Industrial 8-port 10/100/1000T 802.3at PoE + 2-port 1G/2.5G SFP Managed Switch

Environmentally Hardened Design

PLANET IGS-10020PT Industrial 8-port Gigabit 802.3at PoE+ Switch is equipped with a rugged IP30 metal case for stable operation in heavy industrial environments. Thus, the IGS-10020PT provides a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curbside traffic control cabinets.

Being able to operate under wide temperature range from -40 to 75 degrees C, the IGS-10020PT can be placed in almost any difficult environment. The IGS-10020PT also allows either DIN rail or wall mounting for efficient use of cabinet space.

Redundant Ring, Fast Recovery for Critical Network Applications

The IGS-10020PT supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant power** input system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments.

The IGS-10020PT also protects customer's industrial network connectivity with switching recovery capability that is used for implementing fault tolerant ring and mesh network architectures. If the Industrial network was interrupted accidentally, the fault recovery times could be less than 50ms to quickly bring the network back to normal operation.

Physical Port

- **8 10/100/1000BASE-T** Gigabit Ethernet RJ45 ports with **IEEE 802.3at PoE+** Injector
- **2 100/1000/2500BASE-X mini-GBIC/SFP slots for SFP** type auto detection
- One RJ45 console interface for basic management and setup

Power over Ethernet

- Complies with IEEE 802.3at Power over Ethernet Plus/end-span PSE
- Up to 8 IEEE 802.3af/802.3at devices powered
- Supports PoE power up to 36 watts for each PoE port
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100m in standard mode and 200m in extend mode
- PoE management features
  - PoE admin-mode control
  - PoE management mode selection
  - Per port PoE function enable/disable
  - PoE port power feeding priority
  - Per PoE port power limit
  - PoE Port Status monitoring
  - PD classification detection
  - Sequence port PoE
- Intelligent PoE features
  - PoE Legacy mode enable/disable
  - Temperature threshold control
  - PoE usage threshold control
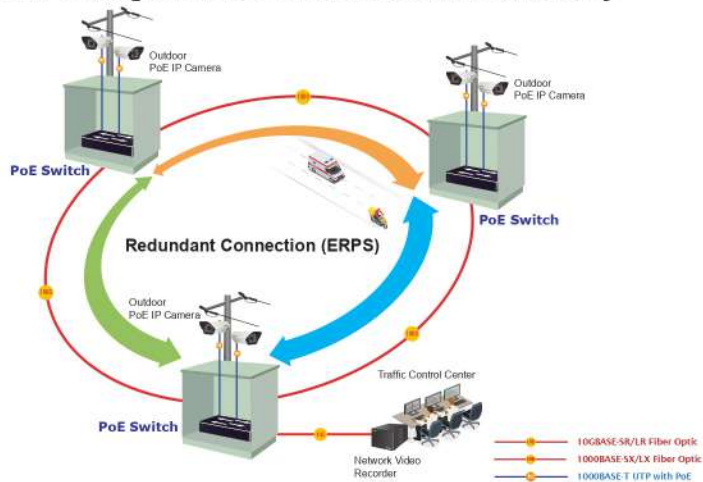 - PoE schedule
  - PD alive check
  - LLDP PoE Neighbors

Industrial Protocol

- Modbus TCP for real-time monitoring in a SCADA system
- IEEE 1588v2 PTP (Precision Time Protocol)

Industrial Case and Installation

- IP30 aluminum case
- DIN rail and wall-mount designs
- DC 48-54V, redundant power with reverse polarity protection

ERPS Ring for Video Transmission Redundancy

- Supports 6000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

Digital Input and Digital Output

- 2 Digital Input (DI)
- 2 Digital Output (DO)
- Integrate sensors into auto alarm system
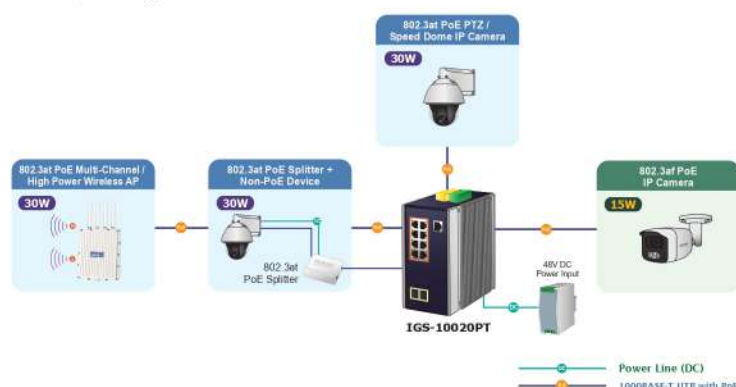- Transfer alarm to IP network via email and SNMP trap

Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity features that virtually need no effort and cost to have included the protection of the switch management and the enhanced security of the mission-critical network. Both SSHv2 and TLSv1.2 protocols are utilized to provide strong protection against advanced threats. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.

Layer 2 Features

- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- High performance of Store-and-Forward architecture, and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support
    - Broadcast/Multicast/Unicast
- Supports **VLAN**
    - IEEE 802.1Q tagged VLAN
    - Supports provider Bridging (VLAN Q-in-Q, IEEE 802.1ad)
    - Private VLAN Edge (PVE)
    - Port Isolation
    - MAC-based VLAN
    - Protocol-based VLAN
    - Voice VLAN
    - GVRP
- Supports **Spanning Tree Protocol**
    - IEEE 802.1D Spanning Tree Protocol (STP)
    - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
    - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), spanning tree by VLAN
    - BPDU Guard
- Supports **Link Aggregation**
    - 802.3ad Link Aggregation Control Protocol (LACP)
    - Cisco ether-channel (static trunk)
    - Maximum 5 trunk groups with 10 ports per trunk group
    - Up to 20Gbps bandwidth (duplex mode)
- Provides port mirror (many-to-1)
- Port mirroring to monitor the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports ERPS (Ethernet Ring Protection Switching)

High Power PoE for Security and Public Service Applications

To fulfill the demand of High Power PoE for network applications with Gigabit speed transmission under wide temperature, the IGS-10020PT provides 8 10/100/1000Mbps ports featuring **IEEE 802.3at** Power over Ethernet Plus (PoE+) that combines up to **36-watt** power output and data per port over one Cat5E/6 Ethernet cable. As the whole system comes with a total **240-watt** PoE budget, the IGS-10020PT is designed specifically to satisfy the growing demand of higher power consuming network PDs (powered devices) such as multi-channel (802.11a/b/g/n) wireless LAN access points, PTZ (Pan, Tilt & Zoom)/Speed Dome network cameras and other PoE network devices, doubling that of the current conventional 802.3af PoE.

