Industrial L3 16-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T + 2-Port 1G/2.5G SFP Managed Ethernet Switch (-40~75 degrees C)

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
- **2 100/1000/2500BASE-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 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 100m in standard mode and 250m in extended mode
- PoE management features
  - PoE admin-mode control
  - PoE management mode selection
  - PoE Legacy mode selection
  - PoE Budget setup option
  - 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
  - Temperature threshold control
  - PoE usage threshold control
  - PoE extension
  - PoE schedule
  - PD alive check
  - LLDP PoE Neighbors

Industrial Protocol

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

Industrial Case & Installation

- IP30 aluminum case
- DIN-rail or wall-mount design

Advanced Manageable PoE Solution for Hardened Environment

PLANET IGS-20160HPT L3 Industrial Managed PoE+ Switch, featuring **16 10/100/1000BASE-T 802.3at PoE+ ports** with each port powering up to 36 watts, and **100/1000/2500BASE-X SFP ports** in an **IP30** rugged metal case, can be installed in any difficult environment. It provides user-friendly yet advanced **IPv6/IPv4 management** interfaces, abundant **L2/L4 switching functions, Layer 3 OSPFv2 dynamic routing** capability, and advanced **ITU-G.8032 ERPS Ring** technology to improve the rapid self-recovery capability and PLANET **intelligent PoE** functions for controlling the PoE outdoor IP surveillance and wireless network applications. It is able to operate reliably, stably and quietly in the temperature range from **-40 to 75 degrees C**.

Layer 3 Dynamic Routing Support

The IGS-20160HPT enables the administrator to conveniently boost network efficiency by configuring Layer 3 IPv4/IPv6 VLAN static routing manually, and the **OSPFv2** (Open Shortest Path First) settings automatically. The OSPF is an interior dynamic routing protocol for autonomous system based on link state. The protocol creates a database for link state by exchanging link states among Layer3 switches, and then uses the Shortest Path First algorithm to generate a route table based on that database.

Cybersecurity Network Solution to Minimize Security Risks

The IGS-20160HPT supports SSHv2 and TLS 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.

Redundant Ring, Fast Recovery for Critical Network Applications

The IGS-20160HPT 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. In a simple Ring network, the recovery time of data link can be as fast as 10ms.

ERPS Ring for Video Transmission Redundancy
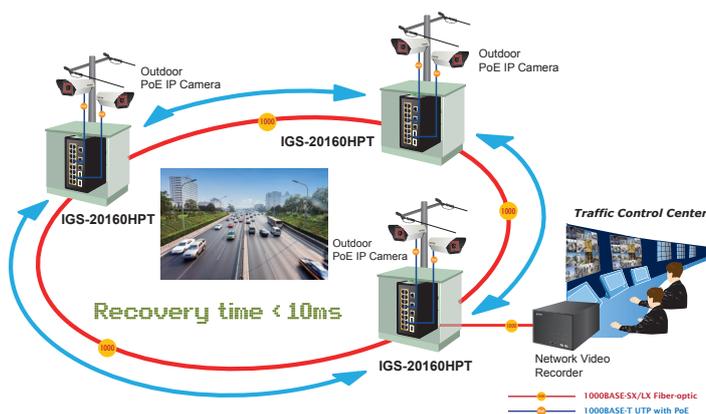
- 48~56V DC, redundant power with reverse polarity protection
- Supports 6KV DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

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 4K VLANs groups, out of 4094 VLAN IDs
  – Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)
  – Private VLAN Edge (PVE)
  – Port Isolation
  – MAC-based VLAN
  – IP Subnet-based VLAN
  – Protocol-based VLAN
  – VLAN Translation
  – 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 Filtering/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)

High Power PoE for Security and Public Service Applications

As the whole system comes with a total 320-watt PoE budget, the IGS-20160HPT 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.

