ORing Guidebook

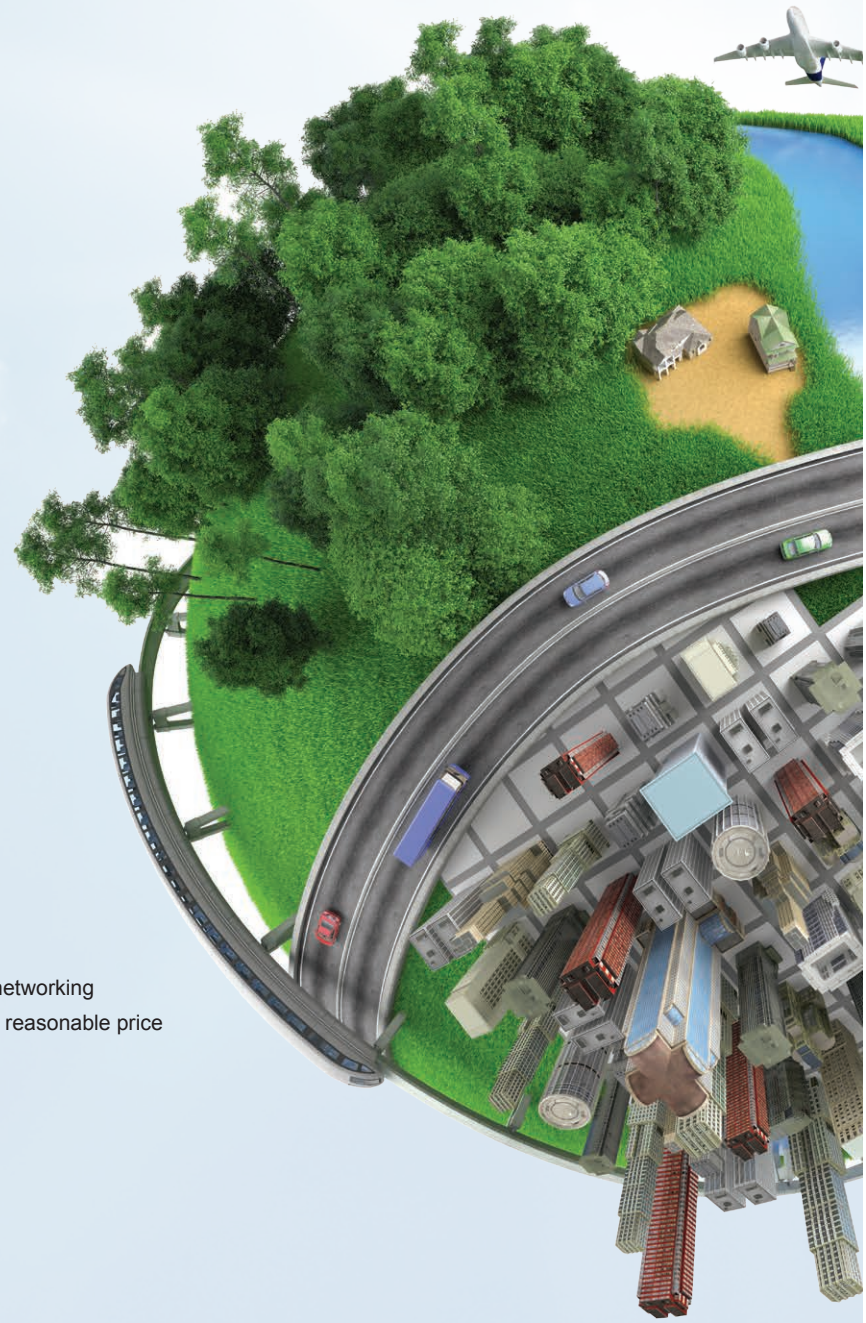
Industrial Networking Solutions

Weidmüller

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 60W/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).

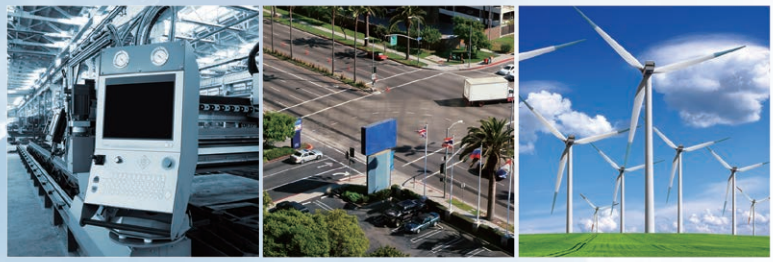
For wireless communications, ORing has developed industrial-grade products conforming to IEEE 802.11n and IEEE 802.11ac standards, X-Roaming technology (cross-AP wireless roaming handoff time < 60 ms), X-Mesh technology for large-scale redundant wireless networks and many more. Other products include industrial M2M gateways and 4G LTE cellular routers featuring 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/UL508/C1D2/ATEX/ IECEx, IEC-61850 for power utilities, EN50155/50121 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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Product Overview

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 or less and industrial control equipment intended for use in an ambient temperature of 0-40°C (32-104°F).

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 2002/95/EC, 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 9001:2008

▪ IRIS

ORing Highlight Products

- Redundant Power
- O-Ring: ORing's proprietary redundant ring technology
- PD:Powered Device
- PSE: Power Sourcing Equipment
- Full Gigabit
- WIFI
- 3G/4G LTE
- Operating Temperature
- IEC 61850: Power Utility Certified
- EN 50155: Railway Certified
- X-Roaming: Support X-roaming
- IP67: Waterproof grade
- RS232/422/485: Serial Port
- SSL: Secure Sockets Layer
- VPN: Supports VPN for secured network connection
- Isolation: Serial Isolation

Desktop-type Ethernet Switch

DGS-R9812GP-AIO_S

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Layer-3 8G+12G SFP Managed Desktop Gigabit Ethernet Switch

Rack-Mount Ethernet Switch

RGPS-R9244GP+-P

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Layer-3 24G P.S.E.+4G/10G SFP Ports Managed Gigabit Ethernet Switch

RGPS-92222GCP-NP Series

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22G P.S.E.+2G Combo P.S.E.+2G SFP Ports Managed Gigabit Ethernet Switch

RGS-PR9000

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Layer-3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots

Gigabit PoE Ethernet Switch

IGPS-9842GTP Series

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8G P.S.E.+4G+2G SFP Ports Managed Gigabit Ethernet Switch

IGPS-9080 Series

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8G P.S.E. Ports Managed Gigabit Ethernet Switch

IGPS-9042GP-24V

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4G P.S.E.+2G SFP Ports Managed Gigabit Ethernet Switch

ORing Highlight Products

IRIS Certification EN50121 EN50155 Transporter Series

EN50155 Ethernet Switch

TPS-1080-M12-BP2 Series

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EN50155 8 P.S.E. Ports, 2xBypass, Unmanaged Ethernet Switch

TPS-141TX-M12 Series

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EN50155 4 P.S.E.+1 Ports, Unmanaged Ethernet Switch

TES-3162GT-M12-BP1

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EN50155 16+2G Ports, 1xBypass, Managed Ethernet Switch

TES-180-M12

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EN50155 8-Port Unmanaged Ethernet Switch

EN50155 Ethernet Switch

TPS-3162GT-M12-BP1 Series

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EN50155 16 P.S.E.+2G Ports, 1xBypass, Managed Ethernet Switch

TPS-3882GT-M12-BP1 Series

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EN50155 8 P.S.E.+8+2G, Managed Ethernet Switch

TGPS-9084GT-M12-BP2 Series

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EN50155 8G P.S.E.+4G Ports, 2xBypass, Managed Gigabit Ethernet Switch

TGPS-9164GT-M12-BP2 Series

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EN50155 16G P.S.E.+4G Ports, 2xBypass, Managed Gigabit Ethernet Switch

ORing Highlight Products

Industrial Wireless Access Point

IAP-420/420+

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IEEE 802.11 b/g/n Wireless AP with 2x10/100Base-T(X)

IAP-W420+/W422+

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Outdoor IEEE 802.11 b/g/n Wireless AP with 2x10/100Base-T(X) PoE P.D., IP-67 Grade

IGAP-6620+

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Dual RF in IEEE 802.11 a/b/g/n Wireless AP with 2x10/100/1000Base-T(X)

IGAP-820

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IEEE 802.11 ac/g/n Wireless AP with 2x10/100/1000Base-T(X)

Industrial Wireless Access Point

IAP-W520+/522+

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Outdoor IEEE 802.11 a/n Wireless AP with 2x10/100Base-T(X) PoE P.D., IP-67 Grade

TGAP-W610+-M12

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Outdoor IEEE 802.11 a/b/g/n AP with 1x10/100/1000Base-T(X) PoE P.D., ,M12 connector,IP-67 Grade

TGAP-W6610+-M12

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EN50155 Dual RF in IEEE 802.11 a/b/g/n Wireless AP with 2x10/100/1000Base-T(X) PoE P.D., M12 connector,IP-67 Grade

TGAP-620-M12

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EN50155 IEEE 802.11 a/b/g/n Wireless AP with 2x10/100/1000Base-T(X), M12 connector

ORing Highlight Products

Industrial VPN Router

IGR-20/20+

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Industrial VPN Router with 2x10/100/1000Base-T(X)

IAR-142(+)-3G/4G Series

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IEEE 802.11 b/g/n 3G/4G Cellular Router with 2x10/100Base-T(X)

TGAR-W1061+-3G/4G-M12

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EN50155 IEEE 802.11 a/b/g/n 3G Cellular Router with 1x10/100/1000Base-T(X), PoE P.D.

TGAR-1062+-3GS/4GS-M12

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EN50155 IEEE 802.11 a/b/g/n 3G/4G Cellular GPS Router with 2x10/100/1000Base-T(X), M12 connector

Industrial VPN Router

IGAR-1662+-3G/4G

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IEEE Dual 802.11 a/b/g/n 3G/4G Cellular Router with 2x10/100/1000Base-T(X)

IGAR-2062+-3G/4G

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IEEE 802.11 a/b/g/n Dual 3G/4G Cellular Router with 2x10/100/1000Base-T(X)

IGAR-1062+-3G/4G

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IEEE 802.11 a/b/g/n 3G/4G Cellular Router with 2x10/100/1000Base-T(X)

TGAR-2062+-3G/4GS-M12

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EN50155 IEEE 802.11 a/b/g/n Dual 3G/4G Cellular GPS Router with 2x10/100/1000Base-T(X), M12 connector

ORing Highlight Products

Industrial Device Server

IDS-312/312+

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1xRS-232/422/485 to 2x10/100Base-T(X), 1-port PoE P.D. Device Server

IDS-322/322+

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2xRS-232/422/485 to 2x10/100Base-T(X), 1-port PoE P.D. Device Server

IDS-342/342+

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4xRS-232/422/485 to 2x10/100Base-T(X), 1-port PoE P.D. Device Server

RDS-3166G

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16xRS-232/422/485 to4x10/100/1000Base-T(X)+2x10/100/1000Base-X SFP Socket Device Server

Industrial Device Server

IDS-M311

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Industrial 1-port Modbus Gateway with 1xRS-232/422/485 and 1x10/100 Base-T(X)

RDS-P3000

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IEC 61850-3 Modular Rack-mount Device Server with 4 Serial Slots and 1 Ethernet Slot

Industrial M2M Gateway

IMG-6322GT

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Industrial Cellular M2M Gateway with IEEE 802.11 a/b/g/n and 1 Port RS-422/485, 1 port RS-232/422/485 & 2x10/100/1000Base-T(X) Gateway

IMG-W6121+-3G/4G-M12

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Industrial Cellular M2M Gateway with IEEE802.11 a/b/g/n, 1G PoE P.D. and 2xRS-232

ORing Highlight Products

Industrial Media Converter

IMC-P111FX

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IEC 61850-3 1x10/100Base-T(X) to 1x100Base-FX Fiber / 1x100Base-FX SFP Socket Media Converter

ISC-1310FB

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1-port RS-232/422/485 to Fiber Serial Media Converter

ISC-1112B/ISC-1112B-I

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RS-232 to RS-422/485 Serial Media Converter

ORing Management Server

OCS-815

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Industrial 6-port Rack-mount multi-functional Management Server

Industrial PoE Ethernet Accessories

INJ-102GT++ Series

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Industrial 2-port Gigabit High Power Plus PoE++ Injector

SPL-101GT++

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Industrial 1-port Gigabit PoE Splitter, 90Watts Output

PET-102GT++

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Industrial 2-port Gigabit High Power PoE++ Extender, 50V~57V Input Support

TINJ- 101GT-M12 Series

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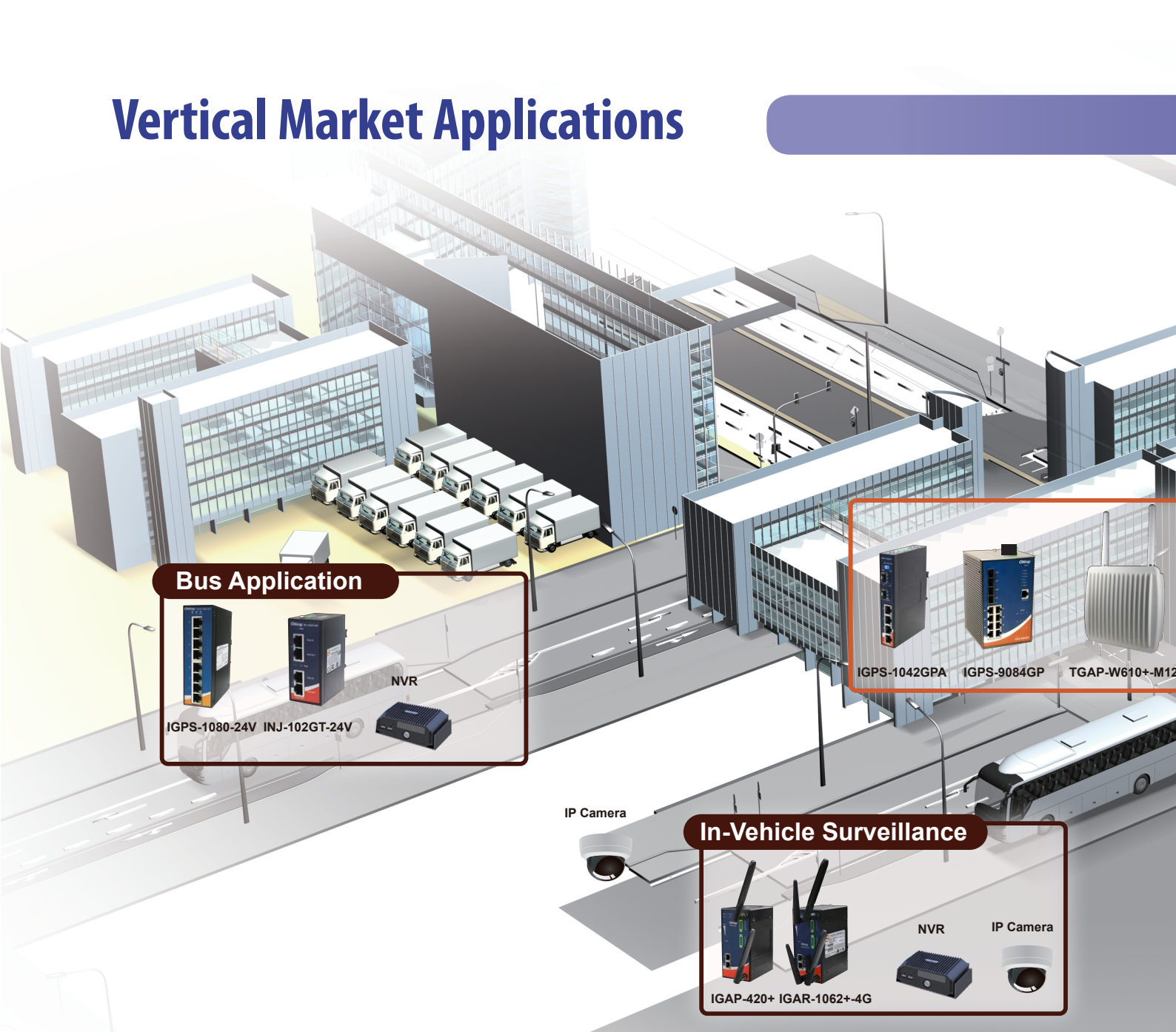
EN50155 Industrial 1-port Gigabit High Power PoE Injector

Vertical Market Applications



Key Products

TINJ-101GT-M12 Series

EN50155 Industrial 1-port Gigabit High Power PoE Injector, M12 Connector

- Supports 1x10/100/1000 Base-T(X) for power and data output
- Fully compliant with IEEE802.3at/802.3af
- Supports Power output up to 30 watts

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TPS-3882GT-M12-BP1

EN50155 18-port Managed PoE Ethernet Switch

- 8 ports P.S.E. fully compliant with IEEE802.3af standard, provide up to 15.4 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

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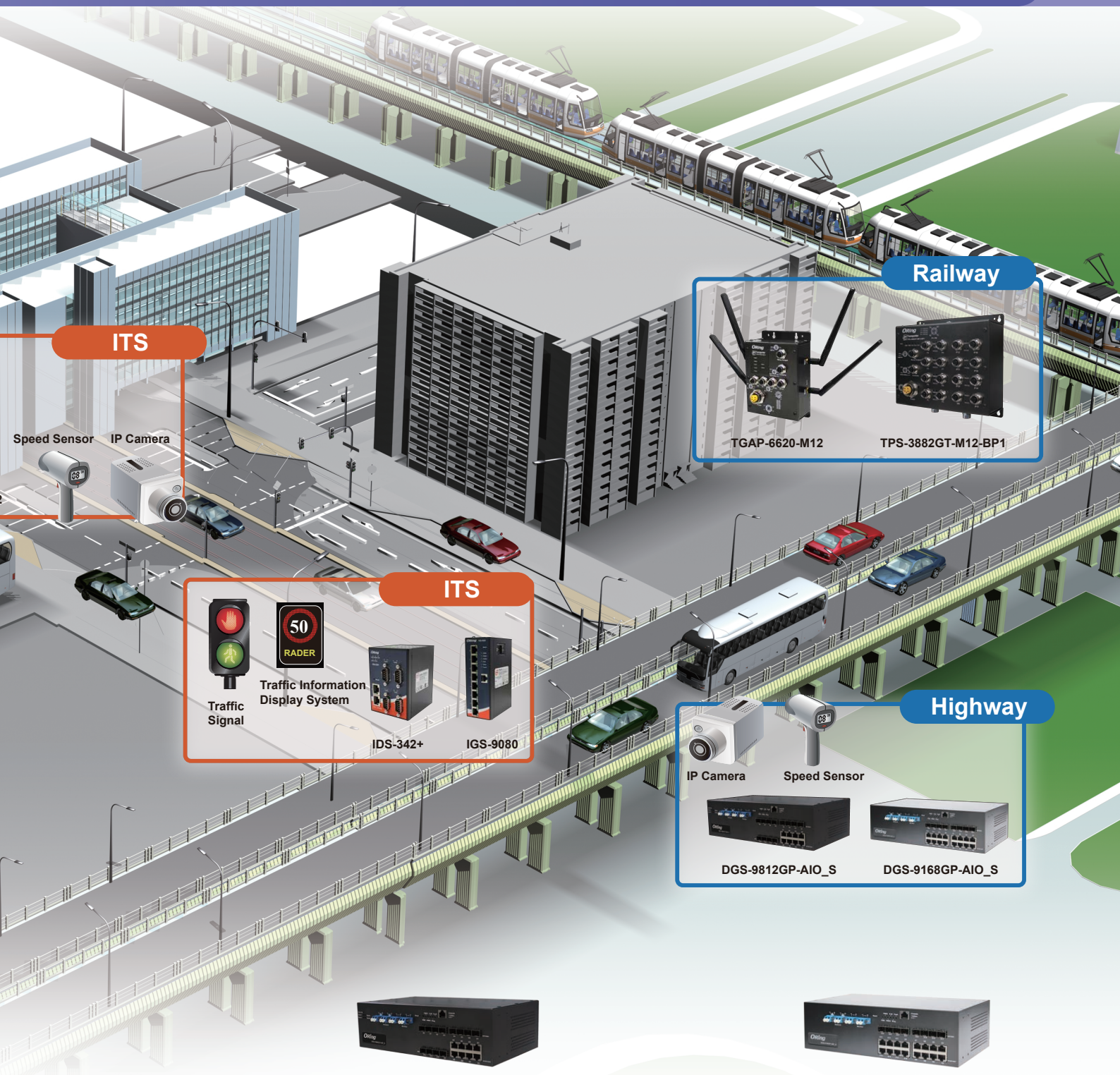

DGS-9812GP-AIO_S

Industrial 20-port Desktop Managed Gigabit Bypass Ethernet Switch

- Supports 8xGigabit ports and 12x100/1000Base-X SFP ports
- Supports more Ethernet redundancy with O-Ring / Open-Ring / O-Chian / MRP / MSTP / RSTP / STP
- Supports Jumbo frame up to 9.6K bytes
- Supports optical bypass function

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DGS-9168GP-AIO_S

Industrial 24-port Desktop Managed Gigabit Bypass Ethernet Switch

- Supports 16xGigabit ports and 8x100/1000Base-X SFP ports
- Supports more Ethernet redundancy with O-Ring / Open-Ring / O-Chian / MRP / MSTP / RSTP / STP
- Supports Jumbo frame up to 9.6K bytes
- Supports optical bypass function

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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

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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 (Media Redundancy Protocol) function

Page 73

IGS-9042GP Series

Industrial 6-port Managed Gigabit Ethernet Switch

- Supports IEEE 802.3az energy-efficient Ethernet technology
- Supports Modbus TCP protocol
- Supports standard IEC 62439-2 MRP (Media Redundancy Protocol) function

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DGS-9812GP-AIO_S

Industrial 20-port Desktop Managed Gigabit Bypass Ethernet Switch

- Supports 8x10/100/100Base-T(X) ports and 12x10/100/100Base-X SFP ports
- Supports Jumbo frame up to 9.6K bytes
- Supports O-Ring (recovery time < 30ms over 250 units of connection), MSTP/RSTP/STP (IEEE 802.1s/w/D) for Ethernet redundancy

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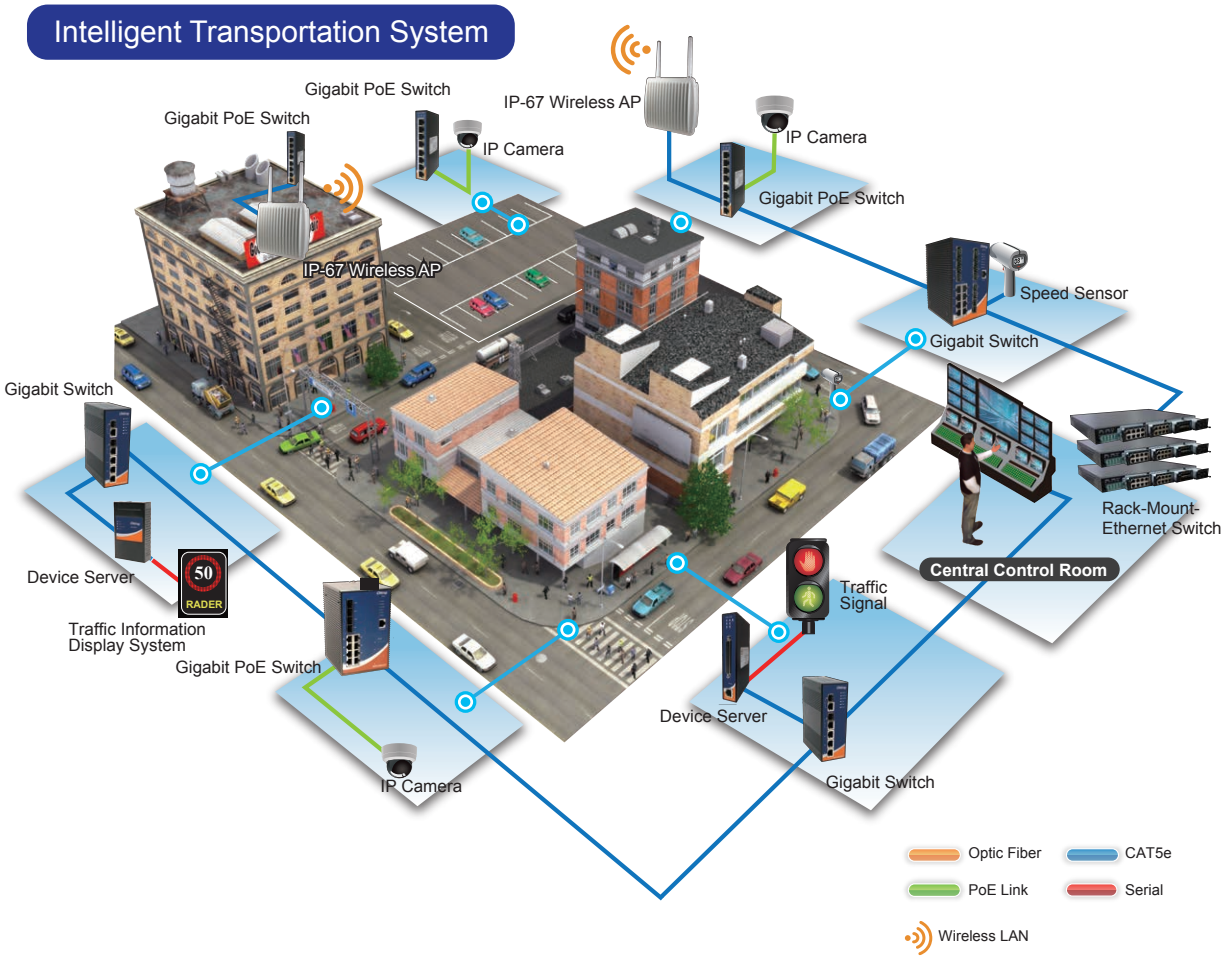
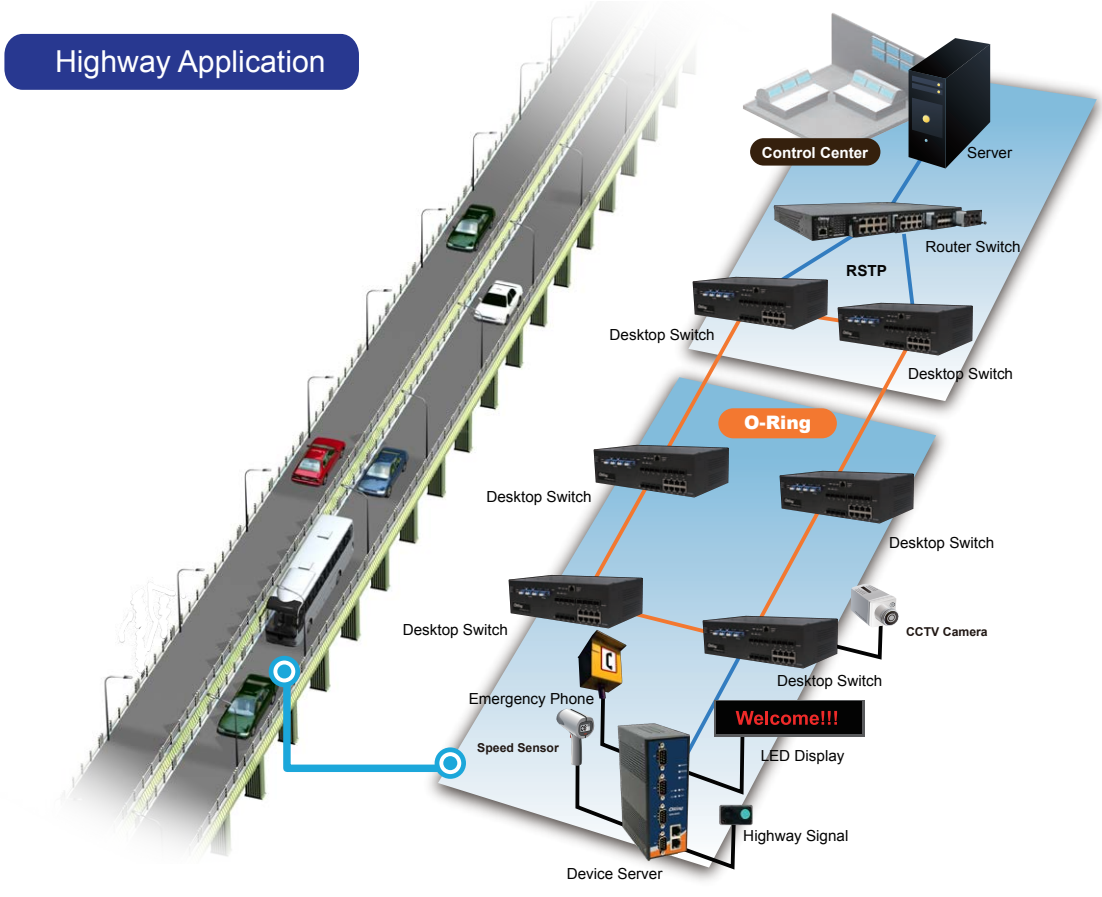
Intelligent Transportation System



