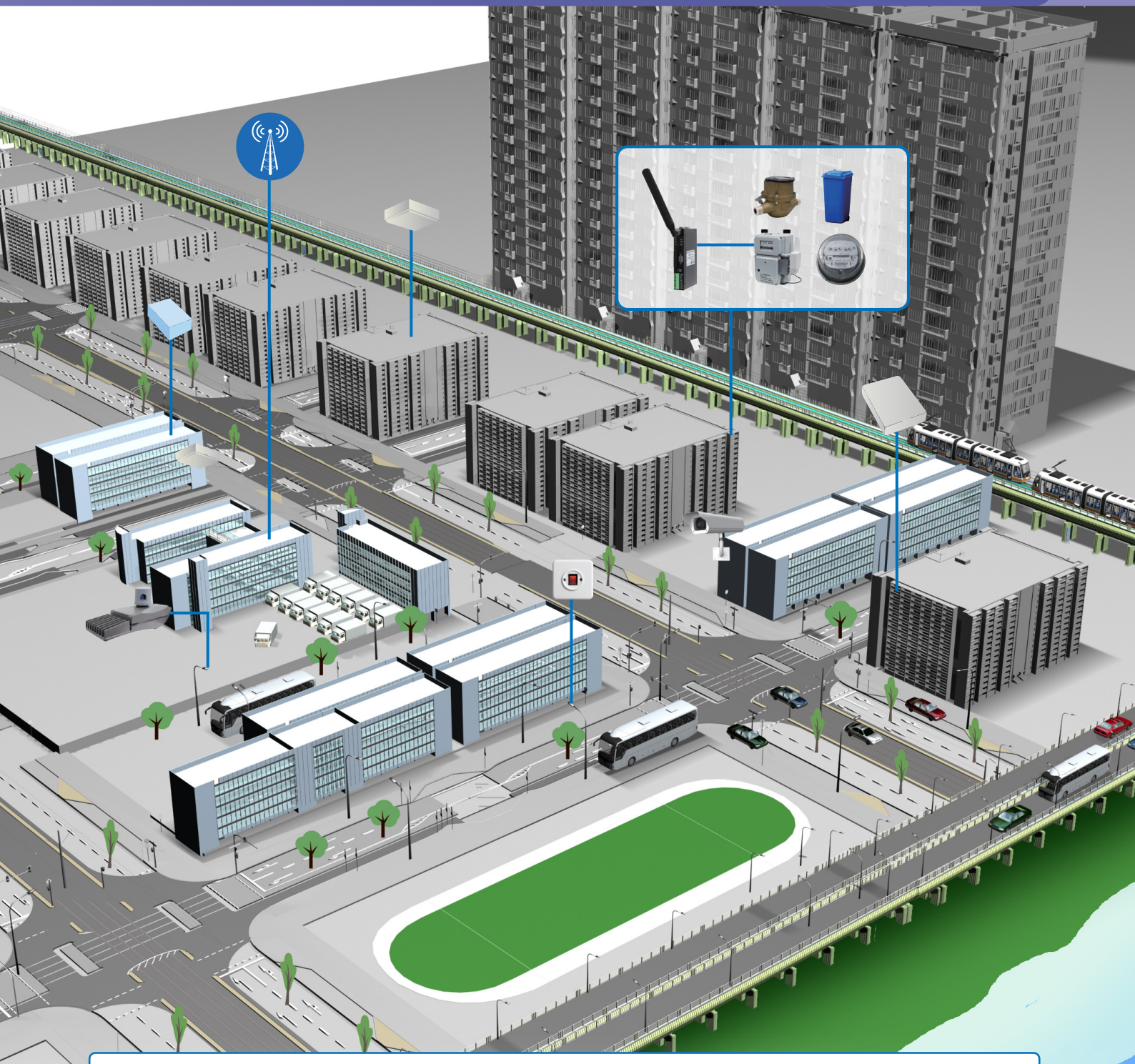
Lighting Controller, Zhaga, NB-IOT/LTE-M, Dali2, G Sensor, Light Sensor, Band3/8/20/28

- Universal luminaire compatibility via standard Zhaga Book 18 socket
- Support Cat.NB1/Cat.NB2/Cat.M1 communication with optional 2G fallback
- mart Control dimming function compatible with DALI2 protocol

OL-B-NB series

Lighting system, corresponding with NBIoT/CATM1 communication protocol

- Designed and optimized by Low Power Wide Area Network (LPWAN) with NBIoT network technology
- Smart Control function (ON/OFF/Dimming)
- Smart power saving mode



LoRa P2P Gateway with Wifi Hotspot
a. 1: 80 Gateway
b. Coverage : 1.5km
c. Installation Height : 6m (Light Pole)

LoRa P2P Cell Controller / NB-IoT Street Light Controller

LoRa / NB-IoT Alarm button

IP Surveillance 4G / Optical Fiber

LoRa / NB-IoT Sensor and Meter IO

Smart City Communication Backbone
a. Fiber Switch
b. 3G/4G Gateway
c. 3G/4G Router
d. Wifi Hot-Spot

LoRa Repeater

LoRa / NB-IoT Tracker

Product Overview & Selection Guide

Product Selection Guide

Product Selection Guide

Industrial Ethernet Switch Overview

ORing provides a comprehensive line of fully managed, lite-managed, and unmanaged industrial Ethernet switches with industrial-grade ruggedness and network reliability. You can choose between different speeds (Gigabit, Fast Ethernet, optical fiber, etc.), mounting types, power supplies, and casing. The switches comply with a variety of safety standards such as IEC61850-3/EN50155/C1D2. The flagship Thunder Series (Thunder Rail, Thunder Rack, & Thunder PoE) feature advanced technologies (Gigabit speed, 9K Jumbo Frame support, Device Binding, and many more) to guarantee the best networking performance.

ORing's Ethernet switches also support optic fiber technology to provide long-haul transmission. Users can use advanced management software to configure various settings such as network redundancy, QoS, VLANs for network segregation, and IGMP for multicast filtering to achieve optimal network performance through. For handling harsh industrial applications, ORing also offers IP-67 grade waterproof Ethernet switches.

Industrial Modular Ethernet Switch

ORing's industrial modular Ethernet switch comes with 3 slots supporting up to total 24 of Gigabit ports and 1 slot supporting up to total 4 of 10G ports

RGS-P9000

Industrial Din-Rail Gigabit Ethernet Switch

ORing's full Gigabit Ethernet switch series includes unmanaged and managed models which support various technologies for transmitting Ethernet packets at a rate of a Gigabit per second, as defined by the IEEE 802.3-2005 standard.

IGS-9168GP

Industrial PoE Ethernet Switch

ORing's ruggedized industrial PoE (Power over Ethernet) switches By enabling alive checking, the switch will periodically communicate with end devices to monitor the real-time status of PDs. This reduces management burden and increases system reliability. Power scheduling will schedule provision of power to end devices. This enables PDs to be switched off at certain times when they are not needed.

By enabling alive checking, the switch will periodically communicate with end devices to monitor the real-time status of PDs. This reduces management burden and increases system reliability. Power scheduling will schedule provision of power to end devices. This enables PDs to be switched off at certain times when they are not needed.

IGPS-9842GTP-24V

Key Technologies

ORing products comply with several international global standards or protocols to provide better solutions in order to meet customers' high standard requirement.

MRP*NOTE

Media Redundancy Protocol (MRP) is a data network protocol standardized for ring redundancy in industrial environment by the International Electrotechnical Commission as IEC 62439-2. MRP is compatible with redundant ring coupling, supports VLANs, and is distinguished by very short reconfiguration times. In the fault-free state of the network, this protocol provides reliable data communication, and preserves determinism of real-time data communication. In cases of fault, removal, and insertion of a component, it provides deterministic recovery times. This function is available by customer's reguest.

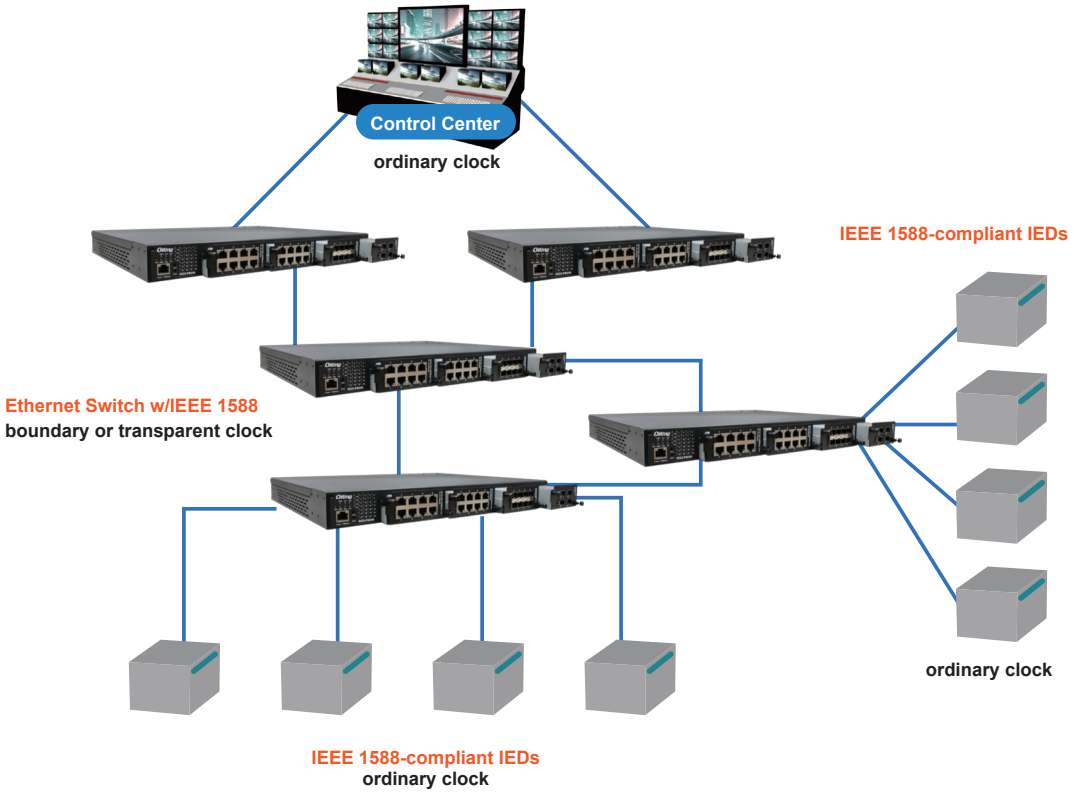
***NOTE: This function is available by request only**

IEEE 802.3az

Energy-Efficient Ethernet is a set of enhancement to the twisted-pair and backplane Ethernet family of computer networking standards that allow for less power consumption during periods of low data activity. The intention was to reduce power consumption by 50% or more, while retaining full compatibility with existing equipment. The Institute of Electrical and Electronics Engineers (IEEE), through the IEEE 802.3az task force developed the standard. ORing's 9000 series products are all compliant with this standard.

IEEE 1588v2

A clock synchronization algorithm drafted by the Institute of Electrical and Electronics Engineers (IEEE). The algorithm provides a standard for clock synchronization based on data packet transmission. In 2001, with the support of the National Institute of Standards and Technology (NIST), the committee drafted the related standard, which has been used as the IEEE 1588 standard since the end of 2002. In the communications industry, the clock signal transmission technology of the PSN(Packet Switched Networks) develops fast. The revised IEEE 1588 standard was issued in June 2006 and the IEEE 1558v2 was revised in 2007. ORing's 9000 series products are all compliant with IEEE 1588v2 hardware-based standard.



IPv6

Internet Protocol version 6 (IPv6) is the latest revision of the Internet Protocol (IP) developed by the Internet Engineering Task Force (IETF). This protocol is for communication and the traffic across the internet.

Jumbo Frame

ORing's Gigabit Ethernet switches, with 10 times the bandwidth of 1000Base-T Ethernet switches, feature Jumbo frame support, which enables Jumbo Frame is useful for transmitting mega-pixel IP surveillance videos since the CPUs have fewer frames to process as a larger payload is put into each frame. This will increase data transmission efficiency, thereby improving network performance.

Redundant Technologies

Technology Description

Many network redundancy or recovery protocols have been defined by the IEEE, such as STP, RSTP, MSTP, to ensure recovery from network disconnections. However, industrial applications require a much shorter recovery time than commercial applications. Hence, industrial networking devices often use proprietary redundant ring technologies to minimize downtime. ORing has developed a variety of proprietary redundancy technologies including O-Ring, O-Chain, and Open-Ring. These proprietary redundant ring technologies not only meet the needs of different networking topologies, but also assure the reliability of the network.

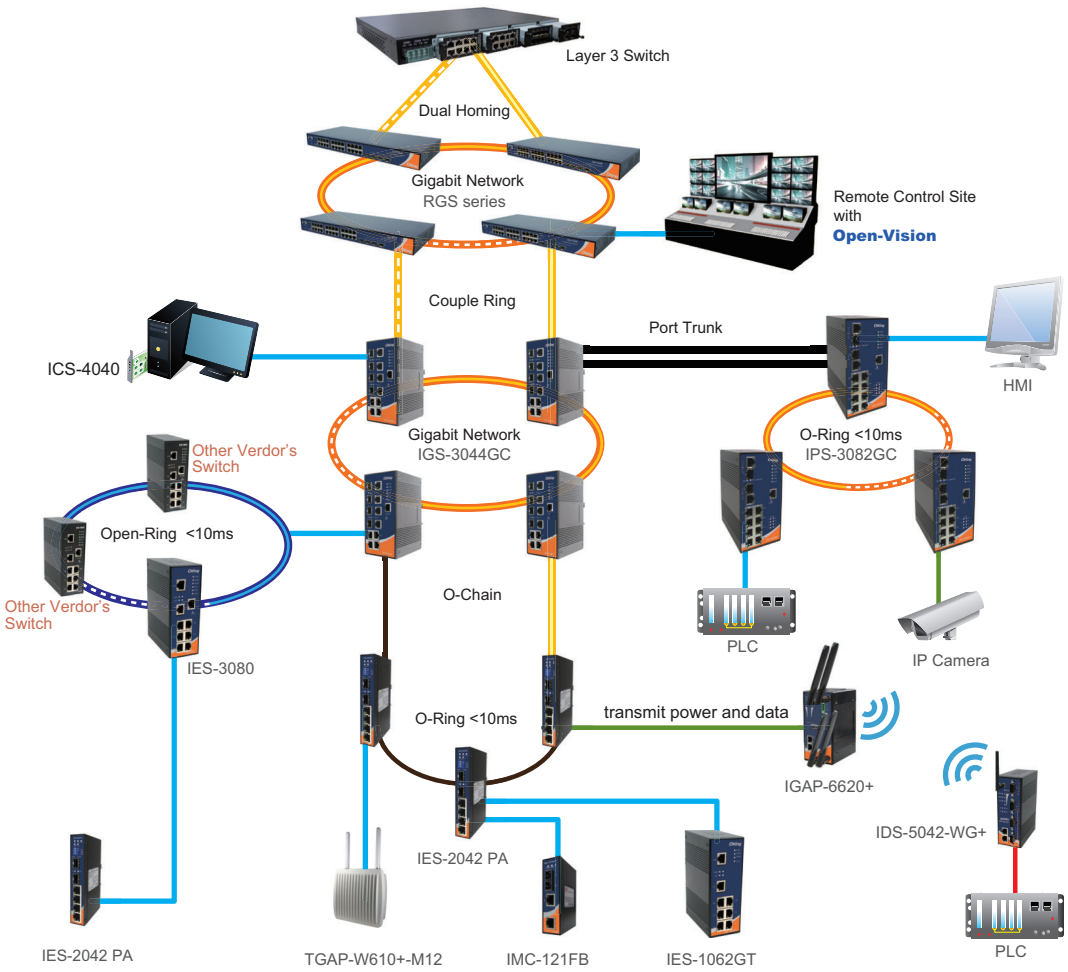
Support for IEEE Standard Redundant Technologies

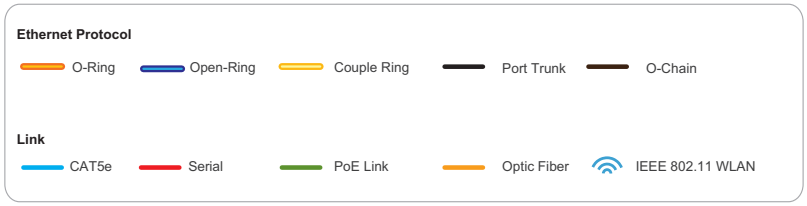
- IEEE802.1d - STP (Spanning Tree Protocol)
- IEEE802.1w – RSTP (Rapid Spanning Tree Protocol)
- IEEE802.1s – MSTP (Multiple Spanning Tree Protocol)
- IEC 62439-2 MRP*NOTE (Media Redundancy Protocol)

Support for ORing's Proprietary Redundant Technologies

- O-Ring (ORing's Proprietary Redundant Ring)
- Open-Ring (Open Architecture Technology)
- O-Chain (ORing's Proprietary Redundant Chain Technology)

***NOTE: This function is available by request only**





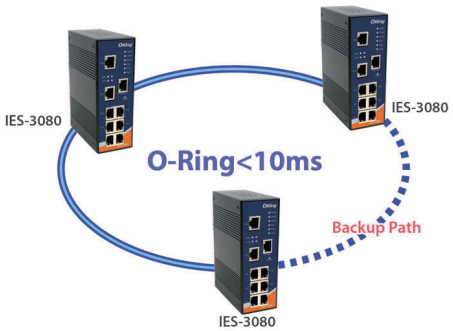
Network Redundancy Comparison Table

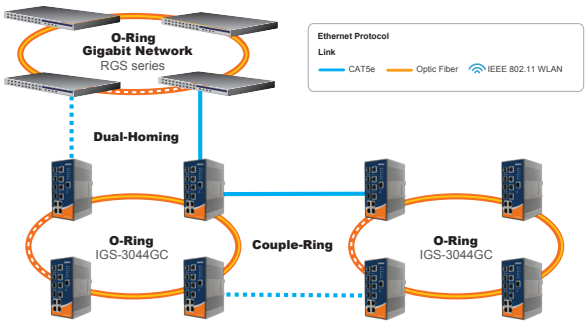
Recovery Technology	STP	RSTP	RSTP 2004	MSTP	Open-Ring	O-Ring	O-Chain
Recovery Time	10 ~ 50 Seconds	3 ~ 5 Seconds	< 100 ms	3 ~ 5 Seconds	-	< 10 ms	< 10 ms
Maximum Nodes	40	20 (Note: Recovery time is unpredictable if there are more than 9 nodes)	80 (Note: Recovery time is unpredictable if there are more than 9 nodes)	20 (Note: Recovery time is unpredictable if there are more than 9 nodes)	250	250	250
Per VLAN STP	NO	NO	NO	YES	NO	NO	NO

Comparison Table of Redundant Technologies

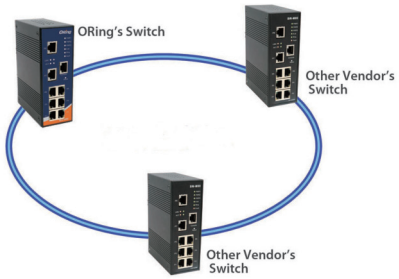
Benefits of ORing's Redundant Technologies

O-Ring : O-Ring is ORing's proprietary redundant ring technology, boasting a recovery time of less than 10 milliseconds and the ability to support up to 250 nodes. The O-Ring redundant ring technology can protect mission-critical applications from network interruptions or temporary malfunction.





Open-Ring : Open-Ring is an enhanced redundant technology that allows ORing's switches to work with other vendor's proprietary redundant ring technologies. It enables ORing's switches to form a single ring with other vendor's switches. In cases where the ring is deployed using proprietary technologies, ORing offers a compatibility service where ORing can make its switches compatible with your particular network requirements.



ORing's managed Ethernet Switches are compatible with other vendors' switches in the same redundant ring.

MRP*NOTE: All of ORing's Ethernet switches come with Media Rendundancy Protocol (MRP) support. MRP is a data network protocol standardized as IEC 62439-2, allowing rings of Ethernet switches to overcome any single failure, providing deterministic recovery time and supporting steamless data transmission. Therefore, it is suitable to most Industial Ethernet applications and in the same time assures the most reliable communication environment.

Modbus TCP : Modbus TCP is simply the Modbus RTU protocol with a TCP interface that runs on Ethernet. Specifically, it covers the use of Modbus messaging in an 'Intranet' or 'Internet' environment using the TCP protocols. The most common use of the protocols at this time are for Ethernet attachment of PLC's, I/O modules, and 'gateways' to other simple field buses or I/O networks. SCADA system can monitor / Control Industrial Ethernet Switch going through Modbus TCP.

RSTP 2004: RSTP-2004 is an enhanced version of RSTP designed to overcome the slow recovery time in certain situations which might take up to 30 seconds when using RSTP. To speed up the recovery time, some significant changes have been made and one of them is transmission of the Bridge Protocol Data Unit (BPDU). When a link in the topology is broken, the device will send out a topology change notice which is encapsulated in the BPDU. Since the notice is triggered by the event, it can be sent out at a much faster rate, making the protocol faster than RSTP standard. With a millisecond-level recovery time, RSTP-2004 can provide higher network availability.

***NOTE: This function is available by request only**

O-Chain: O-Chain is a revolutionary network redundancy technology that provides an *add-on* network redundancy topology for any backbone network, providing ease-of-use while maximizing fault-recovery swiftness, flexibility, compatibility, and cost-effectiveness in one set of network redundancy topology.

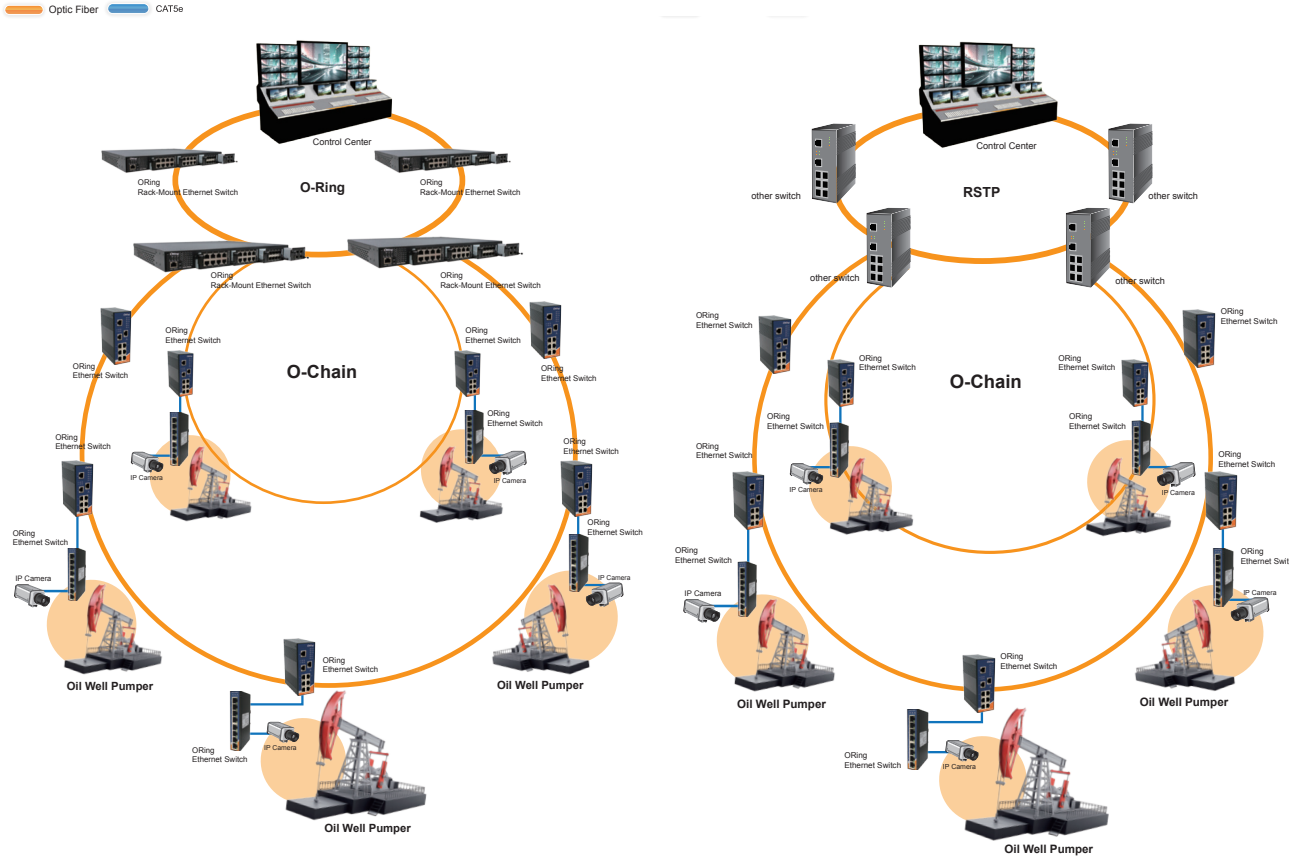
O-Chain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound network topology, i.e. the creation of multiple redundant networks beyond the limitations of current redundant ring technology.

O-Chain is a highly flexible self-healing Ethernet technology designed for distributed and complex industrial networks. It allows our switches to be quickly and easily deployed in any type of complex redundant network and offer fast fault recovery, flexible construction, unlimited expansion, and cost-effective configuration. If at any time a segment of the chain fails, the network is able to recover in less than 10ms for up to 250 switches.

O-Chain is very easy to configure and manage. Simply define an edge port on the edge switch and enable the O-Chain function of other switches, O-Chain will be up and running.

O-Chain provides the following key advantages:

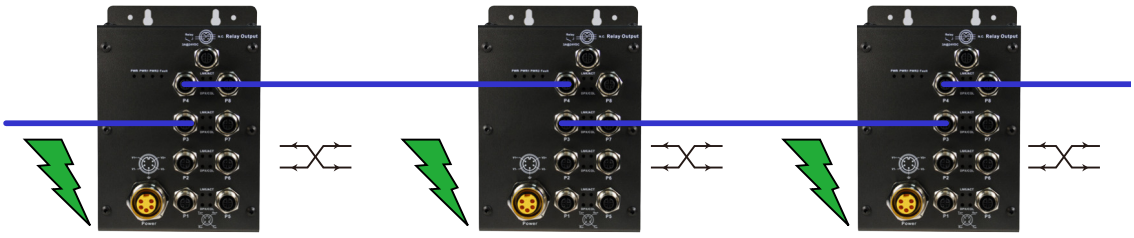
1. Outstanding recovery time (< 10ms) for up to 250 switches
2. Flexible, scalable redundant network topologies
3. Compatible with other redundant protocols (RSTP, STP, etc.)
4. Significant reduction in development costs (time and effort, cables, and Ethernet ports)



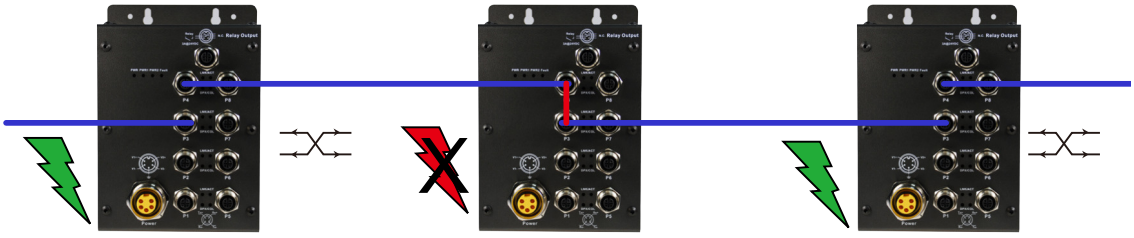
ORing's Hardware Bypass redundancy technology naturally and effectively avoids single-point power failure in daisy chain topology or multi-point power failures . For conventional wired Ethernet network, there is the Copper Interface Bypass. An ORing Ethernet switch with Copper Interface Bypass would have 2 of the Ethernet ports designated as the bypass path. Under normal circumstances, these ports would function just like any other ports. However, when one of the switches in the loop loses power, the internal bypass circuit will connect the two bypass ports to pass the traffic on to other active switches.

