

Industrial L2+ 16-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T + 2-Port 100/1000X SFP Managed Switch (-40~75 degrees C)



Environmentally Hardened Design

PLANET Industrial 16-Port Gigabit 802.3at PoE+ Switch, IGS-20160HPT, is equipped with rugged IP30 metal case for stable operation in heavy Industrial demanding environments. With IP30 industrial case protection, the IGS-20160HPT 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-20160HPT can be placed in almost any difficult environment. The IGS-20160HPT also allows either DIN rail or wall mounting for efficient use of cabinet space.



Cybersecurity Network Solution to Minimize Security Risks

The new generation of IGS-20160HPT has the cybersecurity feature to protect the switch management and enhance the security for mission-critical network without extra deployment cost and effort. The new IGS-20160HPT expands its memory and upgrades the kernel of SSH, TLS and SSL protocols to provide strong protection against advanced threats. It includes a range of cybersecurity features such as DHCP Snooping, IP Source Guard, ARP Inspection Protection, 802.1x port-based and MAC-based network access control, RADIUS and TACACS+ user accounts management, SNMPv3 authentication, and so on to complement it as an all-security solution. The network administrator can now construct highly-secure corporate networks with considerably less time and effort than before.

Physical Port

- 16 10/100/1000BASE-T Gigabit Ethernet RJ45 ports with IEEE 802.3at PoE+ Injector
- 2 10/100/1000BASE-T Gigabit Ethernet RJ45 ports
- 2 100/1000BASE-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 16 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 100 meters in standard mode and 250m in extend mode
- PoE management features
 - Total PoE power budget control
 - Per port PoE function enable/disable
 - PoE admin-mode control
 - PoE port power feeding priority
 - Per PoE port power limit
 - PD classification detection
- Intelligent PoE features
 - Temperature threshold control
 - PoE usage threshold control
 - PD alive check
 - PoE schedule

Industrial Protocol

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

Industrial Case & Installation

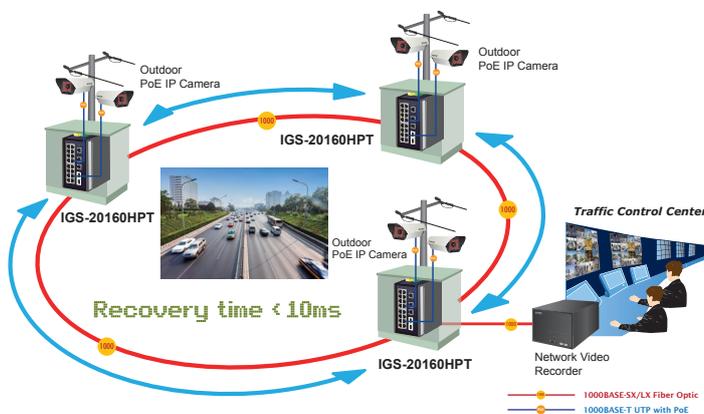
- IP30 aluminum case protection
- DIN rail and wall-mount design
- 48~56V DC, redundant power with polarity reverse protect function
- Supports 6000V DC Ethernet ESD protection



Redundant Ring, Fast Recovery for Surveillance System

The IGS-20160HPT supports redundant ring technology and features strong rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **Redundant Ring** technology, Spanning Tree Protocol (802.1w RSTP), and redundant power supply system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. The IGS-20160HPT 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 10ms** to quickly bring the network back to normal operation.

ERPS Ring for Video Transmission Redundancy



Convenient and Smart ONVIF Devices with Detection Feature

PLANET has newly developed an awesome feature -- ONVIF Support -- which is specifically designed for co-operating with video IP surveillances. From the IGS-20160HPT'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 all the cameras. Moreover, you can get real-time surveillance information and online/offline status; the PoE reboot can be controlled from the GUI.