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-20160HPT GUI, clients just need one click to search and show all of the ONVIF devices via network application. In addition, clients can upload floor images to the switch series, making the deployments of surveillance and other devices easy for planning and inspection purposes. Moreover, clients can get real-time surveillance's information and online/offline status; the PoE reboot can be controlled from the GUI.
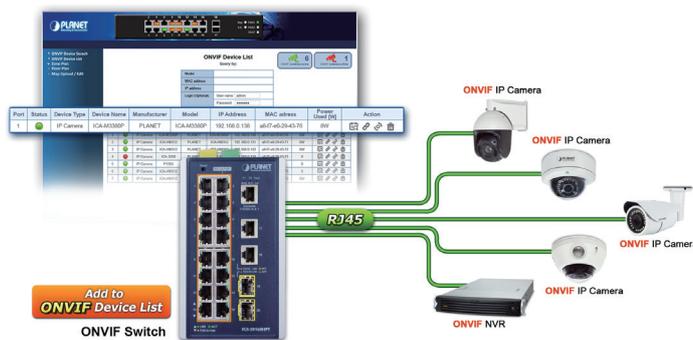
Intelligent Alive Check for Powered Device

The IGS-20160HPT 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.
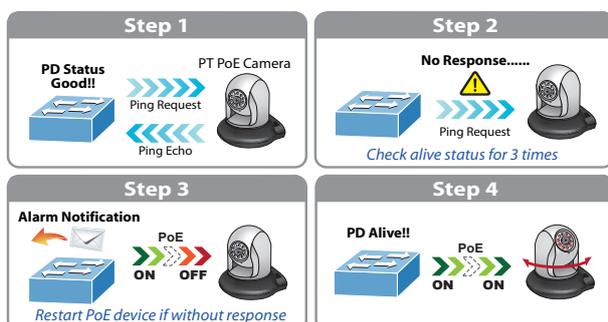
- Compatible with Cisco **Uni-directional link detection** (UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices
- Link Layer Discovery Protocol (LLDP)
- Provides ONVIF for co-operating with PLANET video IP surveillances

Layer 3 IP Routing Features

- Supports maximum 128 static routes and route summarization
- IPv4 dynamic routing protocol supports OSPFv2
- IPv4/IPv6 hardware static routing
- Routing interface provides per VLAN routing mode

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 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

- 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)
  - MAC-based Access Control List

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.

| 8 AM | | 5 PM | | 5 PM | | 8 AM |

| Power On | Power On | Power On | Power On |
| 6 Watts | 6 Watts | 12 Watts | 12 Watts |

Total Consumption of 36 watts/hr

| Power Off | Power Off | Power Off | Power On |
| 6 Watts | 6 Watts | 12 Watts | 12 Watts |

Save 24 watts/hr during off-business hours
＊ Total Saved = 10800 watts/month

1000BASE-TX UTP with PoE
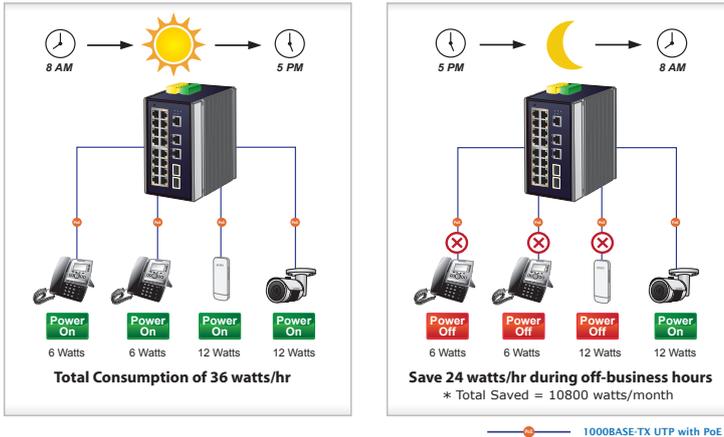
Scheduled Power Recycling

The IGS-20160HPT 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 Every Friday 23:00

S M T W T F S

PoE

ON OFF ON

PoE PT Camera

CPU/Buffer Load 85%

CPU/Buffer Load 10%
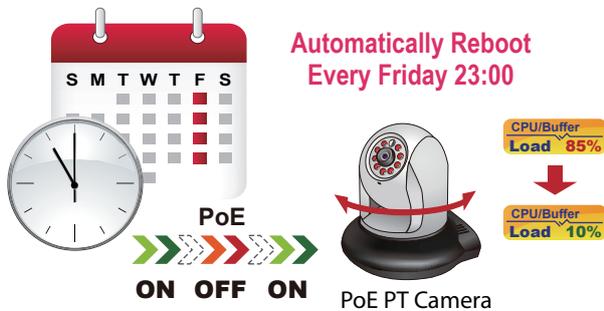
SMTP/SNMP Trap Event Alert

The IGS-20160HPT 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.