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

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IGPS-9042GP-24V

Industrial 6-port Managed Gigabit PoE Ethernet Switch

- 4 port P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports IEEE 802.3az energy-efficient Ethernet technology
- Supports Modbus TCP protocol

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RGPS-9084GP-P

Industrial 12-port Rack Mount Managed Gigabit PoE Ethernet Switch

- Supports IEEE 802.3at compliant PoE 30 watts per port
- Supports PoE schedule configuration and PoE alive check function
- Supports IEEE 1588v2 clock synchronization

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IGPS-9842GTP-24V

Industrial 14-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP (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

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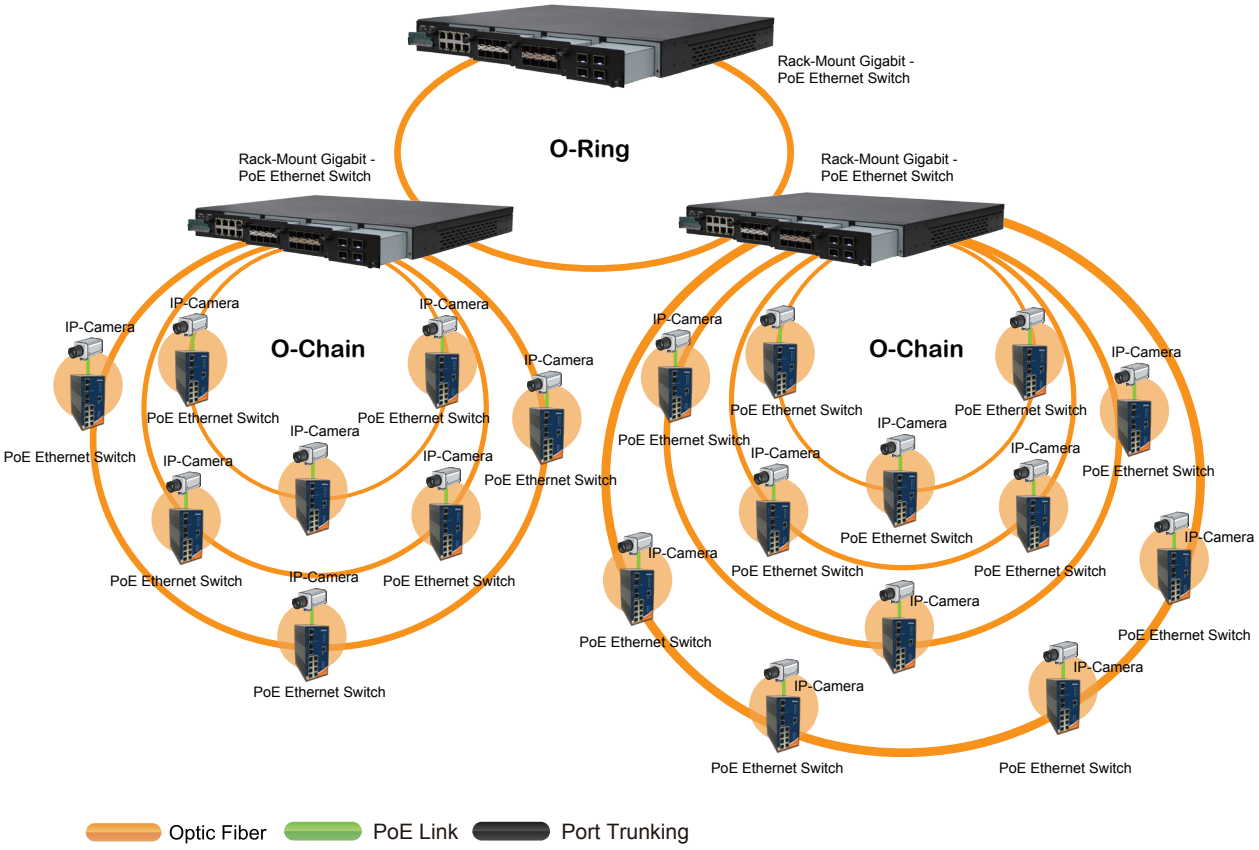
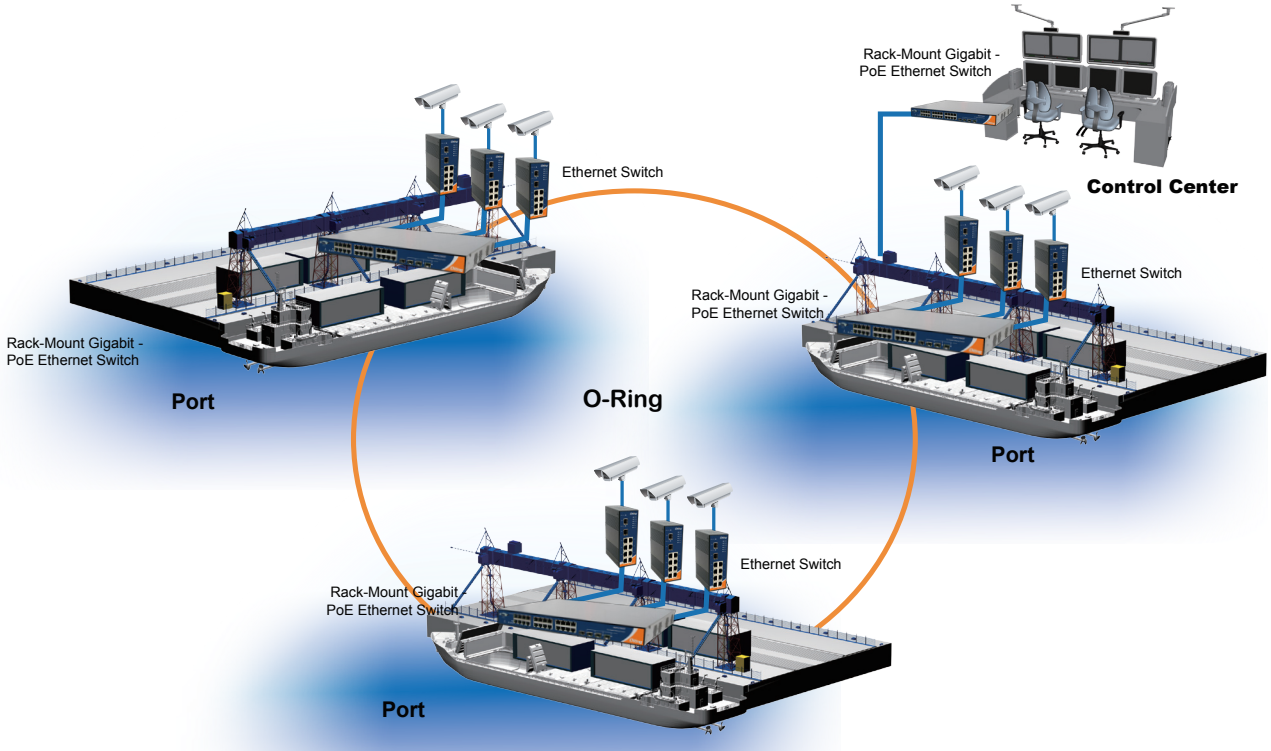
City Surveillance





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/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 (Media Redundancy Protocol) function

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RGPS-R9244GP+-P

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

- Supports standard IEC 62439-2 MRP (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

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TPS-3162GT-M12-BP1

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 IEEE802.3af standard, provide up to 15.4 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

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TGAR-2062+-3GS/4GS-M12

Industrial EN50155 IEEE 802.11 a/b/g/n Dual 3G Cellular GPS Router/4G LTE GPS Cellular 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

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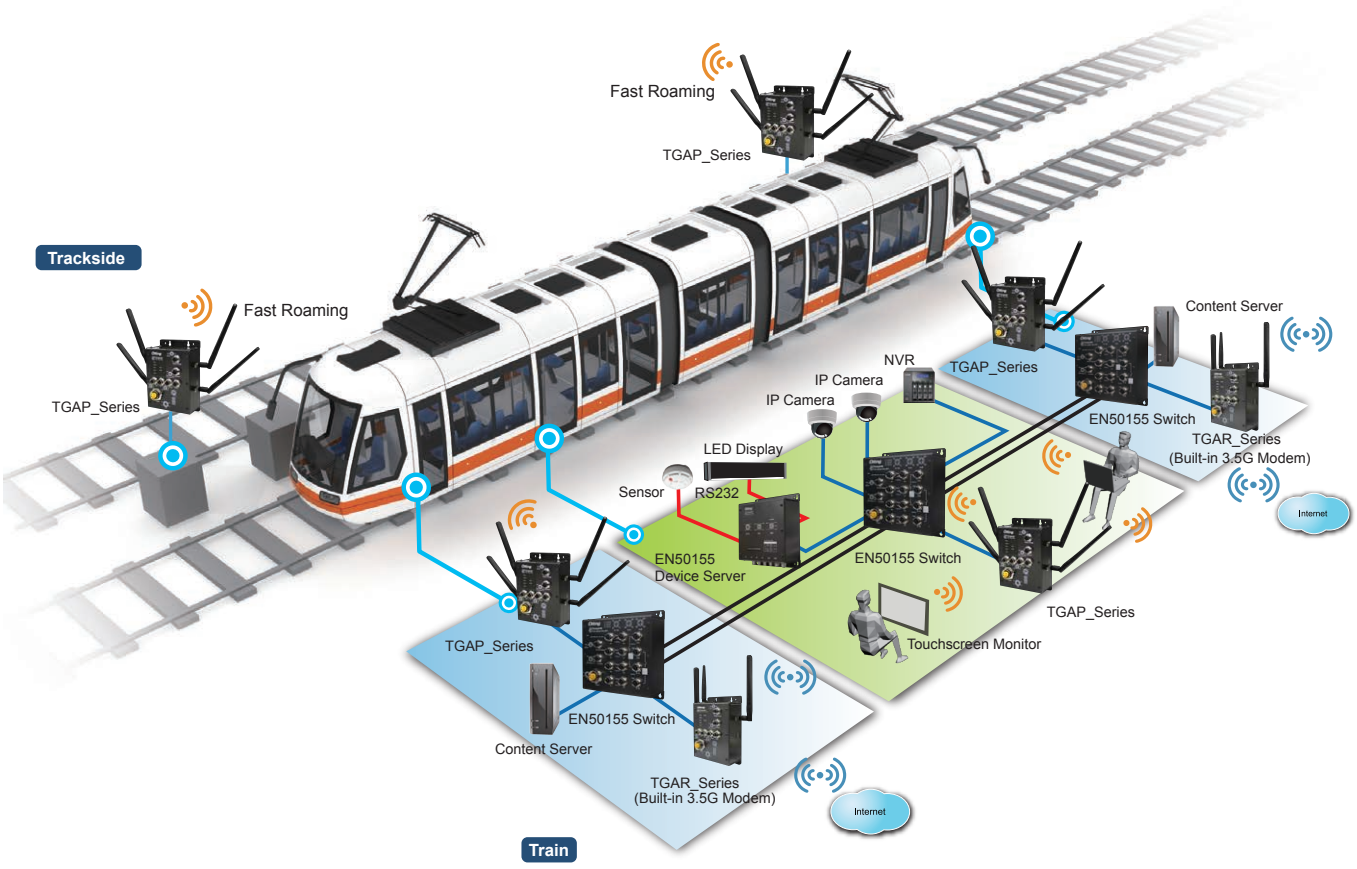
Railway Application

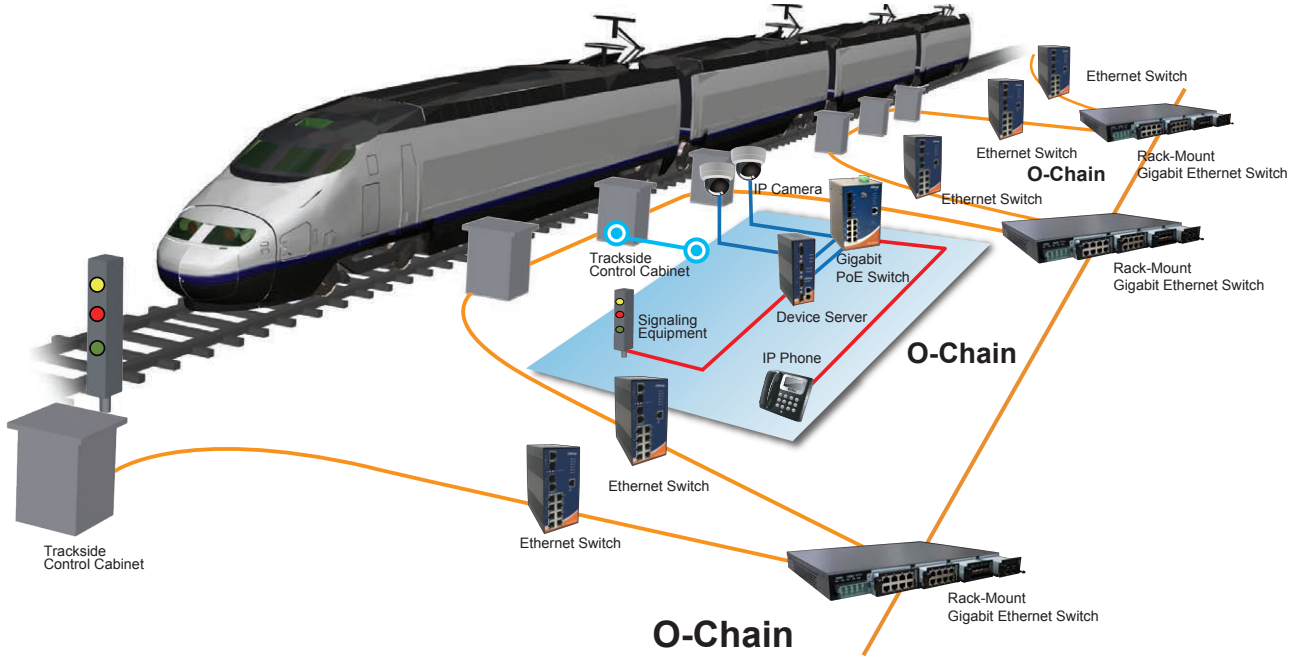
IRIS Certification EN50121 EN50155 Transporter Series



Trackside Application

Port Trunk Optic Fiber CAT5e Serial

Cellular Interface Wireless LAN



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

Page 74

IGAR-1662+-3G

Industrial IEEE Dual 802.11 a/b/g/n 3G Cellular Router with 2x10/100/1000Base-T(X)

- High Speed Air Connectivity: WLAN interface supports up to 300Mbps link speed
- Dual RF for redundant wireless communication
- Provide 2 port 10/100/1000Base-T(X) port and 1 sim card slot

Page 102

TGAR-W1061+-4G-M12

Industrial EN50155 IEEE 802.11 a/b/g/n 4G LTE Cellular Router with 1x10/100/1000Base-T(X) PoE P.D., IP-67

- EN50155-compliant wireless access point for rolling stock application
- High Speed Air Connectivity: WLAN interface supports up to 300Mbps link speed
- Highly Security Capability: WEP/WPA/WPA-PSK(TKIP,AES)/ WPA2/WPA2-PSK(TKIP,AES)/802.1X authentication supported

Page 104

IGPS-9042GP-24V

Industrial 6-port Managed Gigabit PoE Ethernet Switch

- 4 ports P.S.E. ,fully compliant with IEEE802.3at standard, provide up to 30 watts per port
- Supports IEEE 802.3az energy-efficient Ethernet technology
- Supports Modbus TCP protocol

Page 73

In-Vehicle Surveillance

CAT5e PoE Link Cellular Interface

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

Page 65

IGAP-620+

Industrial IEEE 802.11 a/b/g/n Wireless Access Point with 2x10/100/1000Base-T(X)

- High speed Air Connectivity: WLAN interface supports up to 300Mbps link speed
- Supports 2x10/100/1000Base-T(X) ports
- Supports PoE P.D. feature on ethernet port which is fully compliant with IEEE802.3af PoE P.D. specification
- Dual redundant Ethernet port support redundant mode (Recovery time < 10ms)

Page 98

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

Page 72

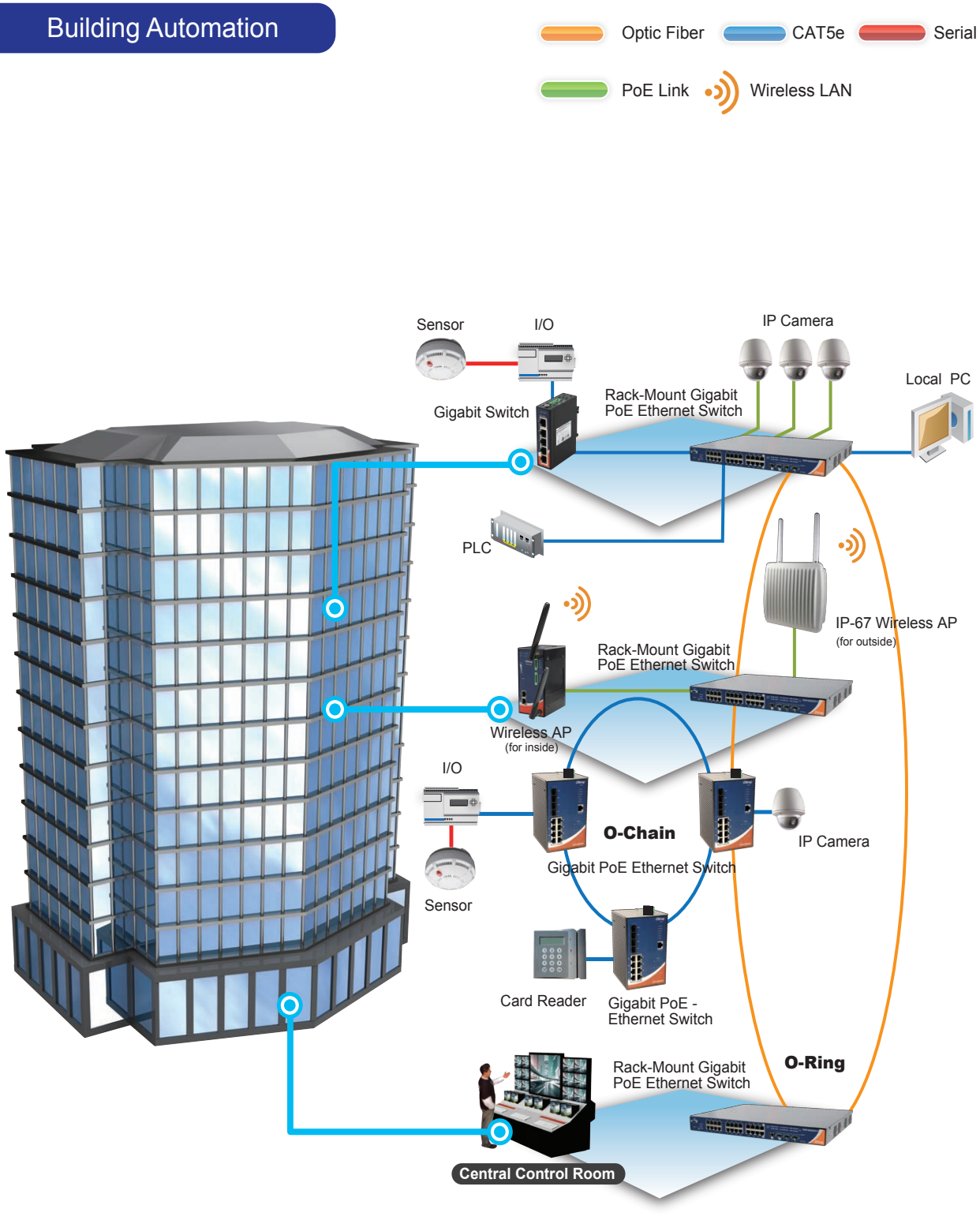
TGAP-W610+-M12

IIndustrial IEEE 802.11 a/b/g/n wireless Access Point

- Supports X-Roaming < 60 ms
- Supports 1KV isolation for PoE P.D.
- Supports up to 300Mbps link speed
- Supports AP/Bridge/Client/AP-Client Mode