Convenient and Smart ONVIF Devices with Detection Feature

PLANET has developed an awesome feature -- ONVIF Support -- which is specifically designed for co-operating with video IP surveillances. From the IGS-10020PT's GUI, you just need one click to search and show all of the ONVIF devices via network application. In addition, you can upload floor images to the switch and can remotely monitor or inspect an assembly line. Moreover, you can get real-time surveillance information and online/offline status; the PoE reboot can be controlled from the GUI

Built-in Unique PoE Functions for Surveillance Management

As an Industrial managed PoE Switch for surveillance network, the IGS-10020PT features the following intelligent PoE management functions:

- PD Alive Check
- Scheduled Power Recycling
- PoE Schedule
- SMTP/SNMP Trap Event Alert

Intelligent Powered Device Alive Check

The IGS-10020PT PoE+ Switch can be configured to monitor connected PD's status in real time via ping action. Once the PD stops working and responding, the IGS-10020PT will recycle the PoE port power and bring the PD back to work. It also greatly enhances the reliability in that the PoE port will reset the PD power, thus reducing administrator's management burden.

- Compatible with Cisco Uni-directional link detection(UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Provides ONVIF for co-operating with PLANET video IP surveillances

Layer 3 IP Routing Features

- Supports maximum 32 static routes and route summarization

Quality of Service

- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - IP TOS/DSCP/IP precedence
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing policies on the switch port
- DSCP remarking

Multicast

- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD snooping v1 and v2
- Querier mode support
- IPv4 IGMP snooping port filtering
- IPv6 MLD snooping port filtering
- Multicast VLAN Registration (MVR) support

Security

- Authentication
  - IEEE 802.1x Port-based/MAC-based network access authentication
  - Built-in RADIUS client to co-operate with the RADIUS servers
  - TACACS+ login users access authentication
  - RADIUS/TACACS+ users access authentication
- Access Control List
 - IP-based Access Control List (ACL)

Scheduled Power Recycling

The IGS-10020PT allows each of the connected PoE IP cameras or PoE wireless access points to reboot at a specific time each week. Therefore, it will reduce the chance of IP camera or AP crash resulting from buffer overflow.

**Automatically Reboot**

PoE Schedule for Energy Savings

Under the trend of energy savings worldwide and contributing to environmental protection on the Earth, the IGS-10020PT can effectively control the power supply besides its capability of giving high watts power. The built-in **"PoE schedule"** function helps you to enable or disable PoE power feeding for each PoE port during specified time intervals and it is a powerful function to help SMBs or enterprises save power and money.
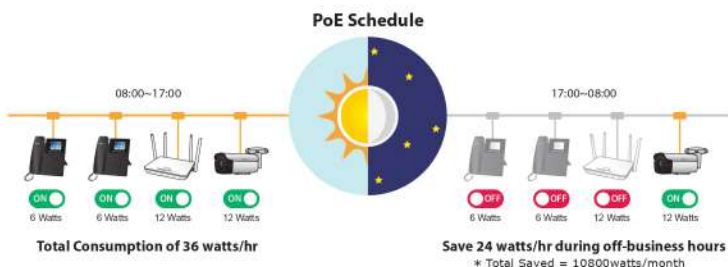
SMTP/SNMP Trap Event Alert

The IGS-10020PT provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, or the rebooting response.
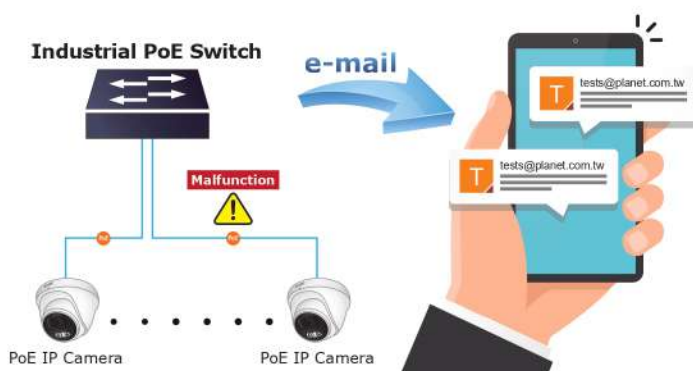
- – MAC-based Access Control List
- • Source MAC/IP address binding
- • DHCP Snooping to filter un-trusted DHCP messages
- • Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding
- • IP Source Guard prevents IP spoofing attacks
- • IP address access management to prevent unauthorized intruder