SMTP/SNMP Trap Event Alert

IGS-20160HPT

E-mail Alert

Malfunction

IP Camera   IP Camera
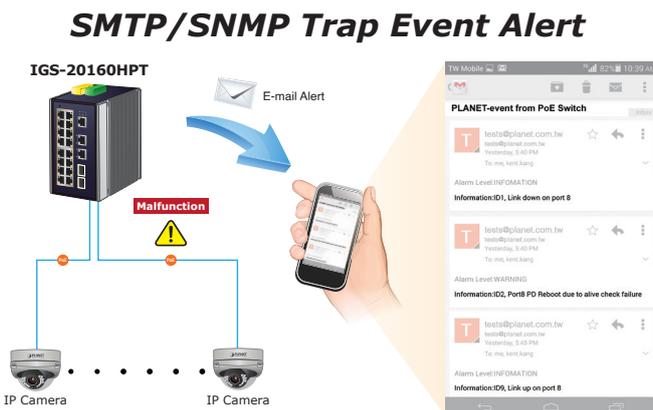
- Source MAC / IP address binding
- **DHCP Snooping** to filter un-trusted DHCP messages
- **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding
- **IP Source Guard** prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

Management

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
    – Web switch management
    – Console/Telnet Command Line Interface
    – SNMP v1 and v2c switch management
    – SSHv2, TLSv1.2 and SNMP v3 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
- User Privilege levels control
- NTP (Network Time Protocol)
- UPnP
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- IEEE 802.3ah OAM
- 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
- Network Diagnostic
    – SFP-DDM (Digital Diagnostic Monitor)
    – 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 Linkup and Linkdown notification
- System Log
- PLANET NMS System and Smart Discovery Utility for deployment management

Effective Alarm Alert for Better Protection

The IGS-20160HPT 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/DC Power Failure   RJ45/Fiber Connection Link Down
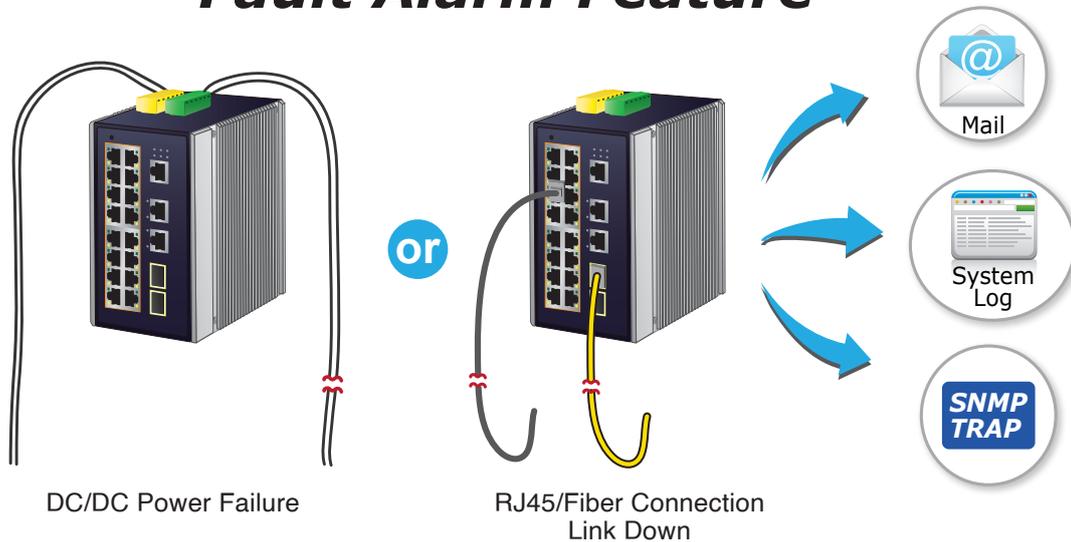
Digital Input and Digital Output for External Alarm

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

Security OK!!	Alarm Warning	Alarm Messaging
Enclosure	Enclosure	Uplink
Door Detector (Door Closed)	Door Detector (Door Open)	Mail System Log SNMP TRAP