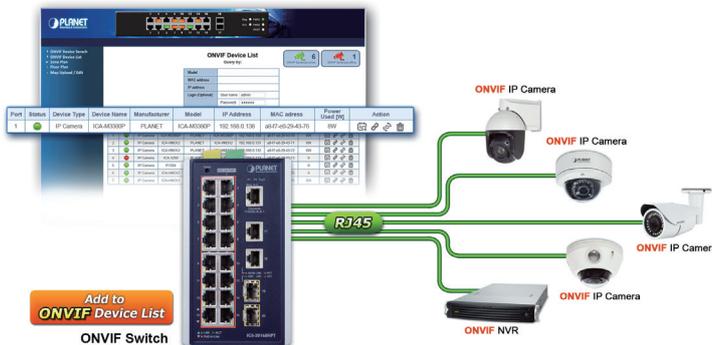
- -40 to 75 degrees C operating temperature

Digital Input & 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

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
 - Up to 255 VLANs groups, out of 4094 VLAN IDs
 - Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
 - Private VLAN Edge (PVE)
 - Protocol-based VLAN
 - MAC-based VLAN
 - Voice VLAN
 - GVRP (GARP VLAN Registration Protocol)
- 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 10 trunk groups with 4 ports per trunk group
 - Up to 8Gbps bandwidth (duplex mode)
- Provides port mirror (1-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)
- Compatible with Cisco **Uni-directional link detection** (UDLD) that monitors a link between two switches and

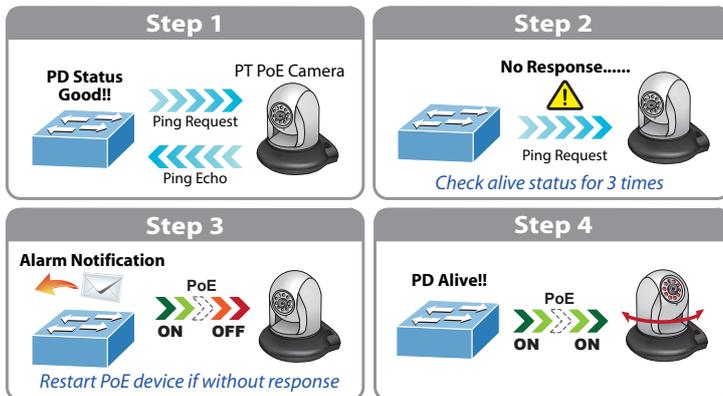


Modbus TCP Provides Flexible Network Connectivity for Factory Automation

With the supported **Modbus TCP/IP** protocol, the IGS-20160HPT 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.

Intelligent Alive Check for Powered Device

The IGS-20160HPT 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-20160HPT 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.



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)

Layer 3 IP Routing Features

- IPv4/IPv6 software static routing
- Routing interface provides per VLAN routing mode
- Supports maximum 32 software 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

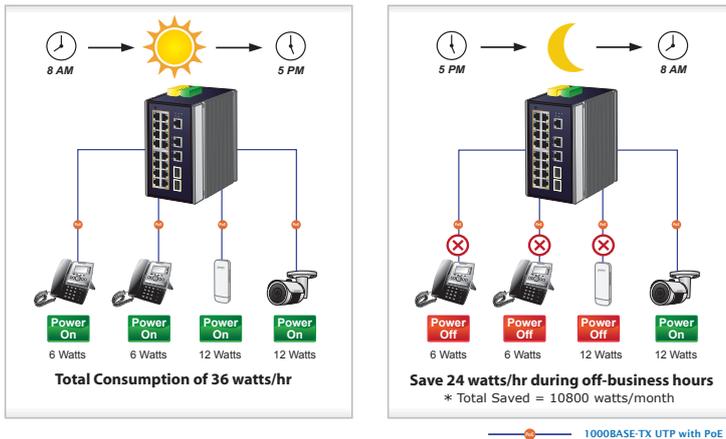
- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD snooping v1 and v2
- Querier mode support
- IPv4 IGMP snooping port filtering
- IPv6 MLD snooping port filtering
- MVR (Multicast VLAN Registration)

Security

- IEEE 802.1x Port-based/MAC-based network access authentication
- Built-in RADIUS client to cooperate with the RADIUS servers
- TACACS+ login users access authentication
- RADIUS/TACACS+ users access authentication
- IP-based Access Control List (ACL)
- MAC-based Access Control List
- Source MAC/IP address binding
- DHCP snooping to filter distrusted DHCP messages
- Dynamic ARP Inspection discards ARP packets with invalid

PoE Schedule for Energy Saving

Under the trend of energy saving worldwide and contributing to environmental protection on the Earth, the IGS-20160HPT 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.