Management

- • IPv4 and IPv6 dual stack management
- • Switch Management Interfaces
  - – Console/Telnet Command Line Interface
  - – Web switch management
  - – SNMP v1, v2c, and v3 switch management
  - – SSHv2 and TLSv1.2 secure access
- • IPv6 IP Address/NTP/DNS management
- • Built-in Trivial File Transfer Protocol (TFTP) client
- • BOOTP and DHCP for IP address assignment
- • System Maintenance
  - – Firmware upload/download via HTTP
  - – Reset button for system reboot or reset to factory default
  - – Dual Images
- • DHCP Relay
- • DHCP Option82
- • DHCP Server Mode support
- • User Privilege levels control
- • NTP (Network Time Protocol)
- • Link OAM
- • Network Diagnostic
  - – ICMPv6/ICMPv4 Remote Ping
  - – Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues
- • SMTP/Syslog remote alarm
- • Four RMON groups (history, statistics, alarms and events)
- • SNMP trap for interface Link up and Link down notification
- • System Log
- • SFP-**DDM** (Digital Diagnostic Monitor)
- • PLANET Smart Discovery Utility for deployment management
- • PLANET NMS system and CloudViewer/CloudViewerPro for deployment management

Effective Alarm Alert for Better Protection

The IGS-10020PT supports a Fault Alarm feature which can alert the users when there is something wrong with the switches. With this ideal feature, the users would not have to waste time finding where the problem is. It will help to save time and human resource.

Fault Alarm Feature

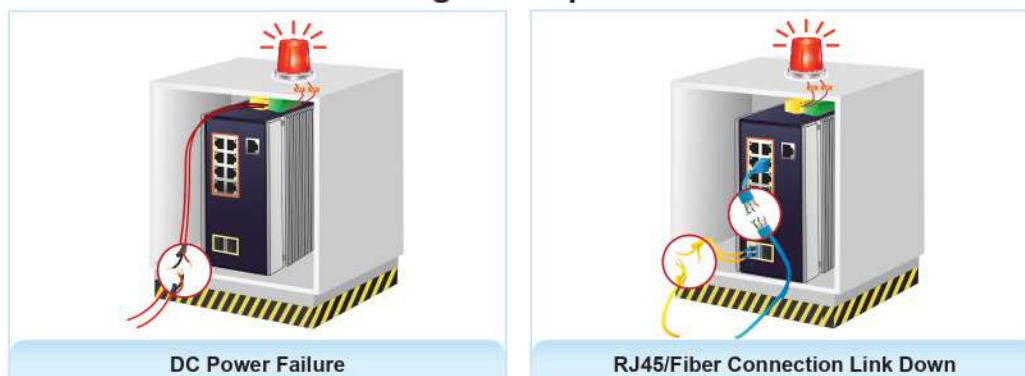DC Power Failure **or** RJ45/Fiber Connection Link Down → Mail / System Log / SNMP TRAP
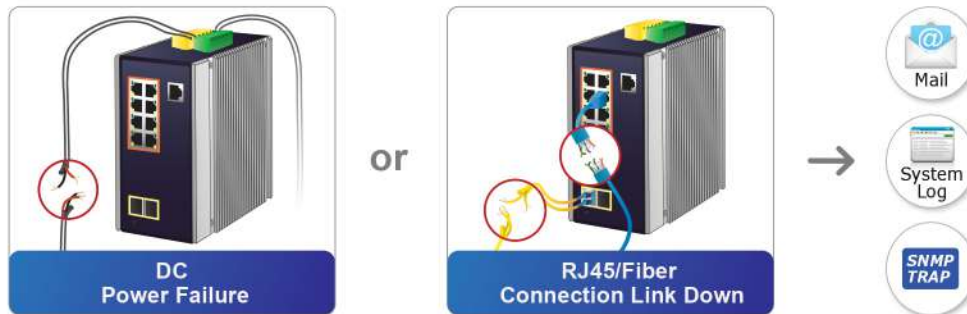
Digital Input and Digital Output for External Alarm

The IGS-10020PT supports Digital Input and Digital Output on its upper panel. This external alarm enables users to use Digital Input to detect and log external device status (such as door intrusion detector), and send event alarm to the administrators. The Digital Output could be used to alarm the administrators if the IGS-10020PT port shows link down, link up or power failure.

Digital Input

| Security OK!! | Alarm Warning | Alarm Messaging |
| Door Detector (Closed) | >1 cm — Door Detector (Opened) | Uplink → Mail / System Log / SNMP TRAP |

Digital Output

DC Power Failure | RJ45/Fiber Connection Link Down

Layer 3 IPv4 and IPv6 Software VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the IGS-10020PT not only provides ultra high transmission performance and excellent Layer 2 technologies, but also IPv4/IPv6 software VLAN routing feature which allows to crossover different VLANs and different IP addresses for the purpose of having a highly-secure, flexible management and simpler networking application.

Robust Layer 2 Features

The IGS-10020PT can be programmed for advanced switch management functions such as dynamic port link aggregation, Q-in-Q VLAN, private VLAN, Rapid Spanning Tree Protocol, Layer 2 to Layer 4 QoS, bandwidth control and IGMP snooping. The IGS-10020PT provides 802.1Q tagged VLAN, and the VLAN groups allowed will be maximally up to 4K. Via aggregation of supporting ports, the IGS-10020PT allows the operation of a high-speed trunk combining multiple ports. It enables a maximum of up to 5 trunk groups with 10 ports per trunk group, and supports fail-over as well.
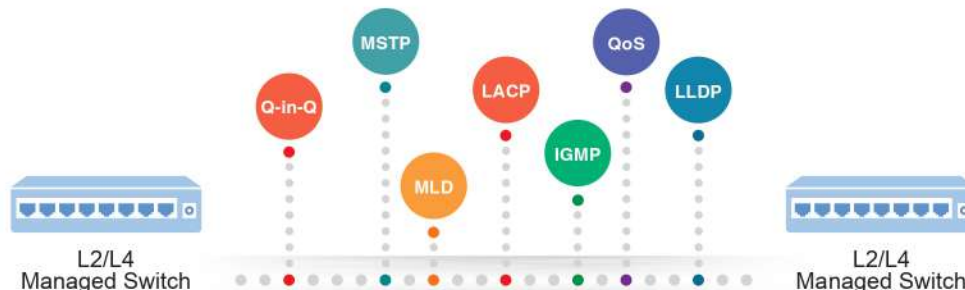
Efficient Secure Management

For efficient management, the IGS-10020PT is equipped with Command line, Web and SNMP management interfaces.