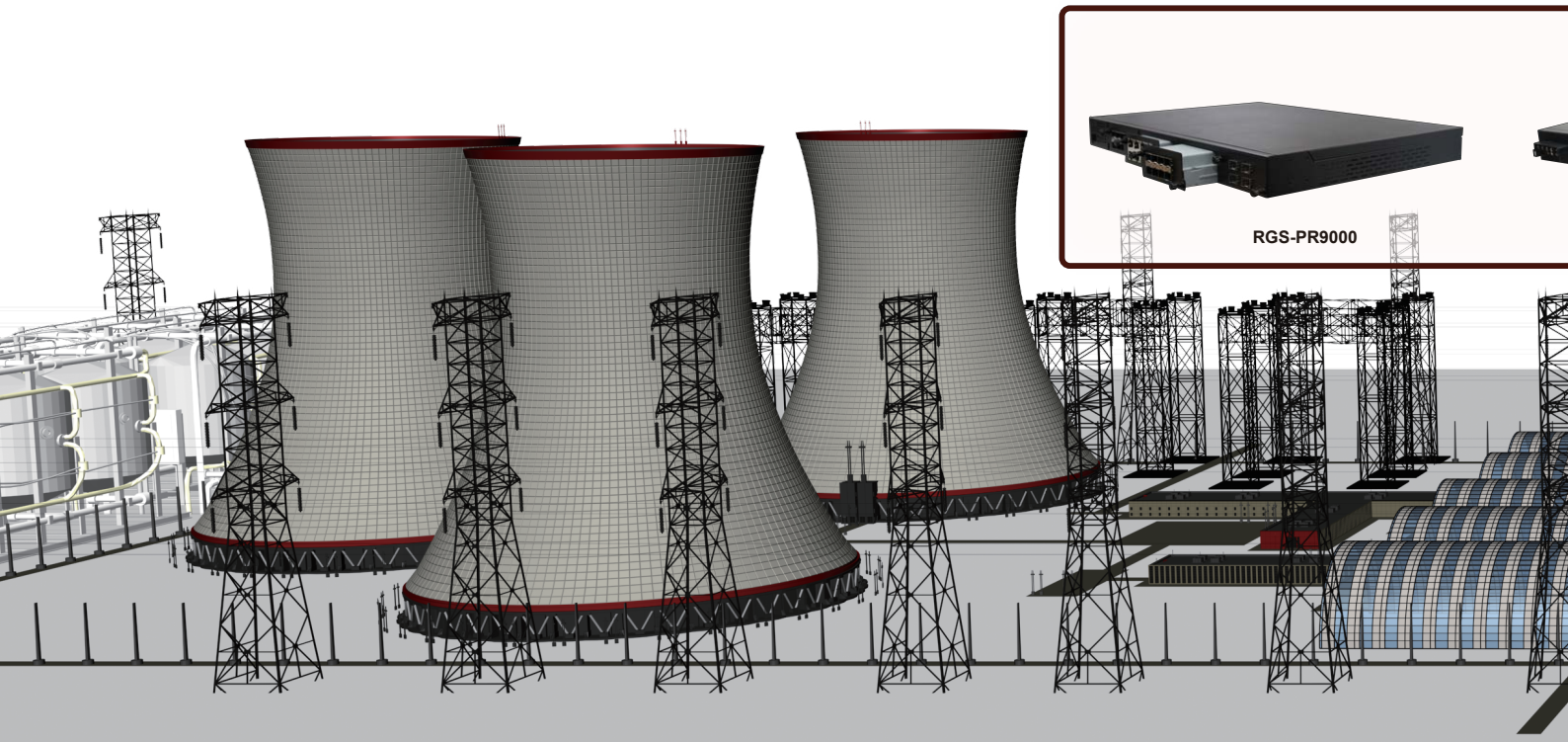
Page 100

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

Page 58

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

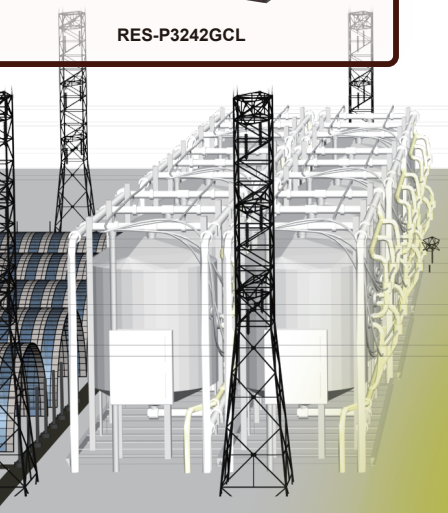
Page 64

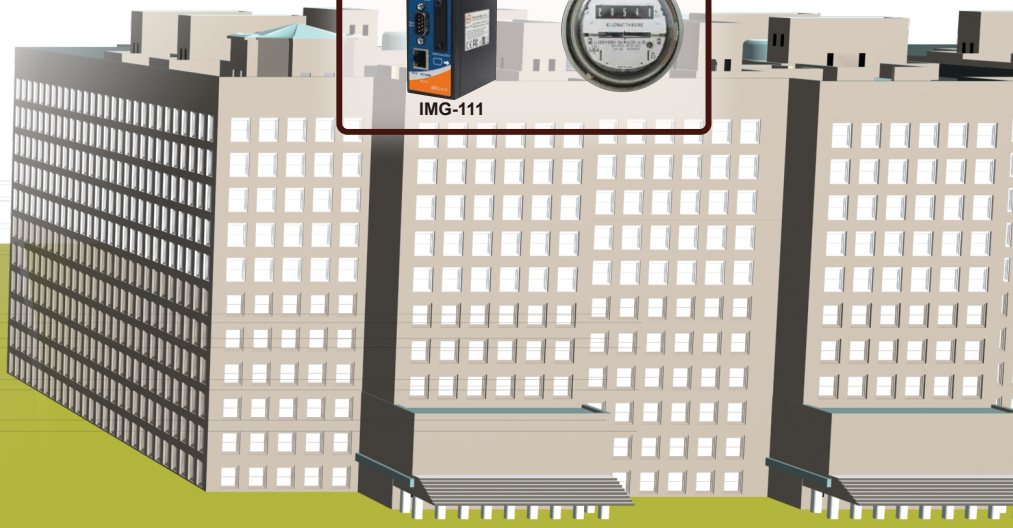
IEC61850
IEEE1613

IEEE 1588_v2


RES-P3242GCL


IMG-111





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 (Media Redundancy Protocol) function

Page 64

IMC-P111FX

Industrial IEC 61850-3 Ethernet to Fiber Media Converter

- Supports 1 x 10 / 100 Base –T(X) port to 1x100Base-FX fiber/ 1x100Base-FX SFP socket
- Design for Railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- EN50155-compliant Ethernet switch for rolling stock application
- Supports auto-negotiation and auto-MDI/MDI-X

Page 91

IMG-W6121+-3G/4G/M12

Industrial Outdoor Cellular M2M Gateway with IEEE802.11 a/b/g/n

- Supports 1x10/100/1000Base-T(X) port with PoE P.D.
- 3.5G HSUDPA or 4G LTE modem included
- Supports 2xRS-232 serial ports

Page 106

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

IES-A3080/A3062

Industrial C1D2/ATEX 8-port Managed Ethernet Switch

- World's fastest redundant Ethernet ring: O-Ring (recovery time < 10ms over 250 units of connection)
- Open-Ring supports the other vendor's ring technology in open architecture
- Supports standard IEC 62439-2 MRP (Media Redundancy Protocol) function
- Supports Auto Negotiation Speed

Page 88

IES-A1080/A1062 Series

Industrial C1D2/ATEX 8-port Unmanaged Ethernet Switch

- IES-A1080 supports 8x10/100Base-T(X) ports
- IES-A1062 series provided 6x10/100Base-T(X) and 2x100FX or 2 x1000X fiber ports
- Supports store and forward transmission
- Supports auto-negotiation and auto-MDI/MDI-X

Page 88

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 (Media Redundancy Protocol) function
- 8 ports P.S.E. fully compliant with IEEE802.3at standard, provide up to 30 watts per port

Page 73

RGPS-R9244GP+-P

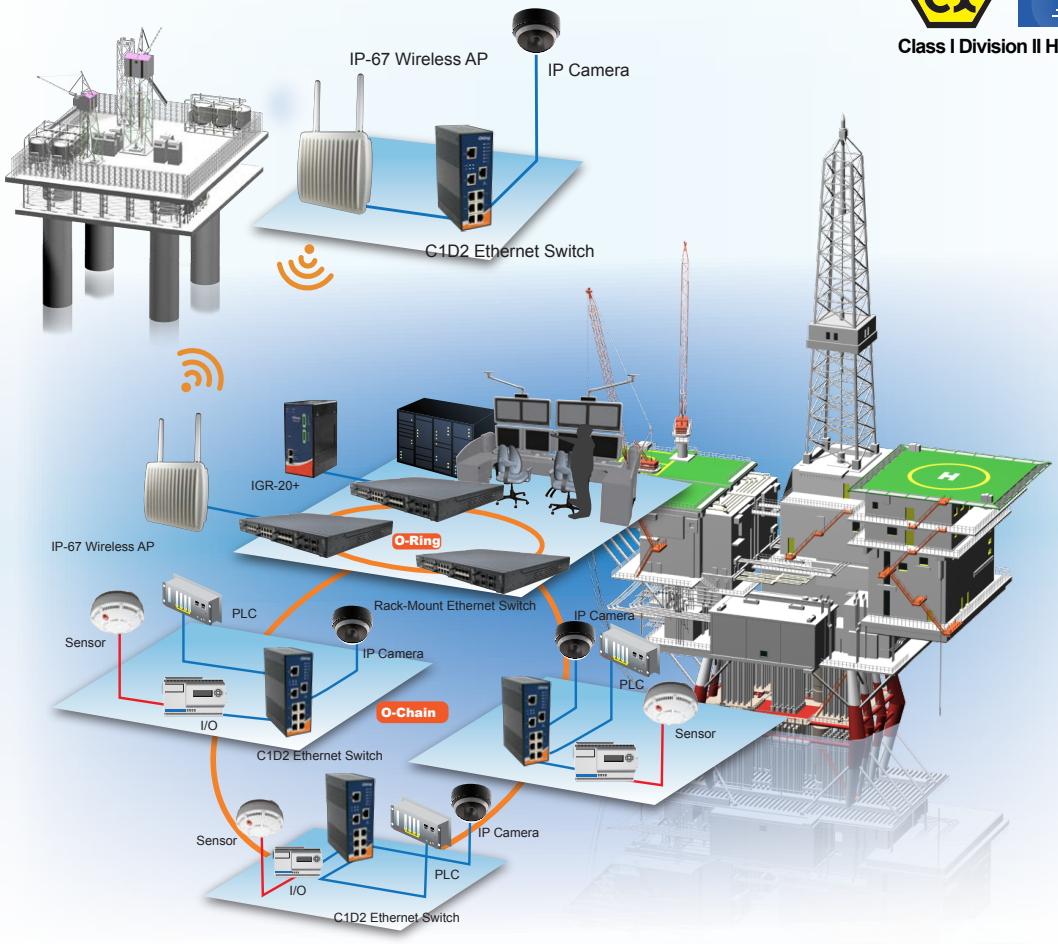
Industrial Layer-3 28-port Managed Gigabit PoE Ethernet Switch

- Supports Layer 3 static routing, RIP and VRRP function
- Supports standard IEC 62439-2 MRP (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

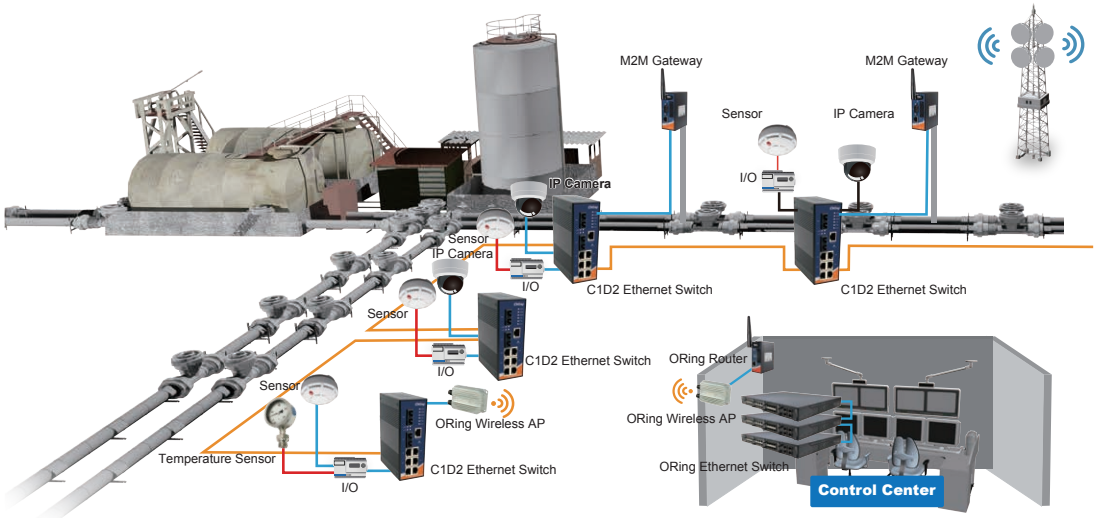
Page 72

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

Page 94

IMC-111PB

Industrial Mini type Ethernet to fiber media converter

- Supports 1 port 10/100Base-T(X) auto-negotiation and auto-MDI/MDI-X
- Supports Ethernet to fiber or Ethernet to SFP port
- Supports LFP (Link Fault Pass-through) function

Page 90

IGPS-9842GTP

Industrial 14-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP (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

Page 73

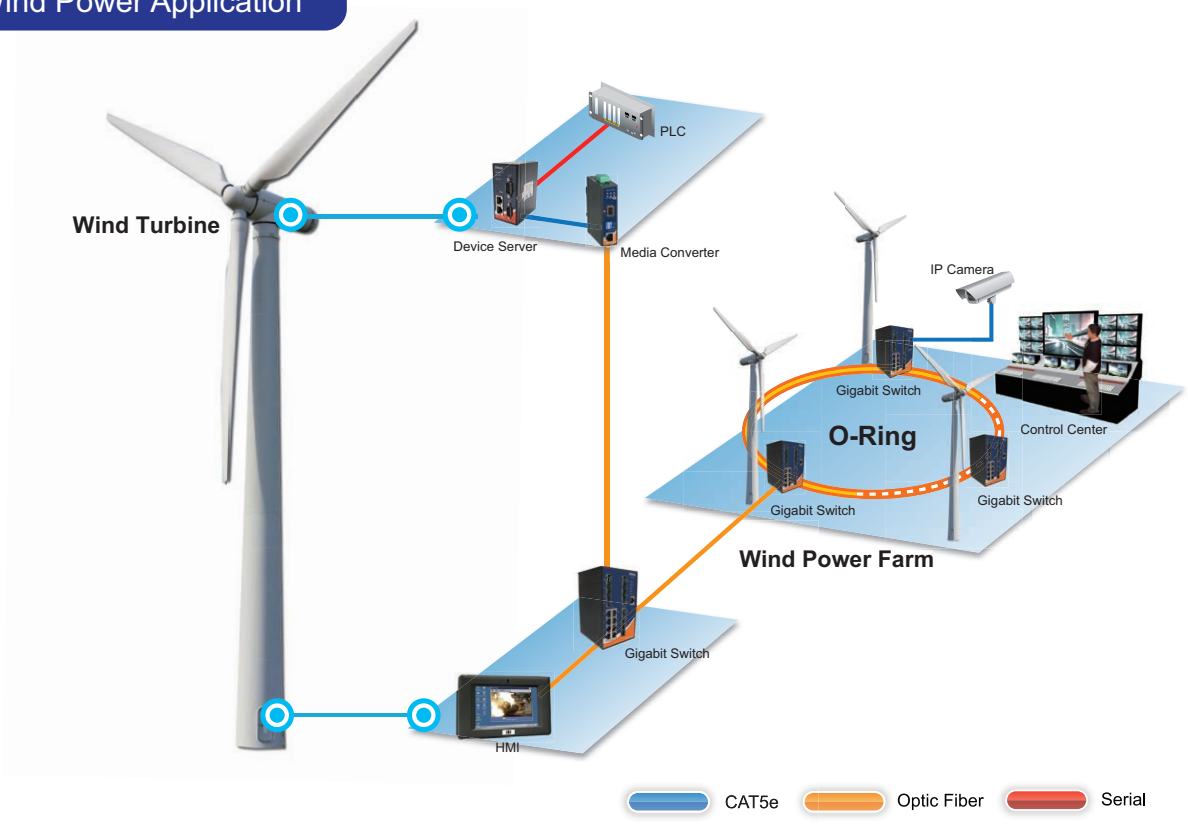
RGS-P9000

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

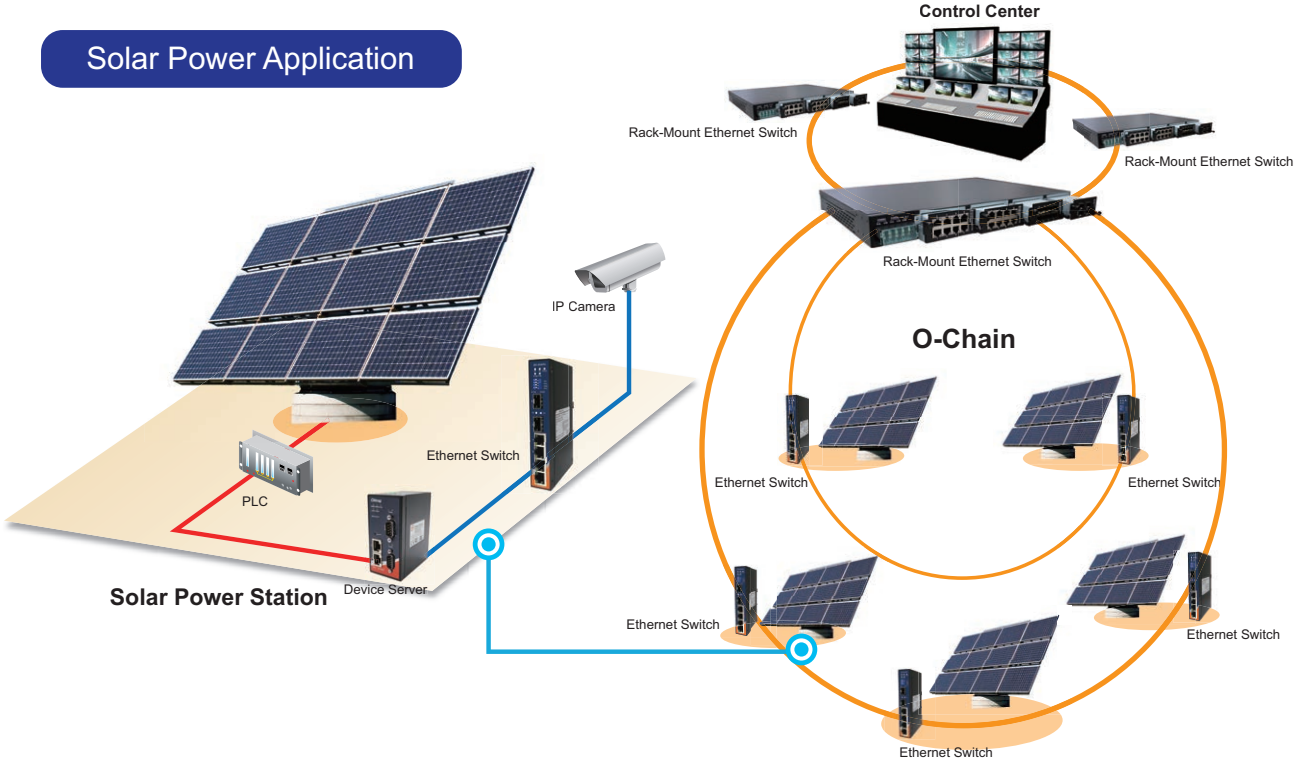
- Design for power substation / railway applications and fully compliant with the requirements of IEC 61850-3 and IEEE 1613
- Modular design makes network planning easy
- Supports IEEE 1588v2 clock synchronization

Page 58

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

IR-710

Industrial Cellular VPN Router with 1x10/100Base-T(X), Cellular Modem Included

- Provides 1 x 10/100Base-T(X) port and 1 SIM card slot
- 3.5G HSDPA Modem dial up included
- Supports VPN Setting (Open VPN, PPTP VPN)

Page 101

DGS-9812GP-AIO_S

Industrial 20-port Desktop Managed Gigabit Bypass Ethernet Switch

- Supports 8x10/100/100Base-T(X) ports and 12x10/100/100Base-X SFP ports
- Supports Jumbo frame up to 9.6K bytes
- Supports O-Ring (recovery time < 30ms over 250 units of connection), MSTP/RSTP/STP (IEEE 802.1s/w/D) for Ethernet redundancy

Page 70

IGPS-9842GTP

Industrial 14-port Managed Gigabit PoE Ethernet Switch

- Supports standard IEC 62439-2 MRP (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

Page 73

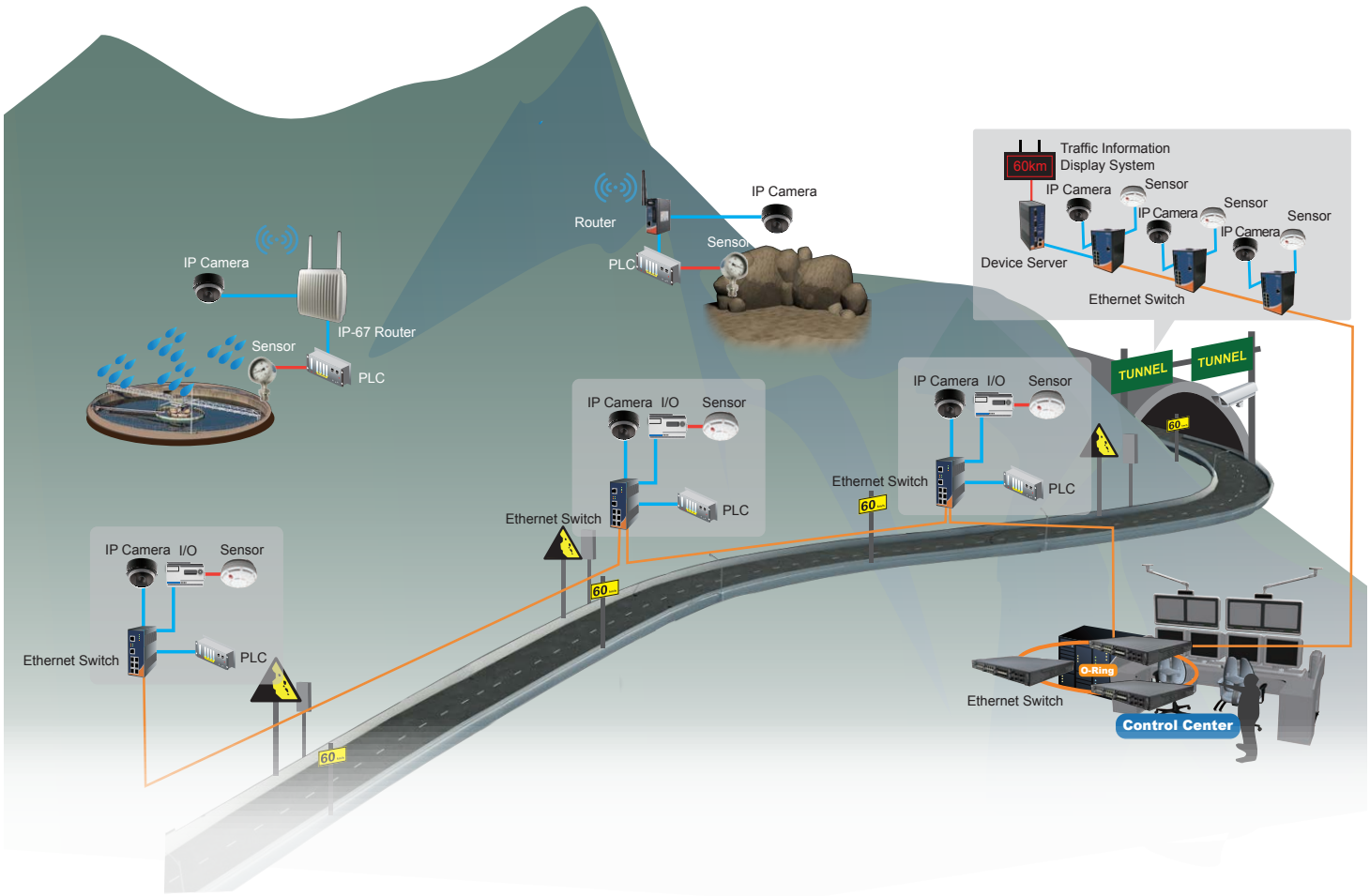
IBS-102FX

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

Page 80

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-M311

Industrial 1-port Modbus Gateway with 1xRS-232/422/485 and 1x10/100 Base-T(X)

- Operating Modes: RTU Master, RTU Slave, ASCII Master, ASCII Slave
- Supports up to 16 TCP connections and 32 requests simultaneously
- Convert between Modbus TCP and Modbus RTU/ASCII

Page 97

IGAP-6620+

Industrial Dual RF in IEEE 802.11 a/b/g/n Wireless Access Point

- High Speed Air Connectivity: WLAN interface supports up to 300Mbps link speed
- Highly Security Capability: WEP/WPA/WPA-PSK(TKIP,AES)/ WPA2/WPA2-PSK(TKIP,AES)/802.1X authentication supported
- Supports X-Roaming < 60 ms

Page 98

IGAR-1062+-4G

Industrial IEEE 802.11 a/b/g/n 4G LTE Cellular Router with 2x10/100/1000Base-T(X)

- High Speed Air Connectivity: WLAN interface supports up to 300Mbps link speed
- Provide 2 port 10/100/1000Base-T(X) port and 1 SIM card slot
- 4G LTE Modem dial up included

Page 102

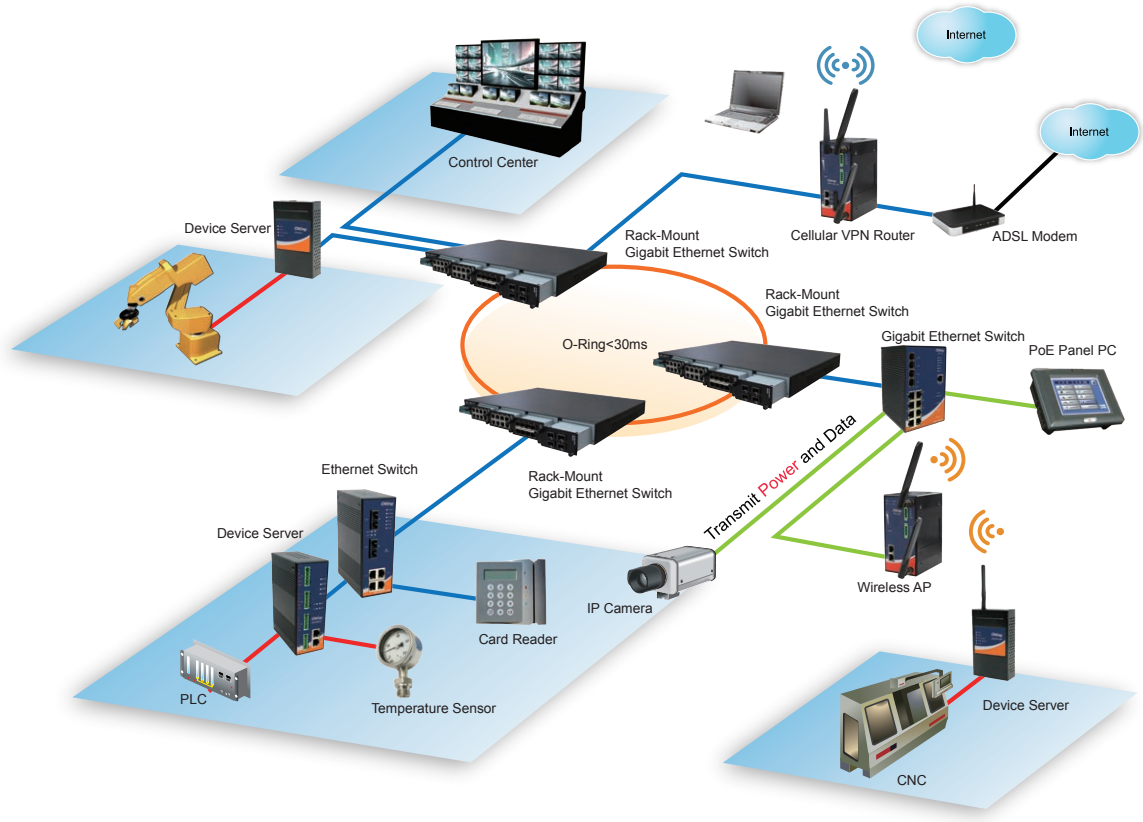
RGPS-R9244GP+-P

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 (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