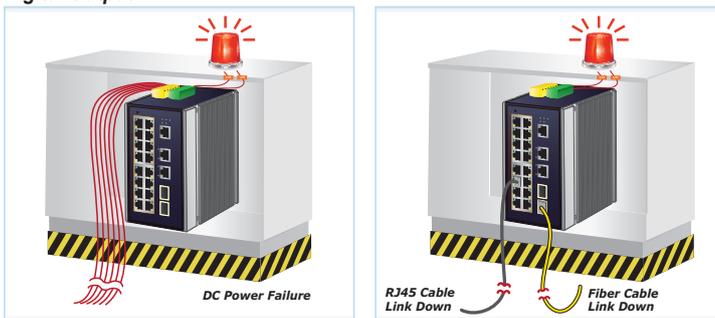
Digital Input and Digital Output for External Alarm

The IGS-20160HPT supports Digital Input and Digital Output on its front 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-20160HPT port shows link down, link up or power failure.

Digital Input



Digital Output



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
 - SSH/TLS secure access
- IPv6 address/NTP management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System Maintenance
 - Firmware upload/download via HTTP/TFTP
 - Reset button for system reboot or reset to factory default
 - Dual images
- DHCP relay and option 82
- User privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Network diagnostic
 - SFP-DDM (Digital Diagnostic Monitor)
 - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
 - ICMPv6/ICMPv4 remote ping
- SMTP/Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interface link up and link down notification
- System Log
- PLANET Smart Discovery Utility for deployment management

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

To help customers stay on top of their businesses, the IGS-20160HPT 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 secured, flexible management and simpler networking application.

Robust Layer 2 Features

The IGS-20160HPT 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-20160HPT provides 802.1Q tagged VLAN, and the VLAN groups allowed will be maximally up to 255. Via aggregation of supporting ports, the IGS-20160HPT allows the operation of a high-speed trunk combining multiple ports. It enables a maximum of up to 10 trunk groups with 4 ports per trunk group, and supports fail-over as well.

Efficient Management

For efficient management, the IGS-20160HPT Managed Ethernet Switch is equipped with console, Web and SNMP management interfaces. With the built-in Web-based management interface, the IGS-20160HPT offers an easy-to-use, platform-independent management and configuration facility. For text-based management, the IGS-20160HPT can be accessed via Telnet and the console port. Moreover, it also offers secure remote management via any standard-based management software by supporting SNMP v3 connection which encrypts the packet content at each session.

Powerful Security

The IGS-20160HPT 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-secured corporate networks with considerably less time and effort than before.

Flexibility and Extension Solution

The two mini-GBIC slots built in the IGS-20160HPT support dual speed, 100BASE-FX and 1000BASE-SX/LX 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 550 meters (multi-mode fiber) to 10/50/70/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.



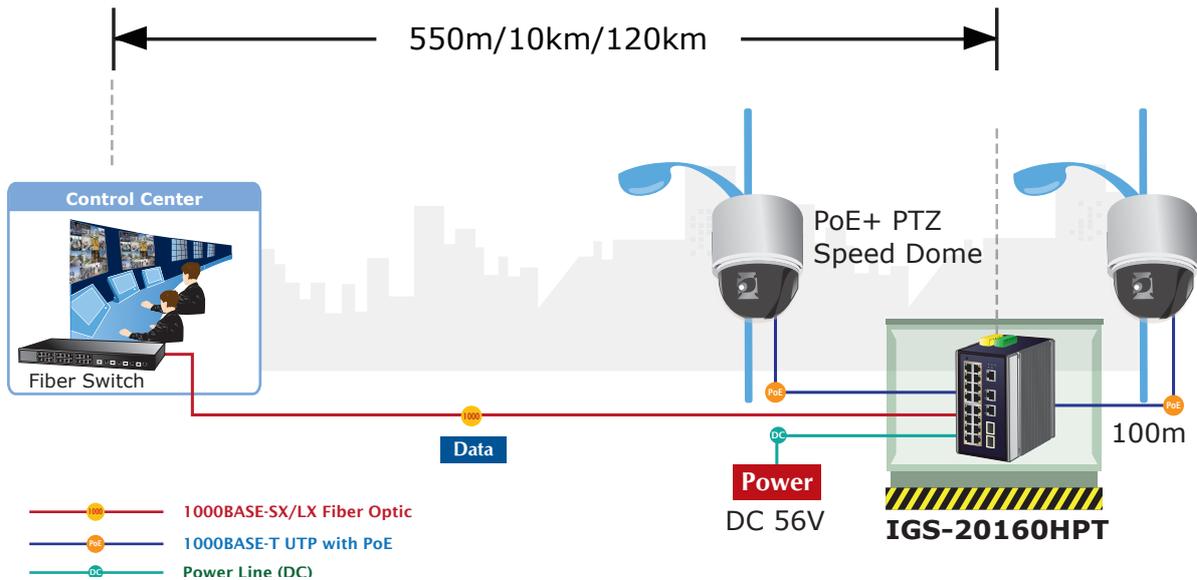
1588 Time Protocol for Industrial Computing Networks