- With the built-in **Web-based** management interface, the IGS-10020PT offers an easy-to-use, platform-independent management and configuration facility.
- For text-based management, it can be accessed via Telnet and the RJ45 console port.
- By supporting the standard SNMP protocol, the switch can be managed via any SNMP-based management software.

Powerful Security

The IGS-10020PT offers comprehensive **Layer 2 to Layer 4 Access Control List (ACL)** for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises **802.1x Port-based** and **MAC-based** user and device authentication. With the private VLAN function, communication between edge ports can be prevented to ensure user privacy. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

Remote Management Solution

PLANET's **Universal Network Management System** (UNI-NMS) and CloudViewerPro app support IT staff by remotely managing all network devices and monitoring PDs' operational statuses. Thus, they're designed for both the enterprises and industries where deployments of PDs can be as remote as possible, without having to go to the actual location once a bug or faulty condition is found. With the UNI-NMS or CloudViewerPro app, all kinds of businesses can now be speedily and efficiently managed from one platform.

NMS Controller   CloudViewerPro App

Flexibility and Extension Solution

The additional two mini-GBIC slots built in the IGS-10020PT support triple-speed 100/1000/2500BASE-X SFP (small form-factor pluggable) fiber-optic modules, meaning the administrator now can flexibly choose the suitable SFP transceiver according to not only the transmission distance but also the transmission speed required. The distance can be extended from 300meters to 2km (multi-mode fiber) and to 10/20/30/40/60/70/80/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The IGS-10020PT supports SFP-**DDM** (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

SFP DDM (Digital Diagnostic Monitor)

| Voltage | Ammeter | Temperature | Power Transceiver | Power Receiver |
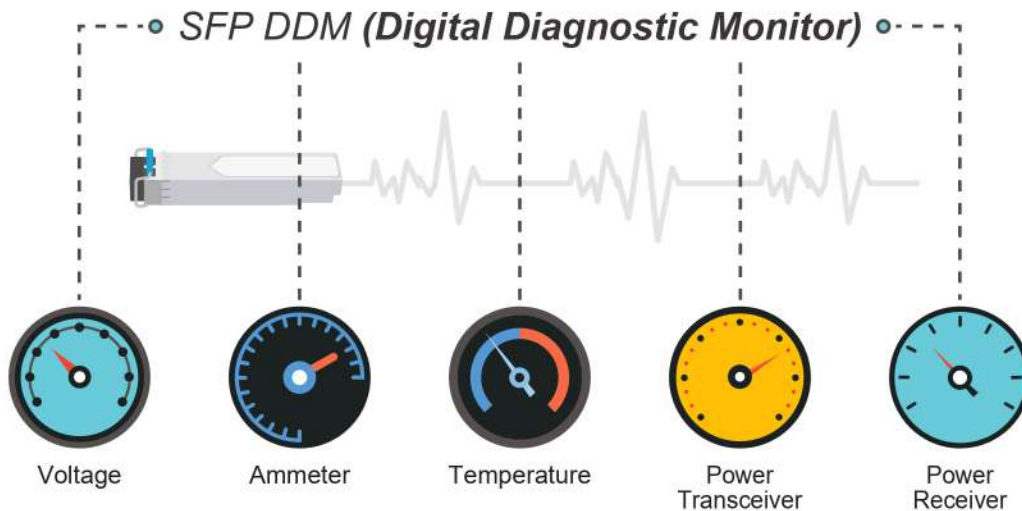
Modbus TCP provides Flexible Network Connectivity for Factory Automation

With the supported **Modbus TCP/IP** protocol, the IGS-10020PT can easily integrate with **SCADA** systems, **HMI** systems and other data acquisition systems in factory floors. It enables administrators to remotely monitor the industrial Ethernet switch's **operating information**, **port information** and **communication status**, thus easily achieving enhanced monitoring and maintenance of the entire factory.

1588 Time Protocol for Industrial Computing Networks

The IGS-10020PT is ideal for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