Page 72

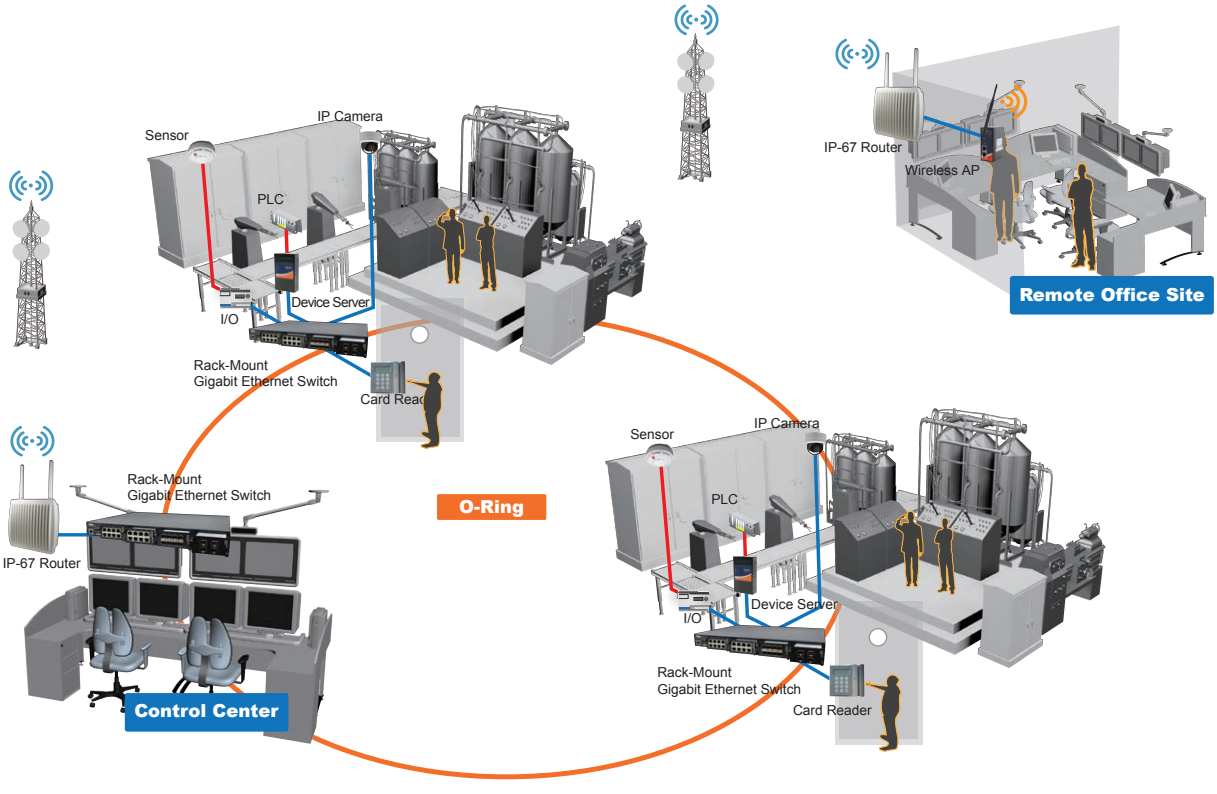
Manufacturing Automation



DSL Optic Fiber CAT5e

Serial PoE Link

Cellular Interface Wireless LAN



Product Overview & 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

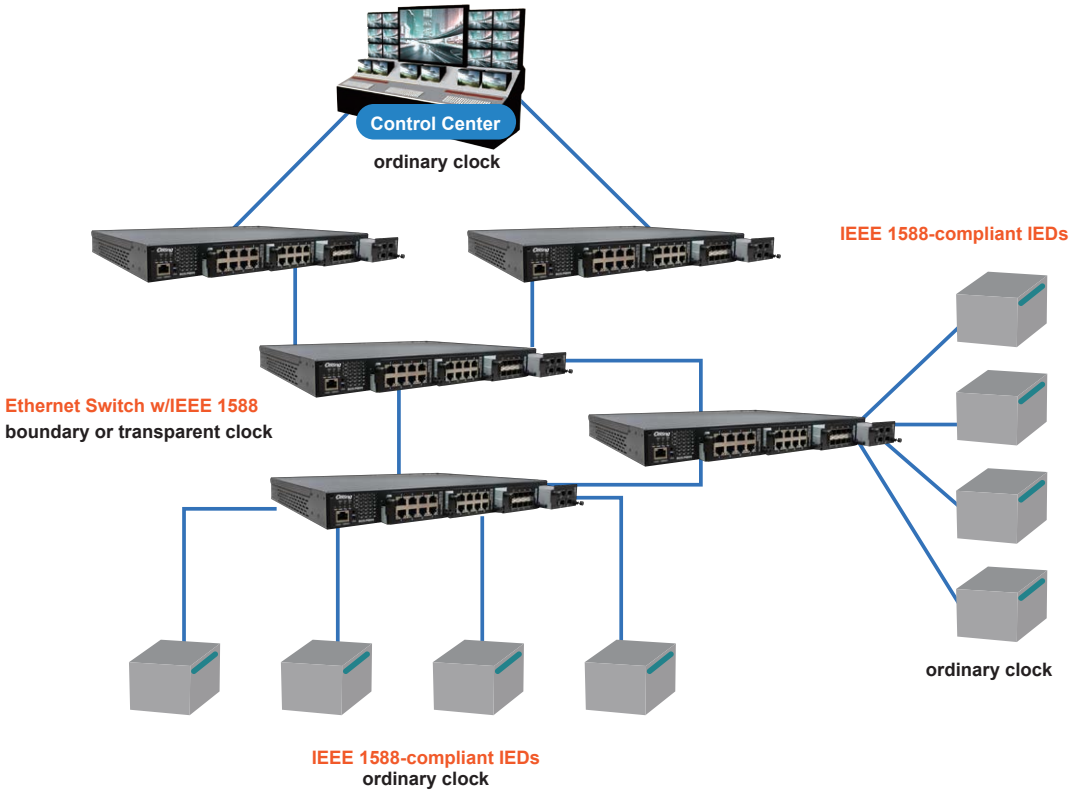
Media Redundancy Protocol (MRP) is a data network protocol standardized for ring redundancy in industrial environment by the International Electrotechnical Commission as IEC 62439-2. MRP is compatible with redundant ring coupling, supports VLANs, and is distinguished by very short reconfiguration times. 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. ORing's 3000, and 9000 series products are all compliant with this standard.

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

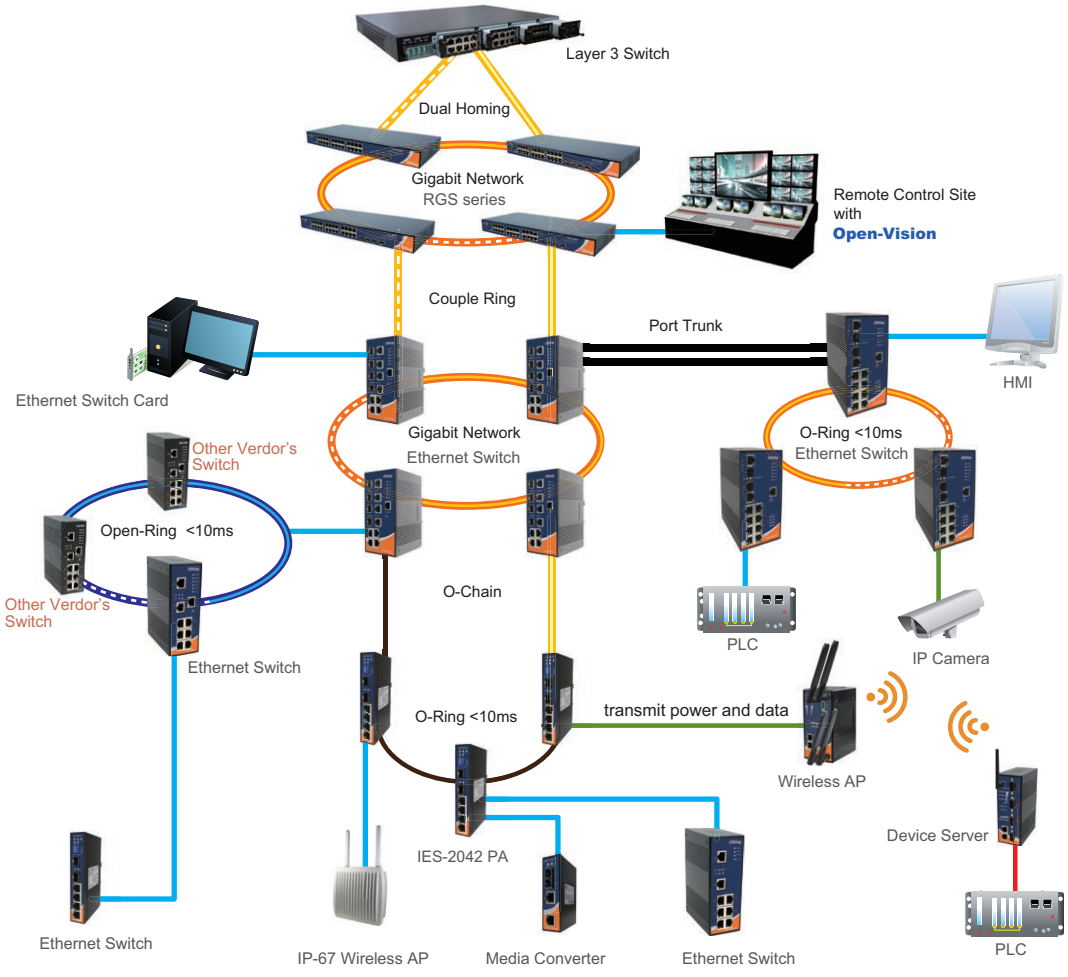
Many network redundancy or recovery protocols have been defined by the IEEE, such as STP, RSTP, MSTP, to ensure recovery from network disconnections. However, industrial applications require a much shorter recovery time than commercial applications. Hence, industrial networking devices often use proprietary 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(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)



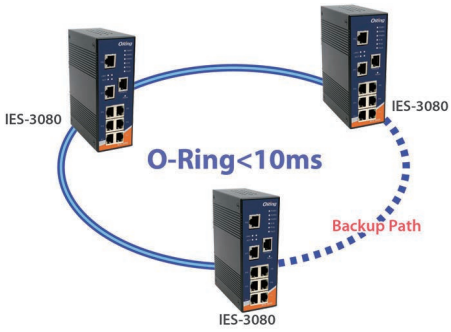
Network Redundancy Comparison Table

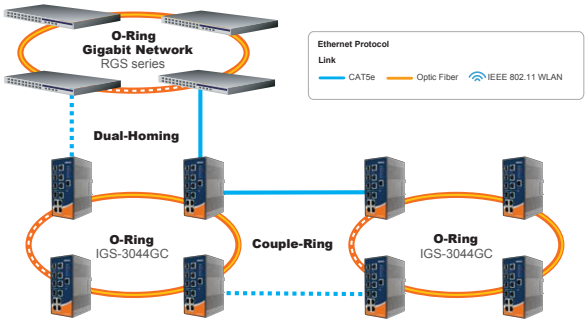
Recovery Technology	STP	RSTP	RSTP 2004	MSTP	Open-Ring	O-Ring	O-Chain
Recovery Time	10 ~ 50 Seconds	3 ~ 5 Seconds	< 100 ms	3 ~ 5 Seconds	-	< 10 ms	< 10 ms
Maximum Nodes	40	20 (Note: Recovery time is unpredictable if there are more than 9 nodes)	80 (Note: Recovery time is unpredictable if there are more 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

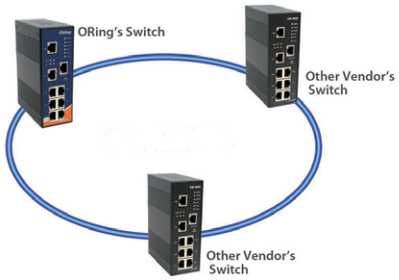
Benefits of ORing's Redundant Technologies

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: 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.

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.

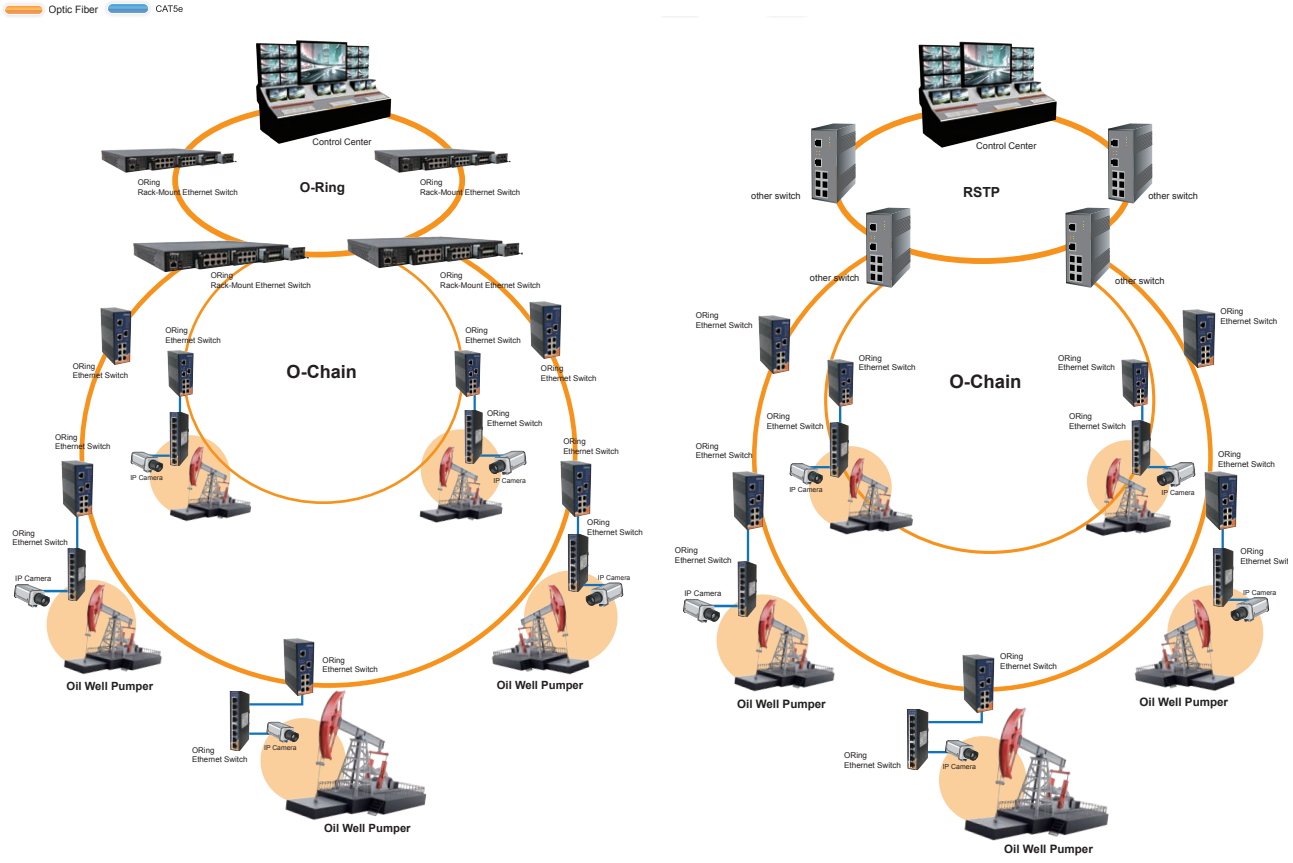
O-Chain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound network topology, i.e. the creation of multiple redundant networks beyond the limitations of current redundant ring technology.

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:

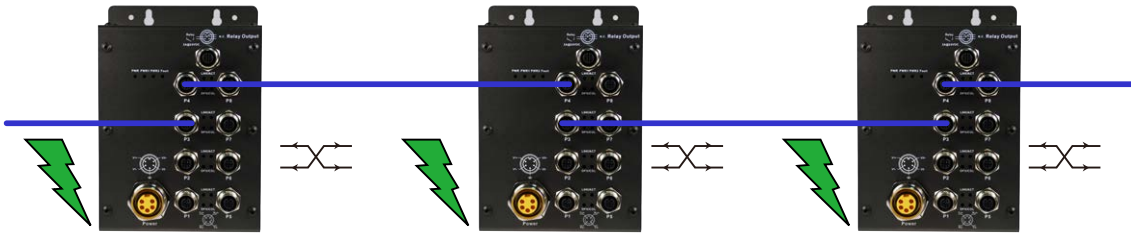
1. Outstanding recovery time (< 10ms) for up to 250 switches
2. Flexible, scalable redundant network topologies
3. Compatible with other redundant protocols (RSTP, STP, etc.)
4. Significant reduction in development costs (time and effort, cables, and Ethernet ports)



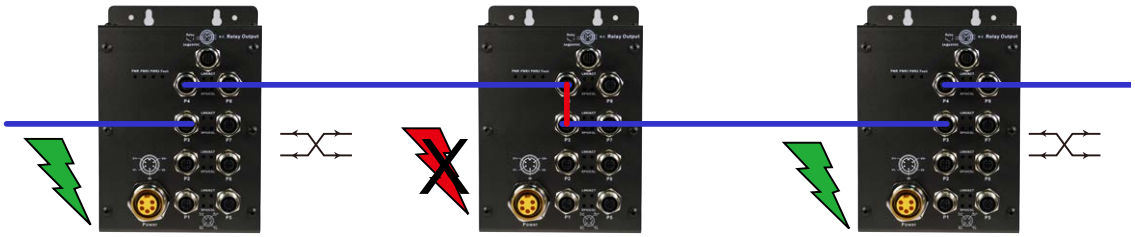
ORing's Hardware Bypass redundancy technology naturally and effectively avoids single-point power failure in daisy chain topology or multi-point power failures . For conventional wired Ethernet network, there is the Copper Interface Bypass. An ORing Ethernet switch with Copper Interface Bypass would 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

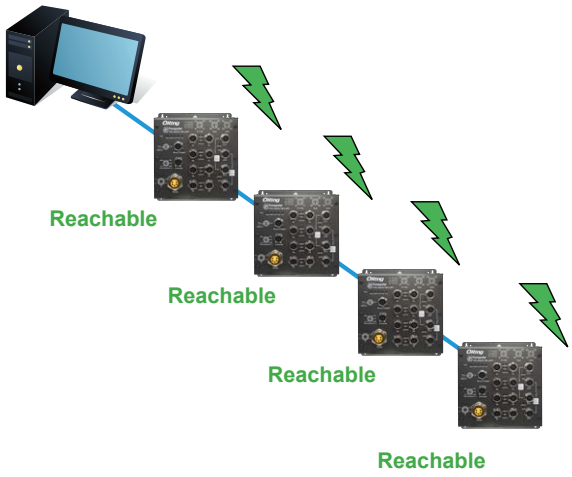
- Normal communications



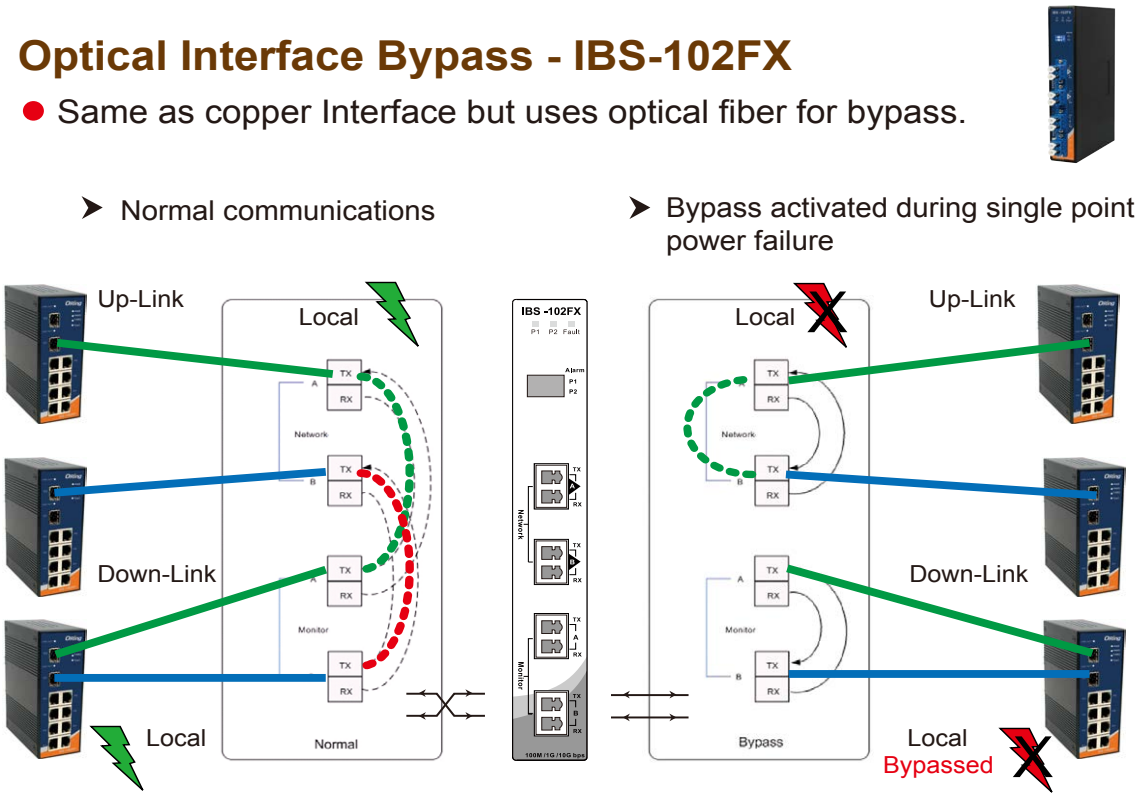
- Bypass activate during single point power failure



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):

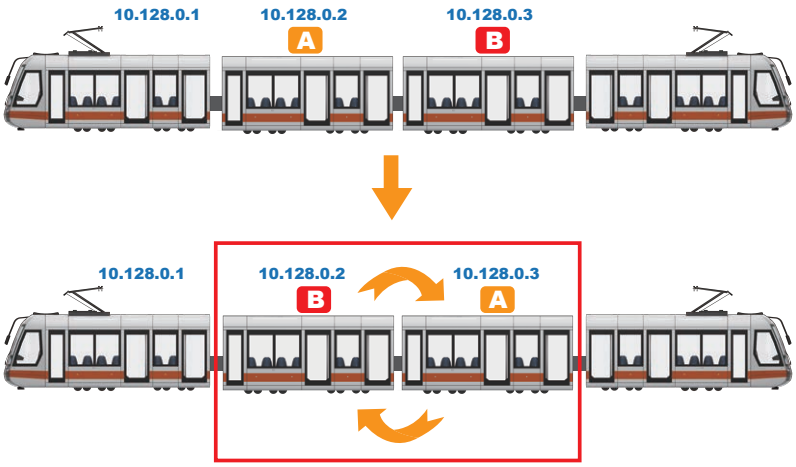
All of ORing's industrial managed and lite-managed Ethernet switch products support O-Ring, Open-Ring, and redundancy technologies. Ethernet switches with the -BP2 suffix support Cooper Interface Bypass, while the IBS-102FX Series support Optical Interface Bypass.

TTDP

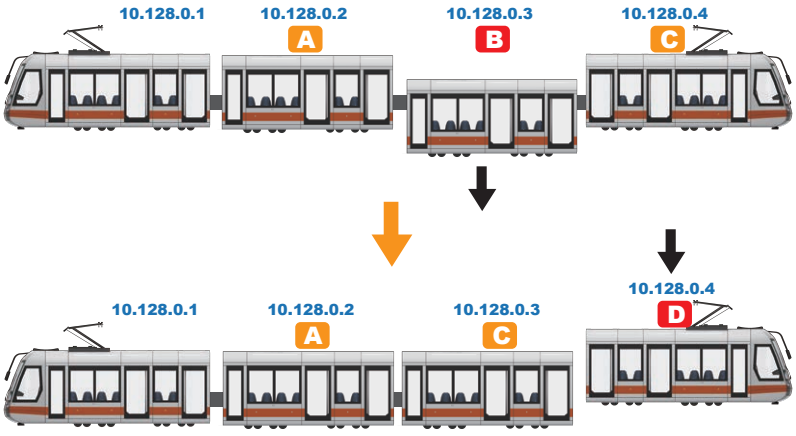
Train topology is dynamic and frequently changes since cars are constantly added, removed, or replaced. Every time the order of the train cars changes, the network must be reconfigured, which is very time-consuming and prone to errors if it's done manually.

TTDP (Train Topology Discovery Protocol) protocol has thus been developed to enhance the efficiency of railway network reconfiguration. The protocol enables network switches to negotiate automatically with other network devices after the network topology is changed and will assign an IP address to the network devices based on the new order of train cars. 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.