The IGS-20160HPT is ideal for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

Applications

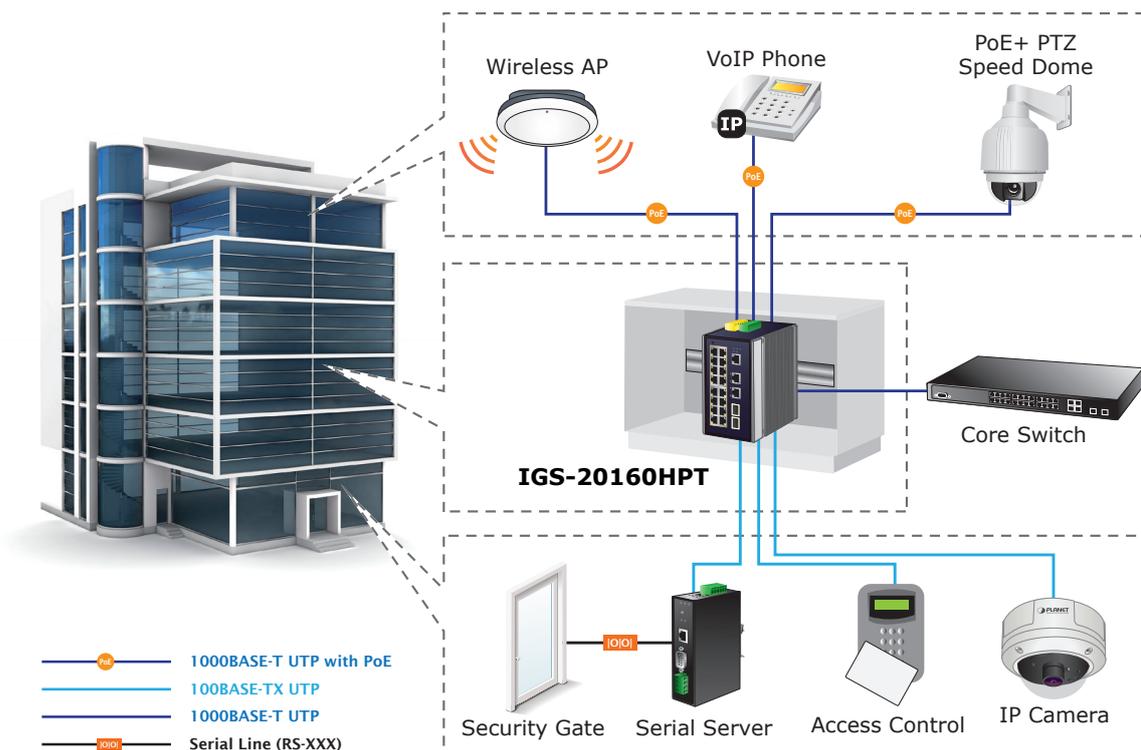
Perfect Integration Solution for Outdoor IP PoE Camera and NVR System

The IGS-20160HPT provides 16 10/100/1000Mbps 802.3at PoE+ ports and can offer sufficient PoE power to 16 PoE IP cameras at the same time. In addition, with the 2 100/1000BASE-X SFP interfaces, the IGS-20160HPT can connect to core fiber switch and send video stream to NVR and monitoring center. Through the high-performance switch architecture, the IGS-20160HPT facilitates the recorded video files from the 16 PoE IP cameras to be saved in the NVR systems. Furthermore, the NVR systems can be controlled and monitored both in the local LAN and the remote site via Internet. The IGS-20160HPT undoubtedly brings an ideal secure surveillance system at a lower total cost.