Copper Interface Bypass - TES series

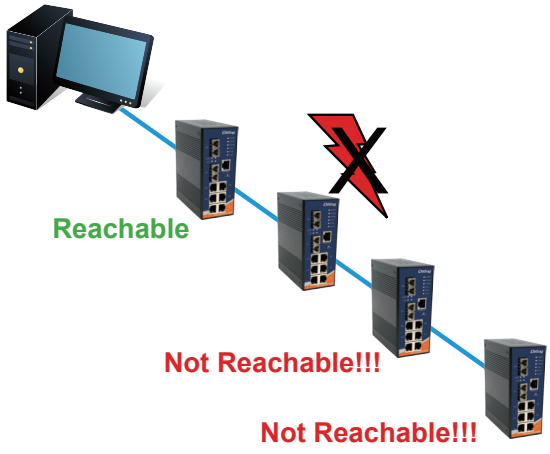
➤ Normal Communication



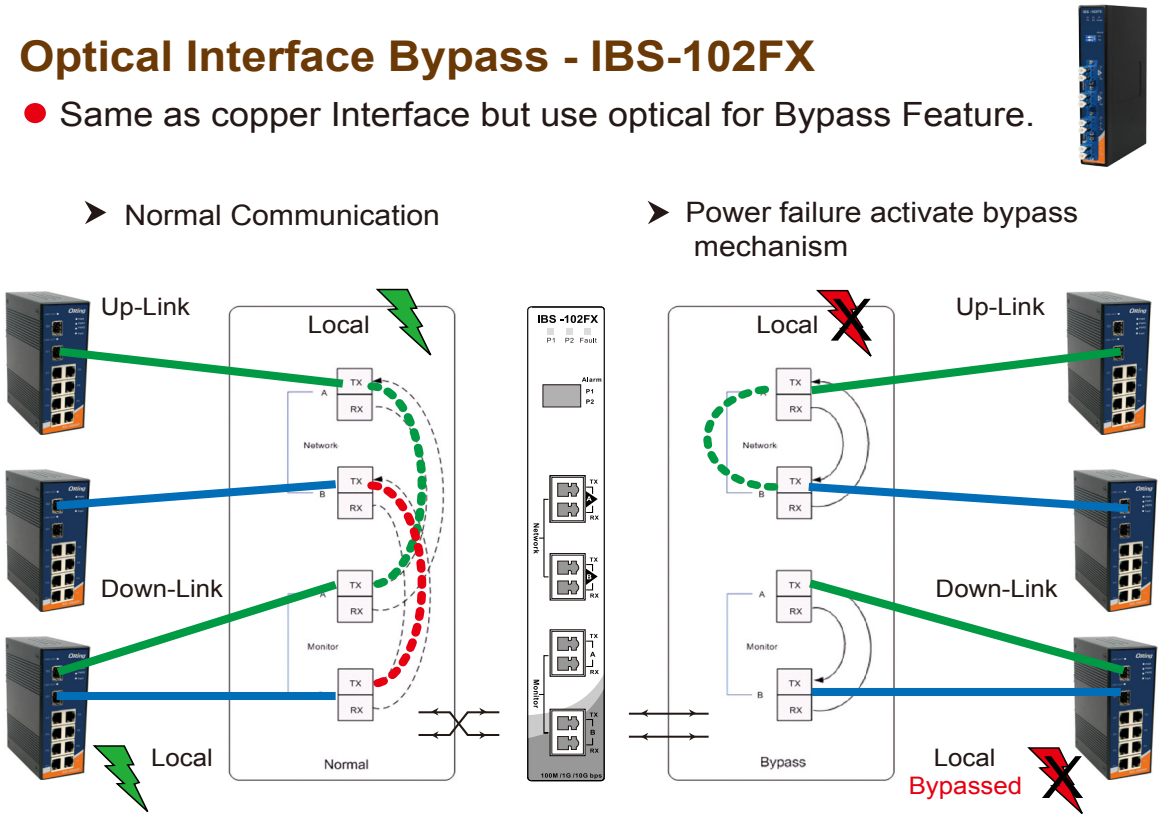
➤ Single point power failure activate bypass mechanism



Hardware Bypass: Redundancy technologies are great for network topologies. When one node fails, the system quickly finds another path and continues to run again. However, if two or more nodes fail in a ring structure, or if one node fails in a daisy chain structure, the network will be irrecoverable until the node problems are solved.



ORing also has the optical solution for hardware bypass network redundancy – Optical Interface Bypass in a dedicated optical bypass switch such as one from the IBS-102FX series. In normal operations, the Bypass switch diverts data from the Network ports to the Monitor ports. When power failure occurs, the Network data traffic is routed directly to the other Network port. Moreover, the Bypass switch has relay output for power failure warning. For different optical data transmission modes, IBS-102FX series comes in two variations – IBS-102FX-MM-LC for multi-mode optical links and IBS-102FX-SS-LC for single-mode optical links.



Supporting Product(s):

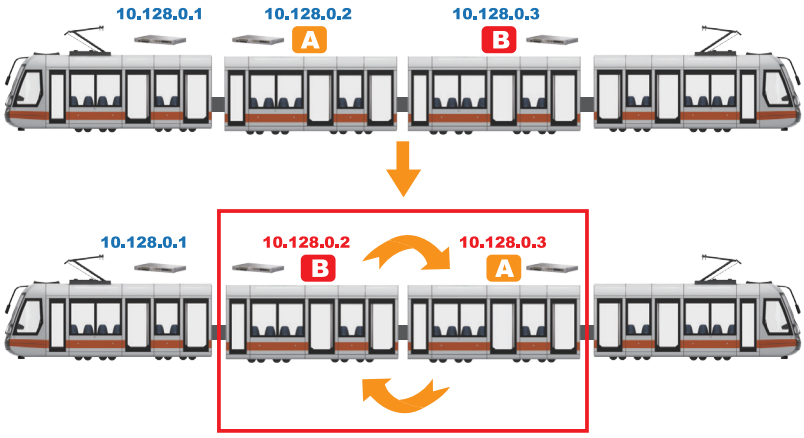
All of ORing's industrial managed and lite-managed Ethernet switch products support O-Ring, Open-Ring, and redundancy technologies. Ethernet switches with the -BP2 suffix support Cooper Interface Bypass, while the IBS-102FX Series support Optical Interface Bypass.

TTDP(Train Topology Discovery Protocol)

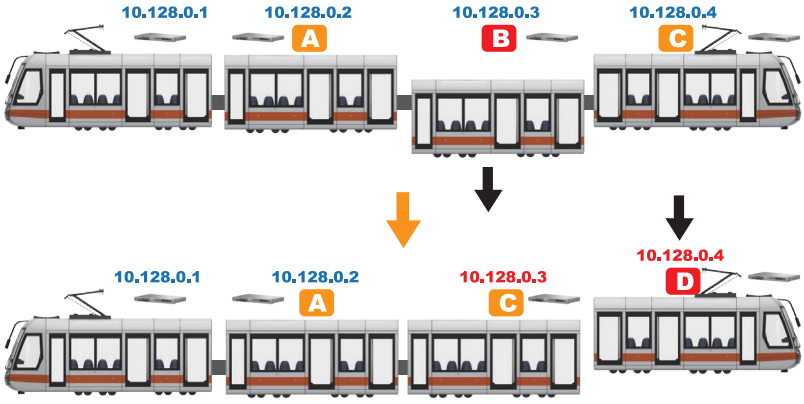
Train topology is dynamic and frequently changes since carriages are constantly added, removed, or replaced. Every time the order of the carriages changes, the network must be reconfigured, which is very time-consuming and prone to errors if it's done manually.

TTDP (Train Topology Discovery Protocol) protocol has thus been developed to enhance the efficiency of railway network reconfiguration. The protocol enables Ethernet switches to negotiate automatically with other network devices after the network topology is changed and will reassign an IP address to the network devices based on the new order of the carriages. Therefore IT staff or operators do not need to reconfigure the network devices manually at all. With this technology, train operators can vastly improve their operational efficiency and minimize configuration errors.

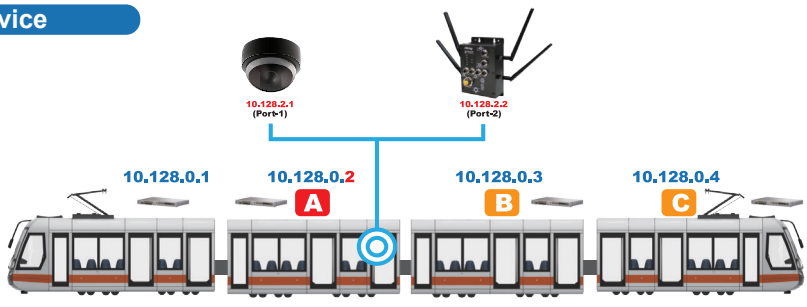
Exchange



Remove & Add

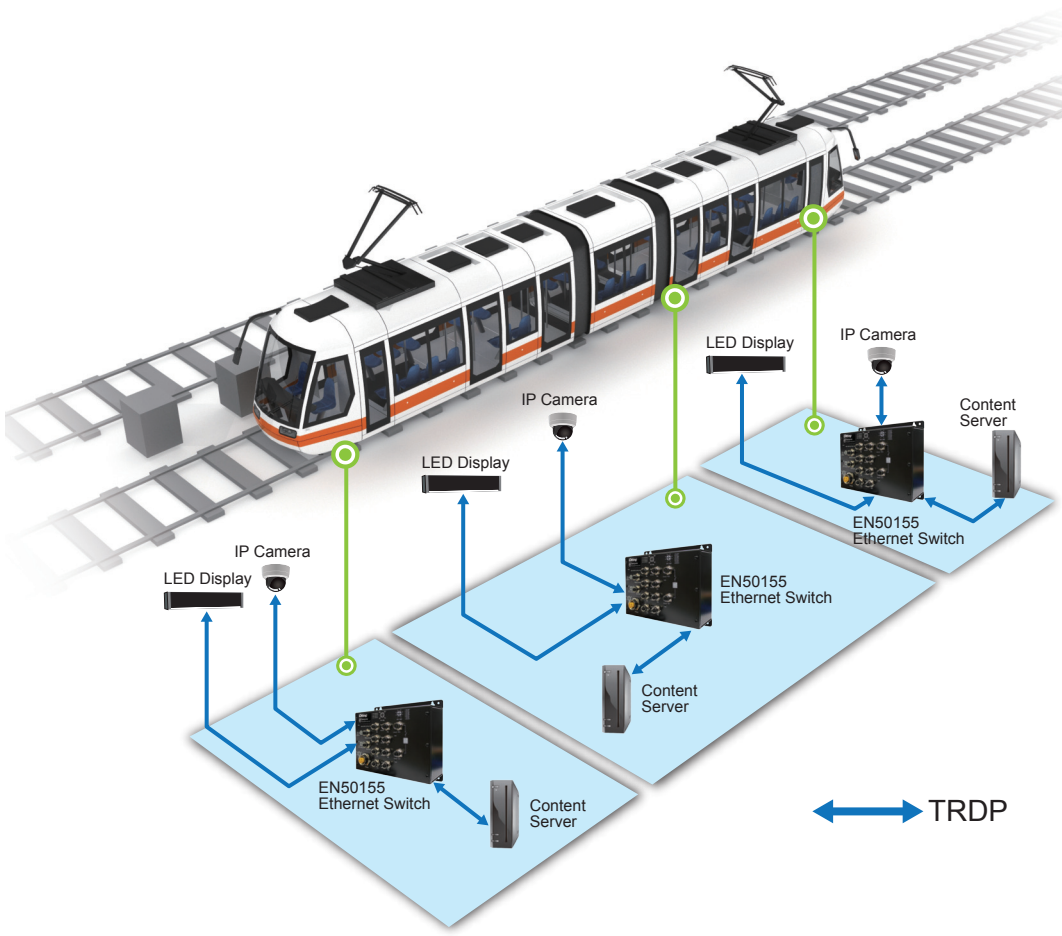


Add Device



TRDP(Train Real-time Data Protocol)-IEC 61375-2-3

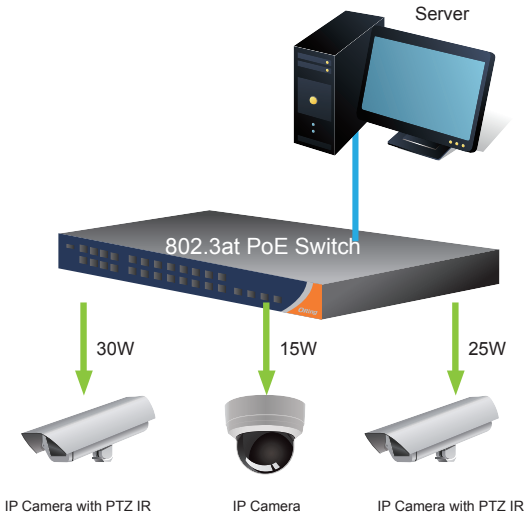
Train Real-time Data Protocol (TRDP) is a protocol for communication and control solutions on board of rolling stock. Railway industries created this new protocol with the aim to improve data communication on board of trains.



Power over Ethernet with Power Management

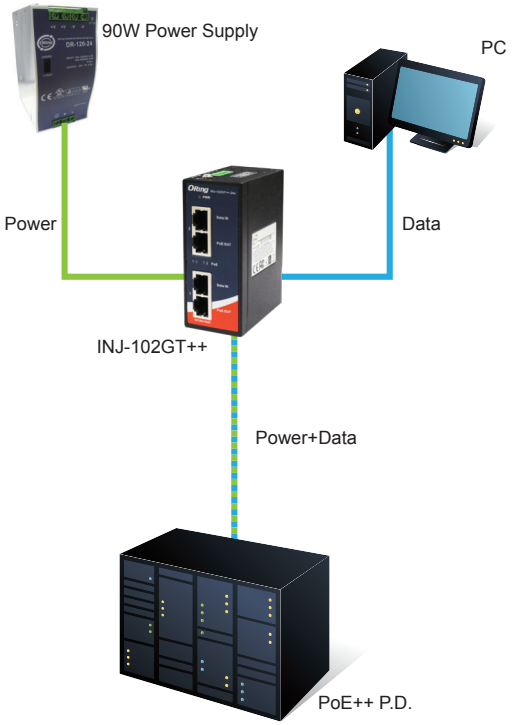
Power over Ethernet (IEEE 802.3at) with PoE+

PoE provides numerous benefits in terms of network efficiency and cost-effectiveness, such as flexible network designs, simplified, faster, and lower-cost installation, easy and fast rearrangement of existing deployments, and centralized power management. The IEEE has ratified two PoE standards, the IEEE 802.3af and the IEEE 802.3at. The former provides up to 15.4W of DC power to each device and the latter, also known as PoE+ or PoE plus, provides up to 30W of power. The IEEE 802.3at technology delivers 30W of power via two twisted pairs — a significant boost from the IEEE 802.3af standard.



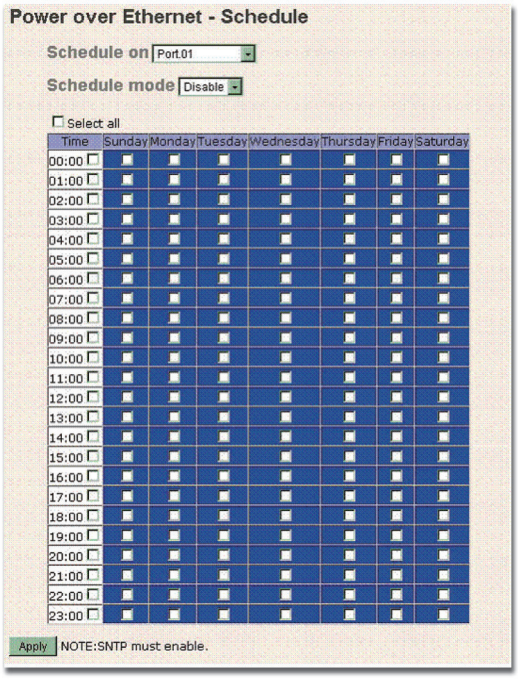
Power over Ethernet with PoE++

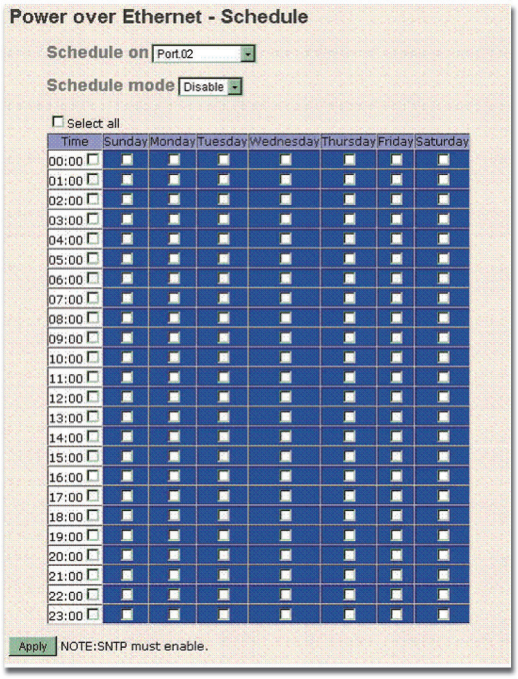
PoE has been widely used in IP surveillance applications with constant addition of new features in IP cameras such as PTZ, IR, and WDR, and hence requiring more power. With the introduction of more power-hungry devices, a new proprietary standard known as LTPoE++ has be developed which extends the PoE and PoE+ specifications to up to 90W of power. With complete interoperability with the IEEE PoE standards, LTPoE++ is backward compatible and interoperable with existing PoE devices. ORing INJ-102GT++ power injector is an advanced high power PoE injector capable of providing 90W of power to a PD device.



Green Power Scheduling

Power schedule allows the administrator to set up power supply schedules based on their operation modes such as power on, power off, restart, or sleep needs so that network devices will be powered at a specified time, instead of consuming power around the clock even when not in use. For example, if the factory wireless PoE access point only needs to be powered on during work hours, the network administrator can enable power output for the device from 6a.m to 10p.m and disable power output from 10p.m to 6a.m.





Alive Checking

ORing's managed/lite-managed PoE switches could be configured to monitor the real-time status of connected powered devices (PD). ORing's managed/lite-managed PoE switches could send alive-checking packets to assure the connected PDs are in working state. If the connected PDs fail to response, ORing's managed/lite-managed PoE switches would reactivate the connected PDs to assure the reliability of the network.

• 3 steps of alive checking

ORing Launched the First Onboard 2.5G/10G Ethernet Switch with Copper Interface and PoE Functions

The demand of bandwidth for data transmission is dramatically increased nowadays. Those applications include popular deployed wireless network(Wi-Fi) for internet access, video streaming for IP surveillance, and network distribution/data concentrator in control center. Thus, the 10G/40G/100G standards or higher data rate technologies were developed for those demands.

Feature	IEEE 802.11ac Wave 1	IEEE 802.11ac Wave 2			
Data Rate	1.3 Gbps	1.3 Gbps	1.73 Gbps	2.6 Gbps	3.5 Gbps
# of Spatial Streams	3	3	4	3	4
Modulation	256 QAM	256 QAM	256 QAM	256 QAM	256 QAM
Channel Bandwidth	20, 40, 80 MHz	20, 40, 80 MHz	20, 40, 80 MHz	20, 40, 80 80+80, 160 MHz	20, 40, 80 80+80, 160 MHz
MIMO IEEE	Single User	Single User Multi User	Single User Multi User	Single User Multi User	Single User Multi User
802.11 protocol support	a, n, ac	a, n, ac	a, n, ac	a, n, ac	a, n, ac

Just take the application of wireless(Wi-Fi) access as the example, the technology of IEEE802.11ac is matured and very popular for huge amount of multimedia data access in these years. Existing 1Gb backbone Ethernet network can not fulfill the demands but become the bottleneck since the data rate of wireless technology already exceed 1Gbps. Then how to upgrade and increase the bandwidth of existing network cable become an important task.

As you know, new wired technology for higher transmission data rate may need new physical cable with better quality and higher dta bandwidth. But the problem is the Cat5e Ethernet cable is so popular and already deployed all over the world in past tens of years. It will be very costly and difficult to replace the cable for new technology. The 10GBase-T technology was already proven which is not possible to operate on existing Cat5e cable but need Cat6a or Cat7 cable. Even though, it is still suitable for network distribution/data concentrator application.

For field side application, we need to find out a solution to increase the data rate on existing Cat5e Ethernet cable to save cost and time. Therefore, the new standard of 2.5GBase-T was defined and developed for faster Ethernet data transmission up to 100 meters like traditional 1Gb Ethernet network did. In addition, the PoE(Power over Ethernet) technology is also possible to be implemented to deliver power and data within the same Ethernet cable.

ORing launched a new series of 2.5G/10G Industrial (PoE) Ethernet switch products for these applications. They are the first 2.5G/10G Industrial grade Ethernet switch products with copper interface and PoE functions for industrial applications with requirement of very high speed data transmission.

Industrial Media Converter Overview

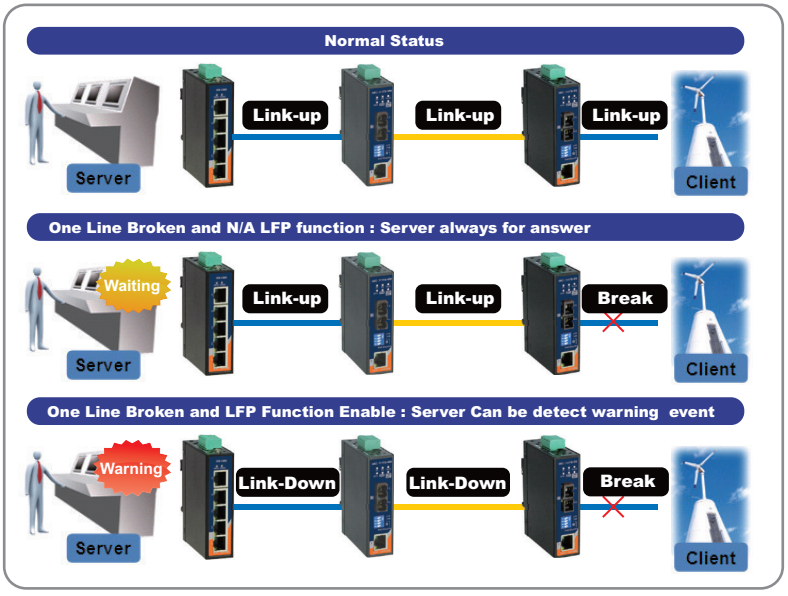
ORing offers Serial to Serial, USB to Serial, Fiber to Ethernet, and Gigabit Fiber to Ethernet media converters. Also, ORing's serial converters allow devices to communicate effortlessly across different serial interfaces and offer convenient, intelligent features.

Key Technologies

LFP (Link Fault Pass-Through)

Technology Description

Link Fault Pass-Through is the technology that actively "passes" any link failure of one side of the media converter to the other side, enabling subsequent devices connected to the other side to respond properly.
Traditional media converters usually suffer from inability to transfer link failure from one side to another. In other words, when link failure occurs on one side, the other side is still transmitting packets without actual data, causing subsequent devices of the link to wait for a response that will never arrive.
Link Fault Pass-Through effectively solves such problem of media converters by actively relaying link failures from one side to another. For example, if the links on the Ethernet side of the media converter fails, the media converter reinitiates auto-negotiation on the Ethernet side but stays in the link failure state. Additionally, the converter actively stop transmitting on links of the optical fiber side so subsequent devices connected to the optical fiber link would respond to network failure properly. With Link Fault Pass-Through technology, link failure would be noticed swiftly, minimizing data loss caused by such failure.



Supporting Product(s): ORing's IMC-111 series and RMC-111 series support this feature.

Hot Plug

Technology Description

ORing RMC-1000 media converter chassis features the revolutionary rack-mount design for hosting up to 18 card-type ORing media converters. For user convenience, RMC-1000 is equipped with Hot Plug technology. This technology enables the user to install or remove a media converter card for each slot without having to power off RMC-1000

Industrial Device Server/M2M Gateway Overview

ORing's serial-to-Ethernet device servers offer up to 8 serial ports along with different interfaces of copper, optic fiber, or wireless LAN, plus support for various operation modes: TCP server, TCP client, UDP, and Virtual COM. All device server models include free-bundled management utility, plus DS-Tool with Virtual COM drivers

Key Technologies

SSL Data Encryption

Technology Description

Handshaking

The client asks the server to identify itself. The server hands a "digital certificate" (public encryption key included) to the client. If the "digital certificate" is trustworthy, the client sends confirmation to the server. Now the client and server have "shaked hands".

Data Transmission

The client encrypts data with a public encryption key and sends the encrypted data to the server. The server then decrypts the received data with its secret private decryption key and retrieves the data. With strong encryption (128-bits or higher), the required decipher time & effort may far exceed any hacker's lifetime.

SSL Data Encryption Benefits

SSL data encryption provides several benefits. It enforces data privacy via strongly designed data encryption schemes. Additionally, it allows identity establishment, i.e. each client has his or her own unique "digital certificate" . Moreover, SSL data encryption is a trust-based data communication scheme. Data communications exist if and only if the server and the client formally trust each other.

Modbus Gateway

Technology Description

ORing also offers a Modbus gateway product portfolio which serves as a converter between Modbus TCP and Modbus RTU/ASCII devices. ORing's Modbus gateways allow Modbus RTU/ASCII devices to be easily connected with network-based Modbus TCP devices without changing existing structure. ORing Modbus gateways are able to support dozens of RTU/ASCII devices through the serial ports, connecting a high density of Modbus nodes to the same network. Apart from Web configuration support, ORing Modbus gateways also provide a wide range of functions such as Master/Slave mode support, a wide range of operating temperature, and rugged design.

Multiple-OS Support

For maximum compatibility and versatility, ORing's device servers support many different Windows Operating systems: Windows NT, 2000, XP, 2003, VISTA(32/64-bit),and Windows 7(32/64-bit).

PPPoE and DDNS for Internet Connection

Technology Description

PPPoE (Point-to-Point Protocol over Ethernet) is a network protocol for encapsulating Point-to-Point Protocol (PPP) frames inside Ethernet frames. It is used mainly with DSL services where individual users connect to the xDSL modem over Ethernet. IDS series products feature PPPoE to build up a connection a network through xDSL modem from Intranet to Internet without routers.
DDNS (Dynamic Domain Name Server) is a method, protocol, or network service that provides the capability for a networked device using the Internet Protocol Suite, such as an IP router or computer system, to notify a domain name server to change, in real time, the active DNS configuration of its configured hostnames, addresses or other information stored in DNS. When getting the connection through PPPoE and the IP address is floated, end users may not configure device servers. However, through DDNS, it's easy for different IP domain users to connect to IDS series device servers.

PPPoE Benefits

PPPoE enables clients to adopt the traditional dial-up access mode, which allows end users to use the familiar hardware and similar software to access the Internet. Moreover, clients can also use Ethernet adapters to connect PCs and xDSL modems so that PCs can share xDSL lines and thus saves investment.

DDNS Benefits

With DDNS, the administrator does not need to set up the static IP address for each PC every time the network infrastructure changes. Moreover, you only need addresses that would be used simultaneously, rather than having one for every possible user of IP.

Industrial Wireless Access Point Overview

ORing's industrial Wireless Access Points are made for rugged and seamless long distance wireless and wireless redundant roaming networks. All of ORing's industrial wireless products feature long communication range with X-Roaming technology, support for IEEE 802.11 standard, and AP/bridge/repeater/AP-client/client operation modes. Some of these Wireless Access Points are even waterproof (the IP-67 models) – perfect for outdoor use. Additionally, some Wireless Access Points are EN50155-certified Transporter series models, making them especially suitable for rolling stock applications.

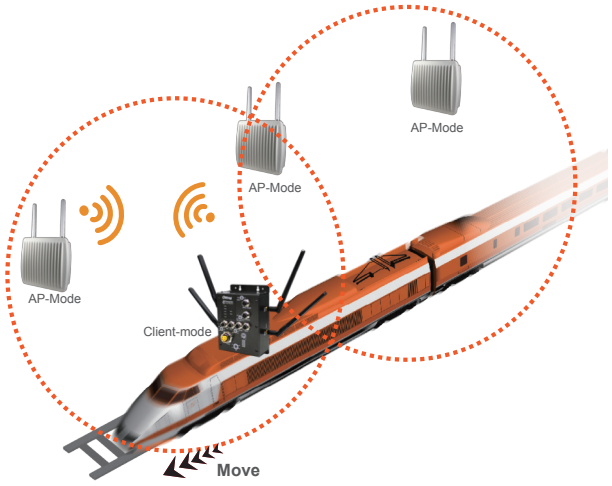
Key Technologies

X-Roaming

Technology Description

IEEE 802.11 networks can only transmit data within a few hundred meters. As for mobile data application, the devices should handoff from one access point to another. ORing's X-Roaming technology, which is available in all of ORing's new wireless access point models, reduces the handoff time between two different access points to less than 100 milliseconds, and makes seamless wireless communication possible.

With ORing's X-Roaming technology, the client can roam seamlessly among different access points. ORing also provides the feature of load balance — to prevent traffic jam of mobile data transmission while roaming, i.e. to limit the total amount of AP clients that connected to the products of ORing APs.