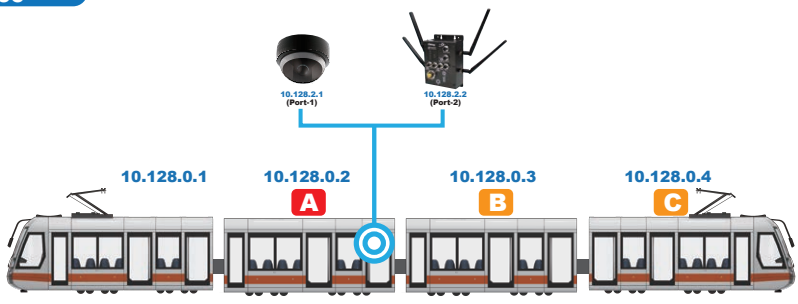
Exchange



Remove & Add



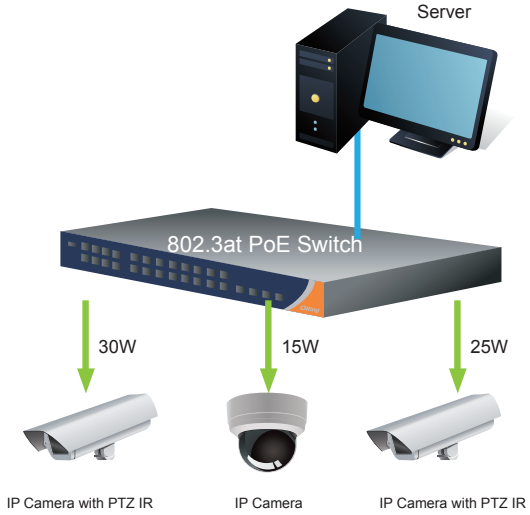
Add Device



Power over Ethernet with Power Management

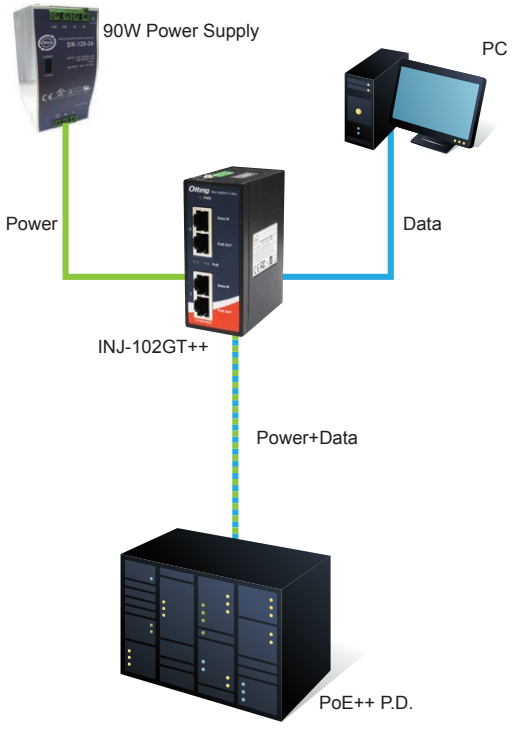
Power over Ethernet (IEEE 802.3at) with PoE+

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.



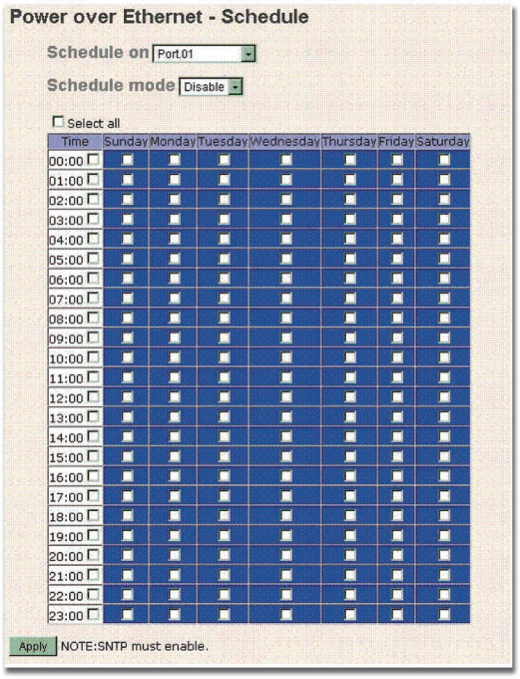
Power over Ethernet with PoE++

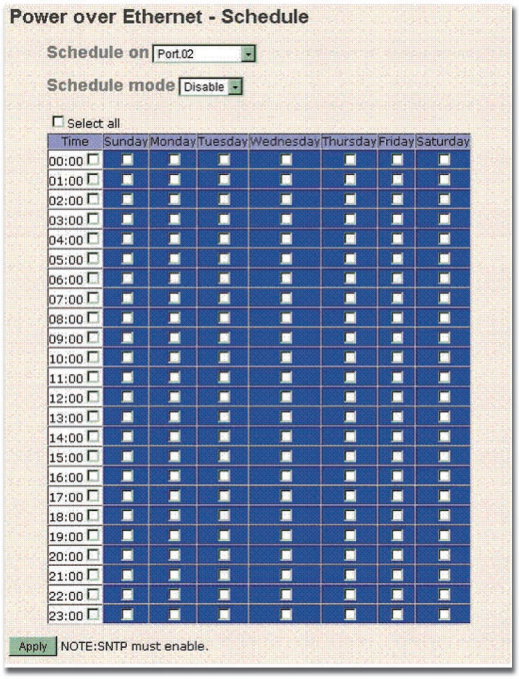
PoE has been widely used in IP surveillance applications with constant addition of new features in IP cameras such as PTZ, IR, and WDR, and hence requiring more power. With the introduction of more power-hungry devices, a new proprietary standard known as LTPoE++ has be developed which extends the PoE 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

Industrial Media Converter Overview

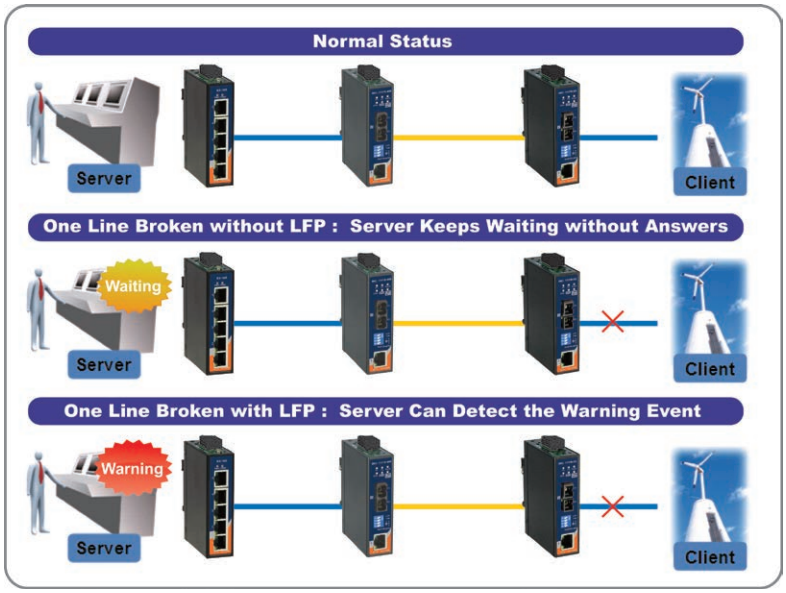
ORing offers Serial to Serial, USB to Serial, Fiber to Ethernet, and Gigabit Fiber to Ethernet media converters. Also, ORing's serial converters allow devices to communicate effortlessly across different serial interfaces and offer convenient, intelligent features.

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

Supporting Product(s):

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.

Supporting Products:

IDS-141A/181A | IDS-5011 | IDS-5011F | IDS-5012 | IDS-5011-WG | IDS-5042-I+ | IDS-5042/5042+ | IDS-5042-WG/IWG

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.

Supporting Products:


IDS-M311


IDS-312/312+


IDS-342/342+


IDS-181A/141A


IDS-5011


IDS-5011F


IDS-5012


IDS-5042-I+


IDS-5042/5042+


IDS-5042-IWG


IDS-5042-WG


RDS-3166G


RDS-P3000

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.

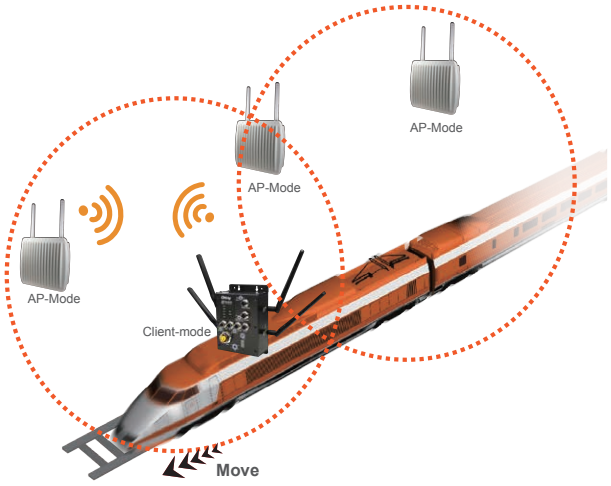
Key Technologies

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.

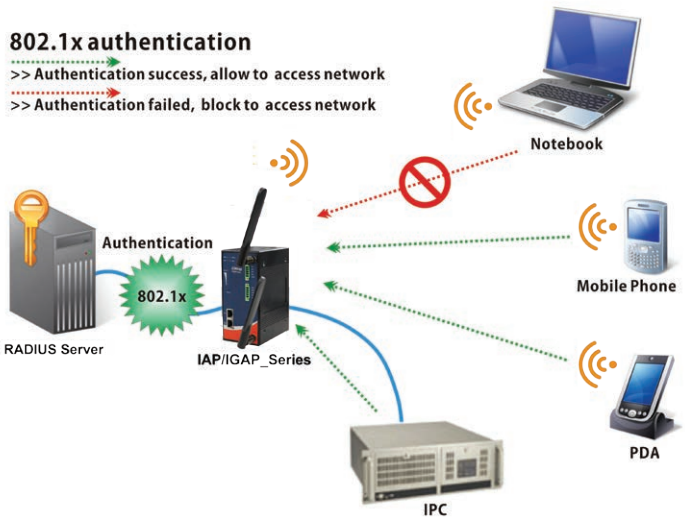
Supporting Products: ORing's full IAP/IGAP Series products support X-Roaming feature .

TGAP-W6610+-M12	IGAP-620/620+	TGAP-W610+-M12	IGAP-6620+	TGAP-6620-M12

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.

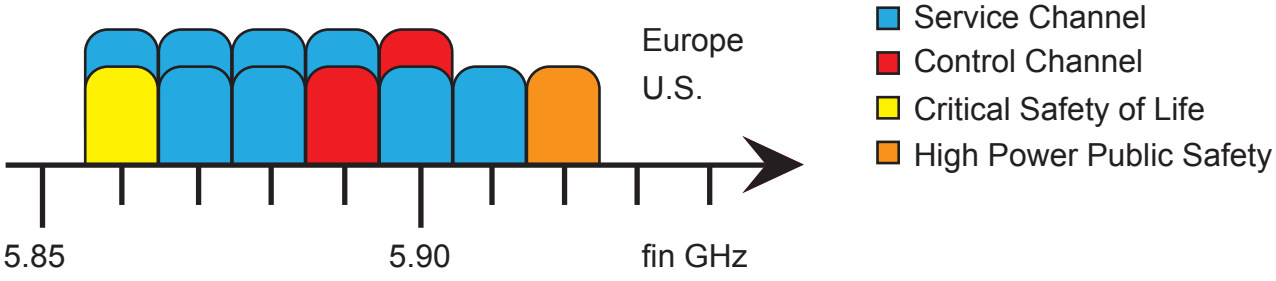
Supporting Products:

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.



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

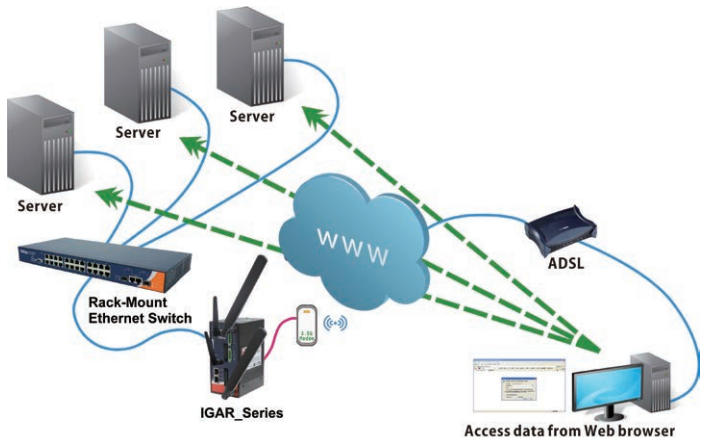
SSL VPN

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.



Supporting Products:

ORing's full router series products support SSL VPN function

IGAR-2062+-4G IGR-20+ IR-710 IAR-142+-4G

TGAR-1062-4G-M12 TGAR-W1061-3G/4G-M12

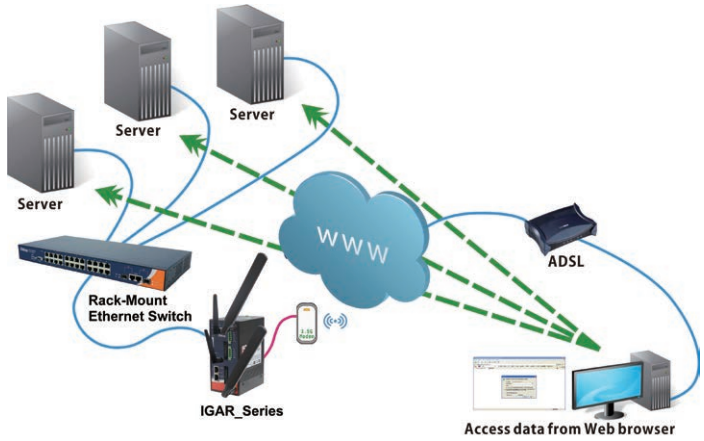
IPsec VPN

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.



Supporting Products:

ORing's full AR series products support IPsec VPN Benefits function

IGAR-2062+-4G TGAR-2062-3G/4G-M12

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.

Supporting Products: ORing's full AR series products support PPoE and DDNS for Internet Connection function

IGAR-2062+-4G TGAR-2062-3G/4G-M12

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.

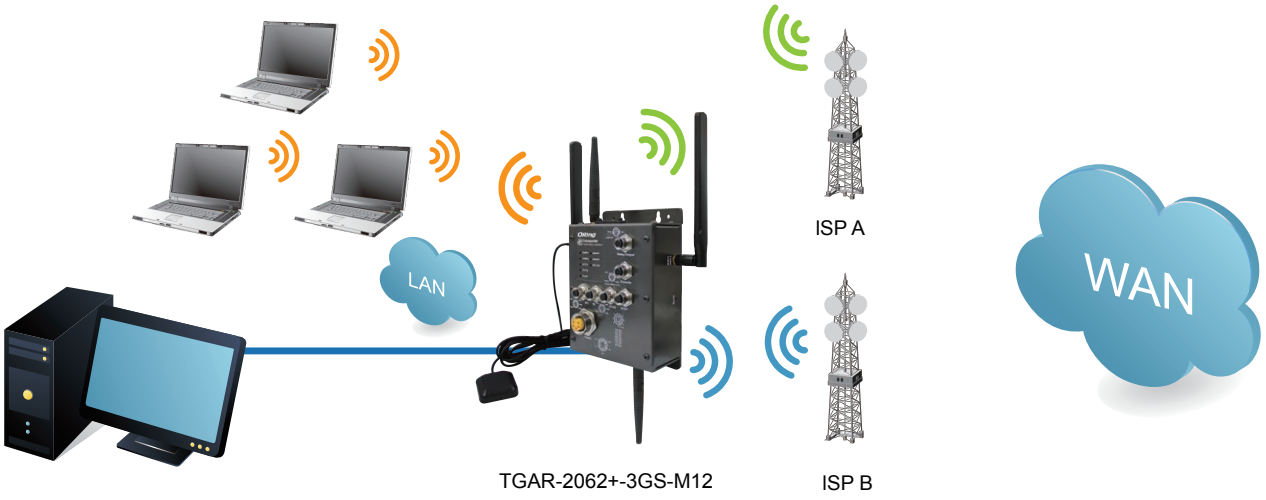
Supporting Products:

IGAR-2062+-3G TGAR-2062-3G/4G-M12

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

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

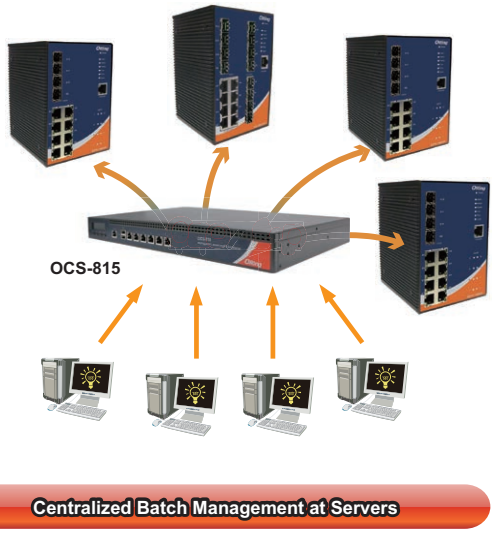
Technology Description

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.

OCS-815

OCS-815 Description

ORing cloud server OCS-815 is a router-based network appliance integrated with management features such as VPN server and device topology view. Designed as a control server to provide centralized management, the OCS-815 can operate as a VPN server which allows registration of multiple VPN clients to form a virtual and private data exchange network. The OCS-815 can either be managed locally via the USB ports or the LCD module or remotely via the Web using the WAN or LAN port.



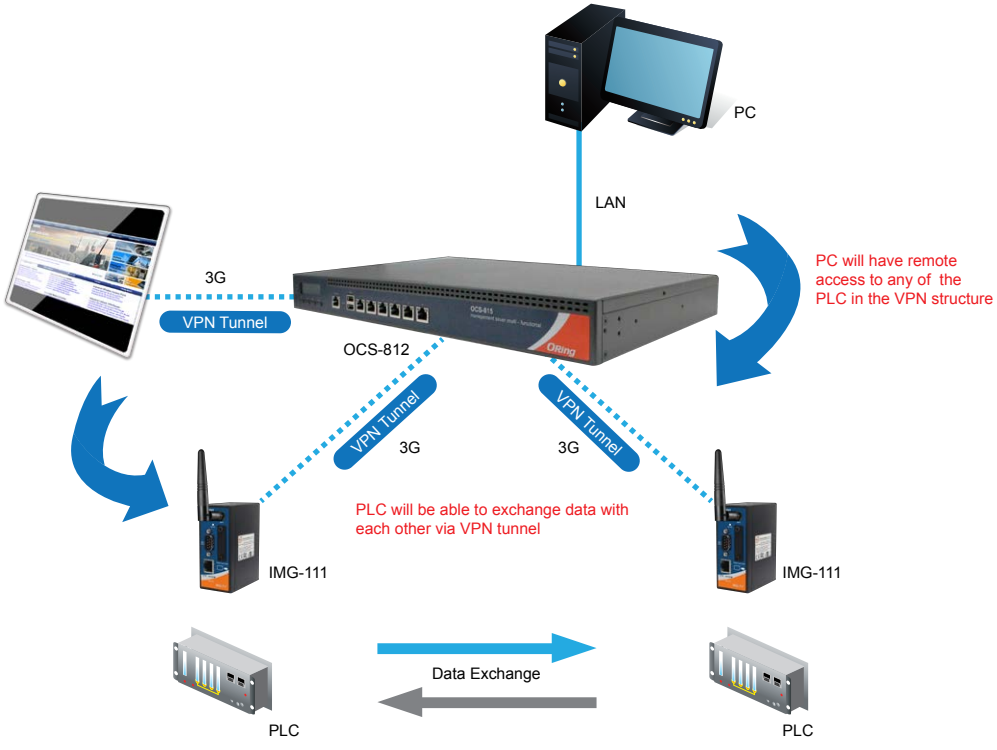
OCS-815 Benefit

Remote accessibility: PLCs can be accessed via WAN without being restricted by LAN or RS-485 connections

Centralized management: All data is integrated in the server to facilitate monitoring and save bandwidth

Easy and cost-effective setup: All routings can be done by the cloud server and only one public IP address is required in the structure

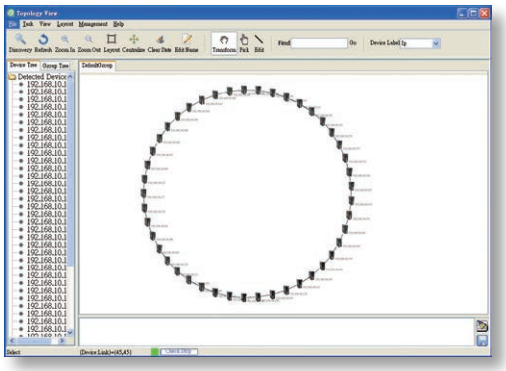
High security data exchange: Higher data exchange security by using VPN tunnels

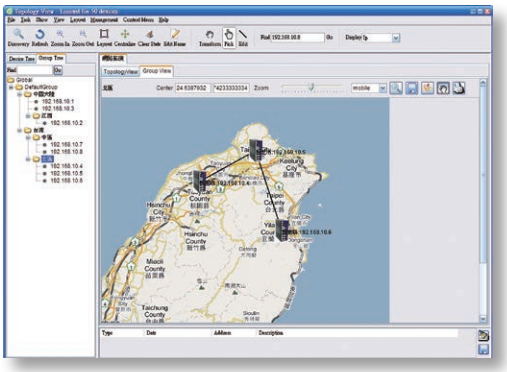


Visualized Management

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.



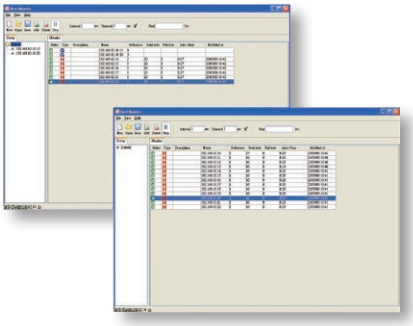


Complete Monitor

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 OCS-815 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.

Product Selection Guide

Industrial Ethernet Switch	Industrial Rack-Mount Gigabit/Fast Ethernet Switch							
	Managed Switch							
								
	RGS-7244GP / 7244GP-E		RGS-7168GCP / 7168GCP-E		RES-3242GC / 3242GC-E		RES-P3242GCL-HV	
Port Number								
Number of ports	28		24		26		26	
10/100Base-T(X) RJ45 Ports	-		-		24		24	
10/100/1000Base-T(X) Ports	24		-		-		-	
100Base-FX Fiber Ports	-		-		-		-	
1000Base-X Fiber Ports			-		-		-	
100Base-FX SFP Ports	-		-		-		-	
1000Base-X SFP Ports	4		8		-		-	
Gigabit Combo Ports	-		16		2		2	
Power Redundancy								
DC Terminal Block	-	2	-	2	-	2	-	
DC Power Jack	-		-		-		-	
AC Power Cord	1	1	1	1	1	1	2	
Installation								
DIN-Rail Mounting	-		-		-		-	
Wall Mounting	-		-		-		-	
Rack Mounting	•		•		•		•	
Physical Characteristics								
Casing Protection	IP-20		IP-20		IP-20		IP-20	
Dimensions (mm)	444(W)x200(D)x44(H)	431(W)x342(D) x44(H)	431(W)x342(D)x44(H)		444(W) x 200(D) x 44(H)		443.7(W) x 262.7(D) x 44(H)	
Operating Temperature								
-10 to 60°C	-		-		•	-	-	
-40 to 70°C	•		•		-	•	-	
-40 to 85°C	-		-		-	-	•	
Network Redundancy								
O-Ring	•		•		•		•	
Open-Ring	•		•		•		•	
O-Chain	•		•		•		•	
MRP	•		•		•		•	
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	SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap	SYSLOG / SNMP Trap / Relay	SYSLOG / SNMP Trap	
DHCP	Server / Client		Server / Client		Server / Client		Server / Client	
VLAN	802.1Q		802.1Q		Port-Based / 802.1Q / Q-in-Q / GVRP		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)		WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)	
Warranty	5 years							

Product Selection Guide

Industrial Ethernet Switch	Industrial Rack-Mount Modular Ehernet Switch Manageed 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	-	-
10G SFP+ Ports	-	-
Gigabit Combo Ports	-	-
Power Redundancy		
DC Terminal Block	-	-
DC Power Jack	-	-
AC Power Cord	2	2
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	-	-
Rack Mounting	●	●
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	443.7(W) x 330(D) x 44(H)	443.7(W) x 330(D) x 44(H)
Operating Temperature		
-40 to 70°C	-	-
-40 to 85°C	●	●
Network Redundancy		
O-Ring	●	●
Open-Ring	●	●
O-Chain	●	●
MRP	●	●
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	Relay/SYSLOG / SNMP Trap	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 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	-	-	-	-
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-MM-LC**	**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	Module Plug-in
Physical Characteristics					
Casing Protection	IP-30	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)	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	multi-mode	single-mode	single-mode
Connector Type	SC	ST	LC	SC	ST
Data Rate	100Mbps	100Mbps	100Mbps	100Mbps	100Mbps
Typical Distance	2km	2km	2km	30km	30km
Wavelength	1310nm	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	-14dbm	-	-
Optical Output Power 62.5/125 µmfiber (Min. TX)	-20dbm	-20dbm-	-20dbm	-	-
Optical Output Power 50/125µm fiber (Max. TX)	-14dbm	-14dbm	-14dbm	-	-
Optical Output Power 50/125µm fiber (Min. TX)	-23.5dbm	-23.5dbm	-23.5dbm	-	-
Optical Input Power-minimum (Sensitivity)	-31dbm	-31dbm	-31dbm	-34dbm	-34dbm
Optical Input Power-maximum (Saturation)	0dbm	-8dbm	-8dbm	0dbm	0dbm
Link Budget	7.5db	8.5db	7.5db	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-MM-LC**	**SWM-04GF-SS-SC**	**SWM-04GF-SS-ST**	**SWM-04GF-SS-LC**
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	Module Plug-in	Module Plug-in
Physical Characteristics						
Casing Protection	IP-30	IP-30	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)	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-	multi-mode	single-mode	single-mode	single-mode
Connector Type	SC	ST	LC	SC	ST	LC
Data Rate	1GMbps	1GMbps	1GMbps	1GMbps	1GMbps	1GMbps
Typical Distance	550m	550m	550m	10km	10km	10km
Wavelength	850nm	850nm	850nm	1310nm	1310nm	1310nm
Optical Output Power 9/125µm fiber (Max. TX)	-	-	-	-3dbm	-3dbm	-3dbm
Optical Output Power 9/125µm fiber (Min. TX)	-	-	-	-9.5dbm	-9.5dbm	-9.5dbm
Optical Output Power 62.5/125 µmfiber (Max. TX)	-4dbm	-4dbm	-4dbm	-	-	-
Optical Output Power 62.5/125 µmfiber (Min. TX)	-9.5dbm	-9.5dbm-	-9dbm	-	-	-
Optical Output Power 50/125µm fiber (Max. TX)	-4dbm	-4dbm	-4dbm	-	-	-
Optical Output Power 50/125µm fiber (Min. TX)	-9.5dbm	-9.5dbm	-9dbm	-	-	-
Optical Input Power-minimum (Sensitivity)	-18dbm	-18dbm	-18dbm	-20dbm	-20dbm	-20dbm
Optical Input Power-maximum (Saturation)	0dbm	-8dbm	-8dbm	0dbm	0dbm	0dbm
Link Budget	8.5db	8.5db	9db	10.5db	10.5db	10.5db
Warranty	5 years					