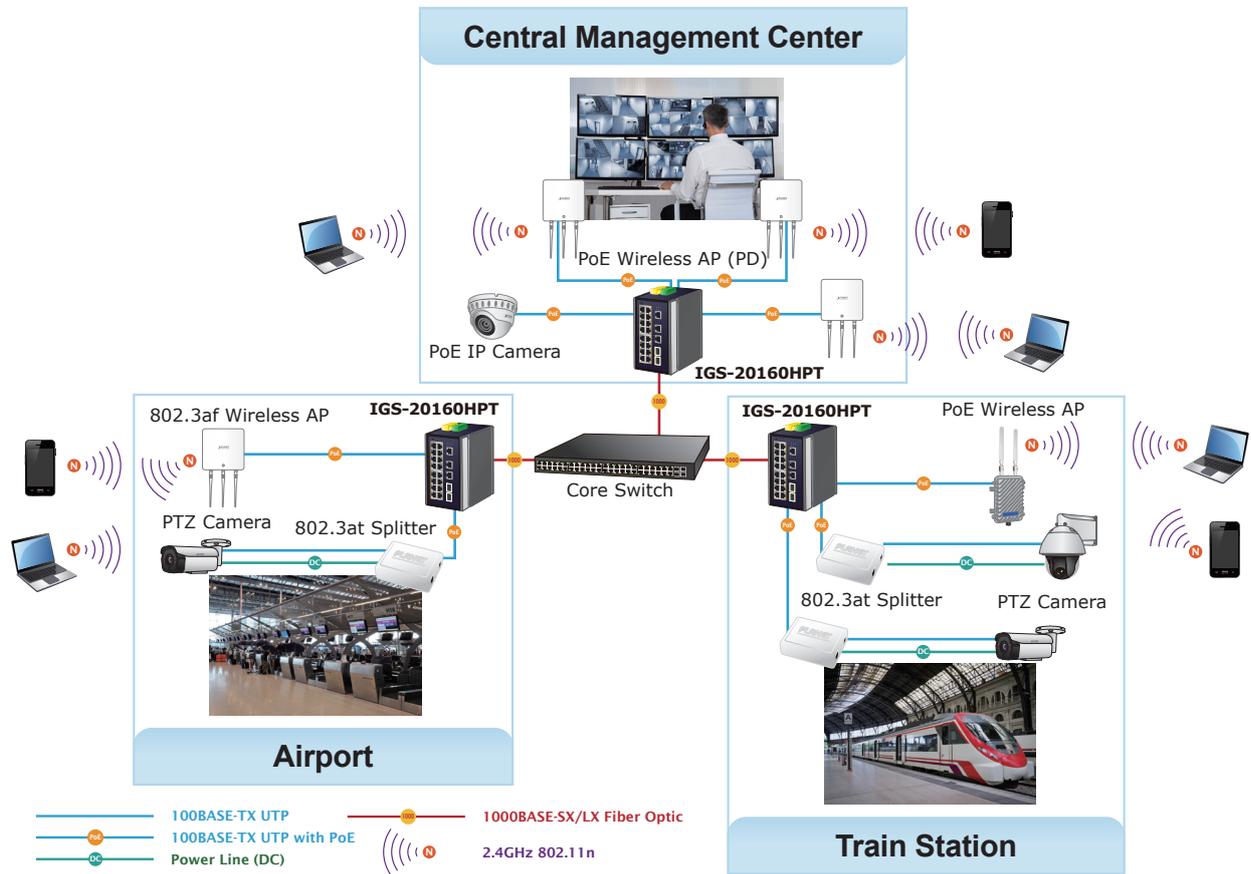
Industrial Area Department/Workgroup PoE Switch

Providing up to 16 PoE+, in-line power interfaces, the IGS-20160HPT can easily build a power centrally controlled for IP phone system, IP camera system, or wireless AP group for Industrial network. For instance, 16 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-20160HPT makes the installation of IP cameras or wireless AP easier and more efficient.