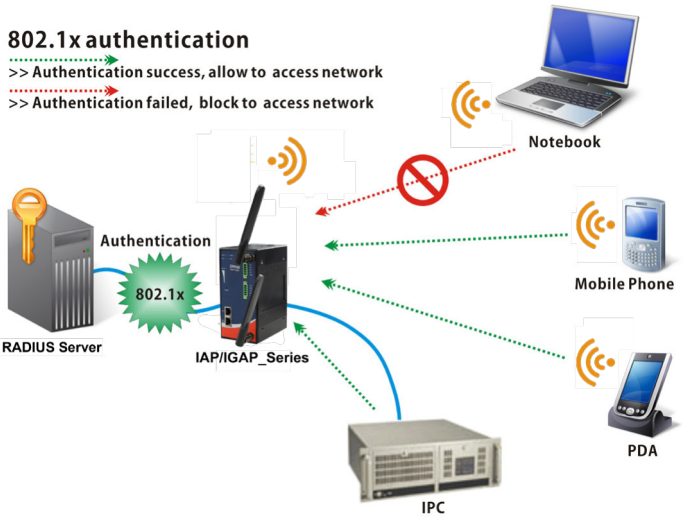
Benefits of X-Roaming

The main benefits of X-Roaming are that it reduces the handoff time between two different access points to less than 100 milliseconds, and therefore it makes seamless wireless communication possible. With ORing's X- Roaming technology, the client can roam seamlessly among different access points.

Security: 802.1x Authentication

Technology Description

ORing's IAP/IGAP product series support IEEE 802.1x to enhance security for wireless connections. ORing's IAP/IGAP series act as authenticator and the clients (supplicants) could get authentications from RADIUS (Remote Authentication Dial In User Service) server.



Security Benefits

ORing's IAP/IGAP series provide client-only authentication or, more appropriately, strong mutual authentication using protocols such as EAP-TLS. Thus, un-authorized/un-authenticated client are not possible to connect to ORing's IAP/IGAP and IAR/IGAR series.

Supporting Products: ORing's full IAP/IGAP Series products support security functions.

Dual RF Wireless Redundancy

Technology Description

Network redundancy is vital for Ethernet network reliability – as one network link fails, the alternative network path can be activated to keep the network functional. The same redundancy concept can also be applied to wireless networks. By simultaneously providing 2 different wireless access paths, with different RF frequencies and SSIDs, the user can set up 2 wireless connections and have both simultaneously connected, ensuring that the wireless network stays uninterrupted when one of the two connections fails.

Supporting Products:

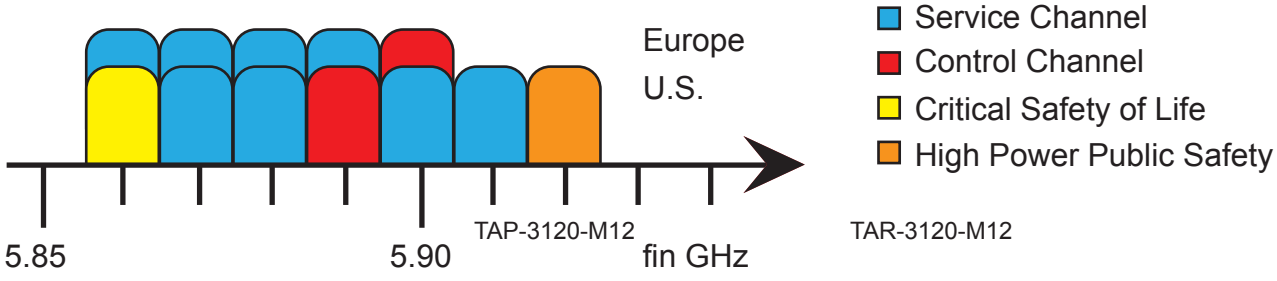
Dual Wifi : IGAP-6620+, TGAP-6620-M12 , TGAP-W6610+-M12 , TGAR-1662+-3G/4G-M12 ,IGAR-1662+-3G

Dual Cellular : TGAR-2062+-3G-M12 , TGAR-2062+-4G-M12 , IGAR-2062+-3G

802.11P

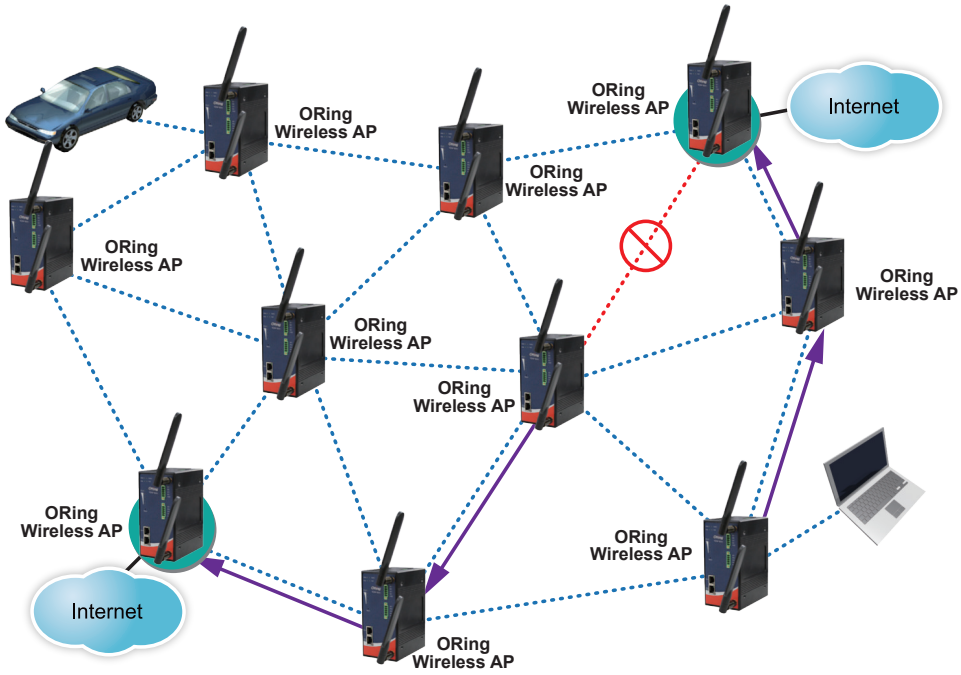
Technology Description

Modified from 802.11a, 802.11p is a standard development to ensure secure wireless communications while in a vehicular environment. Also known as WAVE, 802.11p covers communications from vehicle to infrastructure, vehicle to vehicle, and vehicle to pedestrian. This standard works in 5.9GHz band with seven channels of 10MHz, one for control and six for data services. As there is no need to associate with base stations, data can be transmitted more quickly. Furthermore, receivers have better noise rejection abilities due to no adjacent interference. The standard enables fast wireless communications in the urban road environment as well as higher transportation safety and communications reliability for moving vehicles.



Wireless X-Mesh

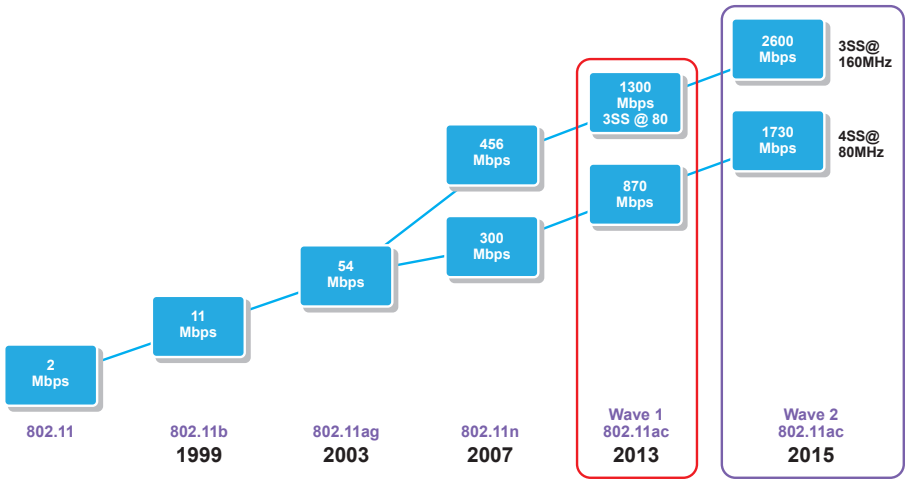
A wireless mesh network consists of several radio nodes in a mesh topology where nodes can communicate with each other even when one node ceases to operate. When a link is down, back-end system will find an available route automatically to ensure signals are transmitted to the destination. Wireless Mesh network has self-configuring and self-healing capabilities. When an AP receives signals, it will determine an optimal route to pass the signals to the next node. If the route encounters interference or hardware problems, the AP will use another route. Compared with traditional star topology, wireless mesh network can reduce traffic congestion and delays.



ORing Has Introduced Our Brand New Industrial 802.11 ac APs

Growing data traffic has led to a dramatic increase in wireless network bandwidth. The data rate in 1999 when 802.11a took place was only 54 Mbps. The speed surged to 300 Mbps in 2009 as 802.11n 2x2 MIMO technology was unveiled and further onto to 2.6 Gbps in 2014 after 3x3 MIMO 802.11ac came into being. The enhancement in data speed boils down to the development of several key technologies, such as multi-streaming, advanced modulation, increased bandwidth, and the transition from single-user to multi-user. As these technologies mature, an increasing number of 802.11ac products have emerged to meet enormous data demand.

ORing has introduced industrial 802.11ac APs with an operating temperature between 70~-25 °C. Equipped with 3x3 external antennas, the APs can provide a data rate of up to 1.3Gbps at 80MHz. To ensure reliable operation in harsh environments, the APs are housed in an IP30- or IP40-rated metal enclosure.



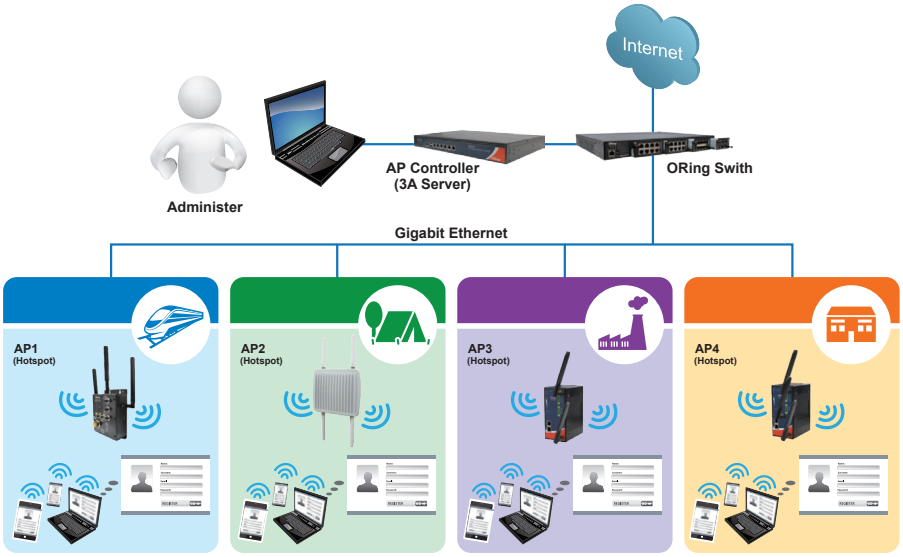
Access Point Controller

Traditionally, managing a large number of wireless APs is time-consuming. Without the ability to manage wireless APs centrally, you usually end up spending a lot of time configuring the APs one by one.

With increased coverage of wireless networks, the number of projects requiring more than 20 wireless APs is on the rise. To deploy and manage the large number of wireless APs easily, AP controllers have emerged.

An AP controller can control multiple APs at the same time with central management, configuration, and connection arrangement. Combined with hotspot and 3A authentication, the controller makes the entire wireless network more secure, convenient, scalable.

ORing's AP controllers can control many APs and configure the APs centrally, while managing firmware version and supporting hotspots and 3A servers, making Wi-Fi network deployment and management a piece of cake.



Industrial Cellular VPN Overview

ORing's wired, wireless, and wireless EN50155 Industrial Cellular VPN Routers are reliable and cost-effective routers for redirecting wired or wireless network connections to wired or wireless 3.5G modems – very useful for mobile internet connection.

All of ORing's industrial Cellular VPN Routers feature highly advanced security features for internet connection. The wireless models, with support of IEEE 802.11 wireless standard, additionally feature long communication range. Additionally, there are EN50155-certified Transporter series wireless models, making them espcially suitable for rolling stock applications.

Key Technologies

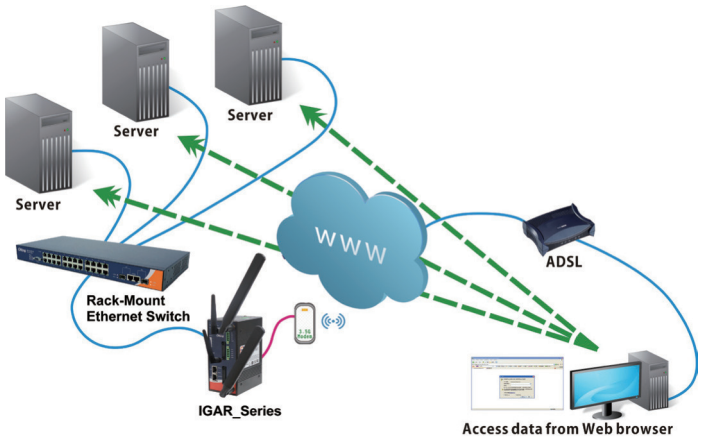
SSL VPN

Technology Description

Secure Sockets Layer virtual private network (SSL VPN) is a kind of VPN that runs on Secure Socket Layers technology and is accessible via https over web browsers. It permits users to establish safe and secure remote access sessions from any Internet connected browser. SSL functions between the Transmission Control Protocol (TCP) layer and application layer protocols. Traditional VPN requires the installation of IPsec client software on a client machine before a connection is established whereas SSL VPN has no such requirement. Corporate users are able to access confidential applications or share files on standard web browsers.

SSL VPN Benefits

The main benefit of SSL VPN technology is that since it is user-based, not device-based. Any authorized user can login from web-enabled PCs for secure, remote access of confidential files. The safety issues are similar to SSL-based credit card online transactions through standard web browsers.



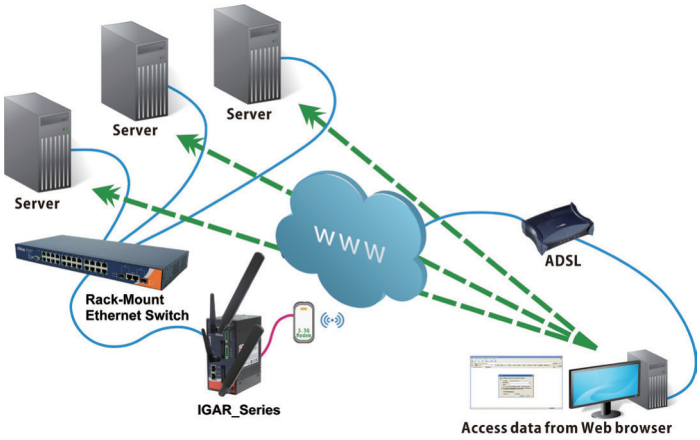
IPsec VPN

Technology Description

Internet Protocol Security (IPsec) is a protocol suite for securing Internet Protocol (IP) communications by authenticating and encrypting each IP packet of a data stream. IPsec also includes protocols for establishing mutual authentication between agents at the beginning of the session and negotiation of cryptographic keys to be used during the session. IPsec can be used to protect data flows between a pair of hosts (e.g. computer users or servers), between a pair of security gateways (e.g. routers or firewalls), or between a security gateway and a host.

IPsec VPN Benefits

IPsec is a dual mode, end-to-end, security scheme operating at the Internet Layer of the Internet Protocol Suite or OSI model Layer 3. IPsec can be used for protecting any application traffic across the Internet.



PPPoE and DDNS for Internet Connection

Technology Description

PPPoE (Point-to-Point Protocol over Ethernet) is a network protocol for encapsulating Point-to-Point Protocol (PPP) frames inside Ethernet frames. It is used mainly with DSL services where individual users connect to the xDSL modem over Ethernet. to build up network connection.

DDNS (Dynamic Domain Name Server) is a method, protocol, or network service that provides the capability for a networked device using the Internet Protocol Suite, such as an IP router or computer system, to notify a domain name server to change, in real time, the active DNS configuration of its configured hostnames, addresses or other information stored in DNS. When getting the connection through PPPoE and the IP address is floated, end users may not configure device server. However, through DDNS method, it's easy for different IP domain users to connect to IR/IAR/TAR series device servers.

PPPoE Benefits

PPPoE enables clients to adopt the traditional dial-up access mode, which allows end users to use the familiar hardware and similar software to access the Internet. Moreover, clients can also use Ethernet adapters to connect PCs and xDSL modems, which allow PCs to share xDSL lines and thus saves investment.

DDNS Benefits

With DDNS, there is no need to go from PC to PC setting up static addresses every time your network infrastructure changes. Moreover, you only need the addresses that would be used simultaneously, rather than having one for every possible user of IP.

Networking Protection

Technology Description

ORing's industrial routers offer comprehensive security features to keep the network well-protected. First of all, ORing routers support the following data encryption schemes:

WEP/WPA/WPA-PSK(TKIP,AES)/ WPA2/WPA2 Personal/WPA2 Enterprise

These encryption schemes prevent hackers from deciphering data (and hence steal the contents) during wireless transmission.

HTTPs

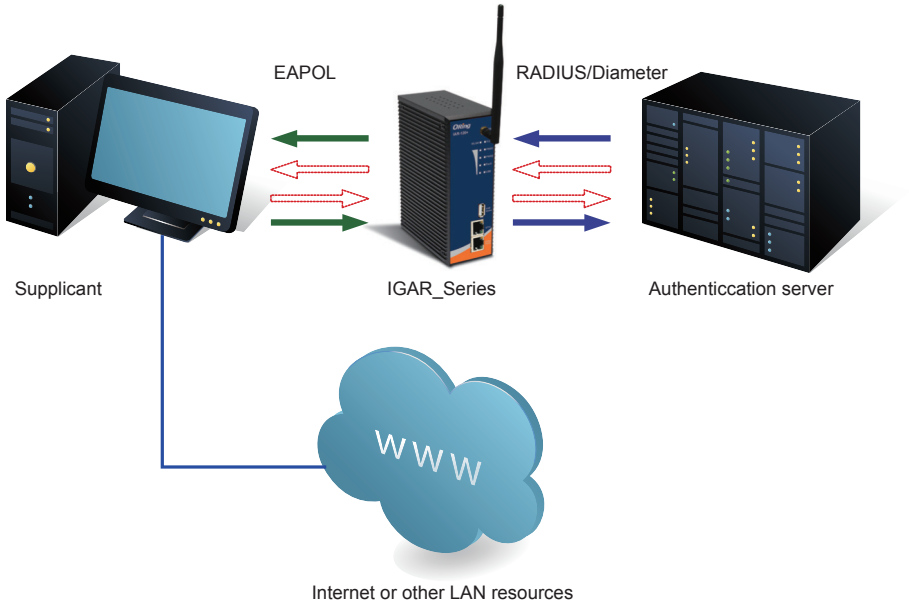
Provides encrypted communication and secure identification of a network web server. HTTPs is very useful for secure network management as well as transmission of sensitive data.

IP Table

Prevents access from unauthorized IP address.

PSK(TKIP,AES)/802.1X Authentication

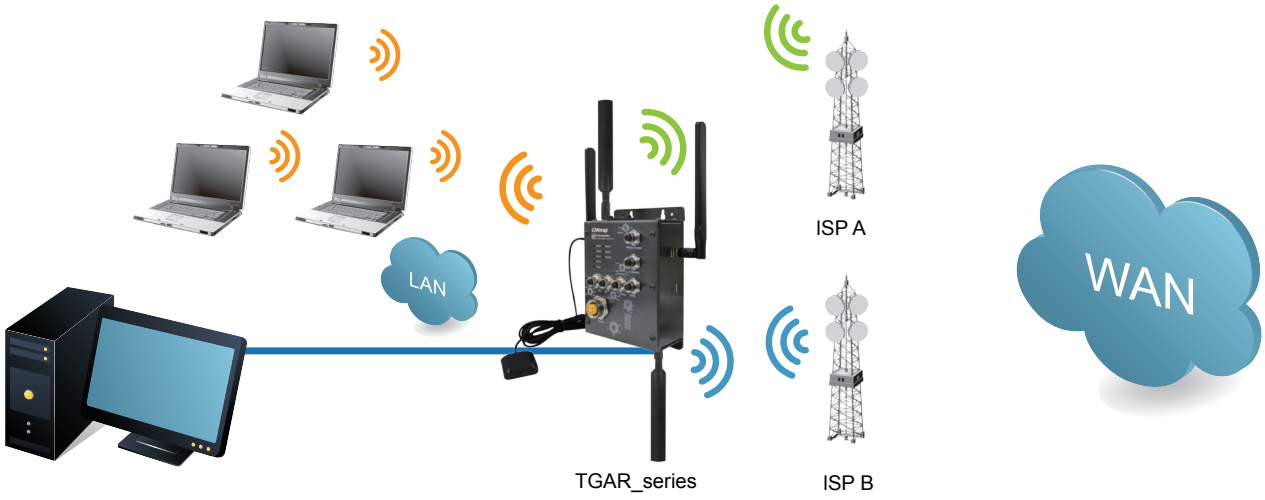
These schemes act as security guards to the network, supporting service identification and optional point to point encryption over the local LAN segment.



Load balance

Technology Description

Load balancing distributes traffic across multiple broadband connections such as multiple 3G/4G links when a single resource is overloaded to enhance the scalability and availability of mission critical, IP-based services. Load balancing can also achieve redundancy when one or more connections fail and hence increase network reliability. Session Load Balancing assigns each session to one of the cellular connections. Normally, all connections are used simultaneously. When one of the connections fails, all traffic is sent over the remaining connections. Once the failed connection recovers, traffic will be returned to that connection.



GPS Function

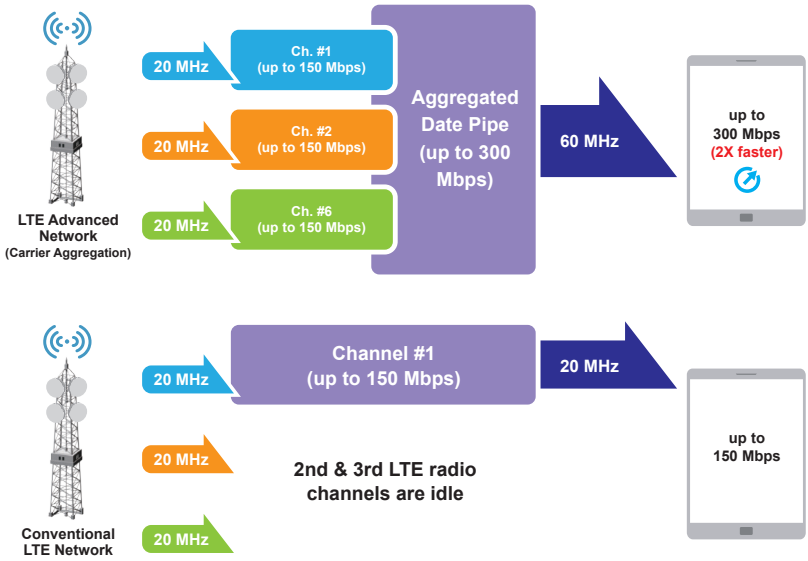
Technology Description

- Supports GPS position function
- Works on 1575.42MHz
- No transmission, only receive
- Three or more satellites obtains obtain an accurate result
- Actives GPS antenna

ORing Launches New Generation 4G LTE Router

LTE has become the mainstream mobile communications standard in many countries. The technology is used not only in mobile devices but also in network communications equipment. Mobile communications technology has moved from the earliest 2G GSM to 3G HSPA, LTE, and the most recent LTE-Advanced (LTE-A), resulting in massive data traffic. In terms of data rate, existing UE (User Equipment) Category 1 – 5 are for LTE standard and UE Category 6 with a uplink/downlink speed of 300/50Mbps are for LTE-A. The key technology of LTE-A is CA (Carrier Aggregation) which aggregates multiple LTE carriers to increase data capacity.

ORing has launched a new generation 4G LTE router featuring a rugged design and 802.11a /b/g/n support. As a Category 6 UE, the router guarantees a faster data rate.



Accessories Overview

ORing has all the industrial networking components for all the small but indispensable industrial networking needs: antennas, cables, fiber patch cords and adapters, connectors, power supplies and adapters, surge protectors, plus Ethernet SFP and BIDI-SFP modules.

Network Management Software & Controller Overview

For facilitated and user-friendly network administration, ORing proudly presents the powerful Network Management Software — Open-Vision, which is the outstanding suite of 3 humanized network management tools: ORing Commander, ORing Topology View (with integrated ORing MAP), and ORing Host Monitoring.

With Open-Vision, the network administrator can enjoy centralized configuration, visualized management, and complete network monitoring with early warning system, as these features help the network administrator maintain stable and reliable industrial network.

Key Technologies

Centralized Management

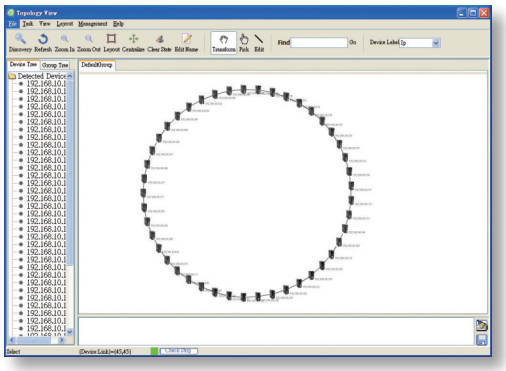
Technology Description

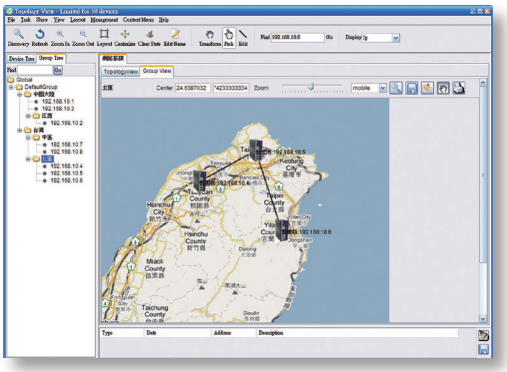
Open-Vision helps the administrator in configuring all ORing's Ethernet switches at once within a few steps by powerful application wizards in ORing Commander: IP Setting Wizard, Firmware Upgrade Wizard, and Redundant Ring (O-Ring) Group Wizard (in ORing Commander). The administrators do not need to configure the managed switches one by one anymore.

Visualized Management

Technology Description

ORing's Topology View can show up the complex topologies of all of ORing's Ethernet switches in the local network. Further, different switches can be grouped by different IPs and to be shown in different topology windows. Thus, administrators need not to monitor all of the switches in the local network at once, which makes the job of monitoring easier and more efficient. On the other hand, the health status of the connections will be shown on by different colors. ORing topology view helps the administrators to do the management visualizely, intuitively, and more efficiently.



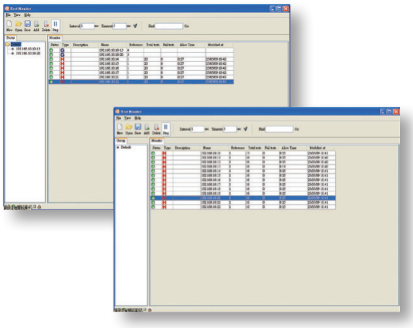


Complete Monitor

Technology Description

ORing-Vision has various mechanisms to monitor the statuses of ORing's switches, including event log, and SNMP traps. The administrators will be informed the occurrences of any abnormal events by email, and the list of event log could be exported as an excel file. Moreover, the configurations of all ORing's switches can be saved and the status of configurations of all switches in local network can be scanned regularly to detect any changes of the configurations. Hence, administrators could know any unexpected changes of the configurations of switches. On the other hand, ORing Host monitor can automatically ping and check the health statuses of connections among all IP-based devices in local area network. Host Monitor also features IP categorized function, and all of IP-based devices can be grouped by the different IPs and to be monitored.

The topology view function has been integrated in the DMG-S15 cloud server which will detect device status automatically and show the topology of all connected switches on the network.



Early Warning

Technology Description

Based on the various monitor mechanisms, if any failure is occurred in the network, administrators can be informed at a very early stage.