Time Synchronization in Network

Base Station

Grand Master

1588 PTP

Industrial PoE Switch
Transparent Clock

1588 PTP

Slave

Base Station

Base Station

1000BASE-SX/LX Fiber Optic
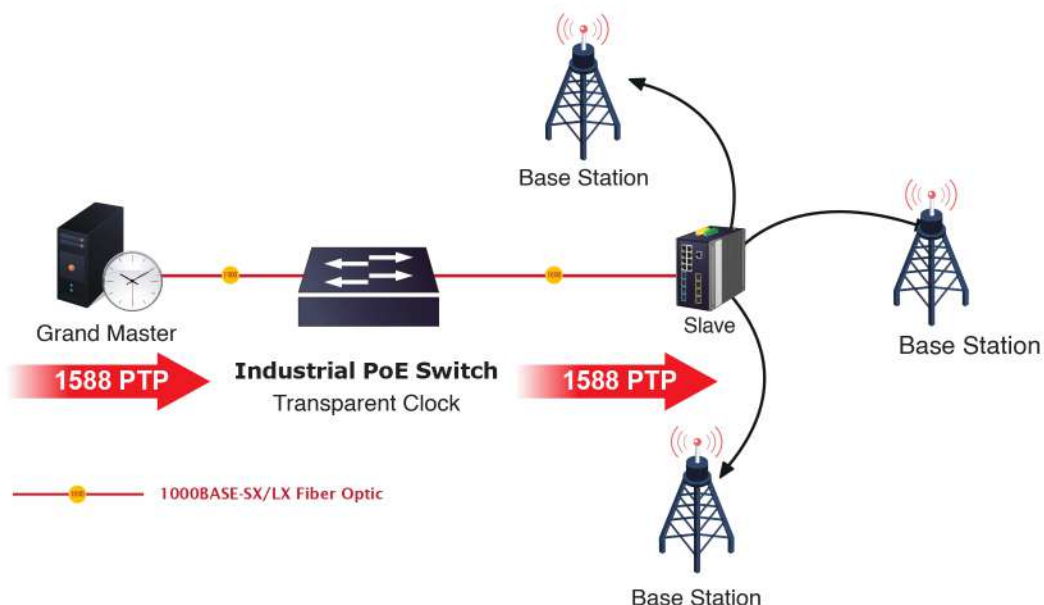
Applications

Industrial Area Department/Workgroup PoE Switch

Providing up to 8 PoE+, in-line power interfaces, the IGS-10020PT can easily build a power centrally controlled by IP phone system, IP camera system, or wirele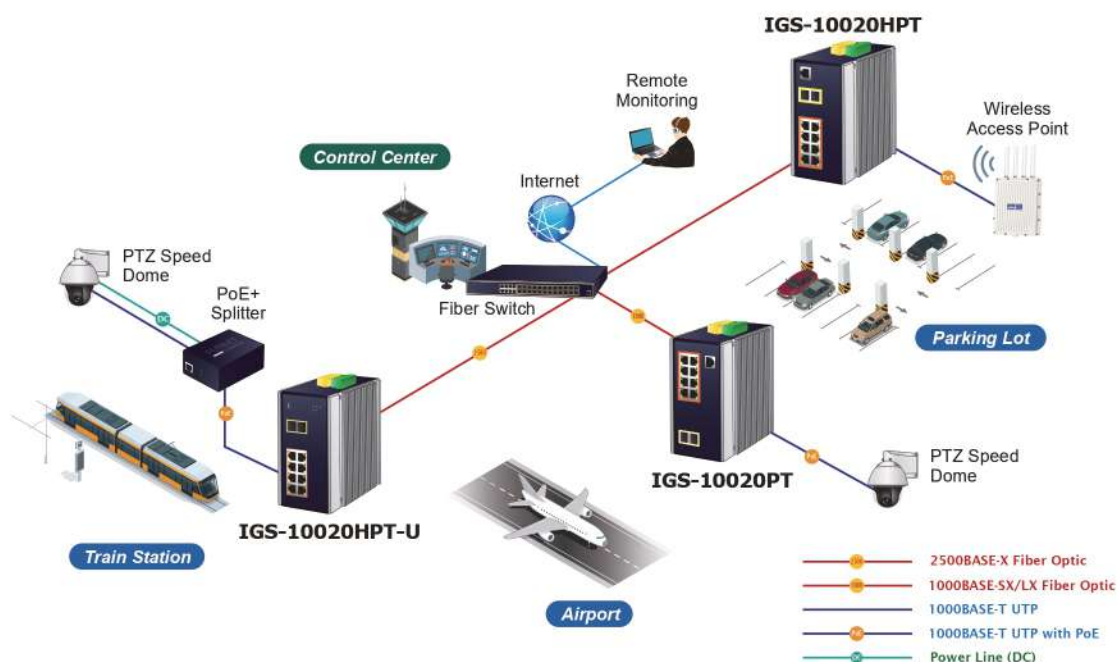ss AP group for Industrial network. For instance, 8 PoE IP cameras or wireless access points can be easily installed around the corner in the industrial environment for surveillance demands or for a wireless roaming network. Without the power-socket limitation, the IGS-10020PT makes the installation of IP cameras or wireless AP easier and more efficient.

- 2500BASE-X Fiber Optic
- 100BASE-TX UTP with PoE
- 1000BASE-T UTP with PoE
- Serial Line (RS-XXX)
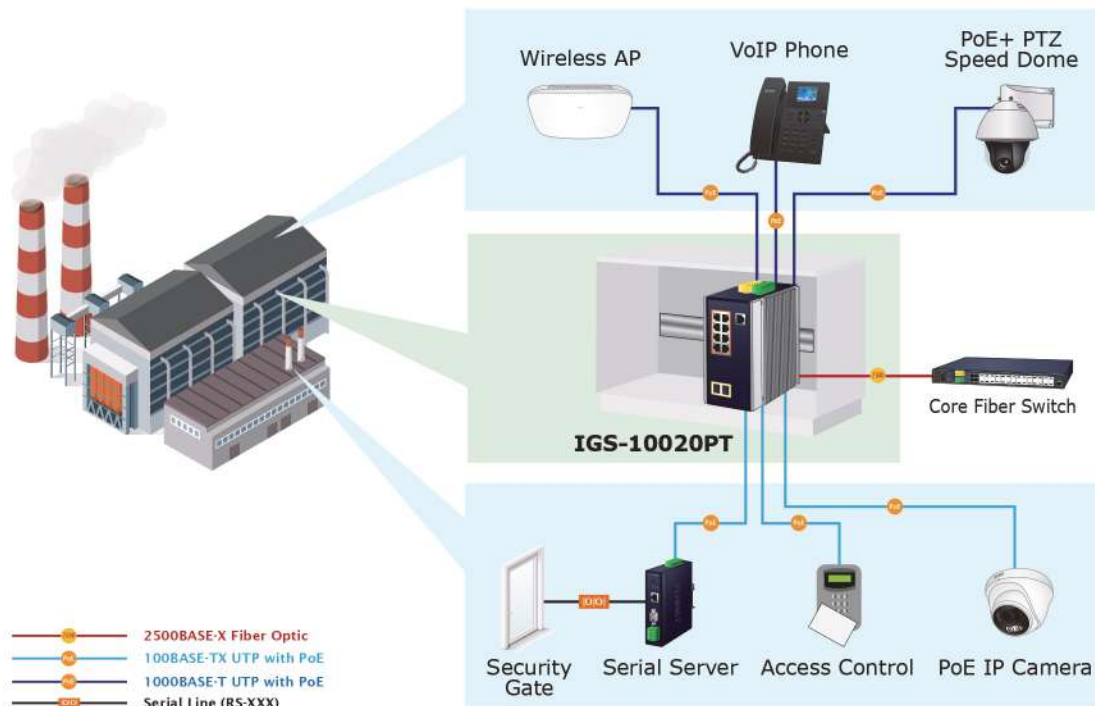
High Power IP Surveillance and Wireless LAN Service in Public Transportation