High Power IP Surveillance and Wireless LAN Service in Public Transportation

With IEEE 802.3at Power over Ethernet Plus standard, the IGS-20160HPT can directly connect with any IEEE 802.3at end-nodes like PTZ (Pan, Tilt & Zoom) network 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.



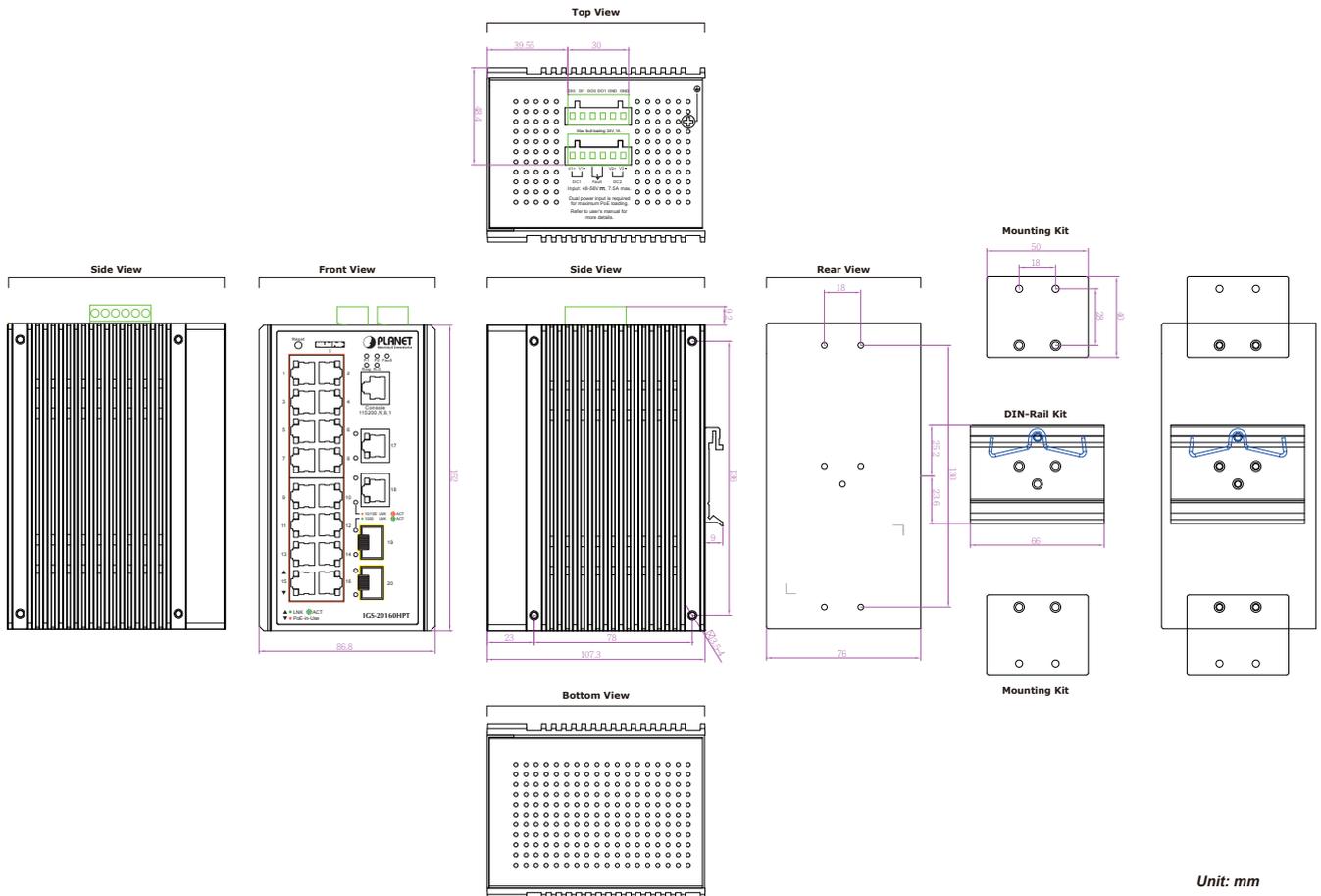
Specifications

| | |
|--------------------------------|--|
| Product | IGS-20160HPT |
| Hardware Specifications | |
| Copper Ports | 18 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports |
| SFP/mini-GBIC Slots | 2 1000BASE-SX/LX/BX SFP interfaces (Port-19 and Port-20) Compatible with 100BASE-FX SFP |
| PoE Injector Port | 16 ports with 802.3at/af PoE injector function with Port-1 to Port-16 |
| Console | 1 x RJ45-to-RS232 serial port (115200, 8, N, 1) |
| Switch Architecture | Store-and-Forward |
| Switch Fabric | 40Gbps/non-blocking |
| Throughput (packet per second) | 29.7Mpps@ 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 |
| Reset Button | < 5 sec: System reboot > 5 sec: Factory default |
| ESD Protection | 6KV DC |
| 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. |
| LED Indicator | System: Power 1 (Green) Power 2 (Green) Fault Alarm (Green) Ring (Green) Ring Owner (Green) Per 10/100/1000T RJ45 PoE+ Ports: PoE-in-Use (Orange) LNK/ACT (Green) Per 10/100/1000T RJ45Ports: 1000 LNK/ACT (Green) 100 LNK/ACT (Orange) Per SFP Interface: 1000 LNK/ACT (Green) 100 LNK/ACT (Orange) |
| Dimensions (W x D x H) | 86.8 x 107.3 x 152 mm |
| Weight | 1533g |
| Power Requirements | Dual 48~56V DC (>51V DC for PoE+ output recommended) |
| Power Consumption | 11.1 watts/37.87BTU (Power on without any connection) 349 watts/119.08BTU (Full loading with PoE function) |
| Power Over Ethernet | |
| PoE Standard | IEEE 802.3at Power over Ethernet Plus/PSE |
| PoE Power Supply Type | End-span |
| PoE Power Output | IEEE 802.3af Standard - Per port 48V~51V DC (depending on the power supply), max. 15.4 watts IEEE 802.3at Standard - Per port 51V~56V DC (depending on the power supply), max. 36 watts |
| Power Pin Assignment | 1/2(+), 3/6(-) |