Industrial IOT Overview

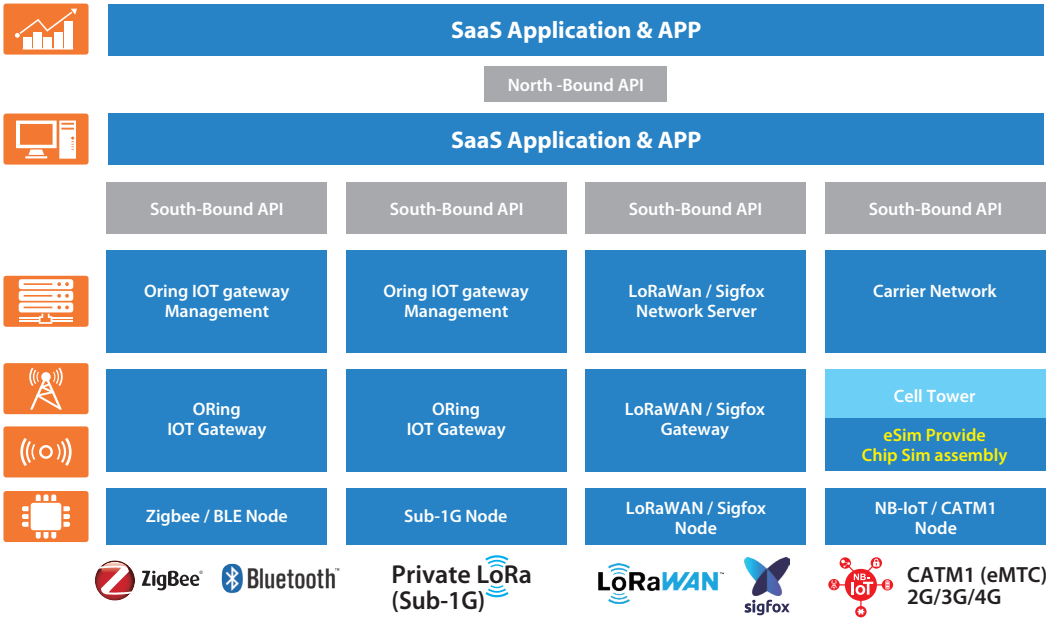
The Industrial Internet of Things (IIoT) is the key object in the past two years. What is IIoT ? What are the differences between IoT and IIoT ? At first, we should specify the IoT before making a statement about the IIoT. The IoT is composed by a network of intelligent computers, devices, and huge amounts of collecting data. The collected data is sent to the cloud central service where can be amounted to other data and then provided to end users with an optimizing solution. The IoT will connect each autonomous device in homes, schools, stores and industries.

The application of the IoT to the field of manufacturing industry is called IIoT. The IIoT will be the revolution in the manufacturing industry. It can greatly improve connectivity, efficiency, scalability, time and cost saving for the industrial organizations. The most important thing, IIoT networks of intelligent devices provides industrial organizations to break open data silos and connect all of their data and processes from factory to offices. Trough IIoT data analyzing also helps business development to clarify how their enterprise is doing, which makes them to do the better decisions.

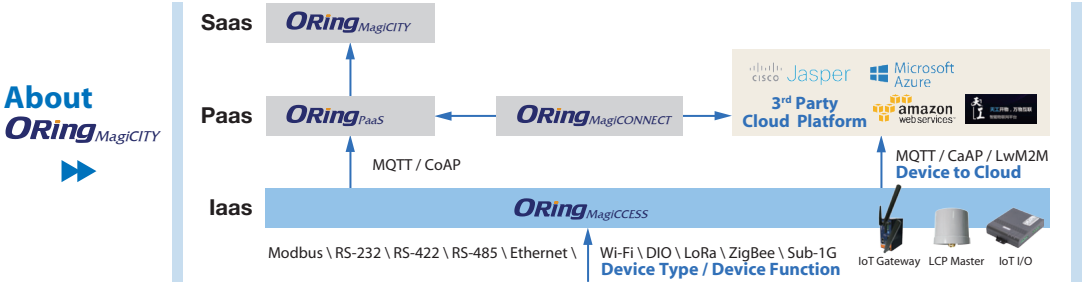
The IIoT is considered to be an up-going trend in the future. **ORing Industrial Networking Corp.** is based on our strong experience of developing wireless communication technology. We incorporated our technological strength with our products – gateways, I/O modules, smart antennas, cloud service platform and APP to provide a total IIoT solution. Potential environmental IIoT applications are growing such as Wi-Fi hotspots, PM2.5 air quality detection, urban marketing, and real-time surveillance systems. More business opportunities can be found in tremendous IIoT solutions and we are looking forward to inviting our ambitious customers to join us.

Key Technologies

ORing Solution for variant IIoT technologies



ORing IIoT Platform Technologies

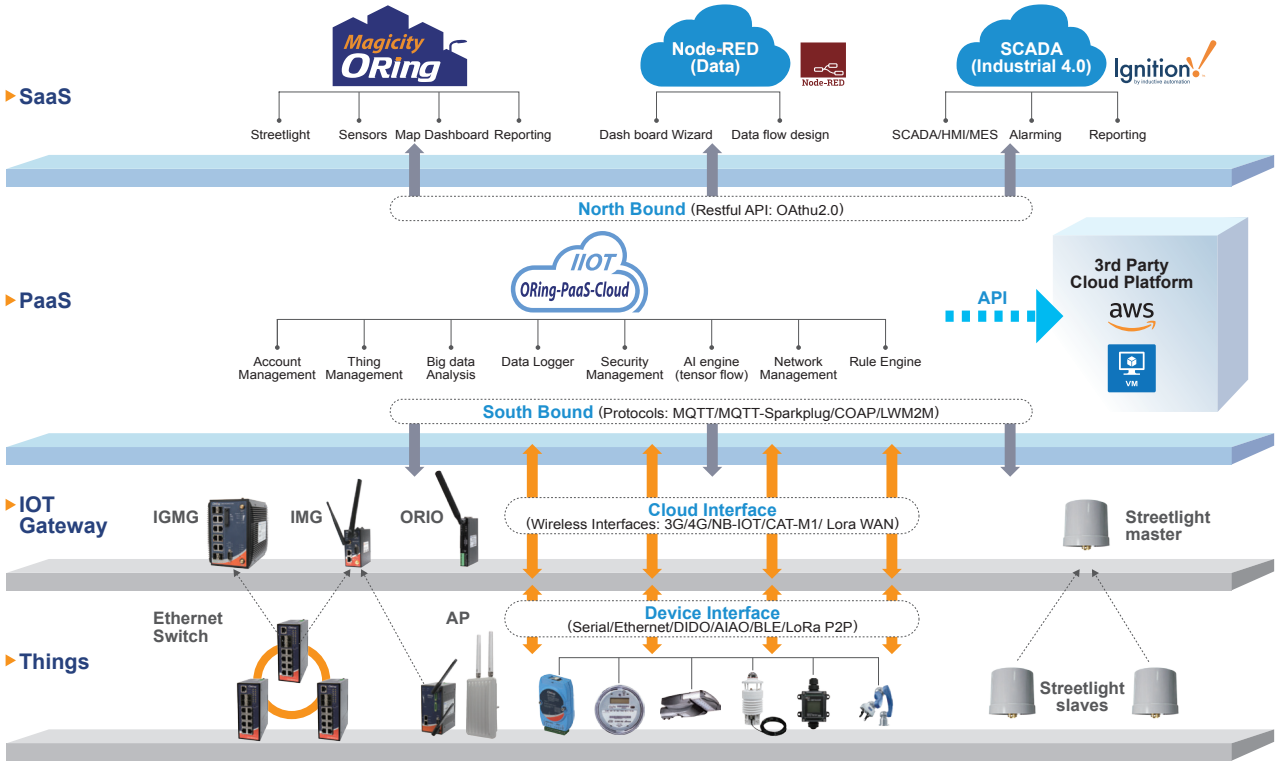


ORing MagiCloud Overview

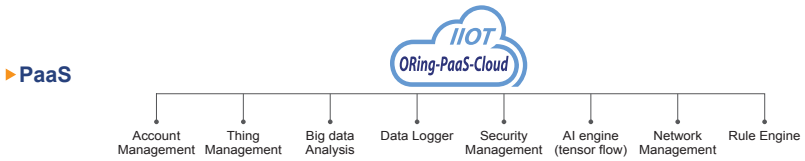
The ORing MagiCloud is a powerful managed cloud platform designed for industrial applications. With support for Modbus-RTU and ModBus-TCP, you can easily connect your devices to the platform and interact with cloud applications and other devices.

The ORing MagiCloud supports billions of devices and routes data to applications or other devices securely and reliably. Along with the ORing IIoT, REST API will be provided to help you track your device connectivity and access data from all of your devices anytime, even if they are offline.

ORing IIoT Roadmap



Functional Block



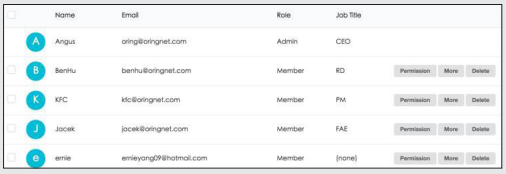
Key Technologies

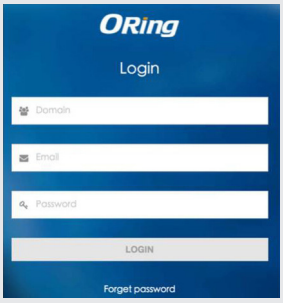
Dashboard Embedded

■ Clear Dashboard and notifications tell you what you should do today

Organization Based

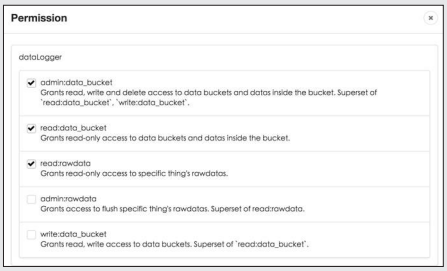
■ Each organization owns one domain name, login your domain to manage your organization





Simple Authorization Management

■ ORing Account Management is built with ACL and OAuth 2.0 which keeps account management, permission setup and authorization more easily.



Connect, Just in a Finger

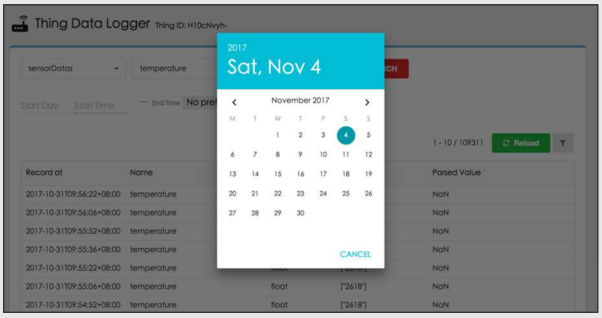
■ With ORing PaaS device management, view the device status and much more information, just at a glance.

Multiple IoT Protocol Supported

■ HTTPs, Socket, WebSocket, MQTT, CoAP and LwM2M

Data, No More Confusion

■ ORing Data Logger assists you to collect and organize your precious data, and also help you synchronize data to your database.



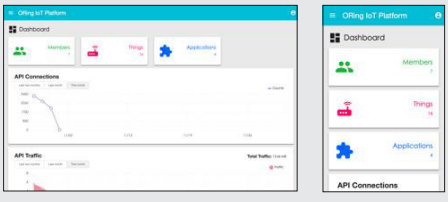
Multiple IoT Protocol Supported

■ SQL and NoSQL database

Cross Platform Multiple Resolution Support

■ Support PC, Laptop, Pad, smart phone and even your smart watch

■ Support Linux, MAC, Windows, iOS and android



Connect your device to ORing PaaS

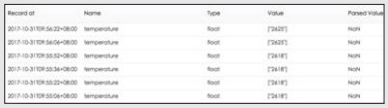
■ Just three steps, create, link and you can see your data on ORing PaaS

Create

Link

MQTT CoAP

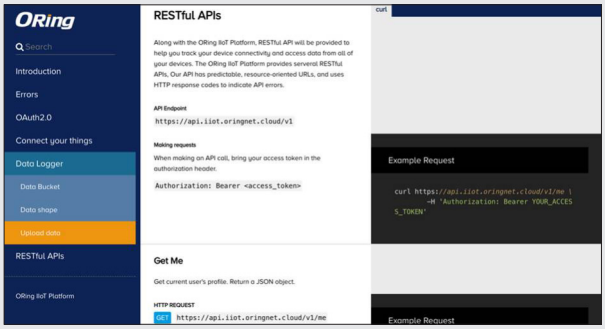
Upload



Developer Portal

■ Powerful API let you develop your own application in a short time

ORing MagiCITY
ORing Market Place
ORing Sensor Network
ORing Hotspot



ORing MagiCity

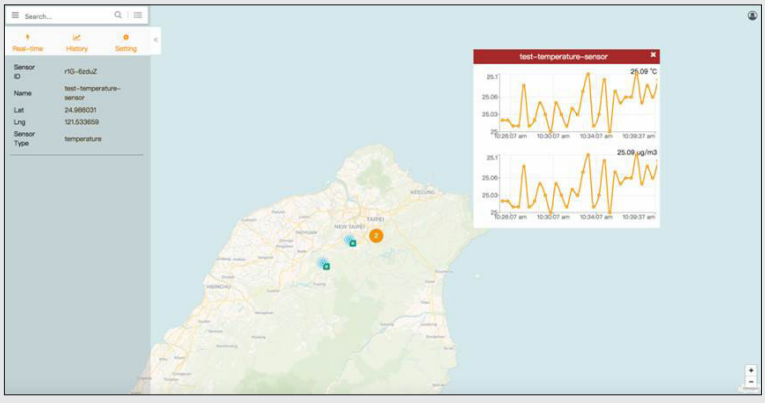
ORing MagiCITY is designed for Smart City Management. MagiCity integrates all the devices you need to interactively manage your smart city, such as smart lighting controls, sensor data loggers, smart meters, and smart trackers. MagiCity has a simple and clear user interface that make it easy for busy city managers to keep their smart city safe and cost efficient.

Sensor, Monitor, Log and Threshold

■ Real time monitoring you data

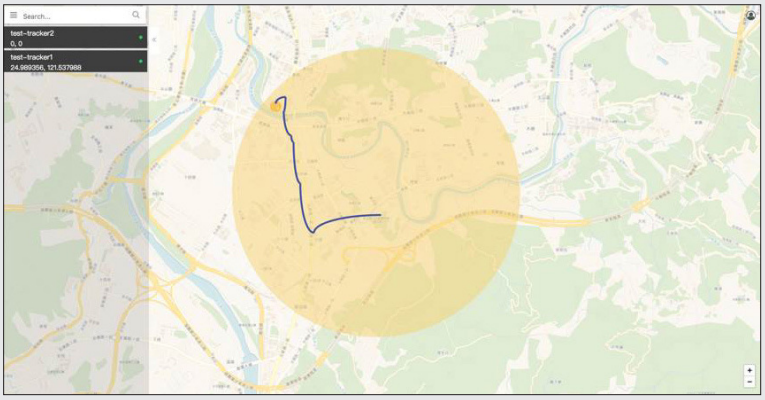
■ Export data or data base migration

■ Set threshold value to alarm nearby citizen



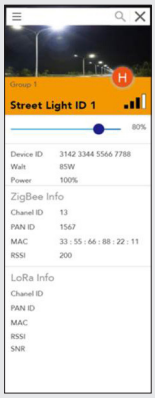
Tracker, Period, Path and S-Zone

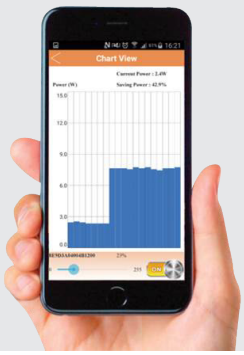
- Periodically report GPS
- Draw the path on your map
- Set S-Zone, Security zone to prevent target ran out of the range



Street Light, Install, Adjust and Repair

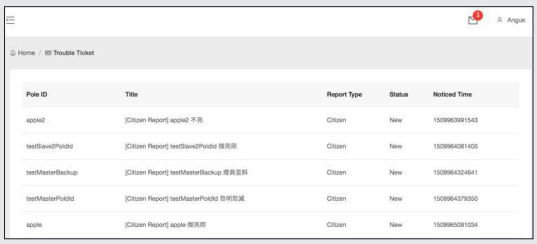
- Powerful, process-based solution for your city's streetlight, from site survey, Construction map, power management, adjustment to repairing process

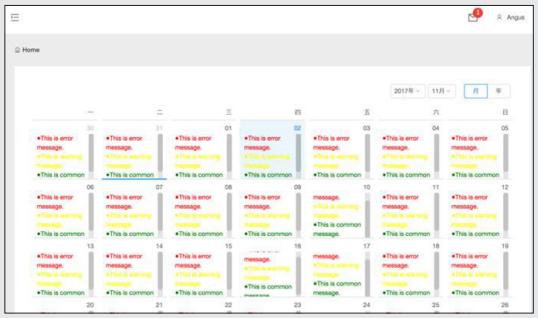




Street Light, Issue Report System

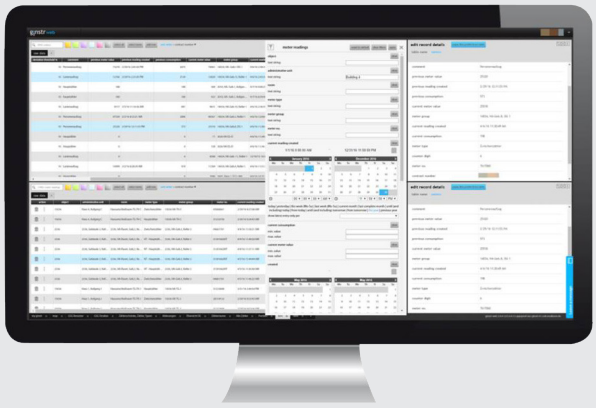
- Every time when you login to system, At calendar, it tells you what should be done within today. When you manipulate system, it will appears notification when something happend





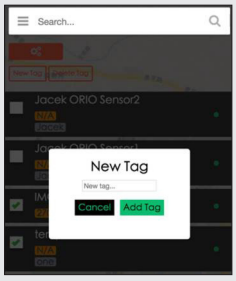
The Needs of Your Citizen, Gas, Water and Meter

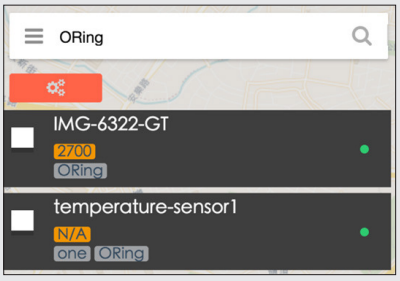
- Remote meter monitoring
- Can be implemented on a "per-customer" basis
- Data can be synchronized to your other city programs and generate bill automatically



Powerful Search Mechanism, Easier to Find Your Device

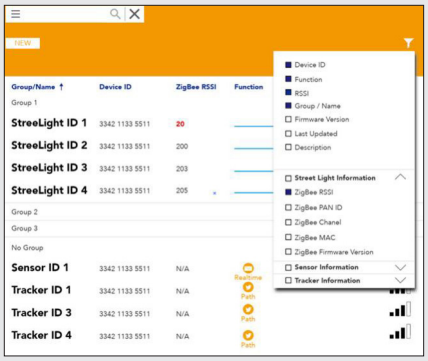
- Support ID search and Tag Search
- One device can have up to 10 tags
- Multi-Dimension array algorithm, reduce the searching time





Easy Way to Fetch, Organizing Data

- A user-friendly interface, keep you fetch your data and sort it to report in a short time.



Product Selection Guide

	Industrial Rack-Mount Gigabit/Fast Ethernet Switch Managed Switch		
Industrial Ethernet Switch			
	RGS-92222GCP-NP / RGS-92222GCP-NP-E	RGS-9168GCP / RGS-9168GCP-E	RGS-9244GP / RGS-9244GP-E
Port Number			
Number of ports	26	24	28
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	22	-	24
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports		-	-
100Base-FX SFP Ports	-	-	-
100/1000Base-X SFP Ports	2	8	4
Gigabit Combo Ports	2	16	-
Power Redundancy			
DC Terminal Block	- / 2 (-E)	2 (-E)	2 (-E)
DC Power Jack	-	-	-
AC Power Cord	1 / 1	1	1
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	-	-	-
Rack Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-20	IP-20	IP-20
Dimensions (mm)	443.7(W)x200(D)x44(H) / 431(W)x342(D)x44(H)	431(W)x342(D)x44(H)	431(W)x342(D)x44(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	-	-	-
-40 to 75°C	●	●	●
Network Redundancy			
O-Ring	●	●	●
Open-Ring	●	-	-
O-Chain	●	●	●
MRP*NOTE	●	●	●
MSTP/STP/RSTP	●	●	●
Management and Control			
802.1X	●	●	●
Rate Limit	●	●	●
Port Mirror	●	●	●
Port Security	●	●	●
IGMP v2/v3	●	●	●
QoS Port Base/COS/TOS	●	●	●
Port Trunk Static/LACP	●	●	●
LLDP	●	●	●
System Alarm	SYSLOG / SNMP Trap / SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap / Relay
DHCP	Server / Client	Server / Client	Server / Client
VLAN	802.1Q	802.1Q	802.1Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years		

*NOTE: This function is available by request only

Product Selection Guide

	Industrial Rack-Mount Fast Ethernet Switch	
	Managed Switch	Layer 3 Switch
Industrial Ethernet Switch		
	RES-9242GC	RES-P9242GCL Series
Port Number		
Number of ports	26	26
10/100Base-T(X) RJ45 Ports	24	24
10/100/1000Base-T(X) Ports	-	-
100Base-FX SFP Ports	-	-
100/1000Base-X SFP Ports	-	-
Gigabit Combo Ports	2	2
Power Redundancy		
DC Terminal Block	-	2(AC/DC)
DC Power Jack	-	-
AC Power Cord	2	-
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	-	-
Rack Mounting	●	●
Physical Characteristics		
Casing Protection	IP-20	IP-20
Dimensions (mm)	440(W) x 200(D) x 44(H)	443.7(W) x 262.7(D) x 44(H)
Operating Temperature		
-40 to 70°C	-	-
-40 to 75°C	-	-
-40 to 85°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP/STP/RSTP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
System Alarm	SYSLOG / SNMP Trap	SYSLOG / SNMP Trap
DHCP	Server / Client	Server / Client
VLAN	802.1Q	802.1Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

	Industrial Rack-Mount Modular Ehernet Switch	
	Manageed Switch	
Industrial Ethernet Switch		
	RGS-PR9000	RGS-P9000
Port Number		
Number of ports	Max:28	Max:28
10/100/1000Base-T(X) Ports	-	-
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
100/1000Base-X SFP Ports	-	-
1G/10G SFP+ Ports	-	-
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2(LV)	2(LV)
DC Power Jack	-	-
AC Power Cord	2(HV)	2(HV)
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	-	-
Rack Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	440(W) x 356(D) x 44(H)	440(W) x 356(D) x 44(H)
Operating Temperature		
-20 to 60°C	-	-
-40 to 70°C	-	-
-40 to 85°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP(RSTP/STP Compliant)	●	●
Management and Control		
Static Routing / RIP /VRRP	●	-
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
Static Routing	●	-
IEEE 1588v2	●	●
System Alarm	SYSLOG / SNMP Trap / Relay	Relay/SYSLOG / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch	Industrial Rack-Mount Modular Ehernet Switch		
	Manageed Switch		
			
	RGS-P9160GCM1	RGS-R9244GP+/-E	
Port Number			
Number of ports	Max:24	Max:24	
10/100/1000Base-T(X) Ports	-	-	
100Base-FX Fiber Ports	-	-	
1000Base-X Fiber Ports	-	16	
100/1000Base-X SFP Ports	-	-	
1G/10G SFP+ Ports	-	-	
Gigabit Combo Ports	16	-	
Power Redundancy			
DC Terminal Block	-	-	2(-E)
DC Power Jack	-	-	-
AC Power Cord	-	1	1
Installation			
DIN-Rail Mounting	-	-	
Wall Mounting	-	-	
Rack Mounting	●	●	
Physical Characteristics			
Casing Protection	IP-30	IP-30	
Dimensions (mm)	440(W) x 325(D) x 44(H)	431 (W) x 342 (D) x 44 (H)	
Operating Temperature			
-20 to 60°C	-	●	
-40 to 70°C	-	-	
-40 to 85°C	●	-	
Network Redundancy			
O-Ring	●	●	
O-Chain	●	●	
MRP*NOTE	●	●	
MSTP(RSTP/STP Compliant)	●	●	
Management and Control			
Static Routing / RIP /VRRP	-	●	
802.1X	●	●	
Rate Limit	●	●	
Port Mirror	●	●	
Port Security	●	●	
IGMP v2/v3	●	●	
QoS Port Base/COS/TOS	●	●	
Port Trunk Static/LACP	●	●	
LLDP	●	●	
Static Routing	-	●	
System Alarm	SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap / Relay	
DHCP	Server / Client	Server / Client / Relay	
VLAN	802.1Q	Port-Based / 802.1Q / Q-in-Q	
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	
Warranty	5 years		

Product Selection Guide

	Industrial Rack-Mount Modular Ethernet Switch			
	Accessories Module			
Industrial Ethernet Switch				
	SWM-80GT	SWM-08GP	SWM-04GP+_4	SWM-02GP+_4
Port Number				
Number of ports	8	8	4	2
10/100/1000Base-T(X) Ports	8	-	-	-
100Base-FX Fiber Ports	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-
100/1000Base-X SFP Ports	-	8	-	-
10G SFP+ Ports	-	-	4	2
Gigabit Combo Ports	-	-	-	-
Power Redundancy				
DC Terminal Block	-	-	-	-
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	-	-	-	-
Rack Mounting	Module Plug-in	Module Plug-in	Module Plug-in	Module Plug-in
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	99(W) x 122(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)	86.7(W) x 151.5(D) x 40.8(H)	86.7(W) x 151.5(D) x 40.8(H)
Operating Temperature				
-20 to 60°C	-	-	●	●
-40 to 85°C	●	●	-	-
Network Redundancy				
O-Ring	-	-	-	-
Open-Ring	-	-	-	-
O-Chain	-	-	-	-
MRP*NOTE	-	-	-	-
MSTP(RSTP/STP Compliant)	-	-	-	-
Management and Control				
802.1X	-	-	-	-
Rate Limit	-	-	-	-
Port Mirror	-	-	-	-
Port Security	-	-	-	-
IGMP v2/v3	-	-	-	-
QoS Port Base/COS/TOS	-	-	-	-
Port Trunk Static/LACP	-	-	-	-
LLDP	-	-	-	-
Static Routing	-	-	-	-
IEEE 1588v2	-	-	-	-
System Alarm	-	-	-	-
DHCP	-	-	-	-
VLAN	-	-	-	-
Management / Configuration	-	-	-	-
Warranty	5 years			

Product Selection Guide

	Industrial Rack-Mount Modular Ethernet Switch			
	Accessories Module			
Industrial Ethernet Switch				
	SWM-04FX-MM-SC	SWM-04FX-MM-ST	SWM-04FX-SS-SC	SWM-04FX-SS-ST
Port Number				
Number of ports	4			
100Base-FX Fiber Ports	4			
Power Redundancy				
DC Terminal Block	-	-	-	-
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	-	-	-	-
Rack Mounting	Module Plug-in	Module Plug-in	Module Plug-in	Module Plug-in
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	99(W) x 122(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)	86.7(W) x 151.5(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)
Operating Temperature				
-40 to 70°C	-	-	-	-
-40 to 85°C	•	•	•	•
Network Redundancy				
Fiber mode	multi-mode	multi-mode	single-mode	single-mode
Connector Type	SC	ST	SC	ST
Data Rate	100Mbps	100Mbps	100Mbps	100Mbps
Typical Distance	2km	2km	30km	30km
Wavelength	1310nm	1310nm	1310nm	1310nm
Optical Output Power 9/125µm fiber (Max. TX)	-	-	-8dbm	-8dbm
Optical Output Power 9/125µm fiber (Min. TX)	-	-	-15dbm	-15dbm
Optical Output Power 62.5/125 µmfiber (Max. TX)	-14dbm	-14dbm	-	-
Optical Output Power 62.5/125 µmfiber (Min. TX)	-20dbm	-20dbm-	-	-
Optical Output Power 50/125µm fiber (Max. TX)	-14dbm	-14dbm	-	-
Optical Output Power 50/125µm fiber (Min. TX)	-23.5dbm	-23.5dbm	-	-
Optical Input Power-minimum (Sensitivity)	-31dbm	-31dbm	-34dbm	-34dbm
Optical Input Power-maximum (Saturation)	0dbm	-8dbm	0dbm	0dbm
Link Budget	7.5db	8.5db	19db	19db
Warranty	5 years			

