

Product Specifications

L2+ Industrial 8-Port 10/100/1000T 802.3at PoE + 2-Port 100/1000X SFP Managed Switch with Wide Operating Temperature

IGS-10020PT

Version 3.0

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Change History:

Revision:	Date:	Author:	Change List
Version 3.0	2018/02/09	Peter	Supports 802.3 AF mode when power input in 48V DC Supports 802.3 AT mode when power input in 56V DC New firmware SDK release.
Version 2.0	2016/03/04	Neo	Change thermal design
Version 1.3	2015/03/05	Jos	Added L2+ feature
Version 1.0	2013/01/02	Neo	Initial Release
Version 0.9	2012/7/13	Norman	Draft version

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1. PRODUCT DESCRIPTION



Environmentally Hardened Design

PLANET Industrial 8-Port Gigabit 802.3at PoE+ Switch, IGS-10020PT, is equipped with rugged IP30 metal case for stable operation in heavy Industrial demanding environments. With IP30 industrial case protection, 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.

Cybersecurity Network Solution to Minimize Security Risks

The new generation of IGS-10020PT 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-10020PT expands its memory and upgrades the kernel of SSH 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.

Redundant Ring, Fast Recovery for Surveillance System

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 supply 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 10ms** to quickly bring the network back to normal operation.

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-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.

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 new IGS-10020PT provides 8 10/100/1000Mbps ports featuring **IEEE 802.3at** Power over Ethernet Plus (PoE+) that combines up to 240-watt power output and data per port over one Cat.5E/6 Ethernet cable. With a total 240-watt PoE budget on the whole system, the IGS-10020PT is designed specifically to satisfy the growing demand of higher power consuming network PDs (powered devices) such as PTZ (Pan, Tilt & Zoom)/**Speed Dome network cameras**, multi-channel (802.11a/b/g/n) wireless LAN access points and other PoE network devices by providing PoE power, doubling that of the current conventional 802.3af PoE.

Intelligent Alive Check for Powered Device

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.

PoE Schedule for Energy Saving

Under the trend of energy saving 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.

Digital Input and Digital Output for External Alarm

The IGS-10020PT 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-10020PT port shows link down, link up or power failure.

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

To help customers stay on top of their businesses, the IGS-10020 series 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-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 255. 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 8 ports per trunk group, and supports fail-over as well.

Efficient Management

For efficient management, the IGS-10020PT Managed Ethernet Switch is equipped with console, 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, the IGS-10020PT 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.

Advanced Network 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, which can be deployed with RADIUS to ensure the port level security and block illegal users. With the protected port function, communication between edge ports can be prevented to guarantee user privacy. Furthermore, the IGS-10020PT also provides DHCP snooping, IP source guard and dynamic ARP inspection functions to prevent IP snooping from attack and discarded ARP packets with invalid MAC address. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

Flexibility and Extension Solution

The two mini-GBIC slots built in the IGS-10020PT 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.

Modbus TCP provides Flexible Network Connectivity for Factory Automation

With the supported Modbus TCP/IP protocol, the IGS-10020PT series 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.

2. PRODUCT FEATURES

➤ **Physical Port**

- 8 10/100/1000BASE-T Gigabit Ethernet RJ45 ports with IEEE 802.3at PoE+ Injector
- 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 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
- PoE management features
 - IEEE 802.3af and IEEE 802.3at mode depend on DC input
 - 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 and Installation**

- IP30 aluminum case protection
- DIN rail and wall-mount design
- 48V-56V DC, redundant power with polarity reverse protect function
- Supports EFT protection of 6000 VDC for power line
- 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

➤ **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, spanning tree by VLAN (MSTP)
 - BPDU Guard
- Supports **Link Aggregation**
 - 802.3ad Link Aggregation Control Protocol (LACP)
 - Cisco ether-channel (static trunk)
 - Maximum 5 trunk groups with 8 ports per trunk group
 - Up to 16Gbps 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 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**

- 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 on the switch port
- DSCP remarking

➤ **Multicast**

- Supports IGMP snooping v1, v2 and v3
- Supports MLD snooping v1 and v2
- Querier mode support
- IGMP snooping port filtering
- 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 MAC address to IP address binding
- IP Source Guard prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

➤ **Management**

- Switch Management Interfaces
 - Console/Telnet Command Line Interface
 - Web switch management
 - SNMP v1 and v2c switch management
 - SSH/SSL and SNMP v3 secure access
- Four RMON groups (history, statistics, alarms, and events)
- IPv6 IP address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Firmware upload/download via HTTP/TFTP
- DHCP Relay
- DHCP Option 82
- DHCP Server
- User Privilege levels control
- Network Time Protocol (NTP)

- Link Layer Discovery Protocol (LLDP)
- SFP-DDM (Digital Diagnostic Monitor)
- Network Diagnostic
 - ICMPv6/ICMPv4 Remote Ping
 - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
- Reset button for system reboot or reset to factory default
- PLANET Smart Discovery Utility for deployment management