| PoE Power Budget | DC 48V Power input - 240W maximum (depending on power input) DC 52~56V Power input - Single power input: 260W maximum (depending on power input) - Dual power input: 320W maximum (depending on power input) |

| | |
|------------------------------|---|
| Max. number of Class 2 PDs | 16 |
| Max. number of Class 3 PDs | 16 |
| Max. number of Class 4 PDs | 10 |
| Layer 2 Function | |
| Basic Management Interfaces | Console; Telnet; Web browser; SNMP v1, v2c |
| Secure Management Interfaces | SSH, SSL, SNMP v3 |
| Port Configuration | Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable Power saving mode control |
| 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 255 VLAN groups, out of 4094 VLAN IDs |
| Link Aggregation | IEEE 802.3ad LACP/static trunk Supports 10 trunk groups with 4 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 | IPv4 IGMP (v1/v2/V3) snooping, up to 255 multicast groups IPv4 IGMP querier mode support |
| MLD Snooping | IPv6 MLD (v1/v2) snooping, up to 255 multicast groups IPv6 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 |
| 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 RFC3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIBMAU-MIB |
| 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 |
| 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 802.3u 100BASE-TX/100BASE-FX |
| | IEEE 802.3z Gigabit SX/LX |
| | IEEE 802.3ab Gigabit 1000T |
| | IEEE 802.3x flow control and back pressure |
| | IEEE 802.3ad port trunk with LACP |
| | IEEE 802.1D Spanning Tree Protocol |
| | IEEE 802.1w Rapid Spanning Tree Protocol |
| | IEEE 802.1s Multiple Spanning Tree Protocol |
| | IEEE 802.1p Class of Service |
| | IEEE 802.1Q VLAN tagging |
| | IEEE 802.1ad Q-in-Q VLAN stacking |
| | IEEE 802.1x Port Authentication Network Control |
| | IEEE 802.1ab LLDP |
| | IEEE 802.3af Power over Ethernet |
| IEEE 802.3at Power over Ethernet Plus | |
| IEEE 1588 PTPv2 | |
| RFC 768 UDP | |
| RFC 793 TFTP | |
| RFC 791 IP | |
| RFC 792 ICMP | |
| RFC 2068 HTTP | |
| RFC 1112 IGMP v1 | |
| RFC 2236 IGMP v2 | |
| ITU G.8032 ERPS Ring | |
| Environment | |
| Operating Temperature | -40 ~ 75 degrees C |
| Storage Temperature | -40 ~ 85 degrees C |
| Humidity | 5 ~ 95% (non-condensing) |

