

Product Specifications

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

IGS-10020MT

Version 3.0

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Change History:

Revision:	Date:	Author:	Change List
Version 3.0	2018/11/28	Marc Liao	New Firmware SDK Initial Release.
Version 2.0	2013/08/02	Kent Kang	1.Upgrade flash size from 8MB to 16MB 2.Add two Ring LEDs 3.Software adds ERPS feature
Version 1.0	2012/7/6	Marc Liao	Initial Release

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Reviewed By:		Approved By:	Kent Kang

1. PRODUCT DESCRIPTION



PLANET IGS-10020MT is a **fully-managed Gigabit fiber switch** usually designed for the industrial network. It features **8 10/100/1000BASE-T** copper ports, **2 100/1000BASE-X SFP** ports and redundant power system in an IP30 rugged but compact-sized case that can be installed in any difficult environment without space limitation. It provides user-friendly yet advanced **IPv6/IPv4 management** interfaces, abundant **L2/L4 switching functions** and Layer 3 static routing capability. The IGS-10020MT can operate stably under the temperature range from **-40 to 75 degrees C** and allows either DIN-rail or wall mounting for efficient use of cabinet space. With **2 dual-speed SFP fiber slots**, it can be flexibly applied to extend the connection distance.

Cybersecurity Network Solution to Minimize Security Risks

The cybersecurity feature that virtually needs no effort and cost to have includes the protection of the switch management and the enhanced security of the mission-critical network. Both SSH and TLS protocols are utilized 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-10020MT 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 certain simple Ring network, the recovery time of data link can be as fast as 10ms.

SMTP/SNMP Trap Event Alert and Alarm Alert

The IGS-10020MT 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. The IGS-10020MT 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.

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

To help customers stay on top of their businesses, the IGS-10020MT not only provides high transmission performance and excellent Layer 2 technologies, but also IPv4/IPv6 software VLAN routing feature which allows to cross over 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-10020MT 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-10020MT provides 802.1Q tagged VLAN, and the VLAN groups allowed will be maximally up to 255. Via aggregation of supporting ports, the IGS-10020MT allows the operation of a high-speed trunk combining multiple ports. It enables a maximum of up to 10 trunk groups with 8 ports per trunk group, and supports fail-over as well.

Efficient Management

For efficient management, the IGS-10020MT is equipped with console, Web and SNMP management interfaces. With the built-in Web-based management interface, the IGS-10020MT offers an easy-to-use, platform-independent management and configuration facility. For text-based management, the IGS-10020MT 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.

Powerful Security from Layer 2 to Layer 4

The IGS-10020MT 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. With the private VLAN function, communication between edge ports can be prevented to ensure user privacy.

Flexibility and Extension Solution

The additional two mini-GBIC slots built in the IGS-10020MT 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 10/40/80/120 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-10020MT 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.

1588 Time Protocol for Industrial Computing Networks

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

Modbus TCP Provides Flexible Network Connectivity for Factory Automation

With the supported **Modbus TCP/IP** protocol, the IGS10020MT can easily integrate with **SCADA** systems, **HMI** systems and other data acquisition systems in factory floors. It enables administrators to remotely monitor the statuses of **the industrial Ethernet switch, ports and communication**, thus easily achieving enhanced monitoring and maintenance of the entire factory.

Environmentally Hardened Design

With IP30 aluminum industrial case protection, the IGS-10020MT provides a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curb-side traffic control cabinets. It also possesses an integrated power supply source with a wide range of voltages (**12 to 48V DC** or **24V AC**) for worldwide high availability applications requiring dual or backup power inputs. Being able to operate under the temperature range from -40 to 75 degrees C, the IGS-10020MT can be placed in almost any difficult environment.