Product Selection Guide

	Industrial Rack-Mount Modular Ethernet Switch			
	Accessories Module			
Industrial Ethernet Switch				
	SWM-04GF-MM-SC	SWM-04GF-MM-ST	SWM-04GF-SS-SC	SWM-04GF-SS-ST
Port Number				
Number of ports	4			
1000Base-X Fiber Ports	4			
Power Redundancy				
DC Terminal Block	-	-	-	-
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	-	-	-	-
Rack Mounting	Module Plug-in	Module Plug-in	Module Plug-in	Module Plug-in
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	99(W) x 122(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)	99(W) x 122(D) x 40.8(H)
Operating Temperature				
-40 to 70°C	-	-	-	-
-40 to 85°C	•	•	•	•
Network Redundancy				
Fiber mode	multi-mode	multi-mode-	single-mode	single-mode
Connector Type	SC	ST	SC	ST
Data Rate	1GMbps	1GMbps	1GMbps	1GMbps
Typical Distance	550m	550m	10km	10km
Wavelength	850nm	850nm	1310nm	1310nm
Optical Output Power 9/125μm fiber (Max. TX)	-	-	-3dbm	-3dbm
Optical Output Power 9/125μm fiber (Min. TX)	-	-	-9.5dbm	-9.5dbm
Optical Output Power 62.5/125 μmfiber (Max. TX)	-4dbm	-4dbm	-	-
Optical Output Power 62.5/125 μmfiber (Min. TX)	-9.5dbm	-9.5dbm-	-	-
Optical Output Power 50/125μm fiber (Max. TX)	-4dbm	-4dbm	-	-
Optical Output Power 50/125μm fiber (Min. TX)	-9.5dbm	-9.5dbm	-	-
Optical Input Power-minimum (Sensitivity)	-18dbm	-18dbm	-20dbm	-20dbm
Optical Input Power-maximum (Saturation)	0dbm	-8dbm	0dbm	0dbm
Link Budget	8.5db	8.5db	10.5db	10.5db
Warranty	5 years			

Product Selection Guide

Industrial Ethernet Switch	 IGS-9822DGP+	 IGS-9812GP	 IGS-9168GP
Port Number			
Number of ports	12	20	24
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	8	8	16
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
1000Base-X SFP Ports	-	-	-
100/1000Base-X SFP Ports	-	12	8
100/1G/2.5GBase-X SFP Ports	2	-	-
1G/10GBase-X SFP Ports	2	-	-
Gigabit Combo Ports	-	-	-
Power Redundancy			
DC Terminal Block	2	2	2
DC Power Jack	-	-	-
AC Power Cord	-	-	-
Installation			
DIN-Rail Mounting	●	●	●
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	74.3(W)x125(D)x153.6(H)	96.4(W)x105.5(D)x154(H)	96.4(W)x105.5(D)x154(H)
Operating Temperature			
-20 to 60°C	-	-	-
-40 to 75°C	●	●	●
Network Redundancy			
O-Ring	●	●	●
O-Chain	●	●	●
MRP*NOTE	-	●	●
MSTP/RSTP/STP	●	●	●
Management and Control			
802.1X	●	●	●
Rate Limit	●	●	●
Port Mirror	●	●	●
Port Security	●	●	●
SNMP v1/v2/v3	●	●	●
IGMP v2/v3	●	●	●
QoS Port Base/COS/TOS	●	●	●
Port Trunk Static/LACP	●	●	●
LLDP	●	●	●
IEEE 1588v2	-	●	●
System Alarm	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay
DHCP	Server / Client/ Relay	Server / Client/ Relay	Server / Client/ Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet / Console(CLI)
Warranty			

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch		
		
	IGS-9122GP	IGS-9084GP
Port Number		
Number of ports	14	12
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	12	8
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
1000Base-FX SFP Ports	-	-
100/1000Base-X SFP Ports	2	4
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	-	-
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	●	●
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	74.3(W)x109.2(D)x153.6(H)	74.3(W)x109.2(D)x153.6(H)
Operating Temperature		
-10 to 60°C	-	-
-40 to 70°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
SNMP v1/v2/v3	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	●
System Alarm	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay
DHCP	Server / Client/ Relay	Server / Client/ Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty		

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch	Industrial Din-Rail Gigabit Ethernet Switch Managed Switch	
		
	IGS-9084GP-FB2 Series	IGS-9084GP-LA
Port Number		
Number of ports	12	12
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	8	8
100Base-FX Fiber Ports	-	-
Fiber bypass Ports	2	-
1000Base-FX SFP Ports	-	-
100/1000Base-X SFP Ports	4	4
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	--	-
AC Power Cord		-
Installation		
DIN-Rail Mounting	●	●
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	96.4(W)x105.5(D)x154(H)	54.3(W)x108.3(D)x145.1(H)
Operating Temperature		
-10 to 60°C	-	-
-40 to 70°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
SNMP v1/v2/v3	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	●
System Alarm	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay
DHCP	Server / Client/ Relay	Server / Client/ Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch		
		
	IGS-R9812GP	IGS-RX164GP+
Port Number		
Number of ports	20	20
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	8	16
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
1000Base-FX SFP Ports	-	-
100/1000Base-X SFP Ports	12	-
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	-	-
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	●	●
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	96.4(W)x145.5(D)x154(H)	96.4(W)x170(D)x180(H)
Operating Temperature		
-40 to 60°C	-	●
-40 to 70°C	-	-
-40 to 75°C	●	-
Network Redundancy		
O-Ring	●	●
Open-Ring	●	-
O-Chain	●	●
MRP*NOTE	●	-
MSTP/RSTP/STP	●	●
Management and Control		
Static Routing/RIP/VRRP	SYSLOG/ SNMP Trap / Relay	
802.1X	●	
Rate Limit	●	
Port Mirror	●	
Port Security	●	
SNMP v1/v2/v3	●	
IGMP v2/v3	●	
QoS Port Base/COS/TOS	●	
Port Trunk Static/LACP	●	
LLDP	●	
IEEE 1588v2	●	
System Alarm	SYSLOG/ SNMP Trap / Relay	
DHCP	Server / Client/ Relay	
VLAN	Port-Based / 802.1Q / Q-in-Q	
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	
Warranty		

*NOTE: This function is available by request only

Product Selection Guide

	Industrial Din-Rail Gigabit Ethernet Switch			
	Managed Switch			
Industrial Ethernet Switch				
	IGS-P9812GP Series	IGS-P9164GF / FX / GC Series		
Port Number				
Number of ports	20	20		
10/100Base-T(X) RJ45 Ports	-	-		
10/100/1000Base-T(X) Ports	8	16		
100Base-FX Fiber Ports	-	-	4	-
1000Base-X Fiber Ports	-	4	-	-
1000Base-X SFP Ports	-	-	-	-
100/1000Base-X SFP Ports	12	-	-	-
Gigabit Combo Ports	-	-	-	4
Power Redundancy				
DC Terminal Block	2 (LV)	2 (LV)		
DC Power Jack	-	-		
AC Power Cord	2 (HV)	2 (HV)		
Installation				
DIN-Rail Mounting	•	•		
Wall Mounting	•	•		
Physical Characteristics				
Casing Protection	IP-30	IP-30		
Dimensions (mm)	115(W)x159(D)x154(H)	115(W)x159(D)x154(H)		
Operating Temperature				
-10 to 60°C	-	-		
-40 to 70°C	-	-		
-40 to 75°C	•	•		
-40 to 85°C	-	-		
Network Redundancy				
O-Ring	•	•		
Open-Ring	•	•		
O-Chain	•	•		
MRP*NOTE	•	•		
MSTP/RSTP/STP	•	•		
Management and Control				
Static Routing/RIP/VRRP	•	-		
802.1X	•	•		
Rate Limit	•	•		
Port Mirror	•	•		
Port Security	•	•		
SNMP v1/v2/v3	•	•		
IGMP v2/v3	•	•		
QoS Port Base/COS/TOS	•	•		
Port Trunk Static/LACP	•	•		
LLDP	•	•		
IEEE 1588v2	•	•		
System Alarm	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay		
DHCP	Server / Client/ Relay	Server / Client/ Relay		
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q		
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)		
Warranty	5 years			

*NOTE: This function is available by request only

Product Selection Guide

		Industrial DIN-Rail Gigabit Ethernet Switch		
		Managed Switch		Unmanaged Switch
Industrial Ethernet Switch				
	IGS-3032GC	IGS-182GP	IGS-C1050	IGS-C1080
Port Number				
Number of ports	5	8	5	8
10/100Base-T(X) RJ45 Ports	-	-	-	-
10/100/1000Base-T(X) Ports	3	8	5	8
100Base-FX Fiber Ports	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-
1000Base-X SFP Ports	-	-	-	-
100/1000Base-X SFP Ports	-	2	-	-
Gigabit Combo Ports	2	-	-	-
Power Redundancy				
DC Terminal Block	2	2	1	1
DC Power Jack	1	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	●	●	●	●
Wall Mounting	●	●	●	●
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-40	IP-40
Dimensions (mm)	54.2(W)x106.1(D)x145.4(H)	41 (W) x 89.8 (D) x 127 (H)mm	26(W)× 103(D)× 64 mm(H)	26(W)× 103(D)× 64 mm(H)
Operating Temperature				
-10 to 60°C	-	-	-	-
-40 to 70°C	●	-	-	-
-40 to 75°C	-	●	●	●
Network Redundancy				
O-Ring	●	-	-	-
Open-Ring	●	-	-	-
O-Chain	●	-	-	-
MRP*NOTE	●	-	-	-
MSTP/RSTP/STP	●	-	-	-
Management and Control				
802.1X	●	-	-	-
Rate Limit	●	-	-	-
Port Mirror	●	-	-	-
Port Security	●	-	-	-
SNMP v1/v2/v3	●	-	-	-
IGMP v2/v3	●	-	-	-
QoS Port Base/COS/TOS	●	-	-	-
Port Trunk Static/LACP	●	-	-	-
LLDP	●	-	-	-
IEEE 1588v2	-	-	-	-
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	-	-	-
DHCP	Server / Client	-	-	-
VLAN	Port-Based / 802.1Q / Q-in-Q / GVRP	-	-	-
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	-	-	-
Warranty		5 years		

*NOTE: This function is available by request only

Product Selection Guide

	Industrial DIN-Rail Gigabit Ethernet Switch			
	Unmanaged Switch			
Industrial Ethernet Switch				
	IGS-1080A	IGS-1041GPA / 1050A	IGS-1042GPA	IGS-150B
Port Number				
Number of ports	8	5	6	5
10/100Base-T(X) RJ45 Ports	-		-	-
10/100/1000Base-T(X) Ports	8	4 / 5	4	5
100Base-FX Fiber Ports	-	- / -	-	-
1000Base-X Fiber Ports	-	- / -	-	-
1000Base-X SFP Ports	-	- / -	-	-
100/1000Base-X SFP Ports	-	1 / -	2	-
Gigabit Combo Ports	-	- / -	-	-
Power Redundancy				
DC Terminal Block	2	2	2	2
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	•	•	•	•
Wall Mounting	•	•	•	•
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W)x94.9(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H	26.1(W)x70(D)x95(H
Operating Temperature				
-10 to 60°C	-	-	-	-
-40 to 75°C	•	•	•	•
-40 to 85°C	-	-	-	-
Network Redundancy				
O-Ring	-	-	-	-
Open-Ring	-	-	-	-
O-Chain	-	-	-	-
MRP*NOTE	-	-	-	-
MSTP/RSTP/STP	-	-	-	-
Management and Control				
802.1X	-	-	-	-
Rate Limit	-	-	-	-
Port Mirror	-	-	-	-
Port Security	-	-	-	-
SNMP v1/v2/v3	-	-	-	-
IGMP v2/v3	-	-	-	-
QoS Port Base/COS/TOS	-	-	-	-
Port Trunk Static/LACP	-	-	-	-
LLDP	-	-		
IEEE 1588v2	-	-	-	-
System Alarm	Relay	Relay	Relay	-
DHCP	-	-	-	-
VLAN	-	-	-	-
Management / Configuration	-	-	-	-
Warranty	5 years			

Product Selection Guide

Industrial Ethernet Switch	Industrial DIN-Rail Fast Ethernet Switch Managed Switch				
					
	IES-3240	IES-3162GC	IES-3160	IES-P3073GC Series	IES-3073GC
Port Number					
Number of ports	24	18	16	10	10
10/100Base-T(X) RJ45 Ports	24	16	16	7	7
10/100/1000Base-T(X) Ports	-	-	-	-	-
100Base-FX Fiber Ports	-	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-	-
100Base-FX SFP Ports	-	-	-	-	-
1000Base-X SFP Ports	-	-	-	-	-
Gigabit Combo Ports	-	2	-	3	3
Power Redundancy					
DC Terminal Block	2	2	2	2 (LV)	2
DC Power Jack	-	-	-	-	-
AC Power Cord	-	-	-	2 (HV)	-
Installation					
DIN-Rail Mounting	•	•	•	•	•
Wall Mounting	•	•	•	•	•
Rack Mounting	-	-	-	-	-
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	96.4(W)x108.5(D)x154(H)	96.4(W)x108.5(D)x154(H)	74.3(W)x109.2(D)x153.6(H)	96.4(W)x145.5(D)x154(H)	74.3(W)x109.2(D)x153.6(H)
Operating Temperature					
-10 to 60°C	-	-	-	-	-
-40 to 70°C	•	•	•	-	•
-40 to 85°C	-	-	-	•	-
Network Redundancy					
O-Ring	•	•	•	•	•
Open-Ring	•	•	•	•	•
O-Chain	•	•	•	•	•
STP/RSTP	•	•	•	•	•
MSTP	•	•	•	•	•
Management and Control					
802.1X	•	•	•	•	•
Rate Limit	•	•	•	•	•
Port Mirror	•	•	•	•	•
Port Security	•	•	•	•	•
IGMP v2/v3	•	•	•	•	•
QoS Port Base/COS/TOS	•	•	•	•	•
Port Trunk Static/LACP	•	•	•	•	•
LLDP	•	•	•	•	•
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	Server / Client	Server / Client	Server / Client	Server / Client	Server / Client
VLAN	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years				

Product Selection Guide

	Industrial DIN-Rail Fast Ethernet Switch			
	Managed Switch			
Industrial Ethernet Switch				
	IES-3082GC	IES-3082GP	IES-3062 Series / IES-3080	
Port Number				
Number of ports	10	10	8	
10/100Base-T(X) RJ45 Ports	8	8	6	8
10/100/1000Base-T(X) Ports	-	-	2	-
100Base-FX Fiber Ports	-	-	2 (Multi/Single-Mode)	-
1000Base-X Fiber Ports	-	-	2 (Multi/Single-Mode)	-
100Base-FX SFP Ports	-	-	-	
1000Base-X SFP Ports	-	2	-	
Gigabit Combo Ports	2	-	-	
Power Redundancy				
DC Terminal Block	2	2	2	
DC Power Jack	1	1	1	
AC Power Cord	-	-	-	
Installation				
DIN-Rail Mounting	•	•	•	
Wall Mounting	•	•	-	
Desktop	-	-	-	
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	
Dimensions (mm)	52(W)x106.1(D)x144.3(H)	52(W)x106.1(D)x144.3(H)	52(W)x106.1(D)x144.3(H)	
Operating Temperature				
-10 to 60°C	-	-	-	
-40 to 70°C	•	•	•	
Network Redundancy				
O-Ring	•	•	•	
Open-Ring	•	•	•	
O-Chain	•	•	•	
MRP*NOTE	•	•	•	
MSTP/RSTP/STP	•	•	•	
Management and Control				
802.1X	•	•	•	
Rate Limit	•	•	•	
Port Mirror	•	•	•	
Port Security	•	•	•	
IGMP v2/v3	•	•	•	
QoS Port Base/COS/TOS	•	•	•	
Port Trunk Static/LACP	•	•	•	
LLDP	•	•	•	
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	
DHCP	Server / Client	Server / Client	Server / Client	
VLAN	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP	Port-Based / 802.1Q / Q-in-Q / GVRP	
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet / Console(CLI)	
Warranty	5 years			

*NOTE: This function is available by request only

Product Selection Guide

	Industrial DIN-Rail Fast Ethernet Switch					
	Lite-Managed Switch			Unmanaged Switch		
Industrial Ethernet Switch						
	IES-2042FX Series	IES-2042PA	IES-2050A	IES-1240	IES-1162GC	IES-1160
Port Number						
Number of ports	6	6	5	24	18	16
10/100Base-T(X) RJ45 Ports	4	4	5	24	16	16
10/100/1000Base-T(X) Ports	-	-	-	-	-	-
100Base-FX Fiber Ports	2 (Multi/Single-Mode)	-	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-	-	-
100Base-FX SFP Ports	-	2	-	-	-	-
1000Base-X SFP Ports	-	-	-	-	-	-
Gigabit Combo Ports	-	-	-	-	2	-
Power Redundancy						
DC Terminal Block	2	2	2	2	2	2
DC Power Jack	1	-	-	-	-	-
AC Power Cord	-	-	-	-	-	-
Installation						
DIN-Rail Mounting	●	●	●	●	●	●
Wall Mounting	●	●	●	●	●	●
Rack Mounting	-	-	-	-	-	-
Physical Characteristics						
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	52(W)x106.1(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H)	26.1(W)x94.9(D) x144.3(H)	96.4(W)x108.5(D)x154(H)	96.4(W)x108.5(D)x154(H)	74.3(W)x109.2(D)x153.6(H)
Operating Temperature						
-10 to 60°C	-	-	-	-	-	-
-40 to 70°C	●	●	●	-	-	-
-40 to 75°C	-	-	-	●	●	●
Network Redundancy						
O-Ring	●	●	●	-	-	-
Open-Ring	●	●	●	-	-	-
O-Chain	●	●	●	-	-	-
STP/RSTP	●	●	●	-	-	-
MSTP	-	-	-	-	-	-
Management and Control						
802.1X	-	-	-	-	-	-
Rate Limit	-	-	-	-	-	-
Port Mirror	-	-	-	-	-	-
Port Security	-	-	-	-	-	-
IGMP v2/v3	-	-	-	-	-	-
QoS Port Base/COS/TOS	-	-	-	-	-	-
Port Trunk Static/LACP	-	-	-	-	-	-
LLDP	●	●	●	-	-	-
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	Relay	Relay	Relay
DHCP	Client	Client	Client	-	-	-
VLAN	Port-Based	Port-Based	Port-Based	-	-	-
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet	-	-	-
Warranty	5 years					

Product Selection Guide

Industrial Ethernet Switch	Industrial DIN-Rail Fast Ethernet Switch Unmanaged Switch			
				
	IES-1142P	IES-1062 Series	IES-1050A / 1080A	
Port Number				
Number of ports	16	8	5	8
10/100Base-T(X) RJ45 Ports	14	6	5	8
10/100/1000Base-T(X) Ports	-	2	-	
100Base-FX Fiber Ports	-	2(Multi/Single-Mode)	-	
1000Base-X Fiber Ports	-	2(Multi/Single-Mode)	-	
100Base-FX SFP Ports	2	-	-	
1000Base-X SFP Ports	-	-	-	
Gigabit Combo Ports	-	-	-	
Power Redundancy				
DC Terminal Block	2	2	2	
DC Power Jack	-	1	-	
AC Power Cord	-	-	-	
Installation				
DIN-Rail Mounting	•	•	•	
Wall Mounting	-	•	•	
Rack Mounting	-	-	-	
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	
Dimensions (mm)	74(W)x140(D)x170(H)	52(W)x106.1(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H)	
Operating Temperature				
-10 to 60°C	-	-	-	
-40 to 75°C	•	•	•	
Network Redundancy				
O-Ring	-	-	-	
Open-Ring	-	-	-	
O-Chain	-	-	-	
STP/RSTP	-	-	-	
MSTP	-	-	-	
Management and Control				
802.1X	-	-	-	
Rate Limit	-	-	-	
Port Mirror	-	-	-	
Port Security	-	-	-	
IGMP v2/v3	-	-	-	
QoS Port Base/COS/TOS	-	-	-	
Port Trunk Static/LACP	-	-	-	
LLDP	-	-	-	
System Alarm	-	Relay	Relay	
DHCP	-	-	-	
VLAN	-	-	-	
Management / Configuration	-	-	-	
Warranty	5 years			

Product Selection Guide

Industrial Ethernet Switch	Industrial DIN-Rail Fast Ethernet Switch Unmanaged Switch			
				
	IES-1041FX / 1042FX		IES-150B	IES-180B
Port Number				
Number of ports	5	6	5	8
10/100Base-T(X) RJ45 Ports	4		5	8
10/100/1000Base-T(X) Ports	-		-	-
100Base-FX Fiber Ports	1 (Multi/Single-Mode)	2 (Multi/Single-Mode)	-	-
1000Base-X Fiber Ports	-		-	-
100Base-FX SFP Ports	-		-	-
1000Base-X SFP Ports	-		-	-
Gigabit Combo Ports	-		-	-
Power Redundancy				
DC Terminal Block	2		2	2
DC Power Jack	-		-	-
AC Power Cord	-		-	-
Installation				
DIN-Rail Mounting	•		•	•
Wall Mounting	•		•	•
Rack Mounting	-		-	-
Physical Characteristics				
Casing Protection	IP-30		IP-30	IP-30
Dimensions (mm)	26.1(W)x94.9(D)x144.3(H)		26.1(W)x70(D)x95(H)	41(W)x90(D)x95(H)
Operating Temperature				
-10 to 60°C	-		-	-
-40 to 70°C	-		-	-
-40 to 75°C	•		•	•
Network Redundancy				
O-Ring	-		-	-
Open-Ring	-		-	-
O-Chain	-		-	-
STP/RSTP	-		-	-
MSTP	-		-	-
Management and Control				
802.1X	-		-	-
Rate Limit	-		-	-
Port Mirror	-		-	-
Port Security	-		-	-
IGMP v2/v3	-		-	-
QoS Port Base/COS/TOS	-		-	-
Port Trunk Static/LACP	-		-	-
LLDP	-		-	-
System Alarm	Relay		-	-
DHCP	-		-	-
VLAN	-		-	-
Management / Configuration	-		-	-
Warranty	5 years			

Product Selection Guide

Industrial Ethernet Switch	Industrial DIN-Rail Fast Ethernet Switch Unmanaged Switch		
			
	IES-C1050	IES-C1080	IES-162FX-L Series
Port Number			
Number of ports	5	8	8
10/100Base-T(X) RJ45 Ports	5	8	6
10/100/1000Base-T(X) Ports	-	-	-
100Base-FX Fiber Ports	-	-	2 (Multi/Single-Mode)
1000Base-X Fiber Ports	-	-	-
100Base-FX SFP Ports	-	-	-
1000Base-X SFP Ports	-	-	-
Gigabit Combo Ports	-	-	-
Power Redundancy			
DC Terminal Block	1	1	1
DC Power Jack	-	-	-
AC Power Cord	-	-	-
Installation			
DIN-Rail Mounting	•	•	•
Wall Mounting	•	•	•
Rack Mounting	-	-	-
Physical Characteristics			
Casing Protection	IP-40	IP-40	IP-30
Dimensions (mm)	26(W)× 103(D)× 64 mm(H)	26(W)× 103(D)× 64 mm(H)	41(W)x83.98(D)x115(H)
Operating Temperature			
-20 to 60°C	-	-	-
-40 to 75°C	•	•	•
Network Redundancy			
O-Ring	-	-	-
Open-Ring	-	-	-
O-Chain	-	-	-
STP/RSTP	-	-	-
MSTP	-	-	-
Management and Control			
802.1X	-	-	-
Rate Limit	-	-	-
Port Mirror	-	-	-
Port Security	-	-	-
IGMP v2/v3	-	-	-
QoS Port Base/COS/TOS	-	-	-
Port Trunk Static/LACP	-	-	-
LLDP	-	-	-
System Alarm	-	-	-
DHCP	-	-	-
VLAN	-	-	-
Management / Configuration	-	-	-
Warranty	5 years		

Product Selection Guide

	Industrial Gigabit PoE Ethernet Switch	
	Managed Rack-Mount Switch	
Industrial Ethernet Switch		
	RGPS-R9244GP+-LP/P	RGPS-92222GCP-NP/LP/P Series
Port Number		
Number of ports	28	26
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	24 (P.S.E) IEEE 802.3 at (max.360/720 Watts)	22 (P.S.E) IEEE 802.3 at (max.720/320 Watts)
100Base-FX Fiber Ports	-	-
1000Base-X SFP Ports	-	-
100/1000Base-X SFP Ports	-	2
10G SFP+	4	-
Gigabit Combo Ports	-	2(P.S.E.)
Power Redundancy		
DC Terminal Block	-	1 - -
DC Power Jack	-	- - -
AC Power Cord	1	- 1 1
Installation		
Rack Mounting	●	●
Physical Characteristics		
Casing Protection	IP-20	IP-20
Dimensions (mm)	431(W) x 342(D) x 44(H)	431(W) x 342(D) x 44(H)
Operating Temperature		
-20 to 60°C	●	-
-40 to 60°C	-	●
-40 to 70°C	-	-
-40 to 75°C	-	-
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	-
System Alarm	SYSLOG / SNMP Trap	SYSLOG / SNMP Trap
DHCP	Server / Client	Server / Client
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)
Warranty	5 years	

Product Selection Guide

	Industrial Gigabit PoE Ethernet Switch	
	Managed DIN-Rail Switch	
Industrial Ethernet Switch		
	IGPS-9842GTP/-24V	IGPS-9822DGP+
Port Number		
Number of ports	14	12
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	8 (P.S.E) IEEE 802.3 at (max 240 /120 Watts)+4	8 (P.S.E) IEEE 802.3 at (max 240W /30W per port)
100Base-FX Fiber Ports	-	-
100/1000Base-X SFP Ports	2	-
100/1G/2.5GBase-X SFP Ports	-	2
1G/10GBase-X SFP Ports	-	2
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	-	-
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	●	●
Wall Mounting	●	●
Rack Mounting	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	74.3(W)x109.2(D)x153.6(H)	74.3(W)x125(D)x153.6(H)
Operating Temperature		
-20 to 60°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	○
MSTP/RSTP/STP	●	●
Management and Control		
Static Routing/RIP/VRRP	-	-
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	-
System Alarm	SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c, v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c, v3 /Telnet / Console(CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch

Industrial Gigabit PoE Ethernet Switch

Managed DIN-Rail Switch

IGPS-9084GP

IGPS-9084GP-LA / -24V

	IGPS-9084GP	IGPS-9084GP-LA / -24V
Port Number		
Number of ports	12	12
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	8 (P.S.E.) IEEE 802.3 at	8 (P.S.E.) IEEE 802.3 at
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
100Base-FX SFP Ports	-	-
100/1000Base-X SFP Ports	4	4
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	-	-
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	●	●
Wall Mounting	●	●
Rack Mounting	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	96.4(W)x105.5(D)x154(H)	54.3(W)x108.3(D)x145.1(H)
Operating Temperature		
-40 to 60°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP*NOTE	●	●
MSTP/RSTP/STP	●	●
Management and Control		
Static Routing/RIP/VRRP	-	-
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	-
System Alarm	SYSLOG / SNMP Trap / Relay	Relay / SYSLOG / SNMP Trap
DHCP	Server / Client /Relay	Server / Client / Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c , v3 /Telnet / Console(CLI)
Warranty	5 years	

Product Selection Guide

Industrial Ethernet Switch	Industrial Gigabit PoE Ethernet Switch Managed DIN-Rail Switch		
			
	IGPS-9080 / -24V	IGPS-R9084GP	IGPS-RX884GTP+
Port Number			
Number of ports	8	12	20
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	8 (P.S.E.) IEEE 802.3 at (max 240 /120 Watts)	8 (P.S.E.) IEEE 802.3 at	8 (P.S.E.) IEEE 802.3 at
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
100Base-FX SFP Ports	-	-	-
100/1000Base-X SFP Ports	-	4(100/1000M)	-
1G/2.5G/10GBase-X with SFP+ port	-	-	•
Power Redundancy			
DC Terminal Block	2	2	2
DC Power Jack	-	-	-
AC Power Cord	-	-	-
Installation			
DIN-Rail Mounting	•	•	•
Wall Mounting	•	•	•
Rack Mounting	-	-	-
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	54.1(W)x106.1(D)x145.4(H)	96.4(W)x145.5(D)x154(H)	116(W)x170(D)x180(H)
Operating Temperature			
-40 to 60°C	-	-	-
-40 to 75°C	•	•	•
Network Redundancy			
O-Ring	•	•	•
Open-Ring	•	•	•
O-Chain	•	•	•
MRP*NOTE	•	•	•
MSTP/RSTP/STP	•	•	•
Management and Control			
OSPF	-	-	•
Static Routing/RIP/VRRP	-	•	•
802.1X	•	•	•
Rate Limit	•	•	•
Port Mirror	•	•	•
Port Security	•	•	•
IGMP v2/v3	•	•	•
QoS Port Base/COS/TOS	•	•	•
Port Trunk Static/LACP	•	•	•
LLDP	•	•	•
IEEE 1588v2	•	•	•
System Alarm	Relay / SYSLOG / SNMP Trap	Relay / SYSLOG / SNMP Trap	Relay / SYSLOG / SNMP Trap
DHCP	Server / Client / Relay	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c, v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c, v3 /Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c, v3 /Telnet / Console(CLI)
Warranty	5 years		