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Switch ASIC:	VITESSE VSC7428	x 1
CPU:	MIPS 416MHz (integrated with VSC7428)	x 1
PoE Chipset:	Microsemi PD69200C+PD69208M	x 1
Flash:	MX25L12845EMI-10G 16Mbytes	x 1
DDR RAM:	MT47H128M8-CF-25E 128Mbytes	x 1

3.2 FUNCTION SPECIFICATIONS

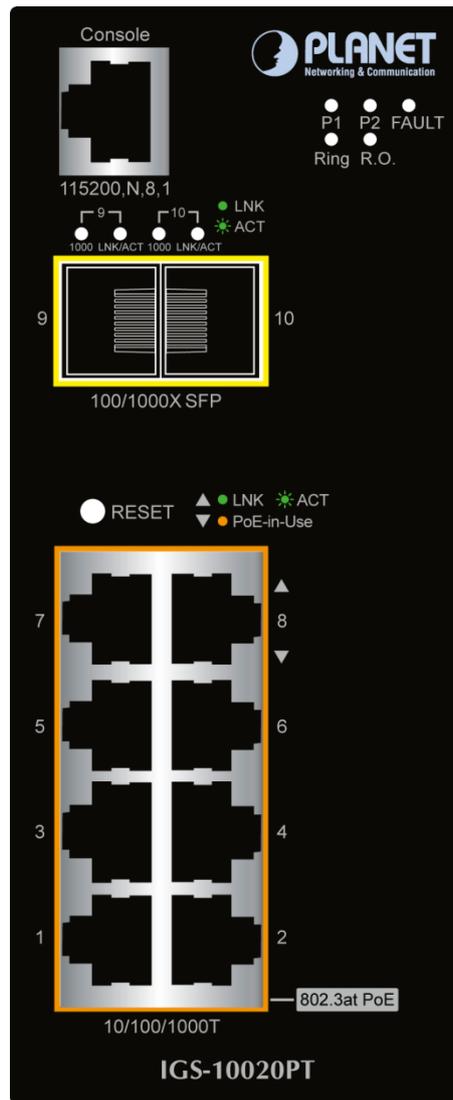
Product	IGS-10020PT
Hardware Specifications	
Version	3
Copper Ports	8 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	2 1000BASE-SX/LX/BX SFP interfaces (Port-9 and Port-10) Compatible with 100BASE-FX SFP
PoE Injector Port	8 ports with 802.3at/af PoE injector function with Port-1 to Port-8
Console	1 x RJ45-to-RS232 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	20Gbps/non-blocking
Throughput (packet per second)	14.8Mpps@ 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 ($\pm 0.1V$) Level 1: 2.1V~24V ($\pm 0.1V$) 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 Ports: PoE-in-Use (Orange) LNK/ACT (Green) Per SFP Interface: 1000 (Orange) LNK/ACT (Green)
Dimensions (W x D x H)	72 x 107x 152 mm
Weight	1032g
Power Requirements	DC 48V ~ 56V
Power Consumption	207 watts/706BTU (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	Per port up to 56V DC, 350mA; max. 15.4 watts (IEEE 802.3af) Per port up to 56V 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 PDs	8
Max. Number of Class 3 PDs	8
Max. Number of Class 4 PDs	8
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 MVR (Multicast VLAN Registration) Up to 255 VLAN groups, out of 4094 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk Supports 5 trunk groups with 8 ports per trunk group
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> 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-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 ITU G.8032 Ethernet Ring Protection Switching 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)

■ Front Panel:



■ LED Definition

System

LED	Color	Function
P1	Green	Lights to indicate that the Switch has power.
P2	Green	Lights to indicate that the Switch has power.
Fault	Green	Lights to indicate power failure.
Ring	Green	Lights to indicate that the ERPS Ring has been created successfully.
R.O.	Green	Lights to indicate that Switch has been enabled to Ring Owner.