Product Selection Guide

	Industrial Din-Rail Gigabit Ethernet Switch		
	Managed Switch		
Industrial Ethernet Switch			
	IGS-9844GPF/IGS-9844GPFX	**IGS-9812GP**	**IGS-9168GP**
Port Number			
Number of ports	**16**	**20**	**24**
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	8	8	16
100Base-FX Fiber Ports	- / 4	-	-
1000Base-X Fiber Ports	4 / -	-	-
1000Base-X SFP Ports	-	-	-
100/1000Base-X SFP Ports	4	12	8
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)	96.4(W)x105.5(D)x154(H)	96.4(W)x105.5(D)x154(H)	96.4(W)x105.5(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	•	•	•
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	5 years		

Product Selection Guide

	Industrial Din-Rail Gigabit Ethernet Switch				
	Managed Switch				
Industrial Ethernet Switch					
	IGS-9164GF/FX Series	**IGS-9084GP**	**IGS-9080 Series**	**IGS-9042GP**	**IGS-7084GCP**
Port Number					
Number of ports	**20**	**12**	**8**	**6**	**12**
10/100Base-T(X) RJ45 Ports	-	-	-	-	-
10/100/1000Base-T(X) Ports	16	8	8	4	-
100Base-FX Fiber Ports	- / 4(Multi)/ Single Mode	-	-	-	-
1000Base-X Fiber Ports	4(Multi)/ Single Mode / -	-	-	-	-
1000Base-FX SFP Ports	- / -	-	-	-	4
100/1000Base-X SFP Ports	-	4	-	2	-
Gigabit Combo Ports	-	-	-	-	8
Power Redundancy					
DC Terminal Block	2	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	IP-30
Dimensions (mm)	96.4(W)x105.5(D)x154(H)	96.4(W)x105.5(D)x154(H)	54.3(W)x108.5(D)x145.1(H)	54.3(W)x108.5(D)x145.1(H)	96.4(W)x105.5(D)x154(H)
Operating Temperature					
-10 to 60°C	-	-	-	-	-
-40 to 70°C	-	-	-	-	•
-40 to 75°C	•	•	•	•	-
Network Redundancy					
O-Ring	•	•	•	•	•
Open-Ring	•	•	•	•	•
O-Chain	•	•	•	•	•
MRP	•	•	•	•	•
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	SYSLOG/ SNMP Trap / Relay	SYSLOG/ SNMP Trap / Relay
DHCP	Server / Client/ Relay	Server / Client/ Relay	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	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)	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 Din-Rail Gigabit Ethernet Switch Managed Switch				
					
	IGS-R9812GP	IGS-P9812GP	IGS-P9164GF / FX / GC		
Port Number					
Number of ports	**20**	**20**	**20**		
10/100Base-T(X) RJ45 Ports	-	-	-		
10/100/1000Base-T(X) Ports	8	8	16		
100Base-FX Fiber Ports	-	-	-	4	-
1000Base-X Fiber Ports	-	-	4	-	-
1000Base-X SFP Ports	-	-	-	-	-
100/1000Base-X SFP Ports	12	12	-	-	-
Gigabit Combo Ports	-	-	-	-	4
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)	96.4(W)x145.5(D)x154(H)	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	•	•	•		
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	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	5 years				

Product Selection Guide

	Industrial DIN-Rail Gigabit Ethernet Switch					
	Managed Switch		Unmanaged Switch			
Industrial Ethernet Switch						
	IGS-3044GC	**IGS-3032GC**	**IGS-1080A**	**IGS-1041GPA / 1050A**	**IGS-1042GPA**	**IGS-150B**
Port Number						
Number of ports	**8**	**5**	**8**	**5**	**6**	**5**
10/100Base-T(X) RJ45 Ports	-	-	-		-	-
10/100/1000Base-T(X) Ports	4	3	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	4	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	•	•	•	•	•	•
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)	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 70°C	•	•	•	•	•	•
-40 to 85°C	-	-	-	-	-	-
Network Redundancy						
O-Ring	•	•	-	-	-	-
Open-Ring	•	•	-	-	-	-
O-Chain	•	•	-	-	-	-
MRP	•	•	-	-	-	-
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	SYSLOG / SMTP / SNMP Trap / Relay	Relay	Relay	Relay	-
DHCP	Server / Client	Server / Client	-	-	-	-
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					

Product Selection Guide

Industrial Ethernet Switch	Industrial DIN-Rail Fast Ethernet Switch Managed Switch				
					
	IES-3240	IES-3162GC	IES-3160	IES-P3073GC-HV	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	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	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	•	•	•	
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			

Product Selection Guide

	Industrial DIN-Rail Fast Ethernet Switch					
	Lite-Managed Switch			Unmanaged Switch		
Industrial Ethernet Switch						
	IES-2060 / 2042FX	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	6 / 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	•	•	•	•	•	•
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 DIN-Rail Fast Ethernet Switch											
	Unmanaged Switch											
Industrial Ethernet Switch												
	IES-1082GP	**IES-1062 Series / IES-1080**		**IES-1050A / 1080A**		**IES-1041FX / 1042FX**		**IES-150B**	**IES-180B**			
Port Number												
Number of ports	**10**	**8**		**5**	**8**	**5**	**6**	**5**	**8**			
10/100Base-T(X) RJ45 Ports	8	6	8	5	8	4		5	8			
10/100/1000Base-T(X) Ports	-	2	-	-		-		-	-			
100Base-FX Fiber Ports	-	2 (Multi/Single-Mode)	-	-		1 (Multi/ Single-Mode)	2 (Multi/Single-Mode)	-	-			
1000Base-X Fiber Ports	-	2 (Multi/Single-Mode)	-	-		-		-	-			
100Base-FX SFP Ports	-	-		-		-		-	-			
1000Base-X SFP Ports	2	-		-		-		-	-			
Gigabit Combo Ports	-	-		-		-		-	-			
Power Redundancy												
DC Terminal Block	2	2		2		2		2	2			
DC Power Jack	1	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)	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)		26.1(W)x70(D)x95(H)	41(W)x90(D)x95(H)			
Operating Temperature												
-10 to 60°C	-	-		-		-		-	-			
-40 to 70°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		Relay		-	-			
DHCP	-	-		-		-		-	-			
VLAN	-	-		-		-		-	-			
Management / Configuration	-	-		-		-		-	-			
Warranty	5 years											

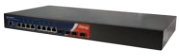
Product Selection Guide

	Industrial Desktop Gigabit Ethernet Switch		
	Managed Switch		
Industrial Ethernet Switch			
	DGS-9812GP-AI0_S	DGS-9168GP-AI0_S	DGS-R9812GP-AI0_S
Port Number			
Number of ports	**20**	**24**	**20**
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	8	16	8
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
Fiber bypass ports	2	2	2
100/1000Base-X SFP Ports	12	8	12
Gigabit Combo Ports	-	-	-
Power Redundancy			
DC Terminal Block	-	-	-
DC Power Jack	-	-	-
AC Power Cord	2 AC(one socket)	2 AC(one socket)	2 AC(one socket)
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	-	-	-
Desktop	•	•	•
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	300(W)x165(D)x88(H)	300(W)x165(D)x88(H)	200(W)x130(D)x88(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 75°C	•	•	•
Network Redundancy			
O-Ring	•	•	•
Open-Ring	•	•	•
O-Chain	•	•	•
MRP	•	•	•
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	•	•	•
IEEE1588v2	•	•	•
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		

Product Selection Guide

	Industrial Desktop Fast Ethernet Switch		
	Managed Switch		
Industrial Ethernet Switch			
	DES-3082GP-AIO_S	**DES-3082GP-P**	**DES-3073GC-P**
Port Number			
Number of ports	**10**	**10**	**10**
10/100Base-T(X) RJ45 Ports	8	8	7
10/100/1000Base-T(X) Ports	-	-	-
100Base-FX Fiber Ports	-	-	-
1000Base-X Fiber Ports	-	-	-
Fiber bypass ports	2	-	-
100/1000Base-X SFP Ports	2	2	2
Gigabit Combo Ports	-	-	3
Power Redundancy			
DC Terminal Block	-	-	-
DC Power Jack	-	-	-
AC Power Cord	2 AC(one socket)	1 AC(one socket)	2 AC(one socket)
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	-	-	-
Desktop	•	•	•
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	300(W)x165(D)x88(H)	200(W)x130(D)x88(H)	150(W)x149(D)x70(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	•	•	•
Network Redundancy			
O-Ring	•	•	•
Open-Ring	•	•	•
O-Chain	•	•	•
MRP	•	•	•
MSTP/RSTP/STP	•	•	•
Management and Control			
802.1X	•	•	•
Rate Limit	•	•	•
Port Mirror	•	•	•
Port Security	•	•	•
IGMP v2/v3	•	•	•
QoS Port Base/COS/TOS	•	•	•
PTP Client	•	•	•
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		

Product Selection Guide

	Industrial Gigabit PoE Ethernet Switch			
	Managed Rack-Mount Switch			
Industrial Ethernet Switch				
	RGPS-R9244GP+-P	**RGPS-92222GCP-P/LP**	**RGPS-9084GP-P**	**RGPS-7244GP / 7244GP-P**
Port Number				
Number of ports	**28**	**26**	**12**	**28**
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.1000/450 Watts)	8 (P.S.E) IEEE 802.3 at (max 120 Watts)	24 (P.S.E) IEEE 802.3 at
100Base-FX Fiber Ports	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-
100/1000Base-X SFP Ports	-	-	-	-
10G SFP+	4	2	4	4
Gigabit Combo Ports	-	2	-	-
Power Redundancy				
DC Terminal Block	-	-	-	1 -
DC Power Jack	-	-	-	-
AC Power Cord	1	1	1	- 1
Installation				
Rack Mounting	●	●	●	●
Physical Characteristics				
Casing Protection	IP-20	IP-20	IP-20	IP-20
Dimensions (mm)	431(W) x 342(D) x 44(H)	431(W) x 342(D) x 44(H)	443.7(W) x 230(D) x 44(H)	431(W) x 342(D) x 44(H)
Operating Temperature				
-40 to 60°C	●	●	-	-
-40 to 70°C	-	-	-	●
-40 to 75°C	●	●	●	-
Network Redundancy				
O-Ring	●	●	●	●
Open-Ring	●	●	●	●
O-Chain	●	●	●	●
MRP	●	●	●	●
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	SYSLOG / SNMP Trap	SYSLOG / SNMP Trap	SYSLOG / SNMP Trap
DHCP	Server / Client / Relay	Server / Client / Relay	Server / Client / Relay	Server / Client
VLAN	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q	Port-Based / 802.1Q / Q-in-Q	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)	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-9842GTP/-24V	IGPS-9084GP	IGPS-9080/-24V	IGPS-9042GP-24V	IGPS-R9084GP
Port Number					
Number of ports	14	12	8	6	12
10/100Base-T(X) RJ45 Ports	-	-	-	-	-
10/100/1000Base-T(X) Ports	8 (P.S.E) IEEE 802.3 at (max 120 Watts)+4	8 (P.S.E.) IEEE 802.3 at	8 (P.S.E) IEEE 802.3 at	4 (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	-	-	-	-	-
1000Base-X SFP Ports	2	4(100/1000M)	-	2	4(100/1000M)
Gigabit Combo Ports	-	-	-	-	-
Power Redundancy					
DC Terminal Block	2	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	IP-30
Dimensions (mm)	74.3(W)x109.2(D)x153.6(H)	96.4(W)x105.5(D)x154(H)	54.1(W)x106.1(D)x145.4(H)	54.1(W)x106.1(D)x145.4(H)	96.4(W)x145.5(D)x154(H)
Operating Temperature					
-40 to 60°C	-	-	-	-	-
-40 to 75°C	•	•	•	•	•
Network Redundancy					
O-Ring	•	•	•	•	•
Open-Ring	•	•	•	•	•
O-Chain	•	•	•	•	•
MRP	•	•	•	•	•
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	Relay / SYSLOG / SNMP Trap	Relay / SYSLOG / SNMP Trap	Relay / SYSLOG / SNMP Trap
DHCP	Server / Client / Relay	Server / Client /Relay	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	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)	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 Unmanaged DIN-Rail Switch		
			
	IGPS-1080-24V	IGPS-1080A	IGPS-1042GPA
Port Number			
Number of ports	8	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)	8 (P.S.E.) IEEE 802.3 at	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	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)	41(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)
Operating Temperature			
-40 to 60°C	-	-	-
-40 to 70°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			

Product Selection Guide

	Industrial Gigabit PoE Ethernet Switch			
	Unmanaged DIN-Rail Switch			
Industrial Ethernet Switch				
	IGPS-1042GP-24V	**IGPS-1041GTA**	**IGPS-1411GTP-24V**	**IGPS-1411GTPA**
Port Number				
Number of ports	**6**	**5**	**6**	**6**
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	4 (P.S.E.) + 1 IEEE 802.3at
100Base-FX Fiber Ports	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-
100Base-FX SFP Ports	-	-	-	-
1000Base-X SFP Ports	2	-	1	1
Gigabit Combo Ports	-	-	-	-
Power Redundancy				
DC Terminal Block	2	2	2	2
DC Power Jack	-	-	-	-
AC Power Cord	-	-	-	-
Installation				
DIN-Rail Mounting	•	•	2	2
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)	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)
Operating Temperature				
-40 to 60°C	-	-	•	-
-40 to 70°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	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	4 (P.S.E.) IEEE802.3 af	2+4 (P.S.E.) IEEE802.3 af	8 (P.S.E.) IEEE802.3 at (max.180 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 70°C	•	•	•	•	•	•
Network Redundancy						
O-Ring	•	•	•	-	-	-
Open-Ring	•	•	•	-	-	-
O-Chain	•	•	•	-	-	-
MRP	•	-	-	-	-	-
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	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					

Product Selection Guide

	Industrial IP-67 Ethernet Switch	Card-Type Ethernet Switch	
	Lite-Managed Switch	Industrial Compact PCIe Ethernet Switch	
Industrial Ethernet Switch			
	IES-2050-M12	**CPS-3080-C**	**CPS-3162GC-C**
Port Number			
Number of ports	**5**	**8**	**18**
10/100Base-T(X) RJ45 Ports	5 (M12 A-coding)	8(in Compact PCI Socket)	8+8(in Compact PCI Socket)
10/100/1000Base-T(X) Ports	-	-	-
100Base-FX Fiber Ports	-	-	-
100Base-FX SFP Ports	-	-	-
1000Base-X SFP Ports	-	-	-
Gigabit Combo Ports	-	-	2
Power Redundancy			
DC Terminal Block	1(M12)	-	-
DC Power Jack	-	-	-
CompactPCI bus power	-	●	●
Installation			
DIN-Rail Mounting	●	-	-
Wall Mounting	●	-	-
CompactPCI bus	-	●	●
Physical Characteristics			
Casing Protection	-	-	-
Dimensions (mm)	125 (W) x 65 (D) x 96 (H)	20 (W) x 187 (D) x 119.7 (H)	80 (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	●	●	●
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	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap
DHCP	Client	Client	Client
VLAN	Port-Based	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	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

	Card-Type Ethernet Switch Managed Switch Industrial Compact PCIe Ethernet Switch		
Industrial Ethernet Switch			
	CPGS-9080-C	**CPGS-9120-C**	**CPGS-9120-M12-C**
Port Number			
Number of ports	**8**	**12**	**12**
10/100Base-T(X) RJ45 Ports	-	-	-
10/100/1000Base-T(X) Ports	8xCPCI interface	8xCPCI interface+4xRJ-45	8xCPCI interface+4xM12
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 bus	●	●	●
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)
Operating Temperature			
-10 to 60°C	-	-	-
-20 to 70°C	-	-	-
-40 to 70°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	SYSLOG / SMTP / SNMP Trap	SYSLOG / SMTP / SNMP Trap	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		

Product Selection Guide

	Card-Type Ethernet Switch			
	Industrial PCIe Ethernet Switch	Industrial PCIe Gigabit Ethernet Switch	Industrial PCIe Gigabit PoE Ethernet Switch	
Industrial Ethernet Switch				
	ICS-4040	**IGCS-E140**	**IGPCS-E140**	**IGPCS-E131GP**
Port Number				
Number of ports	**4**	**4**	**4**	**4**
10/100Base-T(X) RJ45 Ports	4	-	-	-
10/100/1000Base-T(X) Ports	-	4	4 (P.S.E.) IEEE 802.3at(max.65 Watts)	3 (P.S.E.) IEEE 802.3at(max.65 Watts)
100Base-FX Fiber Ports	-	-	-	-
100Base-FX SFP Ports	-	-	-	-
100/1000Base-X SFP Ports	-	-	-	1
Gigabit Combo Ports	-	-	-	-
Power Redundancy				
DC Terminal Block	-	-	-	-
DC Power Jack	-	-	-	-
Card Bus Power	PCI bus	PCIe bus	PCIe bus	PCIe bus
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	-	-	-	-
Card Bus	PCI	PCIe	PCIe	PCIe
Physical Characteristics				
Casing Protection	-	-	-	
Dimensions (mm)	121(W) x 100(D)	21.3(W)x136(D)x121(H)	21.3(W)x178(D)x121(H)	21.3(W)x178(D)x121(H)
Operating Temperature				
-10 to 60°C	•	•	•	•
-20 to 70°C	-	-	-	-
-40 to 70°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	SYSLOG / SMTP / SNMP Trap / Relay	-	-	-
DHCP	Client	-	-	-
VLAN	Port-Based	-	-	-
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet	-	-	-
Warranty	5 years			

Product Selection Guide

	Optical / PoE Network Accessories				
	Optical / PoE Network Accessories	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) Ports	-	2 (P.S.E.)		-	
PoE++(90 Watts) Ports	-	-	-	2	
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	24-50VDC	50-57VDC	24-50VDC
Output Power	-	30 Watts Max.PerPort		90 Watts per port	90 Watts in total
Installation					
DIN-Rail Mounting	•	•		•	
Wall Mounting	•	•		•	
PCIe Bus Power	-	-		-	
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					
-10 to 60°C	-	-		-	
-20 to 70°C	-	•		•	
-40 to 70°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

Industrial Ethernet Switch	Optical / PoE Network Accessories				
	PoE Splitter		PoE Extender	EN50155 PoE Injector	
	 SPL-101GT-AT	 SPL-101GT++	 PET-102GT++	 TINJ-101GT-M12/24V	 TINJ-101-M12/24V
Port Number					
Number of ports	**2**	**2**	**3**	**2(M12)**	**2(M12)**
10/100Base-T(X) RJ45 Ports	-	-	-	-	1 (M12)
10/100/1000Base-T(X) RJ45 Ports	1	1	3	1 (M12)	-
PoE+(30 Watts) Ports	1(P.D.)	-	-	1 (P.S.E.)	1 (P.S.E.)
PoE++(90 Watts) Ports	-	1(P.D.)	2 (P.S.E.)+1(P.D.)	-	-
100/1G/10G Fiber Ports	-	-	-	-	-
Optical Bypass ports	-	-	-	-	-
Power Redundancy					
DC Terminal Block	1 (24VDC output)	1 (24VDC output)	1	1	1
DC Power Jack	-	-	-	-	-
Operating Voltage	36-57VDC	36-57VDC	50-57VDC	50-57VDC 12-50VDC	50-57VDC 12-50VDC
Output Power	24V@1.25A MAX	24V@.2.5A MAX	45 Watts Max.PerPort	30 Watts Max.PerPort	30 Watts Max.PerPort
Installation					
DIN-Rail Mounting	•	•	•	•	•
Wall Mounting	•	•	•	•	•
PCIe Bus Power	-	-	-	-	-
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W)x70(D)x95(H)	40(W)x70(D)x95(H)	40(W)x70(D)x95(H)	88.9(W)x40(D)x178.2(H)	88.9(W)x40(D)x178.2(H)
Operating Temperature					
-10 to 60°C	-	-	-	-	-
-20 to 70°C	•	•	•	-	-
-25 to 70°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 EN50155 Ethernet Switch					
	Managed Switch		Lite-Managed Switch	Unmanaged Switch		
Industrial Ethernet Switch						
	TES-3162GT-M12-BP1	TES-3080-M12 / -BP2	TES-250-M12	TES-1080-M12 / -BP2	TES-180-M12	TES-150-M12
Port Number						
Number of ports	18	8	5	8	8	5
10/100Base-T(X) M12 D-Coding Ports	16	8	4+4(2-pair bypass)	5	8	4+4(2-pair bypass)	8	5
10/100/1000Base-T(X) M12 A-Coding Ports	2(1-pair bypass)	-	-	-	-	-
100Base-FX Fiber Ports	-	-	-	-	-	-
1000Base-X Fiber Ports	-	-	-	-	-	-
Gigabit Combo Ports	-	-	-	-	-	-
Power Redundancy						
On M12 Connector	-	-	1(M12)	-	1	1(M12)
On M23 Connector	2(M23)	2(M23)	-	2(M23)	-	-
Installation						
DIN-Rail Mounting	-	-	-	-	-	-
Wall Mounting	●	●	●	●	●	●
Physical Characteristics						
Casing Protection	IP-40	IP-40	IP-40	IP-40	IP-40	IP-40
Dimensions (mm)	260(W) x 91.3(D) x 216(H)	125(W) x 65(D) x 196(H)	89(W) x 40(D) x 178(H)	125(W) x 65(D) x 196(H)	88.9(W) x 40(D) x 178.2(H)	89(W) x 40(D) x 178(H)
Operating Temperature						
-10 to 60°C	-	-	-	-	-	-
-40 to 70°C	●	●	●	●	●	●
Network Redundancy						
O-Ring	●	●	●	-	-	-
Open-Ring	●	●	●	-	-	-
O-Chain	●	●	●	-	-	-
MRP	●	●	-	-	-	-
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	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 / Console (CLI)	WEB / Windows Utility / SNMP v1,v2c,v3 / Telnet	-	-	-
Warranty	5 years					

* Provide 2pairs of HW Bypass ports.

Product Selection Guide

	Industrial EN50155 PoE Ethernet Switch		
	Managed Switch		
Industrial Ethernet Switch			
	TPS-3882GT-M12-BP1/-24V	**TPS-3162GT-M12-BP1/-24V**	**TPS-3044TX-M12**
Port Number			
Number of ports	**18**	**18**	**8**
10/100Base-T(X) M12 D-Coding Ports	8 (P.S.E.)+8 IEEE 802.3 af	16 (P.S.E.) IEEE 802.3 af	4 (P.S.E.)+4 IEEE 802.3 af
10/100/1000Base-T(X) M12 A-Coding Ports	2(1-pair Bypass)	2(1-pair 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)	2(M23)
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-40	IP-40	IP-40
Dimensions (mm)	260(W) x 91.3(D) x 216(H)	260(W) x 91.3(D) x 216(H)	170(W) x 75(D) x 196(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	●	●	●
Network Redundancy			
O-Ring	●	●	●
Open-Ring	●	●	●
O-Chain	●	●	●
MRP	●	●	●
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		

* Provide 2pairs of HW Bypass ports.

Product Selection Guide

	Industrial EN50155 PoE Ethernet Switch			
	Managed Switch	Unmanaged Switch		
Industrial Ethernet Switch				
	TPS-3082GT-M12-BP1	TPS-141TX-M12/24V	TPS-1080-M12 -BP2/-24V	
Port Number				
Number of ports	**10**	**5**	**8**	
10/100Base-T(X) M12 D-Coding Ports	8 (P.S.E.) IEEE 802.3 af	4 (P.S.E.) + 1 IEEE 802.3 at	8 (P.S.E.) IEEE 802.3 af	4 (P.S.E.) + 4 (P.S.E.)(2-pair bypass) IEEE 802.3 af
10/100/1000Base-T(X) M12 A-Coding Ports	2(1-pair Bypass)D-Coding	-	-	
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	-	2	
Installation				
DIN-Rail Mounting	-	-	-	
Wall Mounting	●	●	●	
Physical Characteristics				
Casing Protection	IP-40	IP-40	IP-40	
Dimensions (mm)	170(W) x 75(D) x 196(H)	89(W) x 40(D) x 178(H)	125(W) x 65(D) x 196(H)	
Operating Temperature				
-10 to 60°C	-	-	-	
-40 to 70°C	●	●	●	
Network Redundancy				
O-Ring	●	-	-	
Open-Ring	●	-	-	
O-Chain	●	-	-	
MRP	●	-	-	
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	-	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			

* Provide 2pairs of HW Bypass ports.