Dimensions



Unit: mm

Ordering Information

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|--------------|--|
| IGS-20160HPT | Industrial 16-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T + 2-Port 100/1000X SFP Managed Switch (-40~75 degrees C) |
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Related Products

| | |
|-----------------|--|
| IGS-10020HPT | L2+ Industrial 8-Port 10/100/1000T 802.3at PoE + 2-Port 100/1000X SFP Managed Ethernet Switch (-40~75 degrees C) |
| IGS-5225-8P2T2S | L2+ Industrial 8-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T + 2-Port 100/1000X SFP Managed Ethernet Switch (-40~75 degrees C) |
| IGS-5225-8P4S | L2+ Industrial 8-Port 10/100/1000T 802.3at PoE + 4-Port 100/1000X SFP Managed Ethernet Switch (-40~75 degrees C) |
| IGS-5225-8P2S2X | L3 Industrial 8-Port 10/100/1000T 802.3at PoE + 4-Port 100/1000X SFP + 2-Port 10G SFP+ Managed Ethernet Switch (-40~75 degrees C) |

Related Products

1000Mbps SFP transceiver modules

| | |
|----------|---|
| MGB-GT | SFP-Port 1000BASE-T Module |
| MGB-SX | SFP-Port 1000BASE-SX mini-GBIC module - 550m |
| MGB-SX2 | SFP-Port 1000BASE-SX mini-GBIC module - 2km |
| MGB-LX | SFP-Port 1000BASE-LX mini-GBIC module - 10km |
| MGB-L40 | SFP-Port 1000BASE-LX mini-GBIC module - 40km |
| MGB-L80 | SFP-Port 1000BASE-LX mini-GBIC module - 80km |
| MGB-L120 | SFP-Port 1000BASE-LX mini-GBIC module - 120km |
| MGB-LA10 | SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 10km |
| MGB-LB10 | SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 10km |
| MGB-LA20 | SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 20km |
| MGB-LB20 | SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 20km |
| MGB-LA40 | SFP-Port 1000BASE-LX (WDM,TX:1310nm) mini-GBIC module - 40km |
| MGB-LB40 | SFP-Port 1000BASE-LX (WDM,TX:1550nm) mini-GBIC module - 40km |
| MGB-TSX | SFP-Port 1000BASE-SX mini-GBIC module - 550m (-40 ~ 75 degrees C) |
| MGB-TLX | SFP-Port 1000BASE-LX mini-GBIC module - 10km (-40 ~ 75 degrees C) |
| MGB-TL40 | SFP-Port 1000BASE-LX mini-GBIC module - 40km (-40 ~ 75 degrees C) |
| MGB-TL80 | SFP-Port 1000BASE-LX mini-GBIC module - 80km (-40 ~ 75 degrees C) |

100Mbps SFP transceiver modules

| | |
|----------|--|
| MFB-FX | SFP-Port 100BASE-FX Transceiver (1310nm) - 2km |
| MFB-F20 | SFP-Port 100BASE-FX Transceiver (1310nm) - 20km |
| MFB-F40 | SFP-Port 100BASE-FX Transceiver (1310nm) - 40km |
| MFB-F60 | SFP-Port 100BASE-FX Transceiver (1310nm) - 60km |
| MFB-FA20 | SFP-Port 100BASE-BX Transceiver (WDM,TX:1310nm) - 20km |
| MFB-FB20 | SFP-Port 100BASE-BX Transceiver (WDM,TX:1550nm) - 20km |
| MFB-TFX | SFP-Port 100BASE-FX Transceiver (1310nm) - 2km (-40 ~ 75 degrees C) |
| MFB-TF20 | SFP-Port 100BASE-FX Transceiver (1310nm) - 20km (-40 ~ 75 degrees C) |