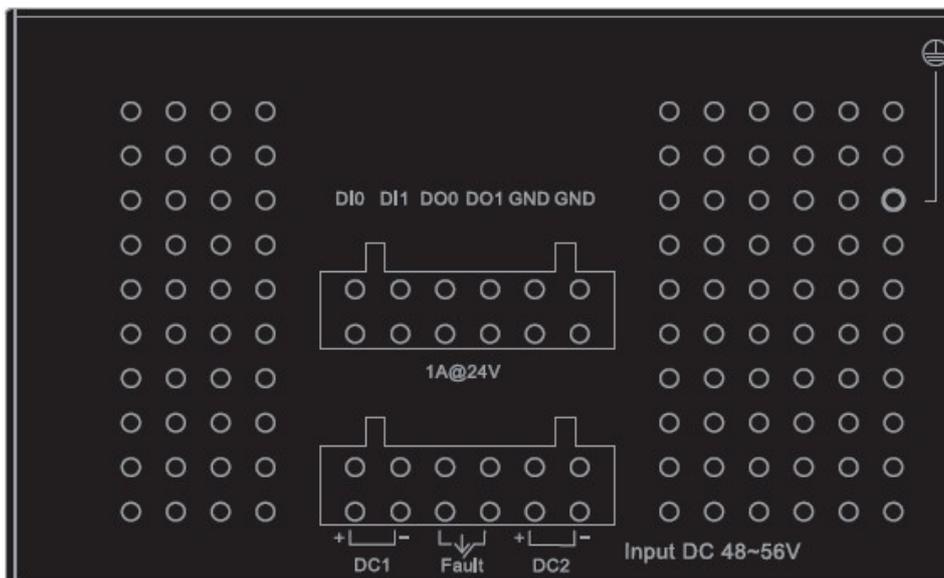
Per 10/100/1000Mbps port with PoE

LED	Color	Function
10/100/1000 LNK/ACT	Green	Lights to indicate the port is running in 10/100/1000Mbps speed and successfully established. Blinks to indicate that the switch is actively sending or receiving data over that port.
PoE-in-Use	Orange	Lights: To indicate the port is providing up to 56V DC in-line power. Off: To indicate the connected device is not a PoE Powered Device (PD).

SFP 100/1000Mbps (Port-9, Port-10 mini-GBIC)

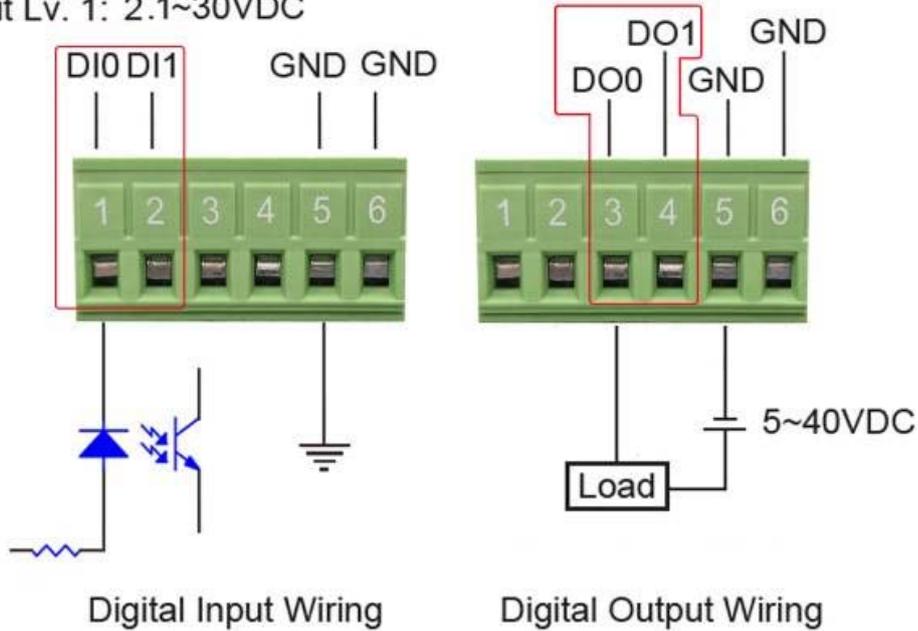
LED	Color	Function	
LNK / ACT	Green	Lights	To indicate the link through that port is successfully established.
		Blinks	To indicate that the Switch is actively sending or receiving data over that port.
1000	Orange	Lights	To indicate that the port is successfully connecting to the network at 1000Mbps.
		Off	To indicate that the port is successfully connecting to the network at 100Mbps.

■ **Upper Panel:**



■ **DI & DO Connectors:**

Input Lv. 0: -30~2.1VDC
Input Lv. 1: 2.1~30VDC



3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

- Temperature: -40 ~ 75 degrees C
- Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

- Temperature: -40 degrees C ~ 85 degrees C
- Relative Humidity: 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATIONS

Power Requirements: 48V -56V DC

Power Consumption:

LOADING INPUT	System on without any devices attached	Port-1~Port-10 Link Up with Full Load (with 8-port PoE+ Load)
	48V	7.2watts/24BTU
56V	7.8watts/26BTU	207watts/706BTU

3.6 REGULATORY COMPLIANCE

CE, FCC Class A

Stability Testing:

- IEC60068-2-32 (free fall)
- IEC60068-2-27 (shock)
- IEC60068-2-6 (vibration)

3.7 RELIABILITY

MTBF > 100,000 hrs @ 25 degrees C

3.8 BASIC PACKAGING

- The IGS-10020PT x 1
- Quick Installation Guide x 1
- DIN Rail Kit x 1
- Wall Mounting Kit x 1
- DB9 to RJ45 Interface RS232 Console Cable x 1
- Dust Cap (Please refer to the table below.)

item	RJ45 Dust Cap	SFP Dust Cap
IGS-10020PT	9	2

3.9 PACKING INFORMATION

Box Dimensions (W x D x H):	300 x 170 x 90 mm
Gross Weight:	1.652g
Carton Dimensions (W x D x H):	385 x 340 x 490 mm
Total Weight:	16.2kg
Quantity:	10pcs per carton