With IEEE 802.3at Power over Ethernet Plus standard, the IGS-10020PT can directly connect with any IEEE 802.3at end-nodes like PTZ (Pan, Tilt & Zoom) IP cameras, PTZ speed dome cameras, color touch-screen Voice over IP (VoIP) telephones, and multi-channel wireless LAN access points. Wireless LAN would be more efficient for the transportation station to provide high speed and wide area Internet services for travelers. With the PoE wireless LAN structure, the transportation authority gains benefits from less cost while providing better Internet services in wider areas for the travelers.
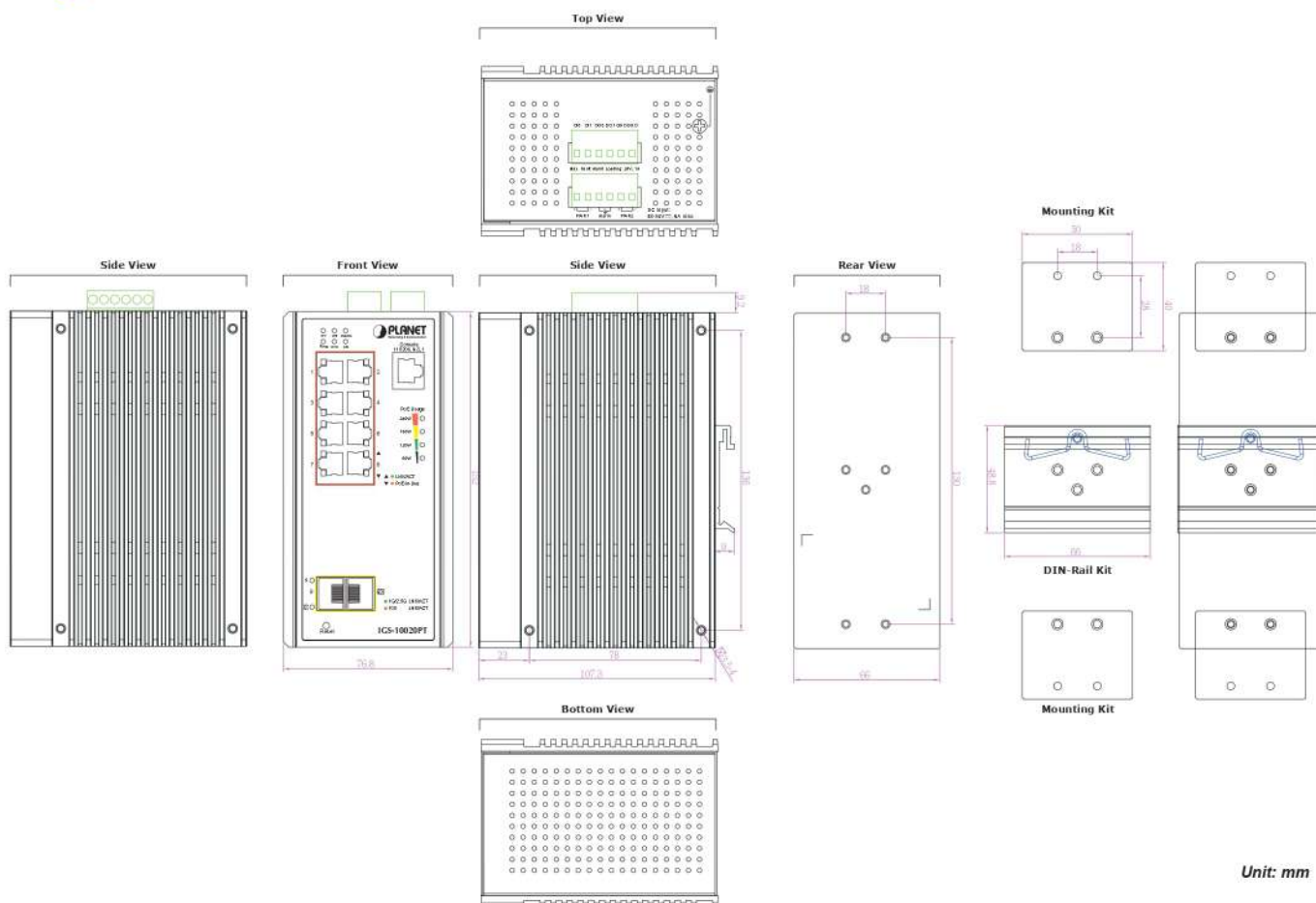

- 2500BASE-X Fiber Optic
- 1000BASE-SX/LX Fiber Optic
- 1000BASE-T UTP
- 1000BASE-T UTP with PoE
- Power Line (DC)