Product Selection Guide

Industrial Ethernet Switch	Unmanaged DIN-Rail Switch	
		
	IGPS-1080-24V	IGPS-1042GPA
Port Number		
Number of ports	8	6
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) Ports	8 (P.S.E) IEEE 802.3 at (max 120 Watts)	4 (P.S.E.) IEEE 802.3at
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
100Base-FX SFP Ports	-	-
1000Base-X SFP Ports	-	2
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	2	2
DC Power Jack	-	-
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	•	•
Wall Mounting	•	•
Rack Mounting	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	41(W)x94.9(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H)
Operating Temperature		
-40 to 60°C	-	-
-40 to 75°C	•	•
Network Redundancy		
O-Ring	-	-
Open-Ring	-	-
O-Chain	-	-
STP/RSTP	-	-
MSTP	-	-
Management and Control		
802.1X	-	-
Rate Limit	-	-
Port Mirror	-	-
Port Security	-	-
IGMP v2/v3	-	-
QoS Port Base/COS/TOS	-	-
Port Trunk Static/LACP	-	-
LLDP	-	-
System Alarm	Relay	Relay
DHCP	-	-
VLAN	-	-
Management / Configuration	-	-
Warranty	5 years	

Product Selection Guide

	Industrial Gigabit PoE Ethernet Switch			
	Unmanaged DIN-Rail Switch			
Industrial Ethernet Switch				
	IGPS-1042GP-24V	IGPS-1411GTP-24V	IGPS-1411GTPA	IGPS-1082GP Series
Port Number				
Number of ports	6	6	6	10
10/100Base-T(X) RJ45 Ports	-	-	-	-
10/100/1000Base-T(X) Ports	4 (P.S.E.) IEEE 802.3at	4 (P.S.E.) + 1 IEEE 802.3at	4 (P.S.E.) + 1 IEEE 802.3at	8 (P.S.E.) IEEE 802.3at
100Base-FX Fiber Ports	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-
100/1000Base-X SFP Ports	2	1	1	2
Gigabit Combo Ports	-	-	-	-
Power Redundancy				
DC Terminal Block	2	2	2	2
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	•	•	•	•
Wall Mounting	•	•	•	•
Rack Mounting	-	-	-	-
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	41(W)x94.9(D)x144.3(H)	41(W)x94.9(D)x144.3(H)	26.1(W)x94.9(D)x144.3(H)	54.3(W)x108.3(D)x145.1(H)
Operating Temperature				
-40 to 60°C	-	-	-	-
-40 to 70°C	-	-	-	-
-40 to 75°C	•	•	•	•
Network Redundancy				
O-Ring	-	-	-	-
Open-Ring	-	-	-	-
O-Chain	-	-	-	-
STP/RSTP	-	-	-	-
MSTP	-	-	-	-
Management and Control				
802.1X	-	-	-	-
Rate Limit	-	-	-	-
Port Mirror	-	-	-	-
Port Security	-	-	-	-
IGMP v2/v3	-	-	-	-
QoS Port Base/COS/TOS	-	-	-	-
Port Trunk Static/LACP	-	-	-	-
LLDP	-	-	-	-
System Alarm	Relay	Relay	Relay	-
DHCP	-	-	-	-
VLAN	-	-	-	-
Management / Configuration	-	-	-	-
Warranty	5 years			

Product Selection Guide

	Industrial PoE Fast Ethernet Switch					
	Managed Switch	Lite-Managed Switch		Unmanaged Switch		
Industrial Ethernet Switch						
	IPS-3082GC-24V/AT	IPS-2042P	IPS-2042TX / 2042FX	IPS-1080A/24V	IPS-1042FA	IPS-1042FX-24V
Port Number						
Number of ports	10	6	6	8	6	6
10/100Base-T(X) RJ45 Ports	8 (P.S.E.) IEEE802.3 af/at	4 (P.S.E.) IEEE802.3 af	2+4 (P.S.E.) IEEE802.3 af	4 (P.S.E.) IEEE802.3 af	8 (P.S.E.) IEEE802.3 at (max.180/120 Watts)	4 (P.S.E.) IEEE802.3 at	4 (P.S.E.) IEEE802.3 at
10/100/1000Base-T(X) Ports	-	-	-	-	-	-	-
100Base-FX Fiber Ports	-	-	-	2 (Multi/ Single-Mode)	-	-	2 (Multi/Single-Mode)	2 (Multi/Single-Mode)
100Base-FX SFP Ports	-	2	-	-	-	-	-
1000Base-X SFP Ports	-	-	-	-	-	-	-
Gigabit Combo Ports	2	-	-	-	-	-	-
Power Redundancy						
DC Terminal Block	2	2	2	2	2	2
DC Power Jack	-	1	1	-	-	-
Installation						
DIN-Rail Mounting	●	●	●	●	●	●
Wall Mounting	●	●	●	●	●	●
Physical Characteristics						
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	74.3(W)x109.2(D)x153.6(H)	54.2(W)x106.1(D)x145.4(H)	54.2(W)x106.1(D)x145.4(H)	26.1(W)x94.9(D) x144.3(H)	41(W)x94.9(D) x144.3(H)	26.1(W)x94.9(D)x144.3(H)	41(W)x94.9(D)x144.3(H)
Operating Temperature						
-10 to 60°C	-	-	-	-	-	-	-
-40 to 60°C	-	-	-	-	-	-	-
-40 to 75°C	●	●	●	●	●	●	●
Network Redundancy						
O-Ring	●	●	●	-	-	-	-
Open-Ring	●	●	●	-	-	-	-
O-Chain	●	●	●	-	-	-	-
MRP*NOTE	●	-	-	-	-	-	-
MSTP/RSTP/STP	●	RSTP/STP	RSTP/STP	-	-	-	-
Management and Control						
802.1X	●	-	-	-	-	-	-
Rate Limit	●	-	-	-	-	-	-
Port Mirror	●	-	-	-	-	-	-
Port Security	●	-	-	-	-	-	-
IGMP v2/v3	●	-	-	-	-	-	-
QoS Port Base/COS/TOS	●	-	-	-	-	-	-
Port Trunk Static/LACP	●	-	-	-	-	-	-
LLDP	●	●	●	-	-	-	-
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	-	-	-	-
DHCP	Server / Client	Client	Client	-	-	-	-
VLAN	Port-Based/802.1Q/Q-in-Q/ GVRP	Port-Based	Port-Based	-	-	-	-
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet	-	-	-	-
Warranty	5 years					
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*NOTE: This function is available by request only

Product Selection Guide

	Card-Type Ethernet Switch Managed Switch Industrial CompactPCI Ethernet Switch			
Industrial Ethernet Switch				
	CPGS-9080-C	CPGS-9120-C	CPGS-9120-M12-C	CPGS-9160-M12-C
Port Number				
Number of ports	8	12	12	16
10/100Base-T(X) RJ45 Ports	-	-	-	-
10/100/1000Base-T(X) Ports	8xCPCI interface	8xCPCI interface+4xRJ-45	8xCPCI interface+4xM12	8xCPCI interface+8xM12
100Base-FX Fiber Ports	-	-	-	-
100Base-FX SFP Ports	-	-	-	-
1000Base-X SFP Ports	-	-	-	-
Gigabit Combo Ports	-	-	-	-
Power Redundancy				
DC Terminal Block		-	-	-
DC Power Jack	-	-	-	-
CompactPCI bus power	●	●	●	●
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	-	-	-	-
CompactPCI Slot	●	●	●	●
Physical Characteristics				
Casing Protection	-	-	-	-
Dimensions (mm)	20 (W) x 209 (D) x 130.7 (H)	40 (W) x 209 (D) x 130.7 (H)	40 (W) x 209 (D) x 130.7 (H)	81.7 (W) x 209 (D) x 130.7 (H)
Operating Temperature				
-10 to 60°C	-	-	-	-
-20 to 70°C	-	-	-	-
-40 to 70°C	●	●	●	●
Network Redundancy				
O-Ring	●	●	●	●
Open-Ring	●	●	●	●
O-Chain	●	●	●	●
MRP*NOTE	○	○	○	○
MSTP/RSTP/STP	●	●	●	●
Management and Control				
802.1X	●	●	●	●
Rate Limit	●	●	●	●
Port Mirror	●	●	●	●
Port Security	●	●	●	●
SNMP v1/v2/v3	●	●	●	●
QoS Port Base/COS/TOS	●	●	●	●
Port Trunk Static/LACP	●	●	●	●
LLDP	●	●	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap
DHCP	Server / Client /Relay	Server / Client /Relay	Server / Client /Relay	Server / Client /Relay
VLAN	Port-Based / 802.1Q / Q-in-Q/ GVRP	Port-Based / 802.1Q / Q-in-Q/ GVRP	Port-Based / 802.1Q / Q-in-Q/ GVRP	Port-Based / 802.1Q / Q-in-Q/ GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet /Console(CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet /Console(CLI)
Warranty	5years			

*NOTE: This function is available by request only

Product Selection Guide

	Optical / PoE Network Accessories				
	Optical Bypass Switch	PoE Injector			
Industrial Ethernet Switch					
	IBS-102FX-MM/SS-LC	INJ-102GT/24V		INJ-102GT++/24V	
Port Number					
Number of ports	4	4		4	
10/100Base-T(X) RJ45 Ports	-	-	-	-	
10/100/1000Base-T(X) RJ45 Ports	-	2		2	
PoE+(30 Watts) Output Ports	-	2 (P.S.E.)		-	
PoE++(60 Watts) Output Ports	-	-	-	-	
PoE++(90 Watts) Output Ports	-	-	-	2 (P.S.E.)	
100/1G/10G Fiber Ports	-	-	-	-	
Optical Bypass ports	4 (LC connector)	-	-	-	
Power Redundancy					
DC Terminal Block	1	1	1	1	
DC Power Jack	1	-	-	-	
Operating Voltage	-	50-57VDC	12-57VDC	50-57VDC	12-57VDC
Output Power	-	30 Watts Per Port		90 Watts per port	90 Watts in total
Installation					
DIN-Rail Mounting	•	•		•	
Wall Mounting	•	•		•	
PCIe Slot	-	-		-	
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	
Dimensions (mm)	26.1(W)x94.9(D)x144.3(H)	26.1(W)x70(D)x95(H)	40(W)x70(D)x95(H)	40(W)x70(D)x95(H)	
Operating Temperature					
-20 to 70°C		-		•	
-40 to 70°C	•	-		-	
-40 to 75°C	-	•		-	
Network Redundancy					
O-Ring	-	-		-	
Open-Ring	-	-		-	
O-Chain	-	-		-	
STP/RSTP	-	-		-	
MSTP	-	-		-	
Management and Control					
802.1X	-	-		-	
Rate Limit	-	-		-	
Port Mirror	-	-		-	
Port Security	-	-		-	
SNMP v1/v2/v3	-	-		-	
QoS Port Base/COS/TOS	-	-		-	
Port Trunk Static/LACP	-	-		-	
LLDP	-	-		-	
System Alarm	Relay	-		-	
DHCP	-	-		-	
VLAN	-	-		-	
Management / Configuration	-	-		-	
Warranty	5 years				

Product Selection Guide

	Optical / PoE Network Accessories		
	PoE Injector		
Industrial Ethernet Switch			
	INJ-101GT++-100W	INJ-101GT++-60W	INJ-101GT++-60W-24V
Port Number			
Number of ports	1	1	1
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) RJ45 Ports	1	1	1
PoE+(30 Watts) Output Ports	-	-	-
PoE++(60 Watts) Output Ports	1(P.S.E.)	1(P.S.E.)	1(P.S.E.)
PoE++(90 Watts) Output Ports	-	-	-
100/1G/10G Fiber Ports	-	-	-
Optical Bypass ports	-	-	-
Power Redundancy			
DC Terminal Block	1	1	1
DC Power Jack	-	-	-
Operating Voltage	50-57VDC	50-57VDC	9 to 57VDC
Output Power	100 Watts	60 Watts	60 Watts
Installation			
DIN-Rail Mounting	•	•	•
Wall Mounting	•	•	•
PCIe Slot	-	-	-
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W)x94.9(D)x144.3(H)	26.1(W)x70(D)x95(H)	41(W)x70(D)x95(H)
Operating Temperature			
-20 to 70°C	-	-	-
-40 to 70°C	-	-	-
-40 to 75°C	•	•	•
Network Redundancy			
O-Ring	-	-	-
Open-Ring	-	-	-
O-Chain	-	-	-
STP/RSTP	-	-	-
MSTP	-	-	-
Management and Control			
802.1X	-	-	-
Rate Limit	-	-	-
Port Mirror	-	-	-
Port Security	-	-	-
SNMP v1/v2/v3	-	-	-
QoS Port Base/COS/TOS	-	-	-
Port Trunk Static/LACP	-	-	-
LLDP	-	-	-
System Alarm	-	-	-
DHCP	-	-	-
VLAN	-	-	-
Management / Configuration	-	-	-
Warranty	5 years		

Product Selection Guide

Industrial Ethernet Switch	Optical / PoE Network Accessorie	
	PoE Splitter	
		
	SPL-101GT	SPL-101GT++-12V/24V
Port Number		
Number of ports	2	2
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) RJ45 Ports	1	1
PoE+(30 Watts) Ports	1(P.D.)	-
PoE++(90 Watts) Ports	-	1(P.D.)
100/1G/10G Fiber Ports	-	-
Optical Bypass ports	-	-
Power Redundancy		
DC Terminal Block	1 (24VDC output) 1 (12VDC output)	1 (24VDC output) 1 (12VDC output)
DC Power Jack	-	-
Operating Voltage	36-57VDC	36-57VDC
Output Power	24V@0.9A MAX 12V@1.8A MAX	24V@2.5A MAX 12V@5A MAX
Installation		
DIN-Rail Mounting	•	•
Wall Mounting	•	•
PCIe Slot	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	26.1(W)x70(D)x95(H)	41(W) x 75 (D) x 115 (H)
Operating Temperature		
-10 to 60°C	-	-
-20 to 70°C		-
-25 to 70°C	-	-
-40 to 75°C	•	•
Network Redundancy		
O-Ring	-	-
Open-Ring	-	-
O-Chain	-	-
STP/RSTP	-	-
MSTP	-	-
Management and Control		
802.1X	-	-
Rate Limit	-	-
Port Mirror	-	-
Port Security	-	-
SNMP v1/v2/v3	-	-
QoS Port Base/COS/TOS	-	-
Port Trunk Static/LACP	-	-
LLDP	-	-
System Alarm	-	-
DHCP	-	-
VLAN	-	-
Management / Configuration	-	-
Warranty	5 years	

Product Selection Guide

	Industrial Rack-Mount EN50155 Ethernet Switch	
	Managed Switch	
Industrial Ethernet Switch		
	TRGPS-9084GT-M12X-BP2-MV	TRGPS-9084TG-M12X-BP2-MV
Port Number		
Number of ports	12	12
10/100/1000Base-T(X) M12 X-Coding P.S.E. Ports	8	8
1G/2.5G/5G/10G Base-T(X) M12 X-Coding Ports	-	4(2-pair bypass)
10/100/1000Base-T(X) M12 X-Coding Ports	4(2-pair bypass)	-
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
Gigabit Combo Ports	-	-
Power Redundancy		
On M12 Connector	●	1
On M23 Connector	-	-
Installation		
Wall Mounting	-	-
Rack Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	438(W) x 250 (D) x 44 (H)	438 (W) x 250 (D) x 44 (H) mm
Operating Temperature		
-40 to 70°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
O-Chain	●	●
MRP*NOTE	○	○
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

	Industrial EN50155 Ethernet Switch	
	Lite Managed Switch	
Industrial Ethernet Switch		
	TES-3080-M12-BP2	TES-250-M12
Port Number		
Number of ports	**8**	**5**
10/100Base-T(X) M12 D-Coding Ports	8(2-pair bypass)	5
10/100/1000Base-T(X) M12 X-Coding Ports	-	-
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
Gigabit Combo Ports	-	-
Power Redundancy		
On M12 Connector	-	1(M12)
On M23 Connector	2(M23)	-
Installation		
Wall Mounting	●	-
Rack Mounting	-	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	125(W) x 65(D) x 196(H)	89(W) x 40(D) x 178(H)
Operating Temperature		
-40 to 70°C	●	●
-40 to 75°C	-	-
Network Redundancy		
O-Ring	●	●
O-Chain	●	●
MRP*NOTE	-	-
MSTP/RSTP/STP	●	RSTP/STP
Management and Control		
802.1X	●	-
Rate Limit	●	-
Port Mirror	●	-
Port Security	●	-
IGMP v2/v3	●	-
QoS Port Base/COS/TOS	●	-
Port Trunk Static/LACP	●	-
LLDP	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap
DHCP	Server / Client / Relay	Client
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet
Warranty	5 years	

*NOTE: This function is available by request only

Industrial Ethernet Switch	Unmanaged Switch		
			
	TXES-180-M12	TXES-150-M12	TES-W9124GT-M12X-BP2-24V-IP54
Port Number			
Number of ports	**8**	**5**	**16**
10/100Base-T(X) M12 D-Coding Ports	8x10/100/500	5x10/100/500	12
10/100/1000Base-T(X) M12 X-Coding Ports	-	-	4
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
Gigabit Combo Ports	-	-	-
Power Redundancy			
On M12 Connector	1(M12)	1(M12)	2(M12)
On M23 Connector	-	-	-
Installation			
Wall Mounting	●	●	●
Rack Mounting	-	-	-
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-54
Dimensions (mm)	89(W) x 40(D) x 178(H)	89(W) x 40(D) x 178(H)	280(W) x 90(D) x 182(H)
Operating Temperature			
-40 to 70°C	-	-	-
-40 to 75°C	●	●	●
Network Redundancy			
O-Ring	-	-	●
O-Chain	-	-	●
MRP*NOTE	-	-	-
MSTP/RSTP/STP	-	-	●
Management and Control			
802.1X	-	-	●
Rate Limit	-	-	●
Port Mirror	-	-	●
Port Security	-	-	●
IGMP v2/v3	-	-	●
QoS Port Base/COS/TOS	-	-	●
Port Trunk Static/LACP	-	-	●
LLDP	-	-	●
System Alarm	-	-	SYSLOG / SMTP / SNMP Trap
DHCP	-	-	Server / Client / Relay
VLAN	-	-	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	-	-	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years		

*NOTE: This function is available by request only

Product Selection Guide

	Industrial EN50155 PoE Ethernet Switch Managed Switch		
Industrial Ethernet Switch			
	TPS-3162GT-M12X-BP1-MV	TPS-3082GT-M12X-BP1-MV	TPS-W9124GT-M12X-BP2-24V-IP54
Port Number			
Number of ports	**18**	**10**	**16**
10/100Base-T(X) M12 D-Coding Ports	16 (P.S.E.) IEEE 802.3 at	8(P.S.E.) IEEE 802.3 af	12(P.S.E.) IEEE 802.3 af
10/100/1000Base-T(X) M12 X-Coding Ports	2	2	4
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
100Base-FX SFP Ports	-	-	-
1000Base-X SFP Ports	-	-	-
Gigabit Combo Ports	-	-	-
Power Redundancy			
On M12 Connector	-	-	2(M12)
On 7/8" Connector	1	1	-
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-54
Dimensions (mm)	260 (W) x 79.3 (D) x 222 (H) mm	260 (W) x 79.3 (D) x 222 (H) mm	280 (W) x 90 (D) x 182 (H) mm
Operating Temperature			
-40 to 70°C	-	-	-
-40 to 75°C	●	●	●
Network Redundancy			
O-Ring	●	●	●
O-Chain	●	●	●
MRP*NOTE	○	○	○
MSTP/RSTP/STP	●	●	●
Management and Control			
802.1X	●	●	●
Rate Limit	●	●	●
Port Mirror	●	●	●
Port Security	●	●	●
IGMP v2/v3	●	●	●
QoS Port Base/COS/TOS	●	●	●
Port Trunk Static/LACP	●	●	●
LLDP	●	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap
DHCP	Server / Client/ Relay	Server / Client/ Relay	Server / Client/ Relay
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years		

*NOTE: This function is available by request only

Product Selection Guide

	Industrial EN50155 Gigabit Ethernet Switch	
	Managed Switch	
Industrial Ethernet Switch		
	TGS-9120-M12 -BP2	TGS-9200-M12-BP2
Port Number		
Number of ports	**12**	**20**
10/100Base-T(X) M12 D-Coding Ports	-	-
10/100/1000Base-T(X) M12 A-Coding Ports	12(2-Pair HW bypass)	20(2-Pair HW bypass)
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	-
100Base-FX SFP Ports	-	-
1000Base-X SFP Ports	-	-
Gigabit Combo Ports	-	-
Power Redundancy		
On M12 Connector	-	-
On M23 Connector	2(M23)	2(M23)
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	260(W) x 91.3(D) x 216(H)	260(W) x 91.3(D) x 216(H)
Operating Temperature		
-10 to 60°C	-	-
-40 to 70°C	●	●
Network Redundancy		
O-Ring	●	●
O-Chain	●	●
MRP*NOTE	○	○
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

Industrial Ethernet Switch	Industrial EN50155 Gigabit PoE Ethernet Switch	
	Managed Switch	
		
	TGPS-9080-M12A-MV	TGPS-W9082GF-MM-M12X-QS-MV-IP54
Port Number		
Number of ports	**8**	**10**
10/100/1000Base-T(X) M12 A-Coding P.S.E. Ports	8	8 (X-coding)
10/100/1000Base-T(X) M12 A-Coding Ports	-	-
10/100/500 /1000Base-T(X) M12 A-Coding Ports	-	-
10/100/1000Base-T(X) M12 X-Coding Ports	-	-
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	-	2
Gigabit Combo Ports	-	-
Power Redundancy		
On M12 Connector	-	1
On M23 Connector	-	-
7/8 inch male connector	1	-
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-54
Dimensions (mm)	205(W) x 99(D)x 175(H)	208 (W) x 89 (D) x 150 (H)
Operating Temperature		
-10 to 60°C	-	-
-40 to 70°C	-	-
-40 to 75°C	●	●
Network Redundancy		
O-Ring	●	●
O-Chain	●	●
MRP*NOTE	-	-
MSTP/RSTP/STP	●	●
Management and Control		
802.1X	●	●
Rate Limit	●	●
Port Mirror	●	●
Port Security	●	●
IGMP v2/v3	●	●
QoS Port Base/COS/TOS	●	●
Port Trunk Static/LACP	●	●
LLDP	●	●
IEEE 1588v2	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years	

*NOTE: This function is available by request only

Product Selection Guide

	Industrial EN50155 Gigabit PoE Ethernet Switch		
	Managed Switch		
Industrial Ethernet Switch			
	TGPS-9168GT-M12-BP2-24V	TGPS-9164GT-M12X-BP2-24V/MV	TGPS-9084GT-M12X-BP2-24V
Port Number			
Number of ports	**16**	**16**	**8**
10/100/1000Base-T(X) M12 A-Coding P.S.E. Ports	16 (8-pin female A-coding)	16 (8-pin female X-coding)	8 (8-pin female X-coding)
10/100/1000Base-T(X) M12 A-Coding Ports	-	-	-
10/100/500 /1000Base-T(X) M12 A-Coding Ports	-	-	-
10/100/1000Base-T(X) M12 X-Coding Ports	8 (8-pin female A-coding with 2xbypass function included)	4 (8-pin female X-coding with 2xbypass function included)	4 (8-pin female X-coding with 2xbypass function included)
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
Gigabit Combo Ports	-	-	-
Power Redundancy			
On M12 Connector	-	2 / 1	2
On M23 Connector	2	-	-
7/8 inch male connector	-	-	-
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	320(W) x 91.3(D)x 228(H)	260 (W) x 89.6 (D) x 216 (H) mm	260 (W) x 89.6 (D) x 216 (H) mm
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	-	-	-
-40 to 75°C	●	●	●
Network Redundancy			
O-Ring	●	●	●
O-Chain	●	●	●
MRP*NOTE	-	-	-
MSTP/RSTP/STP	●	●	●
Management and Control			
802.1X	●	●	●
Rate Limit	●	●	●
Port Mirror	●	●	●
Port Security	●	●	●
IGMP v2/v3	●	●	●
QoS Port Base/COS/TOS	●	●	●
Port Trunk Static/LACP	●	●	●
LLDP	●	●	●
IEEE 1588v2	●	●	●
System Alarm	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	Server / Client / Relay	Server / Client / Relay	Server / Client / Relay
VLAN	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP	Port-Based/802.1Q/Q-in-Q/GVRP
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet / Console (CLI)
Warranty	5 years		

Product Selection Guide

		Industrial EN50155 Gigabit PoE Ethernet Switch	
		Unmanaged Switch	
Industrial Ethernet Switch			
	TGXPS-1080-M12-24V Series	TGXS-1080-M12 Series	TXPS-141XT-M12-24V/MV
Port Number			
Number of ports	8	8	5
10/100Base-T(X) M12 D-Coding Ports	-	-	-
10/100/500 Base-T(X) M12 D-Coding Ports	-	-	4 (P.S.E.) IEEE 802.3 at+1
10/100/500 /1000Base-T(X) M12 A-Coding Ports	8 (P.S.E.)/ 8 (P.S.E.)(2-pair HW Bypass)IEEE 802.3 at(Max.120W)	8	-
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
100Base-FX SFP Ports	-	-	-
1000Base-X SFP Ports	-	-	-
Gigabit Combo Ports		-	-
Power Redundancy			
On M12 Connector	-	-	1
On M23 Connector	2	-	-
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	125(W) x 65(D) x 196(H)	125 (W) x 65 (D) x196 (H) mm	88.9(W) x 40(D) x 178.2(H)	88.9(W) x 55(D) x 178.2(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	●	-	-
-40 to 75°C	-	●	●
Network Redundancy			
O-Ring	-	-	-
O-Chain	-	-	-
MRP*NOTE	-	-	-
MSTP/RSTP/STP	-	-	-
Management and Control			
802.1X	-	-	-
Rate Limit	-	-	-
Port Mirror	-	-	-
Port Security	-	-	-
IGMP v2/v3	-	-	-
QoS Port Base/COS/TOS	-	-	-
Port Trunk Static/LACP	-	-	-
LLDP	-	-	-
System Alarm	-	-	-
DHCP	-	-	-
VLAN	-	-	-
Management / Configuration	-	-	-
Warranty	5 years		

Product Selection Guide

	Industrial EN50155 Gigabit PoE Ethernet Switch		
	Unmanaged Switch		
Industrial Ethernet Switch			
	TSPL-101GT-M12 Series	TINJ-101GT-M12 series	TINJ-101-M12 series
Port Number			
Number of ports	**2(M12)**	**2(M12)**	**2(M12)**
10/100Base-T(X) RJ45 Ports	-	-	1(M12)
10/100/1000Base-T(X) RJ45 Ports	1(M12)	1(M12)	-
PoE+(30 Watts) Ports	1(P.D)	1(P.S.E.)	1(P.S.E.)
PoE++(90 Watts) Ports	-	-	-
100/1G/10G Fiber Ports	-	-	-
Optical Bypass ports	-	-	-
Power Redundancy			
DC Terminal Block	1	1	1
DC Power Jack	-	-	-
Operating Voltage	36 to 57 VDC	50-57VDC / 12-50VDC	50-57VDC / 12-50VDC
Output Power	-	30 Watts Max.	30 Watts Max.
Output Voltage	24V@1A / 12V@2A	-	-
Installation			
DIN-Rail Mounting	-	•	•
Wall Mounting	•	•	•
Physical Characteristics			
Casing Protection	IP-40	IP-30	IP-30
Dimensions (mm)	88.9(W)x40(D)x178.2(H)	88.9(W)x40(D)x178.2(H)	88.9(W)x40(D)x178.2(H)
Operating Temperature			
-10 to 60°C	-	-	-
-25 to 70°C	-	•	•
-25 to 75°C	•	-	-
Network Redundancy			
O-Ring	-	-	-
Open-Ring	-	-	-
O-Chain	-	-	-
STP/RSTP	-	-	-
Management and Control			
802.1X	-	-	-
Rate Limit	-	-	-
Port Mirror	-	-	-
Port Security	-	-	-
IGMP v2/v3	-	-	-
QoS Port Base/COS/TOS	-	-	-
Port Trunk Static/LACP	-	-	-
LLDP	-	-	-
System Alarm	-	-	-
DHCP	-	-	-
VLAN	-	-	-
Management / Configuration	-	-	-
Warranty	5 years		