Product Selection Guide

	Industrial EN50155 Gigabit Ethernet Switch		
	Managed Switch		Unmanaged Switch
Industrial Ethernet Switch			
	TGS-9200-M12 / -BP2	**TGS-9120-M12 / -BP2**	**TGS-1080-M12 / -BP2**
Port Number			
Number of ports	**20**	**12**	**8**
10/100Base-T(X) M12 D-Coding Ports	-	-	-
10/100/1000Base-T(X) M12 A-Coding Ports	**20**/ 16+4(2-Pair HW bypass)	**12**/ 8+4(2-Pair HW bypass)	**8**/ 4+4(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)	2(M23)
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-40
Dimensions (mm)	260(W) x 91.6(D) x 228(H)	260(W) x 91.3(D) x 216(H)	125(W) x 65(D) x 196(H)
Operating Temperature			
-10 to 60°C	-	-	-
-40 to 70°C	●	●	●
Network Redundancy			
O-Ring	●	●	-
Open-Ring	●	●	-
O-Chain	●	●	-
MRP	●	●	-
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	Relay
DHCP	Server/Client	Server/Client	-
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		

Product Selection Guide

	Industrial EN50155 Gigabit PoE Ethernet Switch			
	Managed Switch			
Industrial Ethernet Switch				
	TGPS-9164GT-M12 / -24V	**TGPS-9164GT-M12-BP2 / -24V**	**TGPS-9084GT-M12 / -24V**	**TGPS-9084GT-M12-BP2 / -24V**
Port Number				
Number of ports	**20**	**20**	**12**	**12**
10/100/1000Base-T(X) M12 A-Coding P.S.E. Ports	16 IEEE 802.3 at	16 IEEE 802.3 at	8 IEEE 802.3 at	8 IEEE 802.3 at
10/100/1000Base-T(X) M12 A-Coding Ports	4	4(2-pair Bypass)	4	4(2-pair 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)	2(M23)	2(M23)
Installation				
DIN-Rail Mounting	-	-	-	-
Wall Mounting	●	●	●	●
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	260(W) x 91.6(D)x 228(H)	260(W) x 91.6(D)x 228(H)	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	●	●	●	●
Open-Ring	●	●	●	●
O-Chain	●	●	●	●
MRP	●	●	●	●
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	SYSLOG / SMTP / SNMP Trap / Relay
DHCP	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
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	5 years			

Product Selection Guide

	Industrial EN50155 Gigabit PoE Ethernet Switch	
	Unmanaged Switch	
Industrial Ethernet Switch		
	TGPS-1080-M12-24V	**TGPS-1080-M12-BP2-24V**
Port Number		
Number of ports	**8**	**8**
10/100Base-T(X) M12 D-Coding Ports	-	-
10/100/1000Base-T(X) M12 A-Coding Ports	8 (P.S.E.)+IEEE 802.3 at(max.120 Watts)	8 (P.S.E.)+IEEE 802.3 at(max.120 Watts)(2-pair 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	2
Installation		
DIN-Rail Mounting	-	-
Wall Mounting	●	●
Physical Characteristics		
Casing Protection	IP-40	IP-40
Dimensions (mm)	125(W) x 65(D) x 196(H)	125(W) x 65(D) x 196(H)
Operating Temperature		
-10 to 60°C	-	-
-40 to 70°C	●	●
Network Redundancy		
O-Ring	-	-
Open-Ring	-	-
O-Chain	-	-
MRP	-	-
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	Relay	Relay
DHCP	-	-
VLAN	-	-
Management / Configuration	-	-
Warranty	5 years	

Product Selection Guide

Industrial Ethernet Switch

Industrial C1D2 DIN-Rail Fast Ethernet Switch

Managed Switch

IES-A3062 Series / IES-A3080

Unmanaged Switch

IES-A1062 Series / IES-A1080

Port Number				
Number of ports	8		8	
10/100Base-T(X) RJ45 Ports	6	8	6	8
10/100/1000Base-T(X) Ports	2	-	2	-
100Base-FX Fiber Ports	2 (Multi/Single-Mode)	-	2 (Multi/Single-Mode)	-
1000Base-X Fiber Ports	2 (Multi/Single-Mode)	-	2 (Multi/Single-Mode)	-
100Base-FX SFP Ports	-		-	
1000Base-X SFP Ports	-		-	
Gigabit Combo Ports	-		-	
Power Redundancy				
DC Terminal Block	2		2	
DC Power Jack	1		1	
AC Power Cord	-		-	
Installation				
DIN-Rail Mounting	•		•	
Wall Mounting	•		•	
Desktop	-		-	
Physical Characteristics				
Casing Protection	IP-30		IP-30	
Dimensions (mm)	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	•			
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		-	
VLAN	Port-Based / 802.1Q / Q-in-Q / GVRP		-	
Management / Configuration	WEB / Windows Utility / SNMP v1,v2c,v3 /Telnet /Console(CLI)		-	
Warranty	5 years			

Product Selection Guide

	Industrial Rack-Mount Ethernet to Fiber Media Converter				
	Chassis	Power Supply	Card type Ethernet to fiber		
Industrial Media Converter					
	RMC-1000	**RPM-130-AC**	**RGMC-111GPB**	**RMC-121FB**	**RMC-111FB / 111PB**
Port Number					
Chassis Slots	18	-	-	-	-
10/100Base-T(X) RJ45 Ports	-	-	-	2	1
10/100/1000Base-T(X) RJ45 Ports	-	-	1	-	-
100Base-FX Fiber Ports	-	-	-	1 (Multi/Single-Mode)	1 (Multi/Single-Mode) 1 (SFP)
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	1
DC Terminal Block	-	-	-	-	-
DC Power Jack	-	-	-	-	-
AC Power Cord	2 (Optional)	1	-	-	-
Installation					
DIN-Rail Mounting	-	-	-	-	-
Wall mounting	-	-	-	-	-
Rack-Mount	●	● (RMC-1000)	● (RMC-1000)	● (RMC-1000)	● (RMC-1000)
Physical Characteristics					
Casing Protection	IP-20		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)	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				
	Slim type Gigabit Ethernet to fiber	Mini type Ethernet to fiber		Mini type Ethernet Extender	
Industrial Media Converter					
	IGMC-1011GF / 1011GP	**IMC-121FB**	**IMC-111FB / 111PB**	**IMC-B111ETB-TB**	**IMC-B111ETB-RJ45**
Port Number					
Chassis Slots	-	-	-	-	-
10/100Base-T(X) RJ45 Ports	-	2	1	1	1
10/100/1000Base-T(X) RJ45 Ports	1	-	-	-	-
100Base-FX Fiber Ports	-	1 (Multi/Single-Mode)	1 (Multi/Single-Mode)	1 (SFP)	-	-
1000Base-X Fiber Ports	1 (Multi/Single-Mode)	1 (SFP)	-	-	-	-
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	2	2
DC Power Jack	-	by cable	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	IP-30	IP-30
Dimensions (mm)	26.1(W) x 94.9(D) x 144.3(H)	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)	26.1(W) x 70(D) x 95(H)
Operating Temperature					
-10 to 60°C	-	-	-	-	-
-10 to 70°C	-	-	-	-	-
-40 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			
	Mini type Ethernet to fiber	IEC 61850-3 Ethernet to fiber	IEC 61850-3 Ethernet to fiber M12 Connector	Mini type Ethernet to fiber
Industrial Media Converter				
	IGMC-111GPB	**IMC-P111FX/P-LV / HV**	**IMC-P111FX/P -M12-LV / HV**	**IPMC-111PB**
Port Number				
Chassis Slots	-	-		
10/100Base-T(X) RJ45 Ports	-	1	1	1(M12 A-Coded)	1(P.S.E.)
10/100/1000Base-T(X) RJ45 Ports	1	-	-		-
100Base-FX Fiber Ports	-	1 (Multi/Single-Mode)	1 (SFP)	1 (Multi/Single-Mode)	1 (SFP)	1 (SFP)
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	-	-		-
DC Terminal Block	2	2(for LV Model)	2(for LV Model)	2
DC Power Jack	by cable	-	-	by cable
AC Power Cord	-	2(for HV Model)	2(for HV Model)	-
Installation				
DIN-Rail Mounting	•	•	•	•
Wall mounting	•	•	•	•
Rack-Mount	-	-	-	-
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W) x 70(D) x 95(H)	52(W) x 106.1(D) x 144.3(H)mm	52(W) x 106.1(D) x 144.3(H)mm	26.1(W) x 70(D) x 95(H)
Operating Temperature				
-10 to 60°C	-	-	-	-
-10 to 70°C	-	-	-	-
-40 to 70°C	•	-	-	•
-10 to 85°C	-	•	•	-
Protection				
Power Overload Current Protection	•	•	•	•
Power Reverse Polarity Protection	•	•	•	•
Serial Isolation Protection	-	-	-	-
Warranty	5 years			

Product Selection Guide

	USB to Serial Media Converter				Serial to Serial Media Converter		
	USB to Serial				Serial to Serial		
Industrial Media Converter							
	ISC-4110U / 8110U	**ISC-1310FB**	**ISC-1210U-I / 1310U-I**		**ISC-1112 / 1112-I**	**ISC-1112B/1112B-1**	**ISC-1212-I**
Port Number							
10/100Base-T(X) RJ45 Ports	-	-	-		-	-	-
10/100/1000Base-T(X) RJ45 Ports	-	-	-		-	-	-
100Base-FX Fiber Ports	-	●	-		-	-	-
1000Base-X Fiber Ports	-	-	-		-	-	-
USB Port	1	-	1		-	-	-
RS-232 Serial Port	4 (DB62 female) 8 (DB62 female) DB62 to DB9 cable attached	-	-		1	1 (DB9 male)	-
RS-422/485 Serial Port	-	-	1	-	1	1	2
RS-232/422/485 Serial Port	-	1	-	1	-	-	-
Serial Port Feature							
Baud Rate	300 ~ 921.6Kbps	50 bps ~ 921.6Kbps	300 ~ 115.2Kbps		300 ~ 115.2Kbps		300 ~ 115.2Kbps
Signals	RS-232 : TX, RX, RTS, CTS, DTR, DSR, DCD, GND	RS-232 : TX, RX, GND RS-422 : TX+, TX-, RX+, RX- RS-485 : Data+, Data-	RS-422 : TX+, TX-, RX+, RX-, RTS+, RTS-CTS+, CTS- RS-485 : Data+, Data-	RS-232 : TX, RX, RTS, CTS, GND RS-422 : TX+, TX-, RX+, RX- RS-485 : Data+, Data-	RS-232 : TX, RX, GND RS-422 : TX+, TX-, RX+, RX- RS-485 : Data+, Data-	RS-232 : TX, RX, RTS, CTS, GND RS-422 : TX+, TX-, RX+, RX- RS-485 : Data+, Data-, GND RS-485(4-wine) : TX+, TX-, RX+, RX-	RS-422 : TX+, TX-, RX+,RX-RS-485 : Data+, Data-
Power Redundancy							
DC Terminal Block	1	2	-		1	2	1
DC Power Jack	1	-	-		-	-	-
USB Bus Power	●	-	●		-	-	-
Installation							
DIN-Rail Mounting	●	●	●		●	●	●
Wall mounting	●	●	●		●	●	●
Physical Characteristics							
Casing Protection	IP-30	IP-30	IP-30		IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W) x 94.9(D) x 144.3(H) mm	26.1(W) x 70(D) x 95(H) mm	71.2(W) x 25.3(D) x 100.6(H) mm		71.2(W)x25.3(D) x100.6(H) mm	26.1(W) x 70(D) x 95(H) mm	71.2(W)x25.3(D) x100.6(H) mm
Operating Temperature							
-10 to 70°C	-	●	●		●	-	●
-40 to 70°C	●	-	-		-	●	-
Protection							
Power Overload Current Protection	●	●	●		●	●	●
Power Reverse Polarity Protection	●	-	-		-	-	-
Serial Isolation Protection	-	-	3000 VDC		- 3000 VDC	- 3000 VDC	3000 VDC
Warranty	5 years	5 years	2 years			5 years	2 years

Product Selection Guide

	Industrial Device Server				
	1-Port Device Server				
Industrial Device Server					
	IDS-5011	**IDS-5011F-MM/SS**	**IDS-5012**	**IDS-5011-WG**	**IDS-1112**
Serial Port					
Serial port Numbers	**1**	**1**	**1**	**1**	**1**
Serial Mode	RS-232	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232
Serial Port Connector	DB9 (male)	DB9 (male)	DB9 (male)	DB9 (male)	DB9 (male)
Serial Port with 2KV Isolation	-	-	-	-	-
Serial Baud Rate	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps	110 bps to 230.4 Kbps	110 bps to 460.8 Kbps
Ethernet Port					
10/100Base-T(X) in RJ45 Auto MDI/MDIX Ports	1	-	2	1	2
100Base-FX Fiber Ports	-	1 (Multi/Single Mode)	-	-	-
Wireless LAN Interface	-	-	-	IEEE 802.11b/g	IEEE 802.11b/g
ETH2 Support PoE (IEEE 802.3af compliant)	-	-	-	-	-
Ethernet Switch mode / Fast Recovery Mode supported	-	-	•	-	•
Power Redundancy					
DC Terminal Block	1	1	1	1	2
DC Power Jack	1	1	1	1	-
Installation					
DIN-Rail Mounting	•	•	•	•	•
Wall mounting	•	•	•	•	•
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	72(W) x 29.4(D) x 123.4(H) mm	72(W) x 29.4(D) x 123.4(H) mm	72(W) x 29.4(D) x 123.4(H) mm	72(W) x 29.4(D) x 123.4(H) mm	40(W) x 115(D) x 153(H) mm
Operating Temperature					
-40 to 70°C	-	-	-	-	-
-10 to 60°C	•	•	•	•	•
Networking Technology					
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	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	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 32/64-Bit/ Windows 7 32/64-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	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	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP
Event Notification	Syslog / SMTP/ SNMP trap / and Beeper	Syslog / SMTP/ SNMP trap / and Beeper	Syslog / SMTP/ SNMP trap / and Beeper	Syslog / SMTP/ SNMP trap / and Beeper	Syslog / SMTP/ SNMP trap / Beeper
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 Device Server			
	Device Server			
Industrial Device Server				
	IDS-342/342+	**IDS-322/322+**	**IDS-312/312+**	**IDS-1112**
Serial Port				
Serial port Numbers	**4**	**2**	**1**	**1**
Serial Mode	RS-232/422/485	RS-232/422/485	RS-232/422/485	RS-232
Serial Port Connector	DB9 (male)	DB9 (male)	DB9 (male)	DB9 (male)
Serial Port with 2KV Isolation	-	-	-	-
Serial Baud Rate	110 bps to 115.2 Kbps	110 bps to 115.2 Kbps	110 bps to 115.2 Kbps	110 bps to 460.8 Kbps
Ethernet Port				
10/100Base-T(X) in RJ45 Auto MDI/MDIX Ports	2	2	2	2
100Base-FX Fiber Ports	-	1 (Multi/Single Mode)	-	-
Wireless LAN Interface	-	-	-	IEEE 802.11b/g
ETH1 Support PoE (IEEE 802.3af compliant)	- / ●	- / ●	- / ●	-
Ethernet Switch mode / Fast Recovery Mode supported	-	-	-	●
Power Redundancy				
DC Terminal Block	1	1	1	2
DC Power Jack	-	-	-	-
Installation				
DIN-Rail Mounting	●	●	●	●
Wall mounting	-	●	●	●
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	66(W) x 80.6(D) x 95(H) mm	45(W) x 80.6(D) x 95(H) mm	45(W) x 80.6(D) x 95(H) mm	40(W) x 115(D) x 153(H) mm
Operating Temperature				
-40 to 70°C	-	-	-	-
-10 to 60°C	●	●	●	●
Networking Technology				
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	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	Windows NT/2000/XP/2003/ VISTA 64-Bit/ Windows 7 64-Bit	Windows NT/2000/XP/2003/ VISTA 32/64-Bit/ Windows 7 32/64-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	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	Syslog / SMTP/ SNMP trap	Syslog / SMTP/ SNMP trap / Beeper
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 Device Server	
	Device Server	
Industrial Device Server		
	RDS-P3000	**RDS-3166G**
Serial Port		
Serial port Numbers	**up to 16**	**16**
Serial Mode	RS-232/422/485	RS-232/422/485
Serial Port Connector	DB9 (male)/RJ48	RJ48
Serial Port with 2KV Isolation	•	•
Serial Baud Rate	110 bps to 230.4 Kbps	110 bps to 230.4 Kbps
Ethernet Port		
10/100Base-T(X) in RJ45 Auto MDI/MDIX Ports	4	4
1000Base-X SFP Ports	2	2
Wireless LAN Interface	-	-
ETH2 Support PoE (IEEE 802.3af compliant)	-	-
Ethernet Switch mode / Fast Recovery Mode supported	-	-
Power Redundancy		
DC Terminal Block	-	1
AC Power Cord	1	1
Installation		
Rack Mounting	•	•
Wall mounting	-	-
Physical Characteristics		
Casing Protection	IP-30	IP-30
Dimensions (mm)	TBD	TBD
Operating Temperature		
-40 to 70°C	•	•
-10 to 60°C	-	-
Networking 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	SNMP trap / and Beeper	SNMP trap / and Beeper
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 Device Server			
	4-Port Device Server			
Industrial Device Server				
	IDS-5042 / 5042+	**IDS-5042-I+**	**IDS-5042-WG / 5042-IWG**	
Serial Port				
Serial port Numbers	**4**	**4**	**4**	
Serial Mode	RS-232/422/485	RS-422/485	RS-232/422/485	RS-422/485
Serial Port Connector	DB9 (male)	5-Pin Ternimal Block	DB9 (male)	5-Pin Ternimal Block
Serial Port with 2KV Isolation	-	•	-	•
Serial Baud Rate	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps	
Ethernet Port				
10/100Base-T(X) in RJ45 Auto MDI/MDIX Ports	2	2	2	
100Base-FX Fiber Ports	-	-	-	
Wireless LAN Interface	-	-	IEEE 802.11b/g	
ETH2 Support PoE (IEEE 802.3af Compliant)	- •	•	•	-
Ethernet Switch mode / Fast Recovery Mode supported	•	•	•	
Power Redundancy				
DC Terminal Block	2	2	2	
DC Power Jack	-	-	-	
Installation				
DIN-Rail Mounting	•	•	•	
Wall mounting	•	•	•	
Physical Characteristics				
Casing Protection	IP-30	IP-30	IP-30	
Dimensions (mm)	52(W) x 106(D) x 144(H) mm	52(W) x 106(D) x 144(H) mm	52(W) x 106(D) x 144(H) mm	
Operating Temperature				
-40 to 70°C	-	-	-	
-10 to 70°C	•	•	•	
Networking Technology				
Operating Modes	Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP	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	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	5 host devices : Virtual COM, TCP Server, TCP Client mode; 4 IP ranges : UDP	
Event Notification	Syslog / SMTP/ SNMP trap / Relay and Beeper	Syslog / SMTP/ SNMP trap / Relay and Beeperr	Syslog / SMTP/ SNMP trap / Relay and Beeper	
NAT Router Pass Through	•	•	•	
PPPoE	•	•	•	
DDNS	•	•	•	
Security				
HTTPS/SSH Management	•	•	•	
IP White List	•	•	•	
SSL Data Encryption	•	•	•	
IEEE 802.1X	-	-	•	
Warranty	5 years	5 years	3 years	

Product Selection Guide

	Industrial Device Server			EN50155 Switch
	1-Port Device Server	Slim Type Device Server		Device Server
Industrial Device Server				
	IDS-M311	IDS-141A / 181A		TDS-5041-I-M12
Serial Port				
Serial port Numbers	1	4	8	4
Serial Mode	RS-232 / 422 / 485	RS-232		RS-422/485
Serial Port Connector	DB9 (male)	DB62 (female, DB62 to DB9 cable attached)		M12 (male)
Serial Port with 2KV Isolation	-	-		•
Serial Baud Rate	110 bps to 115.2 Kbps	110 bps to 115.2 Kbps		110 bps to 460.8 Kbps
Ethernet Port				
10/100Base-T(X) in RJ45 Auto MDI/MDIX Ports	1	1		1(M12)
100Base-FX Fiber Ports	-	-		-
Wireless LAN Interface	-	-		-
ETH2 Support PoE (IEEE 802.3af Compliant)	-	-		-
Ethernet Switch mode / Fast Recovery Mode supported	-	-		-
Power Redundancy				
DC Terminal Block	1	2		1(M12)
DC Power Jack	1	1		-
Installation				
DIN-Rail Mounting	•	•		-
Wall mounting	•	•		•
Physical Characteristics				
Casing Protection	IP-30	IP-30		IP-40
Dimensions (mm)	72(W) x 29.4(D) x 123.4(H) mm	26.1(W) x 94.9(D) x 144.3(H) mm		170(W) x 65(D) x 195(H) mm
Operating Temperature				
-40 to 70°C	-	-		•
-10 to 60°C	•	•		-
Networking Technology				
Operating Modes	RTU Master , RTU Slave, ASCII Master , ASCII Slave	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		Windows NT/2000/XP/2003/ VISTA 32/64-Bit/ Windows 7 32/64-Bit
Multiple Link	16 TCP Connections	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	Beeper	Syslog / SMTP/ SNMP trap / and Relay		Syslog / SMTP/ SNMP trap / Beeper
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				
					
	IGAP-820+	IGAP-620/620+	IGAP-6620+	IAP-620/620+	IAP-420/420+
Ethernet Ports					
10/100 Base-T(X) LAN Ports	-	-	-	2	2
10/100 /1000 Base-T(X) LAN Ports	2	2	2	-	-
PoE(P.D.) Support	• (LAN Port-2)	- / • (LAN Port-2)	• (LAN Port-2)	- / • (LAN Port-2)	- / • (LAN Port-1)
Ethernet Switch / Redundant Mode Support	•	•	•	•	•
WLAN Interface					
WLAN Standard	IEEE802.11a/b/g/n/ac	IEEE802.11a/b/g/n	DualRF IEEE802.11a/b/g/n	IEEE802.11a/b/g/n	IEEE802.11b/g/n
Transmit Power	18 dBm max.	17 dBm max.	17 dBm max.	16 dBm max.	14 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps IEEE802.11ac : 1.3Gbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11g : 54Mbps IEEE802.11n :150Mbps
Antenna Connector	Reverse SMA	Reverse SMA	Reverse SMA	Reverse SMA	Reverse SMA
Antenna	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi
Power Redundancy					
Power Connector	2(Terminal Block)	2(Terminal Block)	2(Terminal Block)	2(Terminal Block)	2(Terminal Block)
Installation					
DIN-Rail Mounting	•	•	•	•	•
Wall Mounting	•	•	•	•	•
Pillar-Mounting	-	-	-	-	-
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	74.3(W)x109.2(D)x153.6(H)	74.3(W)x109.2(D)x153.6(H)	74.3(W)x109.2(D)x153.6(H)	54.2(W)x106.1(D)x145.4(H)	41(W)x81(D)x95(H)
Operating Temperature					
-10 to 60°C	-	-	•	•	•
-25 to 70°C	•	•	•	-	-
Network Technology					
Alarm Notification	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log
Management / Configuration	WEB/Window Utility	WEB/Window Utility	WEB/Window Utility	WEB/Window Utility	WEB/Window Utility
Warranty	5 years				3 years

Product Selection Guide

	Industrial IP-67 WLAN Access Point				EN50155 WLAN Access Point	
Industrial Wireless Access Point						
	IAP-W420+ / IAP-W422+		**IAP-W520+ / IAP-W522+**		**TAP-620-M12**	**TGAP-620-M12**
Ethernet Ports						
10/100 Base-T(X) LAN Ports	**2**		**2**		**2 (M12)**	-
10/100/1000 Base-T(X) LAN Ports	-		-		-	**2 (M12)**
PoE(P.D.) Support	•		•		-	(TGAP-620+-M12)
Ethernet Switch / Redundant Mode Support	-		-		•	•
WLAN Interface						
WLAN Standard	IEEE802.11 b/g/n		IEEE802.11a/n		IEEE802.11a/b/g/n	IEEE802.11a/b/g/n
Transmit Power	29 dBm max.		27 dBm max.		16 dBm max.	17 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11g : 54Mbps IEEE802.11n : 300Mbps		IEEE802.11a : 54Mbps IEEE802.11n : 300Mbps		IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps EEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna Connector	-	N-Type	-	N-Type	Reverse SMA	Reverse SMA
Antenna	Built-in 15 dBi	-	Built-in 15 dBi	-	2.4GHz :2 dBi 5GHz :3 dBi	2.4GHz :2 dBi 5GHz :2 dBi
Power Redundancy						
Power Connector	-		-		2 (M23)	2 (M23)
Installation						
DIN-Rail Mounting	-		-		-	-
Wall Mounting	-		-		•	•
Pillar-Mounting	•		•		-	-
Physical Characteristics						
Casing Protection	IP-67		IP-67		IP-40	IP-40
Dimensions (mm)	162(W)x102(D)x58(H)		162(W)x102(D)x58(H)		125(W)x65(D)x196(H)	125(W)x65(D)x196(H)
Operating Temperature						
-10 to 60°C	-		-		•	-
-25 to 70°C	•		•		-	•
Network Technology						
Alarm Notification	SNMP Trap / System Log		SNMP Trap / System Log		Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log
Management / Configuration	WEB/Window Utility		WEB/Window Utility		WEB/Window Utility	WEB/Window Utility
Warranty	5 years					