2. PRODUCT FEATURES

➤ **Physical Port**

- 8 10/100/1000BASE-T Gigabit Ethernet RJ45 ports
- 2 100/1000BASE-X mini-GBIC/SFP slots for SFP type auto detection

➤ **Industrial Case and Installation**

- IP30 aluminum case protection
- DIN-rail or wall-mount design
- Redundant power design
 - 12 to 48V DC, redundant power with polarity reverse protect function
 - AC 24V power adapter acceptable
- Supports 6000 VDC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

➤ **Industrial Protocol**

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

➤ **Layer 2 Features**

- High performance of Store-and-Forward architecture and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support
 - Broadcast, Multicast and Unknown Unicast
- Supports **VLAN**
 - IEEE 802.1Q tagged VLAN
 - Up to 255 VLANs groups, out of 4095 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 5 trunk groups, up to 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)
- 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 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 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 cooperate 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
 - 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**

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
 - Telnet Command Line Interface
 - Web switch management
 - SNMP v1 and v2c switch management
 - SSH/TLS and SNMP v3 secure access
- SNMP Management
 - Four RMON groups (history, statistics, alarms, and events)
 - SNMP trap for interface Link Up and Link Down notification
- 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/TFTP
 - Reset button for system reboot or reset to factory default
 - Dual Images
- DHCP Relay and DHCP Option 82
- DHCP Server
- User Privilege levels control
- Network Time Protocol (NTP)
- SFP-**DDM** (Digital Diagnostic Monitor)
- Network Diagnostic
 - ICMPv6/ICMPv4 Remote Ping
 - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
- 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
Flash:	MX25L12845EMI-10G 16Mbytes	x 1
DDR RAM:	MT47H128M8-CF-25E 128Mbytes	x 1

3.2 FUNCTION SPECIFICATIONS

Model Name	IGS-10020MT	
Hardware Specifications		
Copper Ports	8 10/ 100/1000BASE-T RJ-45 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	
Switch Architecture	Store-and-Forward	
Switch Fabric	20Gbps / non-blocking	
Throughput (packet per second)	14.8Mpps	
Address Table	8K entries, automatic source address learning and ageing	
Shared Data Buffer	512 kilobytes	
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 metal 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	
Alarm	One relay output for power failure. Alarm relay current carry ability: 1A @ DC 24V	
LED Indicator	System: Power 1 (Green) Power 2 (Green) Fault Alarm (Green) Ring (Green) R.O. (Green)	Per 10/100/1000T RJ45 Ports: LNK/ACT (Green) 1000 (Orange) Per SFP Interface: LNK/ACT (Green) 1000 (Orange)
Power Requirements	Dual 12~48V DC 24V AC	
Power Consumption	10 watts / 34BTU (full loading)	
Layer 2 function		
Basic Management Interfaces	Web Browser, Remote Telnet, SNMP v1, v2c	
Secure Management Interface	SSH, TLS, 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, and trunk status.
Port Mirroring	TX / RX / Both Many to 1 monitor
VLAN	802.1Q tagged 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 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP / static trunk Support 5 trunk groups with 10 ports per trunk
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	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 <ul style="list-style-type: none"> -Ingress: 500Kb~80Mbps -Egress: 64Kb~80Mbps
SNMP MIBs	RFC-1213 MIB-II RFC-2737 Entity MIB IF-MIB RFC-2618 RADIUS Client MIB RFC-1493 Bridge MIB RFC-2933 IGMP-STD-MIB RFC-1643 Ethernet MIB RFC3411 SNMP-Frameworks-MIB RFC-2863 Interface MIB IEEE 802.1X PAE RFC-2665 Ether-Like MIB LLDP RFC-2819 RMON MIB (Groups 1, 2, 3 and 9) 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	
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 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 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 FRC 3810 MLD version 2 ITU G.8032 ERPS Ring