Digital Output

DC Power Failure

RJ45 Cable Link Down   Fiber Cable Link Down
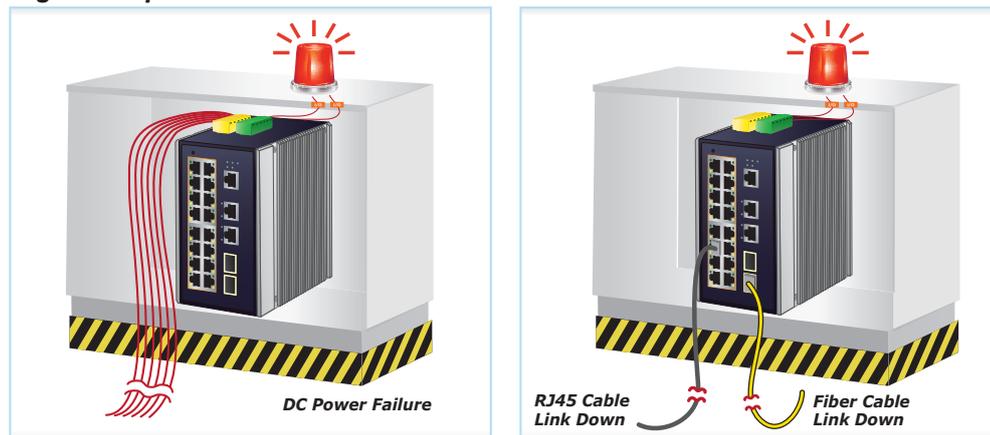
Robust Layer 2 Features

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 4K. 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.

L2/L4 Managed Switch   L2/L4 Managed Switch
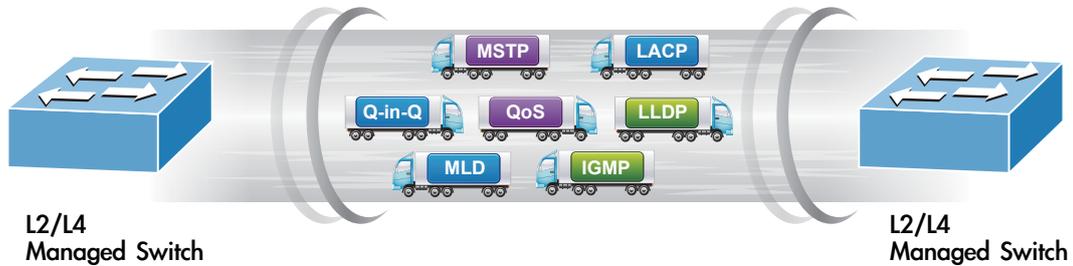
Efficient Management

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 SNMPv3 connection which encrypts the packet content at each session.

Secure Management

Computer

HTTPS TLS   SSHv2   SNMPv3

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-secure corporate networks with considerably less time and effort than before.

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.

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.

Time Synchronization in Network

Grand Master

Time Synchronization via **IGS-20160HPT**

Base Station

Slave

Base Station

Base Station

─ 1000 ─ **1000BASE-SX/LX Fiber Optic**
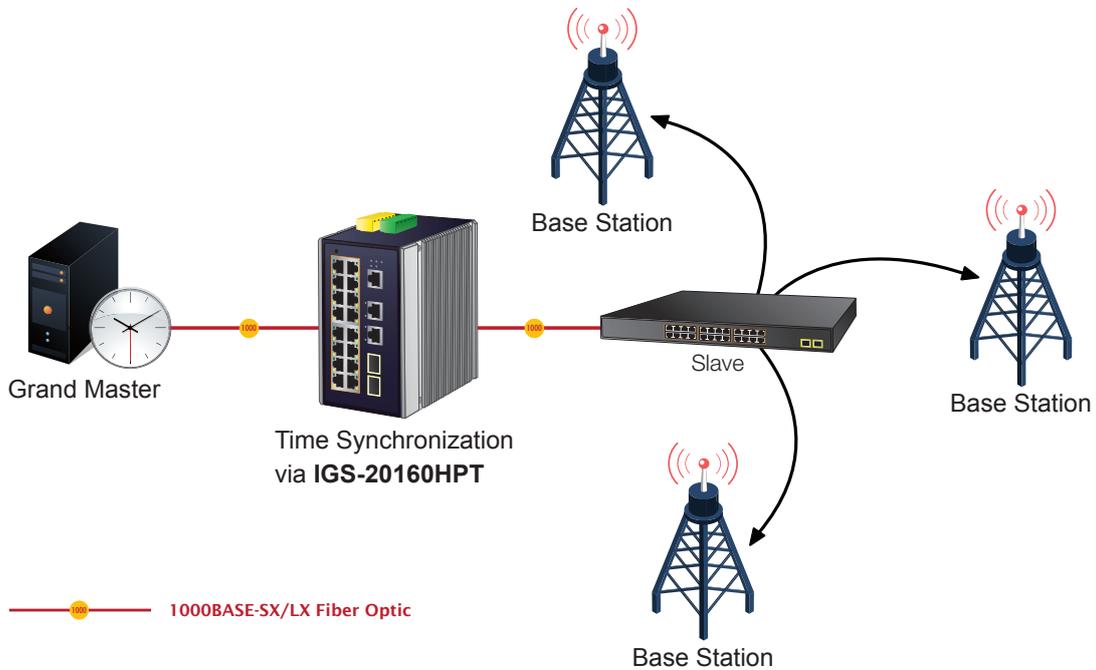
Flexibility and Extension Solution