Product Selection Guide

	Industrial Rack-Mount Ethernet to Fiber Media Converter		
	Chassis	Card type Ethernet to fiber	
Industrial Media Converter			
	RMC-1000	**RGMC-111GPB**	**RMC-121FB**
Port Number			
Chassis Slots	18	-	-
10/100Base-T(X) RJ45 Ports	-	-	2
10/100/1000Base-T(X) RJ45 Ports	-	1	-
100Base-FX Fiber Ports	-	-	1 (Multi/Single-Mode)
1000Base-X Fiber Ports	-	1 (SFP)	-
USB Port	-	-	-
RS-232 Serial Port	-	-	-
RS-422/485 Serial Port	-	-	-
RS-232/422/485 Serial Port	-	-	-
Serial Port Feature			
Baud Rate	-	-	-
Signals	-	-	-
Power Redundancy			
DC Back Plane	-	1	1
DC Terminal Block	-	-	-
DC Power Jack	-	-	-
AC Power Cord	2 (Optional)	-	-
Installation			
DIN-Rail Mounting	-	-	-
Wall mounting	-	-	-
Rack-Mount	●	● (RMC-1000)	● (RMC-1000)
Physical Characteristics			
Casing Protection	IP-20	IP-20	IP-20
Dimensions (mm)	430(W) x 243(D) x 132(H)	21.8W) x 66.8(D) x 126(H)	68(D) x 126(H)
Operating Temperature			
-10 to 60°C	●	●	●
-10 to 70°C	-	-	-
-40 to 70°C	-	-	-
Protection			
Power Overload Current Protection	●	●	●
Power Reverse Polarity Protection	-	-	-
Serial Isolation Protection	-	-	-
Warranty	2 years		

Product Selection Guide

	Industrial Ethernet to Fiber Media Converter		
	Mini type Ethernet to fiber	Mini type Ethernet Extender	
Industrial Media Converter			
	IMC-121FB	IMC-B111ETB-TB	IMC-B111ETB-RJ45
Port Number			
Chassis Slots	-	-	-
10/100Base-T(X) RJ45 Ports	2	1	1
10/100/1000Base-T(X) RJ45 Ports	-	-	-
100Base-FX Fiber Ports	1 (Multi/Single-Mode)	-	-
1000Base-X Fiber Ports	-	-	-
100M Extende Port	-	1 (Terminal Block -2 Wired)	1 (RJ45-2/4/8 Wired)
RS-232 Serial Port	-	-	-
RS-422/485 Serial Port	-	-	-
RS-232/422/485 Serial Port	-	-	-
Serial Port Feature			
Baud Rate	-	-	-
Signals	-	-	-
Power Redundancy			
DC Back Plane	-	-	-
DC Terminal Block	2	2	2
DC Power Jack	by cable	by cable	by cable
AC Power Cord	-	-	-
Installation			
DIN-Rail Mounting	•	•	•
Wall mounting	•	•	•
Rack-Mount	-	-	-
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W) x 70(D) x 95(H)	26.1(W) x 70(D) x 95(H)	26.1(W) x 70(D) x 95(H)
Operating Temperature			
-10 to 60°C	-	-	-
-10 to 70°C	-	-	-
-40 to 75°C	•	•	•
Protection			
Power Overload Current Protection	•	•	•
Power Reverse Polarity Protection	•	•	•
Serial Isolation Protection	-	-	-
Warranty	5 years		

Product Selection Guide

	Industrial Ethernet to Fiber Media Converter		
	Slim type Gigabit Ethernet to fiber		
Industrial Media Converter			
	IGMC-1011GF / 1011GP		IGPMC-111GP-BT-24V
Port Number			
Chassis Slots	-		-
10/100Base-T(X) RJ45 Ports	-		-
10/100/1000Base-T(X) RJ45 Ports	1		1(90W PoE)
100Base-FX Fiber Ports	-		-
1000Base-X Fiber Ports	1 (Multi/Single-Mode)	1 (SFP)	1 (SFP)
100M Extende Port	-		-
RS-232 Serial Port	-		-
RS-422/485 Serial Port	-		-
RS-232/422/485 Serial Port	-		-
Serial Port Feature			
Baud Rate	-		-
Signals	-		-
Power Redundancy			
DC Back Plane	-		-
DC Terminal Block	2		2
DC Power Jack	-		-
AC Power Cord	-		-
Installation			
DIN-Rail Mounting	●		●
Wall mounting	●		●
Rack-Mount	-		-
Physical Characteristics			
Casing Protection	IP-30		IP-30
Dimensions (mm)	26.1(W) x 94.9(D) x 144.3(H)		40(W) x 70(D) x 95(H)
Operating Temperature			
-40 to 75°C	●		●
-40 to 85°C	-		-
Protection			
Power Overload Current Protection	●		●
Power Reverse Polarity Protection	●		●
Serial Isolation Protection	-		-
Warranty	5 years		

Product Selection Guide

	Industrial Ethernet to Fiber Media Converter	
	Mini type Ethernet to fiber	
Industrial Media Converter		
	IGMC-111GPB	ITGMC-111GP+
Port Number		
Chassis Slots	-	-
10/100Base-T(X) RJ45 Ports	-	-
10/100/1000Base-T(X) RJ45 Ports	1	-
1G/10GBase-T(X) RJ45 Ports	-	1
100Base-FX Fiber Ports	-	-
1000Base-X Fiber Ports	1 (SFP)	-
1G/10GBase-X Fiber Ports	-	1
USB Port	-	-
RS-232 Serial Port	-	-
RS-422/485 Serial Port	-	-
RS-232/422/485 Serial Port	-	-
Power Redundancy		
DC Back Plane	-	-
DC Terminal Block	2	2
DC Power Jack	by cable	by cable
AC Power Cord	-	-
Installation		
DIN-Rail Mounting	•	•
Wall mounting	•	•
Rack-Mount	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	26.1(W) x 70(D) x 95(H)	40 (W) x 108 (D) x 154 (H)mm
Operating Temperature		
-10 to 60°C	-	-
-20 to 60°C	•	•
-40 to 75°C	-	-
Protection		
Power Overload Current Protection	•	•
Power Reverse Polarity Protection	•	•
Serial Isolation Protection	-	-
Warranty	5 years	

Product Selection Guide

Industrial Media Converter

	Serial Media Converters	
	Serial to Serial	
		
	ISC-1112-I	
Port Number		
10/100Base-T(X) RJ45 Ports	-	
10/100/1000Base-T(X) RJ45 Ports	-	
Fiber Ports	-	
1000Base-X Fiber Ports	-	
USB Port	-	
RS-232 Serial Port	1	
RS-422/485 Serial Port	1	
RS-232/422/485 Serial Port	-	
Serial Port Feature		
Baud Rate	300 ~ 115.2Kbps	
Signals	RS-232 : TX, RX, GND RS-422 : TX+, TX-, RX+,RX- RS-485 : Data+, Data-	
Power Redundancy		
DC Terminal Block	1	
DC Power Jack	-	
USB Bus Power	-	
Installation		
DIN-Rail Mounting	•	
Wall mounting	•	
Physical Characteristics		
Casing Protection	IP-30	
Dimensions (mm)	71.2(W)x25.3(D)x100.6(H) mm	
Operating Temperature		
-10 to 70°C	•	
-20 to 70°C	-	
-40 to 70°C	-	
Protection		
Power Overload Current Protection	•	
Power Reverse Polarity Protection	-	
Serial Isolation Protection	-	3000 VDC
Warranty	5 years	

Product Selection Guide

Industrial Device Server

IDS-322

IDS-312L

	IDS-322	IDS-312L
Serial Port		
Serial port Numbers	2	1
Serial Mode	RS-232/422/485	RS-232/422/485
Serial Port Connector	DB9 (male)	DB9 (male)
Serial Port with 2KV Isolation	-	-
Serial Baud Rate	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps
Ethernet Port		
10/100Base-T(X) in RJ45 Ports	2	2
10/100/1000Base-T(X) in RJ45 Ports	-	-
Wireless LAN Interface	-	-
Support PoE (IEEE 802.3af compliant)	•	-
Ethernet Switch mode / Fast Recovery Mode supported	-	-
Power Redundancy		
DC Terminal Block	2	1
DC Power Jack	-	-
Installation		
DIN-Rail Mounting	•	•
Wall mounting	•	•
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	45(W) x 80.6(D) x 95(H) mm	26(W) x 75(D) x 110(H) mm
Operating Temperature		
-40 to 70°C	•	•
-10 to 60°C	-	-
Networking Technology		
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UD	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
Windows O.S.Supported	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit
Multiple Link	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP
Event Notification	Syslog / SMTP/ SNMP trap	Syslog / SMTP/ SNMP trap
NAT Router Pass Through	-	-
PPPoE	-	-
DDNS	-	-
Security		
HTTPS/SSH Management	•	•
IP White List	•	•
SSL Data Encryption	•	•
IEEE 802.1X	-	-
Warranty	5 years	

Product Selection Guide

Industrial Wireless Access Point	DIN-Rail WLAN Access Point	
		
	IAP-420/420+	IGAP-610H+
Ethernet Ports		
10/100 Base-T(X) LAN Ports	2	-
10/100 /1000 Base-T(X) LAN Ports	-	1
PoE(P.D.) Support	-	• (LAN Port-1)
Ethernet Switch / Redundant Mode Support	•	-
WLAN Interface		
WLAN Standard	IEEE802.11b/g/n	Dual IEEE802.11a/b/g/n
Transmit Power	19 dBm max.	27 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11g : 54Mbps IEEE802.11n :150Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna Connector	Reverse SMA	Reverse SMA
Antenna	2.4GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi
Power Redundancy		
Power Connector	2(Terminal Block)	2(Terminal Block)
Installation		
DIN-Rail Mounting	•	•
Wall Mounting	•	•
Pillar-Mounting	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	41(W)x81(D)x95(H)	45(W)x95(D)x115(H)
Operating Temperature		
-10 to 60°C	•	-
-10 to 70°C	-	•
-25 to 70°C	-	-
Network Technology		
Alarm Notification	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log
Management / Configuration	WEB/Window Utility	WEB/Window Utility
Warranty	5years	

Product Selection Guide

	Industrial IP-67 WLAN Access Point	
Industrial Wireless Access Point		
	IGAP-W612H+	**IGAP-W99110GP+**
Ethernet Ports		
10/100 Base-T(X) LAN Ports	-	-
10/100 /1000 Base-T(X) LAN Ports	**1 (RJ45)**	**1 (RJ45)**
PoE(P.D.) Support	LAN Port	LAN Port
Ethernet Switch / Redundant Mode Support	-	-
1000 Base-X SFP Ports	-	1
WLAN Interface		
WLAN Standard	IEEE802.11a/b/g/n	IEEE802.11a/b/g/n/ac/ax
Transmit Power	27 dBm max.	28 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps IEEE802.11ac :867Mbps IEEE802.11ax : 1200Mbps
Antenna Connector	Reverse SMA	-
Antenna	2.4GHz :4 dBi 5GHz :6 dBi	Build-in 9dBi
Power Redundancy		
Power Connector	-	1(DC Jack)
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	●	●
Pillar-Mounting	●	●
Physical Characteristics		
Casing Protection	IP-67	IP-68
Dimensions (mm)	220(W)x127(D)x75(H)	251 x 168 × 64 mm
Operating Temperature		
-10 to 70°C	●	-
-25 to 70°C	-	-
-40 to 65°C	-	●
Network Technology		
Alarm Notification	Relay Output / SNMP Trap / System Log	SNMP Trap/ System Log
Management / Configuration	WEB/Window Utility	WEB/Console
Warranty		3 years

Product Selection Guide

Industrial Cellular VPN Router	DIN-Rail Cellular VPN Router	EN50155 WLAN Cellular VPN Router
		
	IAR-142(+)-4G	TGAR-2062+-4GS-M12
Ethernet Ports		
10/100 Base-T(X) LAN Ports	2	-
10/100/1000 Base-T(X) LAN Ports	-	2 (M12)
10/100 Base-FX Fiber Ports	-	-
PoE (P.D.)Support	●(LAN Port-1)	(TGAR-2062+-3GS/4GS-M12)
Ethernet switch/redundant mode support	-	●
WLAN Interface		
WLAN Standard	IEEE802.11b/g/n	IEEE802.11a/b/g/n
Transmit Power	19 dBm max.	17 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11g : 54Mbps IEEE802.11n : 150Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna connector	Reverse SMA	Reverse SMA
Antenna	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :3 dBi
GPS		
Antenna connector	-	1 x External SMA antenna connector
Frequency	-	1575.42MHz
WAN Interface		
Cellular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE
Transmission Power	33 dbm max.	33 dbm max.
SIM Slot	1	2
Antenna connector	-	SMA
Antenna	Multi-Band Antenna	Multi-Band Antenna
WAN Connection Type	-	Static/Dynamic IP,PPPoE
WAN Dial-UP	-	Dual 4G LTE
Power Redundancy		
Power Connector	1(Terminal Block)	2 (M23)
Installation		
DIN-Rail Mounting	●	-
Wall mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-40
Dimensions (mm)	45(W) x 80.6(D) x 95(H)	125(W) x 65(D) x 196(H)
Operating Temperature		
-10 to 60°C	●	-
-20 to 70°C	-	-
-25 to 70°C	-	●
Network Technology		
Alarm Notification	SNMP Trap / System Log/SMTP	Relay Output / SNMP Trap / System Log/SMTP
Management / Configuration	WEB / Window Utility	WEB / Window Utility
Warranty		

Product Selection Guide

Industrial M2M Gateway

	Industrial Media Gateway	
	M2M Gateway	
		
	IMG-4312D+-D4G	IMG-4312+-4G
Ethernet Ports		
10/100/1000 Base-T(X) LAN Ports	2	2
10/100/1000 Base-T(X) Port with PoE P.D	-	-
Serial Port		
Serial port Numbers	1	1
Serial Mode	RS-232/422/485	RS-232/422/485
Serial Port Connector	DB9	DB9
Serial Baud Rate	110 bps to 115.2Kbps	110 bps to 115.2Kbps
PIDO	1	-
WLAN Interface		
WLAN Standard	Industrial IEEE 802.11 b/g/n	Industrial IEEE 802.11 b/g/n
Transmit Power	802.11b: 19dBm ±1.5dBm 802.11g: 17dBm ±1.5dBm 802.11n(2.4G@20MHz): 16dBm ±1.5dBm 802.11n(2.4G@40MHz): 14dBm ±1.5dBm	802.11b: 19dBm ±1.5dBm 802.11g: 17dBm ±1.5dBm 802.11n(2.4G@20MHz): 16dBm ±1.5dBm 802.11n(2.4G@40MHz): 14dBm ±1.5dBm
Transmission Rate	802.11b: 1/2/5.5/11 Mbps 802.11g: 6/9/12/18/24/36/48/54 Mbps 802.11n(40MHz): UP to 150 Mbps	802.11b: 1/2/5.5/11 Mbps 802.11g: 6/9/12/18/24/36/48/54 Mbps 802.11n(40MHz): UP to 150 Mbps
Antenna connector	1 x RP-SMA Female	1 x RP-SMA Female
Antenna	1	1
Cellular Interface		
Cullular Standard	GSM / GPRS / EGPRS / EDGE / WCDMA / HSDPA / HSUPA/LTE	GSM / GPRS / EGPRS / EDGE / WCDMA / HSDPA / HSUPA/LTE
Band Option	**America (US grade)** LTE: FDD:1900(B2)/1700(B4)/850(B5)/700(B12)/700(B13)/700(B14)/1700(B66)/600(B71) MHz UMTS/HSDPA/HSUPA/HSPA+: 1900/1700/850 MHz **Europe (EU grade)** LTE: FDD:2100(B1)/1800(B3)/2600(B7)/900(B8)/800(B20) MHz TDD:TDD:2600(B38)/2300(B40)/2500(B41) MHz UMTS/HSDPA/HSUPA/HSPA+: 2100(B1)/900(B8) MHz GSM/GPRS/EDGE: 900/850 MHz	**America(US grade)** LTE: 1900(B2)/1700(B4)/850(B5)/700(B13)/700(B17)/1900(B25) MHz CDMA/EVDO rev. a/b: 800/1900 UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+: 850/900/1700/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz **Europe(EU grade)** LTE: 2100(B1)/1800(B3)/2600(B7)/900(B8)/800(B20) MHz UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+: 800/850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz
Dual Sim	2	2
Power Redundancy		
DC Terminal Block	2	2
Installation		
DIN-Rail Mounting	●	●
Wall mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	45(W)x80.6(D)x95(H)	45(W)x80.6(D)x95(H) mm
Operating Temperature		
-40 to 70°C	●	●
Network Technology		
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
Windows O.S.Supported	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit
Multiple Link	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP
Event Notification	Syslog / SMTP/ SNMP trap	Syslog / SMTP/ SNMP trap
Warranty	5 years	

Product Selection Guide

	Industrial Media Gateway	
	M2M Gateway	
Industrial M2M Gateway		
	IMG-311DL-4GS	**IMG-311DL-MN**
Physical Ports		
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	1	1
Sim card slot	1	1
SD card slot	1	1
GNSS Suppor		
Antenna Connector	1 x External reverse SMA antenna connector	-
Frequency	GPS 1575.42± 1.023 MHz	-
Serial Ports		
Connector	DB9 x 1	
Operation Mode	RS-232/422/485	
Serial Baud Rate	110 bps to 115.2 Kbps	
Data Bits	7, 8	
Parity	odd, even, none, mark, space	
Stop Bits	1, 1.5, 2	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND	
Flow Control	XON/XOFF, RTS/CTS, DTR/DSR	
Cellular Interface		
LTE Connector	2 x SMA Female	1 x SMA Female
Cellular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA /LTE	LTE Cat-M1, Cat-NB1
Download/Upload Rate	100 /50 Mbps	LTE Cat-M1:300 / 375 Kbps LTE Cat-NB1: 32 / 70 Kbps
Band Option	**EU grade** LTE: FDD:B1/B3/B7/B8/B20/B28 UMTS/HSDPA/HSUPA:B1/B8 GSM/GPRS/EDGE:900/1800 MHz **US grade** LTE: FDD:B2/B4/B5/B12/B13 UMTS/HSDPA/HSUPA:B2/B4/B5	LTE Cat-M1/NB : LTE FDD:B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/
SIM	1	1
Power		
Input power	DC inputs. 12-48VDC	DC inputs. 12-48VDC
Installation		
DIN-Rail Mounting	●	●
Wall mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	
Dimensions (mm)	26.1(W) x 94.9(D) x 144.3(H) mm	
Operating Temperature		
-10 to 60°C	●	●
Network Technology		
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
Windows O.S.Supported	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit
Multiple Link	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP
Event Notification	Syslog / SMTP/ SNMP trap	Syslog / SMTP/ SNMP trap
Warranty	5 years	

Product Selection Guide

Industrial M2M Gateway

	Industrial Media Gateway
	M2M IoT Gateway
	
	IGMG-P83244GC+-D4G
Ethernet Ports	
10/100/1000 Base-T(X) LAN Ports	4
10/100/1000 Base-T(X) Port with PoE P.D	4
Serial Port	
Serial port Numbers	2
Serial Mode	Port 1 : RS-422/RS-485 Port 2 : RS-232/RS-422/RS-485
Serial Port Connector	Port 1 : Terminal Block Port 2 : DB9 male
Serial Baud Rate	110 bps to 921.6 Kbps
WLAN Interface	
WLAN Standard	-
Transmit Power	-
Transmission Rate	-
Antenna connector	-
Antenna	-
Cellular Interface	
Cullular Standard	GSM / GPRS / EGPRS / EDGE / WCDMA / HSDPA+ / HSUPA/LTE
Band Option	America(US) LTE: 700/1700/2100 MHz UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+:800/850/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz Europe(EU) LTE: FDD:2100(B1)/1800(B3)/2600(B7)/900(B8)/800(B20) MHz TDD:2600(B38)/2300(B40)/2500(B41) MHz UMTS/HSDPA/HSUPA/HSPA+/DC-HSPA+/2100(B1)/900(B8) MHz GSM/GPRS/EDGE: 900/850 MHz
SIM Card slot	2
Storage	
SSD	Support 64GB SSD storage for data logging(128/256GB option)
Power Redundancy	
DC Terminal Block	2
Application	
Enhance App	Node-RED, Ignition EDGE
Installation	
DIN-Rail Mounting	●
Wall mounting	●
Physical Characteristics	
Casing Protection	IP-30
Dimensions (mm)	116.4mm(W) x 170mm(D) x 154mm(H)
Operating Temperature	
-40 to 70°C	●
Network Technology	
Operating Modes	TCP Server, TCP Client, UDP, Virtual Com, Serial Tunnel
David Multiple Link	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP
Event Notification	Syslog / SMTP/ SNMP trap
Warranty	5 years

Product Selection Guide

Accessories

Fiber Patch Cord(FPC)/ Fiber Patch Adapter(FCA)/ Fiber Attenuator(FAT)					
Model Name	Optical Connector	Multi-mode	Single-mode	Diameter	Specification
FPC-SCSC-MM3M	SC / SC	•		62.5/125 µm	3 m
FPC-SCSC-SS3M	SC / SC		•	9/125 µm	3 m
FPC-SCLC-MM3M	SC / LC	•		62.5/125 µm	3 m
FPC-SCLC-SS3M	SC / LC		•	9/125 µm	3 m
FPC-SCST-MM3M	SC / ST	•		62.5/125 µm	3 m
FPC-SCST-SS3M	SC / ST		•	9/125 µm	3 m
FPC-LCLC-MM3M	LC / LC	•		62.5/125 µm	3 m
FPC-LCLC-SS3M	LC / LC		•	9/125 µm	3 m
FCA-SC-MM	SC / SC	•		62.5/125 µm	-
FCA-SC-SS	SC / SC		•	9/125 µm	-
FAT-LC-SS05	LC / LC		•	9/125 µm	5 db
FAT-LC-SS10	LC / LC		•	9/125 µm	10 db
FAT-LC-SS15	LC / LC		•	9/125 µm	15 db
FAT-LC-SS20	LC / LC		•	9/125 µm	20 db

DIN-Rail Power Supply	
Regular Type	
Model Name	Description
NDR-75-12	475W DIN-Rail 12VDC/6.3A (voltage adjustable 12~14VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
NDR-75-24	75W DIN-Rail 24VDC/3.2A (voltage adjustable 24~28VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
NDR-75-48	775W DIN-Rail 48VDC/1.6A (voltage adjustable 48~55VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
NDR-120-12	120W DIN-Rail 12VDC/10A (voltage adjustable 12~14VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
NDR-120-24	120W DIN-Rail 24VDC/5A (voltage adjustable 24~28VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
NDR-120-48	120W DIN-Rail 48VDC/2.5A (voltage adjustable 48~55VDC) Power Supply with universal 100 to 240VAC input, -20~70°C
SDR-240-48	240W DIN-Rail 48VDC/5A Power Supply with 100 to 240VAC input , -25~70°C
SDR-480-48	480W DIN-Rail 48VDC/10A Power Supply with 100 to 240VAC input , -25~70°C

Product Selection Guide

Power Cord with Ferrule terminal (For Din-Rail Power Supply)	
Model Name	Description
PCF-AU	Power Cord with Ferrule terminal, AU plug
PCF-UK	Power Cord with Ferrule terminal, UK plug
PCF-US	Power Cord with Ferrule terminal, US plug
PCF-EU	Power Cord with Ferrule terminal, EU plug
PCF-JP	Power Cord with Ferrule terminal, JP plug

Power Adapter	
Model Name	Description
PAA-121000	12VDC/1000mA 12W Power Adapter with universal 100 to 240VAC input, US plug, 0~40°C
PAE-121000	12VDC/1000mA 12W Power Adapter with universal 100 to 240VAC input, EU plug, 0~40°C
PAA-123750	12VDC/3750mA 45W Power Adapter with universal 100 to 240VAC input, US plug, -40~75°C
PAE-123750	12VDC/3750mA 45W Power Adapter with universal 100 to 240VAC input, EU plug, -40~75°C
PAA-482500	48VDC/2500mA 120W Power Adapter with universal 100 to 240VAC input, US power cord, -30~70°C
PAE-482500	48VDC/2500mA 120W Power Adapter with universal 100 to 240VAC input, EU power cord, -30~70°C
PAA-502400	50VDC/2400mA 120W Power Adapter with universal 100 to 240VAC input, US power cord, -10~50°C
PAE-502400	50VDC/2400mA 120W Power Adapter with universal 100 to 240VAC input, EU power cord, -10~50°C

*Note: Other plugs upon request.