3.3 PHYSICAL SPECIFICATIONS:

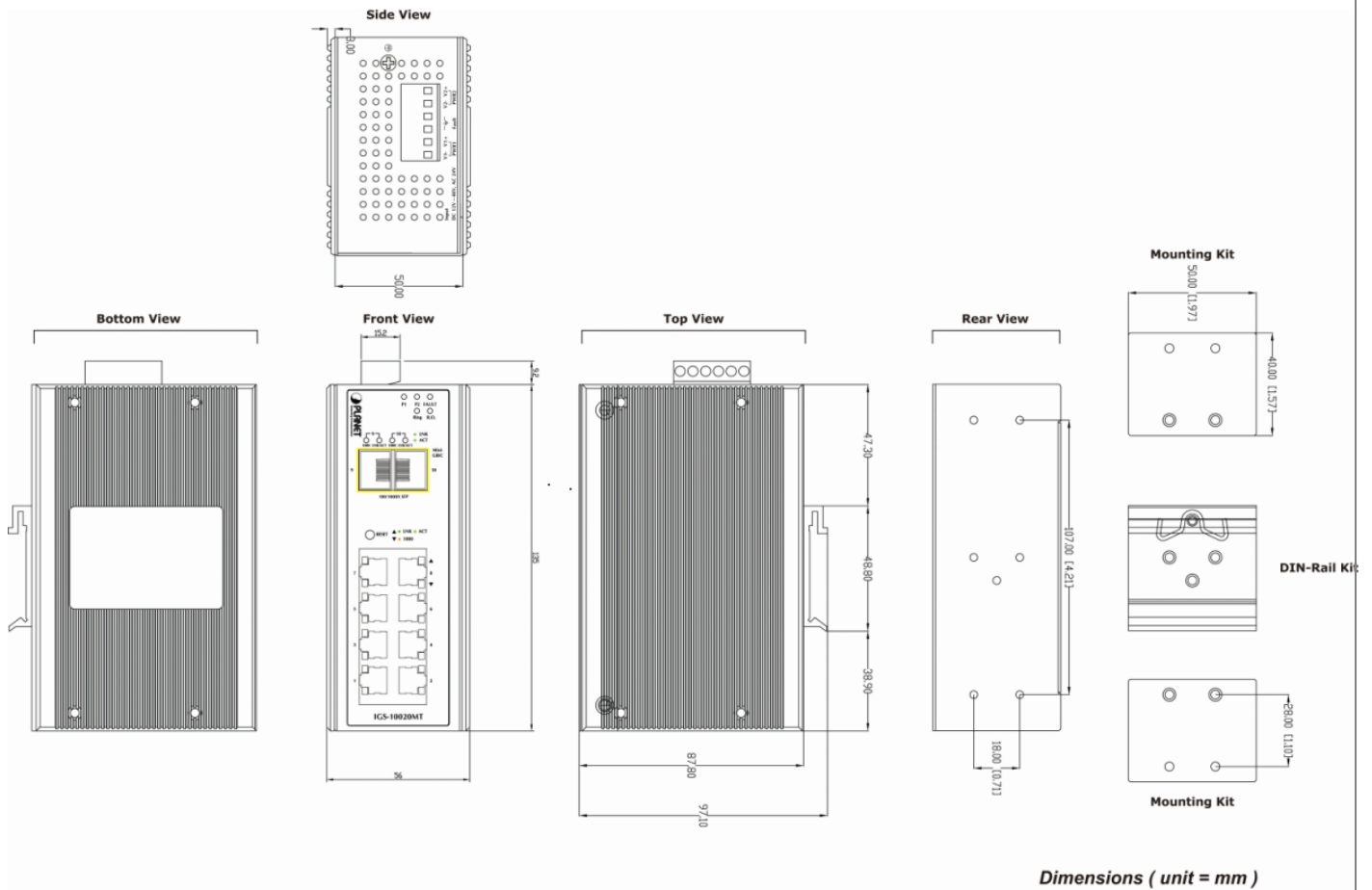
■ **Dimensions:**

56 x 87.8 x 135 mm (W x D x H)