The two mini-GBIC slots built in the IGS-20160HPT support triple speed, 100BASE-FX, 1000BASE-SX/LX and 2500BASE-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 300 meters to 2km (multi-mode fiber) and up to 10/20/40/60/80/120 kilometers (single-mode fiber or WDM fiber). They are well suited for applications within the enterprise data centers and distributions.

Small in Size but Big on PoE Output!

75°C -40°C ERPS PoE+ Redundant Power IP30

Intelligent SFP Diagnosis Mechanism

The IGS-20160HPT 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.

Digital Diagnostic Monitor *(DDM)*
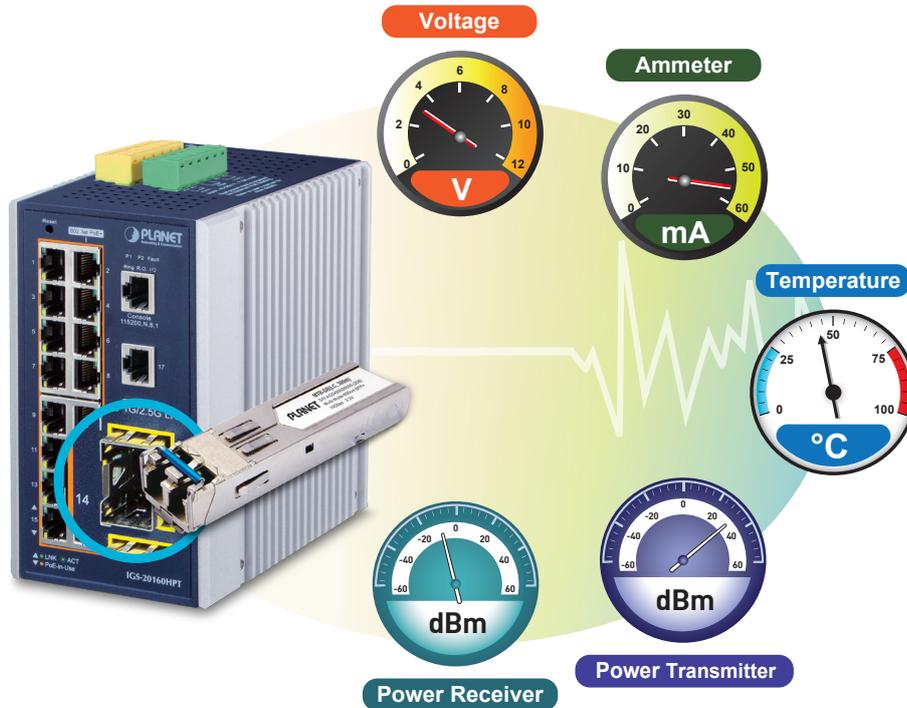
Applications

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.