Specifications

Product	IGS-10020PT
Hardware Specifications	
Version	4
Copper Ports	8 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	2 100/1000/2500BASE-X mini-GBIC SFP ports (Port 9 and Port 10)
Console	1 x RJ45-to-RS232 serial port (115200, 8, N, 1)
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
Enclosure	IP30 aluminum case
Installation	DIN-rail kit and wall-mount kit
Connector	Removable 6-pin terminal block for power input Pin 1/2 for Power 1, Pin 3/4 for fault alarm, Pin 5/6 for Power 2 Removable 6-pin terminal block for DI/DO interface Pin 1/2 for DI 1 & 2, Pin 3/4 for DO 1 & 2, Pin 5/6 for GND
Alarm	One relay output for power failure. Alarm Relay current carry ability: 1A @ DC 24V
DI/DO	2 Digital Input (DI): Level 0: -24V~2.1V (±0.1V) Level 1: 2.1V~24V (±0.1V) Input Load to 24V DC, 10mA max. 2 Digital Output (DO): Open collector to 24V DC, 100mA max.
Dimensions (W x D x H)	76.8 x 107x 152 mm
Weight	1119g
Power Requirements	48-54V
Power Consumption	257 watts/876BTU (Full loading with PoE function)
ESD Protection	6KV DC
EFT Protection	6KV DC
LED Indicator	**System:** Power 1 (Green) Power 2 (Green) Fault Alarm (Red) Ring (Green) R.O. (Ring Owner) (Green) DIDO (Red) **Per 10/100/1000T RJ45 Ports:** PoE-in-Use (Amber) LNK/ACT (Green) **Per 100/1000/2500BASE-X SFP Interface:** 1G/2.5G (Green) 100 (Amber) **4 x LED for PoE Usage:** 60W, 120W, 180W and 240W (Amber)
Switching Specifications	
Switch Architecture	Store-and-Forward
Switch Fabric	26Gbps/non-blocking
Throughput (packet per second)	19.34Mpps@ 64Bytes packet
Address Table	8K entries, automatic source address learning and aging
Shared Data Buffer	4Mbits
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	9Kbytes
Power Over Ethernet	
PoE Standard	IEEE 802.3at Power over Ethernet Plus/PSE
PoE Power Supply Type	End-span
PoE Power Output	Per port 54V DC, 350mA; max. 15.4 watts (IEEE 802.3af) Per port 54V DC, 590mA; max. 36 watts (IEEE 802.3at)
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Budget	240W maximum (depending on power input)
Max. Number of Class 2 PD @ 7 watts	8
Max. Number of Class 3 PDs@ 15.4 watts	8
Max. Number of Class 4 PDs@ 30.8 watts	8
PoE Extend Mode	Remote power feeding up to 100m in standard mode and 200m in extend mode

Layer 2 Function	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable
Port Status	Display each port's speed duplex mode, link status, flow control status, auto negotiation status, trunk status
Port Mirroring	TX/RX/both 1 to 1 monitor
VLAN	802.1Q tagged based VLAN, up to 255 VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN GVRP MVR (Multicast VLAN Registration) Up to 4K VLAN groups, out of 4094 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk Supports 5 trunk groups with 10 ports per trunk group

QoS	Traffic classification based, strict priority and WRR
	8-level priority for switching
	  - Port number
	  - 802.1p priority
	  - 802.1Q VLAN tag
	  - DSCP/TOS field in IP packet

IGMP Snooping	IGMP (v1/v2/V3) snooping, up to 255 multicast groups IGMP querier mode support
MLD Snooping	MLD (v1/v2) snooping, up to 255 multicast groups MLD querier mode support
Access Control List	IP-based ACL/MAC-based ACL Up to 123 entries

Bandwidth Control	Per port bandwidth control
	  Ingress: 500Kb~1000Mbps
	  Egress: 500Kb~1000Mbps

Storm Control	Unicast/Multicast/Broadcast
Layer 3 Function	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
Management	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2,TLSv1.2, SNMP v3
ONVIF	ONVIF device discovery ONVIF device monitoring Floor Map
SNMP MIBs	RFC-1213 MIB-II IF-MIB RFC-1493 Bridge MIB RFC-1643 Ethernet MIB RFC-2863 Interface MIB RFC-2665 Ether-Like MIB RFC-2819 RMON MIB (Group 1, 2, 3 and 9) RFC-2737 Entity MIB RFC-2618 RADIUS Client MIB RFC-2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB Power over Ethernet MIB
Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE

Stability Testing	IEC60068-2-32 (free fall)	
	IEC60068-2-27 (shock)	
	IEC60068-2-6 (vibration)	
Standards Compliance	IEEE 802.3 10BASE-T	IEEE 802.3at Power over Ethernet Plus
	IEEE 802.3u 100BASE-TX/100BASE-FX	IEEE 802.3ah OAM
	IEEE 802.3ab Gigabit 1000T	IEEE 802.1ag Connectivity Fault Management(CFM)
	IEEE 802.3z Gigabit SX/LX	IEEE 1588 PTPv2
	IEEE 802.3bz 2.5GBASE-X	RFC 768 UDP
	IEEE 802.3x flow control and back pressure	RFC 783 TFTP
	IEEE 802.3ad port trunk with LACP	RFC 791 IP
	IEEE 802.1D Spanning Tree Protocol	RFC 792 ICMP
	IEEE 802.1w Rapid Spanning Tree Protocol	RFC 793 TCP
	IEEE 802.1s Multiple Spanning Tree Protocol	RFC 2068 HTTP
	IEEE 802.1p Class of Service	RFC 1112 IGMP v1
	IEEE 802.1Q VLAN tagging	RFC 2236 IGMP v2
	IEEE 802.1x Port Authentication Network Control	ITU-T G.8032 ERPS Ring
	IEEE 802.1ab LLDP	ITU-T Y.1731 Performance Monitoring
	IEEE 802.3af Power over Ethernet	

Environment

Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

Diagram

Unit: mm

Ordering Information

IGS-10020PT	Industrial 8-port 10/100/1000T 802.3at PoE + 2-port 1G/2.5G SFP Managed Switch

Available 100Mbps Modules

Fast Ethernet Transceiver (100BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MFB-TFX	100	LC	Multi-Mode	2km	1310nm	-40 ~ 85 degrees C
MFB-TF20	100	LC	Single Mode	20km	1310nm	-40 ~ 85 degrees C