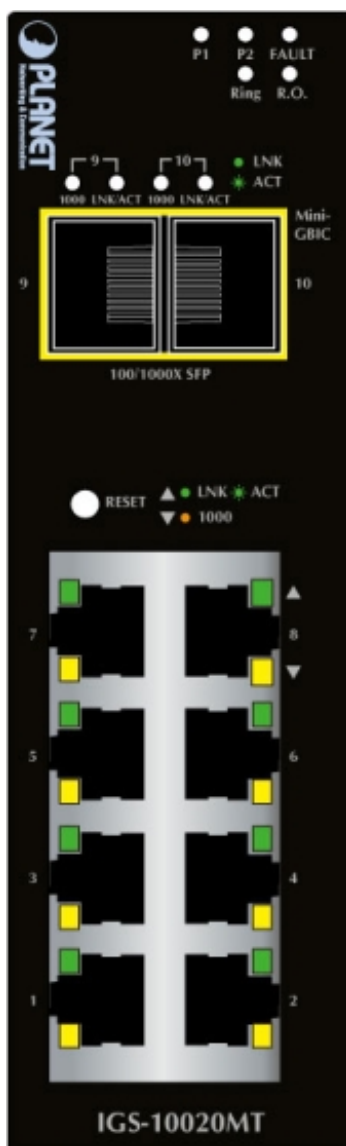
■ **Weight:**

720g

■ **Diagram:**



■ 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.

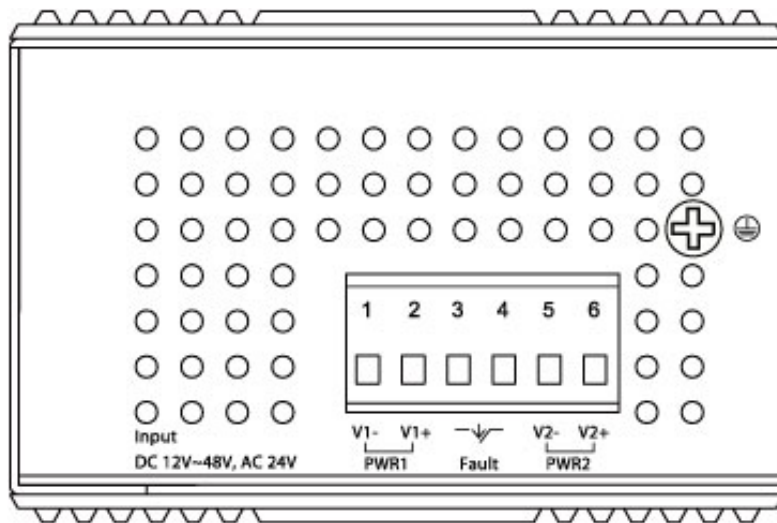
Per 10/100/1000BASE-T Port

LED	Color	Function	
LNK / ACT	Green	Light	Indicates the link through that port is successfully established.
		Blink	Indicates that the Switch is actively sending or receiving data over that port.
1000	Orange	Light	Indicates that the port is successfully connecting to the network at 1000Mbps.
		Off	Indicates that the port is successfully connecting to the network at 10Mbps or 100Mbps.

Per SFP Interface

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

■ Upper Panel:



3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: -40 ~ 75 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

Temperature: -40 degrees C ~ 75 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATIONS

Power Requirements: 12 to 48V DC, redundant power with polarity reverse protection

AC 24V Power Adapter

Power Consumption:

LOADING INPUT	System on without any devices attached	Port-1~Port-10 Link Up with Full Load
12V	5.04 watts	10.8 watts
24V	5.04 watts	10.8 watts
48V	5.28 watts	10.8 watts

3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

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-10020MT x 1
- Quick Installation Guide x 1
- DIN Rail Kit x 1
- Wall Mounting Kit x 1
- Dust Cap (Please refer to the table below.)

Item	RJ45 Dust Cap	SFP Dust Cap
IGS-10020MT	8	2

3.9 PACKING INFORMATION

Box Dimensions (W x D x H):	202 x 140 x 94mm
Gross Weight:	1075g
Carton Dimensions (W x D x H):	600 x 239 x 322mm
Total Weight:	12.9kg
Quantity:	12pcs per carton