Extending Ethernet Distance
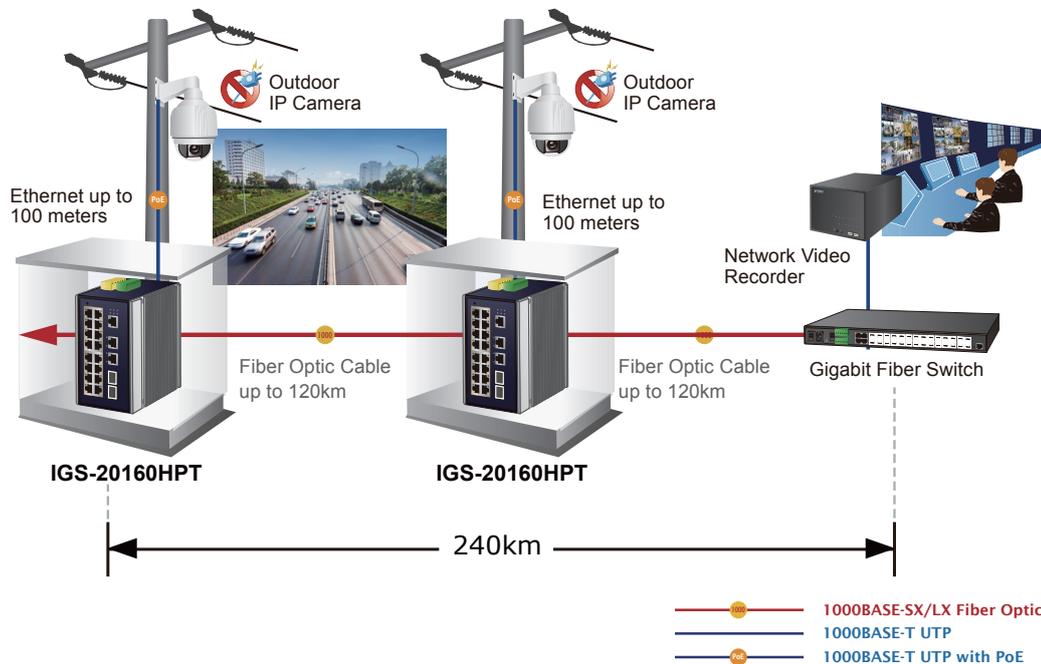
Layer 3 VLAN Dynamic Routing and PoE Application

With the built-in robust IPv4/IPv6 Layer 3 traffic routing protocols, the IGS-20160HPT ensures reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 32 routing entries. The IGS-20160HPT is certainly a cost-effective and ideal solution for enterprises.

Providing up to 16 Gigabit PoE+ ports and in-line power interface, the IGS-20160HPT PoE+ Managed Switch can easily build a centrally-controlled power network shared by wireless Gigabit AP, IP phone system, or mega-pixel IP camera system group for the enterprises.

VLAN Routing + PoE Applications

VoIP Phone (PoE)
VLAN100 Domain B 192.168.10.x/24

IP Surveillance (PoE)
VLAN300 Domain A 192.168.30.x/24

IGS-20160HPT
Layer 3 IP Dynamic Routing

Wireless AP (PoE)
VLAN200 Domain C 192.168.20.x/24

NVR Server
IP PBX Server

Control Center
VLAN1 Domain 192.168.0.x/24

1000BASE-T UTP with PoE
1000BASE-SX/LX Fiber Optic

Specifications

Product	IGS-20160HPT
Hardware Specifications	
Copper Ports	18 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	2 1000/2500BASE-X 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)
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 @ 24V DC

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)	86 x 107 x 152 mm
Weight	1548g
Power Requirements	Dual 48~56V DC (>51V DC for PoE+ output recommended)
Power Consumption	Max. 27 watts/92BTU (Power on without any connection) Max. 361 watts/1231BTU (Full loading with PoE function)

LED Indicator	System:
	    Power 1 (Green)
	    Power 2 (Green)
	    Fault Alarm (Red)
	    Ring (Green)
	    Ring Owner (Green)
	    DIDO (Red)
	Per 10/100/1000T RJ45 PoE+ Ports:
	    PoE-in-Use (Amber)
	    LNK/ACT (Green)
	Per 10/100/1000T RJ45Ports:
	    1000 LNK/ACT (Green)
	    100 LNK/ACT (Orange)
	Per SFP Interface:
	    10/100 LNK/ACT (Amber)
	    1G/2.5G LNK/ACT (Green)

Switching	
Switch Architecture	Store-and-Forward
Switch Fabric	46Gbps/non-blocking
Throughput (packet per second)	34.2Mpps@ 64 bytes packet
Address Table	32K entries, automatic source address learning and aging
Shared Data Buffer	32Mbits
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	10K bytes
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	48V Power input
	  - 240W maximum (depending on power input)
	52~56V Power input
	  - Single power input: 240W maximum (depending on power input)
	  - Dual power input: 320W maximum (depending on power input)
	*Dual power input must be the same as DC voltage, like dual 56V