M-Series Cables and connectors		
Model Name	Description	Cable Length
M12C-4M4M-300	4-pin M12 Male to 4-pin M12 Male IP-67 Ethernet Cable, 3m, A-coding	3 m
M12C-4M4F-1000	4-pin M12 Male to 4-pin M12 Female IP-67 Ethernet Cable, 10m, A-coding	10 m
M12C-4M4F-3000	4-pin M12 Male to 4-pin M12 Female IP-67 Ethernet Cable, 30m, A-coding	30 m
M12C-4MRJ-300	4-pin M12 Male to RJ45 plug Ethernet Cable, 3m, A-coding	3 m
M12C-4M4M-300D	4-pin M12 Male to 4-pin M12 Male IP-67 Ethernet Cable, 3m, D-coding	3 m
M12C-4M4F-1000D	4-pin M12 Male to 4-pin M12 Female IP-67 Ethernet Cable,10m, D-coding	10 m
M12C-4M4F-3000D	4-pin M12 Male to 4-pin M12 Female IP-67 Ethernet Cable, 30m, D-coding	30 m
M12C-4MRJ-300D	4-pin M12 Male to RJ45 Plug Ethernet Cable, 3m, D-coding	3 m
M12C-5MDB9-300	5-pin M12 Male to DB9 console Cable, 3m, A-coding	3 m
M12C-5M00-300	5-pin M12 Male to Tin-plated Bare Wire Power Cable, 3m, A-coding	3 m
M12C-5M5F-1000	5-pin M12 Male to 5-pin M12 Female IP-67 Cable, 10m, A-coding	10 m
M12C-5M5F-3000	5-pin M12 Male to 5-pin M12 Female IP-67 Cable, 30m, A-coding	30 m
M12C-8M8M-300	8-pin M12 Male to 8-pin M12 Male IP-67 Ethernet Cable, 3m, A-coding	3 m
M12C-8M8F-1000	8-pin M12 Male to 8-pin M12 Female IP-67 Ethernet Cable, 10m, A-coding	10 m
M12C-8M8F-3000	8-pin M12 Male to 8-pin M12 Female IP-67 Ethernet Cable, 30m, A-coding	30 m
M12C-8MRJ-300	8-pin M12 Male to RJ45 plug Ethernet Cable, 3m, A-coding	3 m
M12C-8M8M-300X	8-pin M12 Male to 8-pin M12 Male IP-67 Ethernet Cable, 3m, X-coding	3 m
M12C-8M8F-1000X	8-pin M12 Male to 8-pin M12 Female IP-67 Ethernet Cable, 10m, X-coding	10 m
M12C-8M8F-3000X	8-pin M12 Male to 8-pin M12 Female IP-67 Ethernet Cable, 30m, X-coding	30 m
M12C-8MRJ-300X	8-pin M12 Male to RJ45 plug Ethernet Cable, 3m, X-coding	3 m
M23C-5M00-300	5-pin M23 Male to Tin-plated Bare Wire Power Cable, 3m, A-coding	3 m
7/8C-5F00-300	5-pin 7/8 inch Female to Tin-plated Bare Wire Power Cable, 3m, A-coding	3 m
M12P-4MD	4-pin M12 Male Assembled Plug, Soldering type, D-coding	-
M12P-4MD-C	4-pin M12 Male Assembled Plug, IDC type, D-coding	-
M12P-4FS-S	4-pin M12 Female Assembled Plug, Screw type, S-coding	-
M12P-5MA	5-pin M12 Male Assembled Plug, Soldering type, A-coding	-

Product Selection Guide

M12P-5MA-C	5-pin M12 Male Assembled Plug, IDC type, A-coding	-
M12P-5FA	5-pin M12 Female Assembled Plug, Soldering type, A-coding	-
M12P-5FA-C	5-pin M12 Female Assembled Plug, IDC type, A-coding	-
M12P-8MA	8-pin M12 Male Assembled Plug, Soldering type, A-coding	-
M12P-8MA-C	8-pin M12 Male Assembled Plug, IDC type, A-coding	-
M12P-8FA	8-pin M12 Female Assembled Plug, Soldering type, A-coding	-
M12P-8FA-C	8-pin M12 Female Assembled Plug, IDC type, A-coding	-
M12P-8MX-C	8-pin M12 Male Assembled Plug, IDC type, X-coding	-
M23P-5MA	5-pin M23 Male Assembled Plug, Soldering type, A-coding	-
M23P-5MAR-S	5-pin M23 Male Assembled Plug, Screw type, A-coding,right angled	-
7/8P-5FA	5-pin 7/8 inch Female Assembled Plug, Soldering type, A-coding	-
7/8P-5FAR-S	5-pin 7/8 inch Female Assembled Plug, Screw type, A-coding, right angled	-

RF Antenna Base (Magnetic)

Model Name	Description	Cable Length
RFB-M2-150	N Female Magnetic WLAN RF Antenna Base, Cable length 1.5m, with SMA Male RS connector	1.5 m
RFB-M2-1000	N Female Magnetic WLAN RF Antenna Base, Cable length 10m, with SMA Male RS connector	10 m
RFB-M3-150	SMA Female RS Magnetic WLAN RF Antenna Base, Cable length 1.5m, with SMA Male RS connector	1.5m

RF Cable

Model Name	Description	Cable Length
RFC-SFR-SMR-1000	Low loss RF Cable, Cable length 10m, RP-SMA Female to RP-SMA Male connector	10 m
RFC-SF-SMR-150	Low loss RF Cable, Cable length 1.5m, SMA Female to RP-SMA Male connector	1.5 m
RFC-SM-SMR-150	Low loss RF Cable, Cable length 1.5m, SMA Male to RP-SMA Male connector	1.5 m
RFC-NM-SMR-150	Low loss RF Cable, Cable length 1.5m, N Male to RP-SMA Male connector	1.5 m
RFC-NM-SMR-500	Low loss RF Cable, Cable length 5m, N Male to RP-SMA Male connector	5m
RFC-NM-SMR-1000	Low loss RF Cable, Cable length 10m, N Male to RP-SMA Male connector	10 m
RFC-NF-NM-50	Low loss RF Cable, Cable length 0.5m, N Female to N Male connector	0.5 m
RFC-NF-NM-500	Low loss RF Cable, Cable length 5m, N Female to N Male connector	5 m
RFC-NF-NM-1000	Low loss RF Cable, Cable length 10m, N Female to N Male connector	10 m
RFC-NM-NM-150	Low loss RF Cable, Cable length 1.5m, N Male to N Male connector	1.5m

RF Surge Protector

Model Name	Description
RFP-NF-NM-WAG	High-power RF Surge Protector, 0~6GHz, N Female to N Male connector

RF Adapter

Model Name	Description
RFC-SF-SM-0R	RF Right Angle Adapter, SMA Female to SMA Male connector
RFC-SFR-SM-0	RF Adapter, RP SMA Female to SMA Male connector
RFC-SFR-SMR-0R	RF Right Angle Adapter, RP-SMA Female to RP-SMA Male connector
RFC-SM-NF-0	RF Adapter, SMA Male to N Female connector
RFC-SMR-NF-0	RF Adapter, RP-SMA Male to N Female connector
RFC-SM-NM-0	RF Adapter , SMA Male to N type Male connector

Product Selection Guide

WLAN RF Antenna (Outdoor Panel Type)	
Model Name	Description
RFA-P14-NF2-WA	Outdoor High-gain Panel Antenna, MIMO,5GHz, 14dbi max., N Female connector x2
RFA-P12-NF-WG	Outdoor High-gain Panel Antenna, 2.4GHz, 12dbi max., N Female connector
RFA-P14-NF-WA	Outdoor High-gain Panel Antenna, 5GHz, 14dbi max., N Female connector
RFA-P13-NF2-WG	Outdoor High-gain Panel Antenna, 2.4GHz, 13dBi max, N-Female connector X2

WLAN RF Antenna (Omni - Directional)	
Model Name	Description
RFA-O7-NM-WG	Omni-directional High-gain Dipole Antenna, 2.4GHz, 7dBi max, N Male connector
RFA-O9-NM-WG	Omni-directional High-gain Dipole Antenna, 2.4GHz, 9dBi max, N Male connector
RFA-O5-NM-WA	Omni-directional High-gain Dipole Antenna, 5GHz, 5dBi max, N Male connector
RFA-O10-NM-WA	Omni-directional High-gain Dipole Antenna, 5GHz, 10dBi max, N Male connector
RFA-O12-NF-WA	Omni-directional High-gain Dipole Antenna, 5GHz, 12dBi max, N Female connector with wall-mount bracket

RF Antenna (Dome Type)	
Model Name	Description
RFA-D9-SM-WG	WLAN RF Dome Antenna 2.4GHz, 9dbi max, 2.4GHz, SMA Male connector
RFA-D28-SM-AG-3M	GPS Active Antenna,1575 MHz, 28dBi max, Magnetic with 3m SMA Male cable

RF Antenna (Roof Type)	
Model Name	Description
RFA-O5-SM-W4G	Rooftop/Outdoor High Performance Omni Antenna for 3G/4G applications 5dBi max, SMA Male connector
RFA-O4-SMR-WG	Rooftop/Outdoor High Performance Omni Antenna, 2.4GHz, 4dBi max, RP-SMA Male connector
RFA-O5-SMR-WA	Rooftop/Outdoor High Performance Omni Antenna, 5 GHz, 5dBi max, RP-SMA Male connector
RFA-O4-SMR2-WG	Rooftop/Outdoor High Performance Omni Antenna, MIMO 2.4GHz, 4dBi max, RP-SMA Male connector x2
RFA-O5-SMR2-WA	Rooftop/Outdoor High Performance Omni Antenna, MIMO 5GHz, 5dBi max.,RP-SMA Male connector x2
RFA-O5-NF3-W3GGS-028	Rooftop/Outdoor High Performance Omni Antenna , 3G/4G, GPS/GLONASS applications, 5dBi max, N Female connector

Product Selection Guide

Accessories
Fast Ethernet SFP modules

Specifications

	Model name				
Characteristics	SFP100-MM/-I	SFP100-SS30/-I	SFP100-SS60/-I	SFP100-SS100/-I	✻SFP100-SS120/-I
Fiber mode	multi-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	2 km	30 km	60 km	100 km	120 km
Operating Temperature	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)
Wavelength	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm
Optical Output Power 9/125 μm fiber (Max. TX)	-	-8 dBm	0 dBm	0 dBm	5 dBm
Optical Output Power 9/125 μm fiber (Min. TX)	-	-15 dBm	-5 dBm	-5 dBm	0 dBm
Optical Output Power 62.5/125 μm fiber (Max. TX)	-14 dBm	-	-	-	-
Optical Output Power 62.5/125 μm fiber (Min. TX)	-20 dBm	-	-	-	-
Optical Output Power 50/125 μm fiber (Max. TX)	-14 dBm	-	-	-	-
Optical Output Power 50/125 μm fiber (Min. TX)	-23.5 dBm	-	-	-	-
Optical Input Power-minimum (Sensitivity)	-31 dBm	-34 dBm	-35 dBm	-35 dBm	-35 dBm
Optical Input Power-maximum (Saturation)	-8 dBm	0 dBm	0 dBm	0 dBm	0 dBm
Link Budget	7.5 dB	19 dB	30 dB	30 dB	35 dB

✻ If two SFP transceivers are connected to each other in a short distance and the received optical power is greater than the listed specification of the received SFP transceiver, please add an optical attenuator(Please refer to FAT-LC series accessories) to avoid any possible damages.

Ordering Information

Model Name	Description
SFP100-MM	100Mbps SFP optical transceiver, multi-mode / 2km, 1310nm, 0 ~ 70℃
SFP100-MM-I	100Mbps SFP optical transceiver, multi-mode / 2km, 1310nm, industrial grade, -40 ~ 85℃
SFP100-SS30	100Mbps SFP optical transceiver, single-mode / 30km, 1310nm, 0 ~ 70℃
SFP100-SS30-I	100Mbps SFP optical transceiver, single-mode / 30km, 1310nm, industrial grade, -40 ~ 85℃
SFP100-SS60	100Mbps SFP optical transceiver, single-mode / 60km, 1310nm, 0 ~ 70℃
SFP100-SS60-I	100Mbps SFP optical transceiver, single-mode / 60km, 1310nm, industrial grade, -40 ~ 85℃
SFP100-SS100	100Mbps SFP optical transceiver, single-mode / 100km, 1550nm, 0 ~ 70℃
SFP100-SS100-I	100Mbps SFP optical transceiver, single-mode / 100km, 1550nm, industrial grade, -40 ~ 85℃
SFP100-SS120	100Mbps SFP optical transceiver, single-mode / 120km, 1550nm, 0 ~ 70℃
SFP100-SS120-I	100Mbps SFP optical transceiver, single-mode / 120km, 1550nm, industrial grade, -40 ~ 85℃

Product Selection Guide

Accessories

Fast Ethernet BIDI-SFP modules

Specifications

	Model Name							
Characteristics	SFP100B3-MM/-I	SFP100B5-MM/-I	SFP100B3-SS20/-I	SFP100B5-SS20/-I	SFP100B3-SS40/-I	SFP100B5-SS40/-I	SFP100B3-SS60/-I	SFP100B5-SS60/-I
Fiber mode	Multi-mode	Multi-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	2 km	2 km	20 km	20 km	40 km	40 km	60 km	60 km
Operating Temperature	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)
Wavelength	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm
Optical Output Power 9/125 μm fiber (Max. TX)	0 dBm	0 dBm	-8 dBm	-8 dBm	0 dBm	0 dBm	0 dBm	0 dBm
Optical Output Power 9/125 μm fiber (Min. TX)	-10 dBm	-10 dBm	-14 dBm	-14 dBm	-8 dBm	-8 dBm	-5 dBm	-5 dBm
Optical Input Power-minimum (Sensitivity)	-28 dBm	-28 dBm	-32 dBm	-32 dBm	-34 dBm	-34 dBm	-34 dBm	-34 dBm
Optical Input Power-maximum (Saturation)	0 dBm	0 dBm	0 dBm	0 dBm	0 dBm	0 dBm	0 dBm	0 dBm
Link Budget	18 dB		18 dB		26 dB		29 dB	

Ordering Information

Model Name	Description
SFP100B3-MM	100Mbps SFP optical Transceiver, Multi-mode BIDI / 2KM, TX1310nm / RX1550nm, 0 ~ 70°C
SFP100B3-MM-I	100Mbps SFP optical Transceiver, Multi-mode BIDI / 2KM, TX1310nm / RX1550nm, industrial grade, -40 ~ 85°C
SFP100B5-MM	100Mbps SFP optical Transceiver, Multi-mode BIDI / 2KM, TX1550nm / RX1310nm, 0 ~ 70°C
SFP100B5-MM-I	100Mbps SFP optical Transceiver, Multi-mode BIDI / 2KM, TX1550nm / RX1310nm, industrial grade, -40 ~ 85°C
SFP100B3-SS20	100Mbps SFP optical transceiver, single-mode BIDI / 20km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP100B3-SS20-I	100Mbps SFP optical transceiver, single-mode BIDI / 20km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP100B5-SS20	100Mbps SFP optical transceiver, single-mode BIDI / 20km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP100B5-SS20-I	100Mbps SFP optical transceiver, single-mode BIDI / 20km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP100B3-SS40	100Mbps SFP optical transceiver, single-mode BIDI / 40km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP100B3-SS40-I	100Mbps SFP optical transceiver, single-mode BIDI / 40km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP100B5-SS40	100Mbps SFP optical transceiver, single-mode BIDI / 40km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP100B5-SS40-I	100Mbps SFP optical transceiver, single-mode BIDI / 40km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP100B3-SS60	100Mbps SFP optical transceiver, single-mode BIDI / 60km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP100B3-SS60-I	100Mbps SFP optical transceiver, single-mode BIDI / 60km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP100B5-SS60	100Mbps SFP optical transceiver, single-mode BIDI / 60km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP100B5-SS60-I	100Mbps SFP optical transceiver, single-mode BIDI / 60km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C

Product Selection Guide

Accessories

Gigabit Ethernet SFP modules

Specifications

Characteristics	Model Name									
	SFP1G-SX/-I	SFP1G-MLX/-I	SFP1G-LX10/-I	✻SFP1G-LX20/-I	✻SFP1G-LHX30/-I	✻SFP1G-LHX40/-I	✻SFP1G-XD50/-I	✻SFP1G-ZX70/-I	✻SFP1G-ZX80/-I	✻SFP1G-EZX120/-I
Fiber mode	multi-mode	multi-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	550 m	62.5/125 : 2km 50/125 : 1km	10 km	20 km	30 km	40 km	50 km	70 km	80 km	120 km
Operating Temperature	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	1550 nm
Optical Output Power 9/125 µm fiber (Max. TX)	-	-	-3 dBm	-2 dBm	1 dBm	1 dBm	1 dBm	5 dBm	5 dBm	5 dBm
Optical Output Power 9/125 µm fiber (Min. TX)	-	-	-9.5 dBm	-8 dBm	-4 dBm	-4 dBm	-4 dBm	0 dBm	0 dBm	0 dBm
Optical Output Power 62.5/125 µm fiber (Max. TX)	-4 dBm	-1 dBm	-	-	-	-	-	-	-	-
Optical Output Power 62.5/125 µm fiber (Min. TX)	-9.5 dBm	-9 dBm	-	-	-	-	-	-	-	-
Optical Output Power 50/125 µm fiber (Max. TX)	-4 dBm	-1 dBm	-	-	-	-	-	-	-	-
Optical Output Power 50/125 µm fiber (Min. TX)	-9.5 dBm	-9 dBm	-	-	-	-	-	-	-	-
Optical Input Power-minimum (Sensitivity)	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-24 dBm	-24 dBm	-24 dBm	-32 dBm
Optical Input Power-maximum(Saturration)	0 dBm	-1 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	20 dB	20 dB	24 dB	24 dB	32 dB

✻ If two SFP transceivers are connected to each other in a short distance and the received optical power is greater than the listed specification of the received SFP transceiver, please add an optical attenuator(Please refer to FAT-LC series accessories) to avoid any possible damages.

Ordering Information

Model Name	Description
SFP1G-SX	1Gbps SFP optical transceiver, multi-mode / 550m, 850nm, 0 ~ 70℃
SFP1G-SX-I	1Gbps SFP optical transceiver, multi-mode / 550m, 850nm, industrial grade, -40 ~ 85℃
SFP1G-MLX	1Gbps SFP optical transceiver, multi-mode / 2km, 1310nm, 0 ~ 70℃
SFP1G-MLX-I	1Gbps SFP optical transceiver, multi-mode / 2km, 1310nm, industrial grade, -40 ~ 85℃
SFP1G-LX10	1Gbps SFP optical transceiver, single-mode / 10km, 1310nm, 0 ~ 70℃
SFP1G-LX10-I	1Gbps SFP optical transceiver, single-mode / 10km, 1310nm, industrial grade, -40 ~ 85℃
SFP1G-LX20	1Gbps SFP optical transceiver, single-mode / 20km, 1310nm, 0 ~ 70℃
SFP1G-LX20-I	1Gbps SFP optical transceiver, single-mode / 20km, 1310nm, industrial grade, -40 ~ 85℃
SFP1G-LHX30	1Gbps SFP optical transceiver, single-mode / 30km, 1310nm, 0 ~ 70℃
SFP1G-LHX30-I	1Gbps SFP optical transceiver, single-mode / 30km, 1310nm, industrial grade, -40 ~ 85℃
SFP1G-LHX40	1Gbps SFP optical transceiver, single-mode / 40km, 1310nm, 0 ~ 70℃
SFP1G-LHX40-I	1Gbps SFP optical transceiver, single-mode / 40km, 1310nm, industrial grade, -40 ~ 85℃
SFP1G-XD50	1Gbps SFP optical transceiver, single-mode / 50km, 1550nm, 0 ~ 70℃
SFP1G-XD50-I	1Gbps SFP optical transceiver, single-mode / 50km, 1550nm, industrial grade, -40 ~ 85℃
SFP1G-ZX70	1Gbps SFP optical transceiver, single-mode / 70km, 1550nm, 0 ~ 70℃
SFP1G-ZX70-I	1Gbps SFP optical transceiver, single-mode / 70km, 1550nm, industrial grade, -40 ~ 85℃
SFP1G-ZX80	1Gbps SFP optical transceiver, single-mode / 80km, 1550nm, 0 ~ 70℃
SFP1G-ZX80-I	1Gbps SFP optical transceiver, single-mode / 80km, 1550nm, industrial grade, -40 ~ 85℃
SFP1G-EZX120	1Gbps SFP optical transceiver, single-mode / 120km, 1550nm, 0 ~ 70℃
SFP1G-EZX120-I	1Gbps SFP optical transceiver, single-mode / 120km, 1550nm, industrial grade, -40 ~ 85℃

Product Selection Guide

Accessories

Gigabit Ethernet BIDI-SFP modules

Specifications

	Model Name									
Characteristics	SFP1GB3-LX10/-I	SFP1GB5-LX10/-I	SFP1GB3-LX20/-I	SFP1GB5-LX20/-I	* SFP1GB3-LX40/-I	* SFP1GB5-LX40/-I	* SFP1GB3-LX60/-I	* SFP1GB5-LX60/-I	* SFP1GB4-LX80/-I	* SFP1GB5-LX80/-I
Fiber mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	10 km	10 km	20 km	20 km	40 km	40 km	60 km	60 km	80 km	80 km
Operating Temperature	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)	0~70°C -40~85°C (-I model)
Wavelength	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1310 nm RX : 1550 nm	TX : 1550 nm RX : 1310 nm	TX : 1490 nm RX : 1550 nm	TX : 1550 nm RX : 1490 nm
Optical Output Power 9/125 µm fiber (Max. TX)	-3 dBm	-3 dBm	-2 dBm	-2 dBm	2 dBm	2 dBm	5 dBm	4 dBm	4 dBm	4 dBm
Optical Output Power 9/125 µm fiber (Min. TX)	-9 dBm	-9 dBm	-8 dBm	-8 dBm	-3 dBm	-3 dBm	0 dBm	-2 dBm	-2 dBm	-2 dBm
Optical Input Power-minimum (Sensitivity)	-21 dBm	-21 dBm	-23 dBm	-23 dBm	-23 dBm	-23 dBm	-24 dBm	-25 dBm	-25 dBm	-25 dBm
Optical Input Power-maximum (Saturation)	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-3 dBm	-3 dBm
Link Budget	12 dB		15 dB		20 dB		22 dB		23 dB	

* If two SFP transceivers are connected to each other in a short distance and the received optical power is greater than the listed specification of the received SFP transceiver, please add an optical attenuator(Please refer to FAT-LC series accessories) to avoid any possible damages.

Ordering Information

Model Name	Description
SFP1GB3-LX10	1Gbps SFP optical transceiver, single-mode BIDI / 10km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP1GB3-LX10-I	1Gbps SFP optical transceiver, single-mode BIDI / 10km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP1GB5-LX10	1Gbps SFP optical transceiver, single-mode BIDI / 10km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP1GB5-LX10-I	1Gbps SFP optical transceiver, single-mode BIDI / 10km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP1GB3-LX20	1Gbps SFP optical transceiver, single-mode BIDI / 20km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP1GB3-LX20-I	1Gbps SFP optical transceiver, single-mode BIDI / 20km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP1GB5-LX20	1Gbps SFP optical transceiver, single-mode BIDI / 20km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP1GB5-LX20-I	1Gbps SFP optical transceiver, single-mode BIDI / 20km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP1GB3-LX40	1Gbps SFP optical transceiver, single-mode BIDI / 40km, TX1310nm, RX1550nm, 0 ~ 70°C
SFP1GB3-LX40-I	1Gbps SFP optical transceiver, single-mode BIDI / 40km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP1GB5-LX40	1Gbps SFP optical transceiver, single-mode BIDI / 40km, TX1550nm, RX1310nm, 0 ~ 70°C
SFP1GB5-LX40-I	1Gbps SFP optical transceiver, single-mode BIDI / 40km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP1GB3-LX60-I	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1310nm, RX1550nm, industrial grade, -40 ~ 85°C
SFP1GB5-LX60-I	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1550nm, RX1310nm, industrial grade, -40 ~ 85°C
SFP1GB4-LX80	1Gbps SFP optical transceiver, single-mode BIDI / 80km, 1490nm, 1550nm, 0 ~ 70°C
SFP1GB4-LX80-I	1Gbps SFP optical transceiver, single-mode BIDI / 80km, 1490nm, 1550nm, industrial grade, -40 ~ 85°C
SFP1GB5-LX80	1Gbps SFP optical transceiver, single-mode BIDI / 80km, 1550nm, 1490nm, 0 ~ 70°C
SFP1GB5-LX80-I	1Gbps SFP optical transceiver, single-mode BIDI / 80km, 1550nm, 1490nm, industrial grade, -40 ~ 85°C

Product Selection Guide

Accessories

10G Ethernet SFP+ modules with Diagnostic Monitoring

Specifications

	Model Name				
Characteristics	SFP10G-MM/-I	SFP10G-LR10/-I	SFP10G-LR20/-I	✻SFP10G-ER40/-I	✻SFP10G-ZR80/-I
Fiber mode	multi-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	62.5/125um : 33m 50/125um(OM2) : 82m 50/125um(OM3) : 300m	10 km	20 km	40 km	80 km
Operating Temperature	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)	0~70℃ -40~85℃ (-I model)
Wavelength	850 nm	1310 nm	1310 nm	1550 nm	1550 nm
Optical Output Power 9/125 µm fiber (Max. TX)	-	0.5 dBm	0.5 dBm	4 dBm	4 dBm
Optical Output Power 9/125 µm fiber (Min. TX)	-	-6 dBm	-4 dBm	-4.7 dBm	0 dBm
Optical Output Power 62.5/125 µm fiber (Max. TX)	-1 dBm	-	-	-	-
Optical Output Power 62.5/125 µm fiber (Min. TX)	-6.5 dBm	-	-	-	-
Optical Output Power 50/125 µm fiber (Max. TX)	-1 dBm	-	-	-	-
Optical Output Power 50/125 µm fiber (Min. TX)	-6.5 dBm	-	-	-	-
Optical Input Power-minimum (Sensitivity)	-9.9 dBm	-14.4 dBm	-15 dBm	-15.8 dBm	-23 dBm
Optical Input Power-maximum (Saturation)	-1 dBm	0.5 dBm	0.5 dBm	-1 dBm	-7 dBm
Link Budget	3.4 dB	8.4 dB	11 dB	11.1 dB	23 dB

✻ If two SFP transceivers are connected to each other in a short distance and the received optical power is greater than the listed specification of the received SFP transceiver, please add an optical attenuator(Please refer to FAT-LC series accessories) to avoid any possible damages.

Ordering Information

Model Name	Description
SFP10G-MM	10Gbps SFP+ optical transceiver, multi-mode / 300m, 850nm, 0 ~ 70℃
SFP10G-MM-I	10Gbps SFP+ optical transceiver, multi-mode / 300m, 850nm, industrial grade, -40 ~ 85℃
SFP10G-LR10	10Gbps SFP+ optical transceiver, single-mode / 10km, 1310nm, 0 ~ 70℃
SFP10G-LR10-I	10Gbps SFP+ optical transceiver, single-mode / 10km, 1310nm, industrial grade, -40 ~ 85℃
SFP10G-LR20	10Gbps SFP+ optical transceiver, single-mode / 20km, 1310nm, 0 ~ 70℃
SFP10G-LR20-I	10Gbps SFP+ optical transceiver, single-mode / 20km, 1310nm, industrial grade, -40 ~ 85℃
SFP10G-ER40	10Gbps SFP+ optical transceiver, multi-mode / 40km, 1550nm, 0 ~ 70℃
SFP10G-ER40-I	10Gbps SFP+ optical transceiver, multi-mode / 40km, 1550nm, industrial grade, -40 ~ 85℃
SFP10G-ZR80	10Gbps SFP+ optical transceiver, single-mode / 80km, 1550nm, 0 ~ 70℃
SFP10G-ZR80-I	10Gbps SFP+ optical transceiver, single-mode / 80km, 1550nm, industrial grade, -40 ~ 85℃

Product Selection Guide

Accessories

Gigabit Ethernet SFP-RJ45 modules

Specifications

	Model Name		
Characteristics	SFP1GRJ	SFP1GRJ-I	SFP10GRJ
Operating Temperature	0~70℃	-40~85℃	0~70℃
RJ45 Operation mode	1000Base-T❄	1000Base-T❄	10GBase-T★
SFP Interface	SERDES, 1000Base-X	SERDES,1000Base-X	SERDES, 10GBase-X

❄1. Please notice 10/100Base-T(X) modes are not supported.
2. Link length up to 100m with Cat5 UTP cable or better.
★ 1. Please notice 10/100/1000Base-T modes are not supported.
2. Link length up to 30m with Cat6a/7 cable.

Ordering Information

Model Name	Description
SFP1GRJ	1Gbps SFP to 1000 Base-T transceirer, 0 ~ 70℃
SFP1GRJ-I	1Gbps SFP to 1000 Base-T transceirer, industrial grade, -40 ~ 85℃
SFP10GRJ	10Gbps SFP+ to 10G - Base-T transceirer, 0 ~ 70℃

10G Ethernet SFP+ Copper Cable

Specifications

	Model Name			
Characteristics	SFPC10G-50	SFPC10G-100	SFPC10G-300	SFPC10G-500
Max.Speed	10 Gbps	10 Gbps	10 Gbps	10 Gbps
Wire Guage	30 AWG	30 AWG	30 AWG	24 AWG
Low Smoke Zero Halogen	•	•	•	•
Cable length	0.5 m	1 m	3 m	5 m
Operating temperature	-40 ~ 85℃	-40 ~ 85℃	-40 ~ 85℃	-40 ~ 85℃

Ordering Information

Model Name	Description	Cable length
SFPC10G-50	10Gbps SFP+ copper cable 30AWG, 0.5 m, -40 ~ 85℃	0.5 m
SFPC10G-100	10Gbps SFP+ copper cable 30AWG, 1 m, -40 ~ 85℃	1 m
SFPC10G-300	10Gbps SFP+ copper cable 30AWG, 3 m, -40 ~ 85℃	3 m
SFPC10G-500	10Gbps SFP+ copper cable 24AWG, 5 m, -40 ~ 85℃	5 m

Product Selection Guide

Network Management Software

Open-Vision v4.0

Ordering Information

Model Name	Description
Open-Vision 4.0	Powerful Network Management Windows Utility Suit, 50 IP devices

Device Configuration Backup Unit

DBU-01 Series

Specifications

Model	DBU-01-DB9	DBU-01-RJ45	DBU-01-M12
Physical Ports			
Connector	DB9	RJ-45	M12(5pin A-coding)
Switch	2 pole DIP switch	-	16
LED indicators			
Power Indicator	1 x LED, Green On : Power is on and device ready		
Transmit Indicator	1 x LED, Amber blinking: data transmitting.		
Status Indicator	1 x LED, Green On : function successful Red On : function fail		
Power			
Input power	5~12VDC (via RS-232 RTS port)		
Physical Characteristic			
Enclosure	IP-40, PC molding		
Dimension (W x D x H)	32(W)x14.5(D)x90(H)mm (1.25 x 0.57 x 3.5 inch.) (cable length:172mm)		
Weight (g)	53g	33g	43g
Environmental			
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Operating Temperature	-10 to 60°C (14 to 140°F)		
Operating Humidity	5% to 95% Non-condensing		
Regulatory approvals			
EMC	CE EMC (EN 55024, EN 55032), EN50121-4 (compliant), FCC Part 15 B		
EMI	EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15 B class A		
EMS	EN 55024 (IEC/EN 61000-4-2 (ESD: Contact 4KV, Air 8KV), IEC/EN 61000-4-3 (RS: 3V),IEC/EN 61000-4-4 (EFT Power 0.5KV, Signal 0.5KV), IEC/EN 61000-4-5 (Surge: Power 0.5KV, Signal 1KV), IEC/EN 61000-4-6 (CS: 3V), IEC/EN 61000-4-8(PFMF), IEC/EN 61000-4-11 (DIP))		
Shock	IEC60068-2-27		
Free Fall	IEC60068-2-31		
Vibration	IEC60068-2-6		
MTBF			
Warranty	3 years		

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