Product Selection Guide

	EN50155 WLAN Access Point		
Industrial Wireless Access Point			
	TGAP-6620-M12 Series	**TGAP-W610+ series**	**TGAP-W6610+ Series**
Ethernet Ports			
10/100 Base-T(X) LAN Ports	-	-	-
10/100/1000 Base-T(X) LAN Ports	**2 (M12)**	**1(M12/RJ45)**	**1(M12/RJ45)**
PoE(P.D.) Support	(TGAP-6620+-M12)	•	•
Ethernet Switch / Redundant Mode Support	•	-	-
WLAN Interface			
WLAN Standard	Dual IEEE802.11a/b/g /n	IEEE802.11a/b/g/n	Dual IEEE802.11a/b/g/n
Transmit Power	17 dBm max.	17 dBm max.	17 dBm max.
Transmission Rate	IIEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps EEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps EEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna Connector	Reverse SMA	N-Type	N-Type
Antenna	2.4GHz :2 dBi 5GHz :3 dBi	2.4GHz :3 dBi 5GHz :5 dBi	2.4GHz :3 dBi 5GHz :5 dBi
Power Redundancy			
Power Connector	2 (M23)	2 (M12)	2 (M12)
Installation			
DIN-Rail Mounting	-	-	-
Wall Mounting	•	•	•
Pillar-Mounting	-	•	•
Physical Characteristics			
Casing Protection	IP-40	IP-67	IP-67
Dimensions (mm)	125(W)x65(D)x196(H)	310(W)x310(D)x87(H)	310(W)x310(D)x87(H)
Operating Temperature			
-10 to 60°C	-	-	-
-25 to 70°C	•	•	•
Network Technology			
Alarm Notification	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log
Management / Configuration	WEB/Window Utility	WEB/Window Utility	WEB/Window Utility
Warranty	5 years		

Product Selection Guide

	DIN-Rail Cellular VPN Router				
Industrial Cellular VPN Router					
	IR-711UB	**IR-710**	**IGR-20 / IGR-20+**	**IAR-142(+)-3G**	**IAR-620 / 620+**
Ethernet Ports					
10/100 Base-T(X) LAN Ports	1	1	-	2	2
10/100/1000 Base-T(X) Lan Ports	-	-	2	-	-
PoE (P.D.)Support	-	-	- / ● (LAN Port-2)	● (LAN Port-1)	- / ● (LAN Port-2)
Ethernet switch/redundant mode support	-	-	●	-	●
USB Ports					
USB 2.0 host	1	-	-	-	1
WLAN Interface					
WLAN/Cellular Standard	-	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA	-	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA	IEEE802.11a/b/g/n
Transmit Power	-	32.5 dbm max.	-	14 dBm max.	16 dBm max.
Transmission Rate	-	14.4 Mbps	-	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	Reverse SMA
Antenna	-	Multi-band Antenna	-	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi
Power Redundancy					
Power Connecton	1(Terminal Block)	1(Terminal Block)	2(Terminal Block)	2(Terminal Block)	2(Terminal Block)
Installation					
DIN-Rail Mounting	●	●	●	●	●
Wall mounting	●	●	●	●	●
Physical Characteristics					
Casing Protection	IP-30	IP-30	IP-30	IP-30	IP-30
Dimensions (mm)	26.1(W) x 70(D) x 95(H)	41(W) x 70(D) x 95(H)	74.3(W)x109.2(D)x153.6(H)	41(W) x 81(D) x 95(H)	54.2(W) x 106.1(D) x 145.4(H)
Operating Temperature					
-10 to 60°C	-	●	-	●	●
-10 to 70°C	-	-	-	-	-
-20 to 70°C	●	-	-	-	-
-40 to 75°C	-	-	●	-	-
Network Technology					
Alarm Notification	Relay Output / System Log	Relay Output / System Log	Relay Output / SNMP Trap / System Log	Relay Output / SNMP Trap / System Log/SMTP	Relay Output / SNMP Trap / System Log/SMTP
Management / Configuration	WEB	WEB	WEB/Window Utility	WEB / Window Utility	WEB / Window Utility
Warranty	5 years			3 years	5 years

Product Selection Guide

Industrial Cellular VPN Router	DIN-Rail Cellular VPN Router		
			
	IGAR-1062+-3G/4G	IGAR-2062 +-3G/4G	IGAR-1662+-3G/4G
Ethernet Ports			
10/100 Base-T(X) LAN Ports	-	-	-
10/100/1000 Base-T(X) Lan Ports	2	2	2
PoE (P.D.)Support	●(LAN Port-2)	●(LAN Port-2)	●(LAN Port-2)
Ethernet switch/redundant mode support	●	●	●
WLAN Interface			
WLAN Standard	IEEE802.11a/b/g/n	IEEE802.11a/b/g/n	Dual IEEE802.11a/b/g/n Dual RF
Transmit Power	17 dBm max.	17 dBm max.	17 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna connector	Reverse SMA	Reverse SMA	Reverse SMA
Antenna	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi	2.4GHz :2 dBi 5GHz :2 dBi
WAN Interface			
Cellular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)	Dual GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)
Transmission Power	33 dbm max.	33 dbm max.	33 dbm max.
SIM Slot	1	2	1
Antenna	Multi-Band Antenna	Multi-Band Antenna	Multi-Band Antenna
Power Redundancy			
Power Connecton	2(Terminal Block)	2(Terminal Block)	2(Terminal Block)
Installation			
DIN-Rail Mounting	●	●	●
Wall mounting	●	●	●
Physical Characteristics			
Casing Protection	IP-30	IP-30	IP-30
Dimensions (mm)	74.3(W) x 109.2(D) x 53.6(H)	74.3(W) x 109.2(D) x 53.6(H)	74.3(W) x 109.2(D) x 53.6(H)
Operating Temperature			
-10 to 60°C	-	-	-
-10 to 70°C	-	-	-
-25 to 70°C	●	●	●
Network Technology			
Alarm Notification	Relay Output / System Log	Relay Output / System Log	Relay Output / System Log
Management / Configuration	WEB	WEB	WEB
Warranty	5 years		

Product Selection Guide

Industrial Cellular VPN Router	EN50155 WLAN Cellular VPN Router	
		
	TGAR-1062+-3GS/4GS-M12	TGAR-1662+-3GS/4GS-M12
Ethernet Ports		
10/100 Base-T(X) LAN Ports	-	-
10/100/1000 Base-T(X) LAN Ports	**2 (M12)**	**2 (M12)**
10/100 Base-FX Fiber Ports	-	-
PoE (P.D.)Support	(TGAR-1062+-3GS/4GS-M12)	(TGAR-1662+-3GS/4GS-M12)
Ethernet switch/redundant mode support	•	•
USB Ports		
USB 2.0 host	-	-
WLAN Interface		
WLAN Standard	IEEE802.11a/b/g/n	Dual IEEE802.11a/b/g/n
Transmit Power	17 dBm max.	17 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna connector	Reverse SMA / Reverse SMA	Reverse SMA / Reverse SMA
Antenna	2.4GHz :2 dBi 5GHz :3 dBi	2.4GHz :2 dBi 5GHz :3 dBi
GPS		
Antenna connector	1 x External SMA antenna connector	1 x External SMA antenna connector
Frequency	1575.42MHz	1575.42MHz
WAN Interface		
Cellular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA / LTE(4G)
Transmission Power	33 dbm max.	33 dbm max.
SIM Slot	1	1
Antenna connector	Reverse SMA / SMA	Reverse SMA / SMA
Antenna	Multi-Band Antenna	Multi-Band Antenna
WAN Connection Type	Static/Dynamic IP,PPPoE	Static/Dynamic IP,PPPoE
WAN Dial-UP	3G / 4G LTE	3G / 4G LTE
Power Redundancy		
Power Connecton	2 (M23)	2 (M23)
Installation		
DIN-Rail Mounting	-	-
Wall mounting	•	•
Physical Characteristics		
Casing Protection	IP-40	IP-40
Dimensions (mm)	125(W) x 65(D) x 196(H)	125(W) x 65(D) x 196(H)
Operating Temperature		
-10 to 60°C	•	-
-20 to 70°C	-	•
Network Technology		
Alarm Notification	Relay Output / SNMP Trap / System Log/SMTP	Relay Output / SNMP Trap / System Log/SMTP
Management / Configuration	WEB / Window Utility	WEB / Window Utility
Warranty	5 years	

Product Selection Guide

		EN50155 Outdoor Cellular VPN Router
Industrial Cellular VPN Router		
	TGAR-2062+-3GS/4GS-M12	TGAR-W1061+-3G/4G
Ethernet Ports		
10/100 Base-T(X) LAN Ports	-	-
10/100/1000 Base-T(X) LAN Ports	**2 (M12)**	**1 (M12/RJ45)**
10/100 Base-FX Fiber Ports	-	-
PoE (P.D.)Support	(TGAR-2062+-3GS/4GS-M12)	●
Ethernet switch/redundant mode support	●	-
USB Ports		
USB 2.0 host	-	-
WLAN Interface		
WLAN Standard	IEEE802.11a/b/g/n	IEEE802.11a/b/g/n
Transmit Power	17 dBm max.	17 dBm max.
Transmission Rate	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps	IEEE802.11b : 11Mbps IEEE802.11a/g : 54Mbps IEEE802.11n : 300Mbps
Antenna connector	Reverse SMA	N-Type
Antenna	2.4GHz :2 dBi 5GHz :3 dBi	2.4GHz :3 dBi 5GHz :5 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(4G)
Transmission Power	33 dbm max.	33 dbm max.
SIM Slot	2	1
Antenna connector	Reverse SMA / SMA	N-Type
Antenna	Multi-Band Antenna	Multi-Band Antenna
WAN Connection Type	Static/Dynamic IP,PPPoE	Static/Dynamic IP,PPPoE
WAN Dial-UP	Dual 3G / Dual 4G LTE	3G / 4G LTE
Power Redundancy		
Power Connecton	2 (M23)	2 (M12)
Installation		
DIN-Rail Mounting	-	-
Wall mounting	●	●
Pillar Mounting	-	●
Physical Characteristics		
Casing Protection	IP-40	IP-67
Dimensions (mm)	125(W) x 65(D) x 196(H)	310(W) x 310(D) x 87(H)
Operating Temperature		
-10 to 60°C	-	-
-25 to 70°C	●	●
Network Technology		
Alarm Notification	Relay Output / SNMP Trap / System Log/SMTP	Relay Output / SNMP Trap / System Log/SMTP
Management / Configuration	WEB / Window Utility	WEB / Window Utility
Warranty	5 years	

Product Selection Guide

	Industrial Media Gateway	
	M2M Gateway	
Industrial M2M Gateway		
	IMG-111	**IMG-1312-D**
Ethernet Ports		
10/100 Base-T(X) LAN Ports	**1**	**2**
10/100 Base-T(X) Port with PoE P.D	-	-
Serial Port		
Serial port Numbers	**1**	**1**
Serial Mode	RS-232	RS-232/422/485
Serial Port Connector	DB9 (male)	DB9 (male)
Serial Port with 2KV Isolation	-	-
Serial Baud Rate	110 bps to 115.2 Kbps	110 bps to 460.8 Kbps
WLAN Interface		
WLAN Standard	-	IEEE802.11b/g
Transmit Power	-	20 dbm max.
Transmission Rate	-	IEEE802.11b : 11Mbps IEEE802.11g : 54Mbps
Antenna connector	-	Reverse SMA
Antenna	-	2 dBi
Cellular Interface		
Cullular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA
Band Option	Dual-band : HSUPA 1900/2100 MHz Quad-band : GSM/GPRS/EDGE 850/900/1800/1900 MHz WCDMA/HSDPA 850/900/1900/2100 MHz	Dual-band : HSUPA 1900/2100 MHz Quad-band : GSM/GPRS/EDGE 850/900/1800/1900 MHz WCDMA/HSDPA 850/900/1900/2100 MHz
Power Redundancy		
DC Terminal Block	1	2
Installation		
DIN-Rail Mounting	•	•
Wall mounting	•	•
Physical Characteristics		
Casing Protection	IP-30	IP-40
Dimensions (mm)	41(W) x 70(D) x 95(H)	72(W) x 29.4(D) x 123.4(H)
Operating Temperature		
-10 to 60°C	•	•
-20 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 /Beeper	Syslog / SMTP/ SNMP trap / Beeper
Warranty	3 years	

Product Selection Guide

Industrial M2M Gateway

	Industrial Media Gateway	
	M2M Gateway	
		
	IMG-6322GT	IMG-W6121+-3G-M12
Ethernet Ports		
10/100/1000 Base-T(X) LAN Ports	**2**	-
10/100/1000 Base-T(X) Port with PoE P.D	-	**1**
Serial Port		
Serial port Numbers	**2**	**2**
Serial Mode	RS-232/422/485	RS-232
Serial Port Connector	DB9 (male)x1+Terminal Blockx1	M12
Serial Port with 2KV Isolation	-	-
Serial Baud Rate	110 bps to 460.8 Kbps	110 bps to 460.8 Kbps
WLAN Interface		
WLAN Standard	-	IEEE802.11a/b/g/n
Transmit Power	802.11a: 12dBm ± 1.5dBm 802.11b: 17dBm ± 1.5dBm 802.11g: 16dBm ± 1.5dBm 802.11gn HT20: 15dBm ± 1.5dBm@150Mbps 802.11gn HT40: 14dBm ± 1.5dBm@300Mbps 802.11an HT20: 12dBm ± 1.5dBm@150Mbps 802.11an HT40: 11dBm ± 1.5dBm@300Mbps	20 dbm max.
Transmission Rate	IEEE802.11b: 1 / 2 / 5.5 / 11 Mbps IEEE802.11a/g: 6 / 9 / 12 / 18 / 24 / 36 / 48 / 54 Mbps IEEE801.11n: up to 300Mbps	IEEE802.11b: 1 / 2 / 5.5 / 11 Mbps IEEE802.11a/g: 6 / 9 / 12 / 18 / 24 / 36 / 48 / 54 Mbps IEEE801.11n: up to 300Mbps
Antenna connector	Reverse SMA connector x2	N-Type
Antenna	-	2 dBi
Cellular Interface		
Cullular Standard	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA	GSM / GPRS/ EGPRS/ EDGE / WCDMA / HSDPA / HSUPA
Band Option	Dual-band : HSUPA 1900/2100 MHz Quad-band : GSM/GPRS/EDGE 850/900/1800/1900 MHz WCDMA/HSDPA 850/900/1900/2100 MHz	Dual-band : HSUPA 1900/2100 MHz Quad-band : GSM/GPRS/EDGE 850/900/1800/1900 MHz WCDMA/HSDPA 850/900/1900/2100 MHz
Power Redundancy		
DC Terminal Block	1	-
Installation		
DIN-Rail Mounting	●	●
Wall mounting	●	-
Physical Characteristics		
Casing Protection	IP-30	IP-67
Dimensions (mm)	75.2(W) x 108.3(D) x 152.6(H)	310(W) x 310(D) x 87(H)
Operating Temperature		
-10 to 60°C	-	-
-20 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	3 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

Model Name	Output Voltage / Current	Approvals	Input Voltage	Temperature Range	Order Number
CP SNT 48W 12V 4A	9…15 VDC / 4A	CSA, CE, UL508, cURus60950, GS Class 2	85…264 VAC / 110…370 VDC	-10 °C...70 °C	8754970000
CP SNT 48W 24V 2A	15…28 VDC / 2A	CSA, CE, UL508, cURus60950, GS Class 2	85…264 VAC / 110…370 VDC	-10 °C...70 °C	8739140000
PRO ECO 72W 24V 3A	24Vdc / 3A	cULus, CE, TUV	85…264 VAC / 80…370 VDC	-25°C to +70°C	1469470000
PRO ECO 120W 24V 5A	24Vdc / 5A	cULus, CE, TUV	85…264 VAC / 80…370 VDC	-25°C to +70°C	1469480000
PRO ECO 240W 24V 10A	24Vdc / 10A	cULus, CE, TUV	85…264 VAC / 80…370 VDC	-25°C to +70°C	1469490000
PRO ECO 480W 24V 20A	24Vdc / 20A	cULus, CE, TUV	85…264 VAC / 80…370 VDC	-25°C to +70°C	1469510000
PROmax 72W 24V 3A	24 Vdc / 3A	cULus C1D2, SEMI F47, GL, CE, CCC, TUV	85-277 VAC/ 80-370 VDC	-25°C …+70°C, startup at -40°C	1478100000
PROmax 120W 24V 5A	24 Vdc / 5A	cULus C1D2, SEMI F47, GL, CE, CCC, TUV	85-277 VAC/ 80-370 VDC	-25°C …+70°C, startup at -40°C	1478110000
PROmax 240W 24V 10A	24 Vdc / 10A	cULus C1D2, SEMI F47, GL, CE, CCC, TUV	85-277 VAC/ 80-370 VDC	-25°C …+70°C, startup at -40°C	1478130000
PROmax 480W 24V 20A	24 Vdc / 20A	cULus C1D2, SEMI F47, GL, CE, CCC, TUV	85-277 VAC/ 80-370 VDC	-25°C …+70°C, startup at -40°C	1478140000

Product Selection Guide

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

RF Cable		
Model Name	Description	Cable Length
RFC-SFR-SMR-1000	Low loss RF Cable, Cable length 10m, RP-SMA Female RS 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

WLAN RF Antenna (Outdoor Panel Type)	
Model Name	Description
RFA-P12-WG	Outdoor High-gain Panel Antenna, 2.4GHz, 12dbi max, N Female connector
RFA-P14-WA	Outdoor High-gain Panel Antenna, 5GHz, 14dbi max, N Female connector

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
RFA-O8-NM-WAG	Omni-directional High-gain Dipole Antenna, 2.4/5GHz, 6/8dBi max, N Male 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	Operating Temperature
SFP100-MM	100Mbps SFP optical transceiver, multi-mode / 2km, 1310nm	0 ~ 70°C
SFP100-MM-I	100Mbps SFP optical transceiver, multi-mode / 2km, 1310nm, industrial grade	-40 ~ 85°C
SFP100-SS30	100Mbps SFP optical transceiver, single-mode / 30km, 1310nm	0 ~ 70°C
SFP100-SS30-I	100Mbps SFP optical transceiver, single-mode / 30km, 1310nm, industrial grade	-40 ~ 85°C
SFP100-SS60	100Mbps SFP optical transceiver, single-mode / 60km, 1310nm	0 ~ 70°C
SFP100-SS60-I	100Mbps SFP optical transceiver, single-mode / 60km, 1310nm, industrial grade	-40 ~ 85°C
SFP100-SS100	100Mbps SFP optical transceiver, single-mode / 100km, 1550nm	0 ~ 70°C
SFP100-SS100-I	100Mbps SFP optical transceiver, single-mode / 100km, 1550nm, industrial grade	-40 ~ 85°C
SFP100-SS120	100Mbps SFP optical transceiver, single-mode / 120km, 1550nm	0 ~ 70°C
SFP100-SS120-I	100Mbps SFP optical transceiver, single-mode / 120km, 1550nm, industrial grade	-40 ~ 85°C

Product Selection Guide

Accessories

Fast Ethernet BIDI-SFP modules

Specifications

	Model Name					
Characteristics	SFP100B3-SS20/-I	SFP100B5-SS20/-I	SFP100B3-SS40/-I	SFP100B5-SS40/-I	SFP100B3-SS60/-I	SFP100B5-SS60/-I
Fiber mode	single-mode	single-mode	single-mode	single-mode	single-mode	single-mode
Typical Distance	20 km	20 km	40 km	40 km	60 km	60 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)
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
Optical Output Power 9/125 μm fiber (Max. TX)	-8 dBm	-8 dBm	0 dBm	0 dBm	0 dBm	0 dBm
Optical Output Power 9/125 μm fiber (Min. TX)	-14 dBm	-14 dBm	-8 dBm	-8 dBm	-5 dBm	-5 dBm
Optical Input Power-minimum (Sensitivity)	-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
Link Budget	18 dB		26 dB		29 dB	

Ordering Information

Model Name	Description	Operating Temperature
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

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

Product Selection Guide

Accessories

Gigabit Ethernet BIDI-SFP modules

Specifications

Characteristics	Model Name									
	SFP1GB3-LX10/-I	SFP1GB5-LX10/-I	SFP1GB3-LX20/-I	SFP1GB5-LX20/-I	* SFP1GB3-LX40/-I	* SFP1GB5-LX40/-I	* SFP1GB3-LX60/-I	* SFP1GB5-LX60/-I	* SFP1GB51-LX80/-I	* SFP1GB59-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℃ -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	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 : 1510 nm RX : 1590 nm	TX : 1590 nm RX : 1510 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	3 dBm	3 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	-26 dBm	-26 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		24 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	Operating Temperature
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	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1310nm, RX1550nm	0 ~ 70°C
SFP1GB3-LX60-I	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1310nm, RX1550nm, industrial grade	-40 ~ 85°C
SFP1GB5-LX60	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1550nm, RX1310nm	0 ~ 70°C
SFP1GB5-LX60-I	1Gbps SFP optical transceiver, single-mode BIDI / 60km, TX1550nm, RX1310nm, industrial grade	-40 ~ 85°C
SFP1GB51-LX80	1Gbps SFP optical transceiver, single-mode BIDI / 80km, TX1510nm, RX1590nm	0 ~ 70°C
SFP1GB51-LX80-I	1Gbps SFP optical transceiver, single-mode BIDI / 80km, TX1510nm, RX1590nm, industrial grade	-40 ~ 85°C
SFP1GB59-LX80	1Gbps SFP optical transceiver, single-mode BIDI / 80km, TX1590nm, RX1510nm	0 ~ 70°C
SFP1GB59-LX80-I	1Gbps SFP optical transceiver, single-mode BIDI / 80km, TX1590nm, RX1510nm, industrial grade	-40 ~ 85°C

Product Selection Guide

Accessories

Gigabit Ethernet SFP-RJ45 modules

Specifications

	Model Name	
Characteristics	SFP1GRJ	SFP1GRJ-I
Operating Temperature	-40~70℃	-40~85℃
RJ45 Operation mode	1000Base-T*	1000Base-T*
SFP Interface	SERDES, 1000Base-X	SERDES,1000Base-X

* Please notice 10/100Base-T(X) mode is not supported

Ordering Information

Model Name	Description	Operating Temperature
SFP1GRJ	1Gbps SFP 1000 Base-T transceirer	-40 ~ 70℃
SFP1GRJ-I	1Gbps SFP 1000 Base-T transceirer, industrial grade	-40 ~ 85℃

10G Ethernet SFP+ modules with Diagnostic Monitoring

Specifications

	Model Name			
Characteristics	SFP10G-MM	SFP10G-MM-I	SFP10G-LR10	SFP10G-LR10-I
Fiber mode	multi-mode	multi-mode	single-mode	single-mode
Typical Distance	62.5/125um : 33m 50/125um(OM2) : 82m 50/125um(OM3) : 300m	62.5/125um : 33m 50/125um(OM2) : 82m 50/125um(OM3) : 300m	10 km	10 km
Operating Temperature	0~70℃	-40~85℃	0~70℃	-40~85℃
Wavelength	850 nm	850 nm	1310 nm	1310 nm
Optical Output Power 9/125 µm fiber (Max. TX)	-	-	0.5 dBm	0.5 dBm
Optical Output Power 9/125 µm fiber (Min. TX)	-	-	-8 dBm	-8 dBm
Optical Output Power 62.5/125 µm fiber (Max. TX)	-1 dBm	-1 dBm	-	-
Optical Output Power 62.5/125 µm fiber (Min. TX)	-6.5 dBm	-6.5 dBm	-	-
Optical Output Power 50/125 µm fiber (Max. TX)	-1 dBm	-1 dBm	-	-
Optical Output Power 50/125 µm fiber (Min. TX)	-6.5 dBm	-6.5 dBm	-	-
Optical Input Power-minimum (Sensitivity)	-9.9 dBm	-9.9 dBm	-14.4 dBm	-14.4 dBm
Optical Input Power-maximum (Saturation)	-1 dBm	-1 dBm	0.5 dBm	0.5 dBm
Link Budget	3.4 dB	3.4 dB	6.4 dB	6.4 dB

Ordering Information

Model Name	Description	Operating Temperature
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℃

Product Selection Guide

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°C	-40 ~ 85°C	-40 ~ 85°C	-40 ~ 85°C

Ordering Information

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

Product Selection Guide

Network Management Software

Open-Vision v3.6

Ordering Information

Model Name	Description
Open-Vision M500	Powerful Network Management Windows Utility Suite, 500 IP devices

Network Management Server

OCS-815

Specifications

Port Number	
10/100/1000Base-T(X) Ports	6
Power Redundancy	
AC Power adapter with power cord	1(100~240VAC)
Installation	
Rack Mounting	•
Physical Characteristics	
Casing Protection	IP-20
Dimensions (mm)	431(W)x276(D)x44(H)
Operating Temperature	
0 to 40°C	•
Management and Control	
VPN	•
Fire Wall	•
Multi-level login	admin / user
Wireless Controller	•
Built in Router	•
Topology View	•
DDNS	•
Event Notification	SYSLOG / SNMP Trap/ Relay
DHCP	Server / Client
Management / Configuration	WEB
Warranty	3 years

Ordering Information

Model Name	Description
OCS-815	Industrial 6-port Rack-mount multi-functional Management Server

Notes

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www.weidmuller.com/oringnetworking

Weidmuller, Canada
10 Spy Court
Markham, Ontario L3R 5H6
Telephone: (800) 268-4080
Facsimile: (877) 300-5635
Email: info1@weidmuller.ca
Website: www.weidmuller.ca

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Weidmuller, Mexico
Blvd. Hermanos Serdán 698,
Col. San Rafael Oriente
Puebla, Puebla, Mexico
C.P. 72029
Telephone: 01 222 2686267
Facsimile: 01 222 2686219
Email: clientes@weidmuller.com.mx
Website: www.weidmuller.com.mx

Weidmuller, United States
821 Southlake Blvd.
Richmond, Virginia 23236
Telephone: (800) 849-9343
Facsimile: (804) 379-2593
Email: info@weidmuller.com
Website: www.weidmuller.com