Max. Number of Class 2 PDs	16
Max. Number of Class 3 PDs	16
Max. Number of Class 4 PDs	10
Layer 3 Functions	
IP Interfaces	Max. 128 VLAN interfaces
Routing Table	Max. 128 routing entries
Routing Protocols	IPv4 hardware static routing IPv6 hardware static routing IPv4 OSPFv2 dynamic routing
Layer 2 Function	
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 Many-to-1 monitor
VLAN	802.1Q tag-based VLAN, up to 4K VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN VLAN Translation Voice VLAN MVR (Multicast VLAN Registration) GVRP Up to 4K 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
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol

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 IPv4 IGMP querier mode support Up to 255 multicast groups
MLD Snooping	IPv6 MLD (v1/v2) snooping IPv6 MLD querier mode support Up to 255 multicast groups

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

Security Functions	

Access Control List	IP-based ACL/MAC-based ACL
	ACL based on:
	  - MAC Address
	  - IP Address
	  - Ethertype
	  - Protocol Type
	  - VLAN ID
	  - DSCP
	  - 802.1p Priority
	Up to 256 entries

Security	Port Security
	IP source guard
	Dynamic ARP inspection
	Command line authority control based on user level
AAA	RADIUS client
	TACACS+ client
Network Access Control	IEEE 802.1x port-based network access control
	MAC-based authentication
	Local/RADIUS authentication

Switch Management	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.2, SNMP v3
System Management	Firmware upgrade by HTTP protocol through Ethernet network
	Configuration upload/download through HTTP
	Remote syslog
	System log
	LLDP protocol
	NTP
	PLANET Smart Discovery Utility
Event Management	Remote syslog
	Local system log
	SMTP
ONVIF	ONVIF device discovery
	ONVIF device monitoring
	Floor Map
SNMP MIBs	RFC 1213 MIB-II
	RFC 2863 IF-MIB
	RFC 1493 Bridge MIB
	RFC 1643 Ethernet MIB
	RFC 2863 Interface MIB
	RFC 2665 Ether-Like MIB
	RFC 2737 Entity MIB
	RFC 2819 RMON MIB (Groups 1, 2, 3 and 9)
	RFC 2618 RADIUS Client 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 802.3ah OAM
	IEEE 802.3u 100BASE-TX/100BASE-FX	IEEE 802.1ag Connectivity Fault Management (CFM)
	IEEE 802.3z Gigabit SX/LX	IEEE 1588 PTPv2
	IEEE 802.3ab Gigabit 1000T	RFC 768 UDP
	IEEE 802.3x flow control and back pressure	RFC 793 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 2068 HTTP
	IEEE 802.1s Multiple Spanning Tree Protocol	RFC 1112 IGMP v1
	IEEE 802.1p Class of Service	RFC 2236 IGMP v2
	IEEE 802.1Q VLAN tagging	RFC 3376 IGMP version 3
	IEEE 802.1ad Q-in-Q VLAN stacking	RFC 2710 MLD version 1
	IEEE 802.1X Port Authentication Network Control	RFC 3810 MLD version 2
	IEEE 802.1ab LLDP	ITU G.8032 ERPS Ring
	IEEE 802.3af Power over Ethernet	ITU-T Y.1731 Performance Monitoring
	IEEE 802.3at Power over Ethernet Plus	

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

Dimensions

Top View

Side View

Front View

Side View

Rear View

Mounting Kit

DIN-Rail Kit

Mounting Kit

Bottom View

Unit: mm

Ordering Information

IGS-20160HPT	Industrial L3 16-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T + 2-Port 1G/2.5G SFP Managed Ethernet Switch (-40~75 degrees C)

Related Products

IGS-6325-16P4S	L3 Industrial 16-Port 10/100/1000T 802.3at PoE + 4-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-5225-8T2S2X	L3 Industrial 8-Port 10/100/1000T + 2-Port 100/1000X SFP + 2-Port 10G 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)
IGS-10020HPT	L2+ Industrial 8-Port 10/100/1000T 802.3at PoE + 2-Port 100/1000X SFP Managed Ethernet Switch (-40~75 degrees C)

Available Modules

MGB2G-Series Transceiver	2500BASE-SX/LX Transceiver
MGB-Series Transceiver	1000BASE-SX/LX Transceiver
MFB-Series Transceiver	100BASE-FX SFP Transceiver

Available Modules

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

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