Fast Ethernet Transceiver (100BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-TFA20	100	WDM (LC)	Single Mode	20km	1310nm	1550nm	-40~85 degrees C
MFB-TFB20	100	WDM (LC)	Single Mode	20km	1550nm	1310nm	-40~85 degrees C
MFB-TFA40	100	WDM (LC)	Single Mode	40km	1310nm	1550nm	-40~85 degrees C
MFB-TFB40	100	WDM (LC)	Single Mode	40km	1550nm	1310nm	-40~85 degrees C
MFB-TSA	100	WDM (LC)	Multi- Mode	2km	1310nm	1550nm	-40~85 degrees C
MFB-TSB	100	WDM (LC)	Multi- Mode	2km	1550nm	1310nm	-40~85 degrees C

Available 1000Mbps Modules

Gigabit Ethernet Transceiver (1000BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Wavelength (nm)
MGB-TGT	1000	Copper	--	100m	--	-40 ~ 85 degrees C
MGB-TSX	1000	LC	Multi Mode	550m	850nm	-40 ~ 85 degrees C
MGB-TSX2	1000	LC	Multi Mode	2km	1310nm	-40 ~ 85 degrees C
MGB-TLX(V2)	1000	LC	Single Mode	20km	1310nm	-40 ~ 85 degrees C
MGB-TL30	1000	LC	Single Mode	30km	1310nm	-40 ~ 85 degrees C
MGB-TL40	1000	LC	Single Mode	40km	1310nm	-40 ~ 85 degrees C
MGB-TL70	1000	LC	Single Mode	70km	1550nm	-40 ~ 85 degrees C
MGB-TL80	1000	LC	Single Mode	80km	1550nm	-40 ~ 85 degrees C

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-TSA	1000	WDM(LC)	Single Mode	2km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-TSB	1000	WDM(LC)	Single Mode	2km	1550nm	1490nm	-40 ~ 85 degrees C
MGB-TLA10(V2)	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-TLB10(V2)	1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 85 degrees C
MGB-TLA20	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-TLB20	1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85 degrees C
MGB-TLA40	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-TLB40	1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 85 degrees C
MGB-TLA60	1000	WDM(LC)	Single Mode	60km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-TLB60	1000	WDM(LC)	Single Mode	60km	1550nm	1310nm	-40 ~ 85 degrees C
MGB-TLA80	1000	WDM(LC)	Single Mode	80km	1490nm	1550nm	-40 ~ 85 degrees C
MGB-TLB80	1000	WDM(LC)	Single Mode	80km	1550nm	1490nm	-40 ~ 85 degrees C
MGB-TLA120	1000	WDM(LC)	Single Mode	120km	1490nm	1550nm	-40 ~ 85 degrees C
MGB-TLB120	1000	WDM(LC)	Single Mode	120km	1550nm	1490nm	-40 ~ 85 degrees C

Available 2500Mbps Modules

Gigabit Ethernet Transceiver (2500BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MGB-2GTSR	2500	LC	Multi Mode	300m	850nm	-40 ~ 85 degrees C
MGB-2GTLR2	2500	LC	Single Mode	2km	1310nm	-40 ~ 85 degrees C
MGB-2GTLR20	2500	LC	Single Mode	20km	1310nm	-40 ~ 85 degrees C

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-2GTLA20	2500	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 85 degrees C
MGB-2GTLB20	2500	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 85 degrees C

Related DIN-rail Power Supplies

| PWR-240-48 | 48V, 240W DIN-rail Power Supply (NDR-480-48, adjustable 48-56V DC Output) |
| PWR-480-48 | 48V, 480W DIN-rail Power Supply (NDR-480-48, adjustable 48-56V DC Output) |

Related PoE+ Indoor Wireless Aps Products

WDAP-C1800AX	Dual Band 802.11ax 1800Mbps Ceiling-mount Wireless Access Point w/802.3at PoE+ and 2 10/100/1000T LAN Ports
WDAP-W1800AXU	Dual Band 802.11ax 1800Mbps In-wall Wireless Access Point w/802.3at PoE+ and Type C USB
WDAP-W1200E	Dual Band 802.11ac 1200Mbps Wave 2 In-wall Wireless Access Point (EU Type, 802.3at PoE, 3 x 10/100/1000T LAN Ports, 1 x RJ11 Port)
WDAP-C7210E	1200Mbps 802.11ac Wave 2 Dual Band Ceiling-mount Wireless Access Point w/802.3at PoE+ and 2 10/100/1000T LAN Ports

Related Outdoor Access Point/Bridge Products

WDAP-850AC	Dual Band 802.11ac 1200Mbps Wave 2 Outdoor Wireless AP
WDAP-1800AX	Dual Band 802.11ax 1800Mbps Outdoor Wireless AP
WBS-900AC-KIT	5GHz 802.11ac 900Mbps TDMA Outdoor Long Range Wireless CPE Kit
WBS-512AC	5GHz 802.11ac 900Mbps Outdoor Wireless CPE

Related IP Surveillance PoE Products

ICA-3280	H.265 1080p Smart IR Bullet IP Camera
ICA-4280	H.265 1080p Smart IR Dome IP Camera
ICA-3480F	H.265+ 4MP Full Color Bullet IP Camera
ICA-4480F	H.265+ 4MP Full Color Dome IP Camera
ICA-M3580P	H.265 5 Mega-pixel Smart IR Bullet IP Camera with Remote Focus and Zoom
ICA-M4580P	H.265 5 Mega-pixel Smart IR Dome IP Camera with Remote Focus and Zoom
ICA-HM620	2 Mega-pixel PoE Plus Speed Dome Internet Camera
ICA-E6260	2 Mega-pixel PoE Plus Speed Dome IP Camera with Extended Suppor

Related PoE+ Indoor VoIP Products

ICF-1900	High Definition Touch Color Screen Smart Media Android SIP Conference Phone
VIP-1120PT	High Definition Color PoE IP Phone
VIP-1140PT	High Definition Color PoE IP Phone
VIP-1260PT	High Definition Color PoE Gigabit IP Phone

IGS-10020PT