Product Specifications

Industrial 8-Port 10/100/1000T + 4-Port 100/1000X SFP Managed Switch

IGS-12040MT

Version 1.0

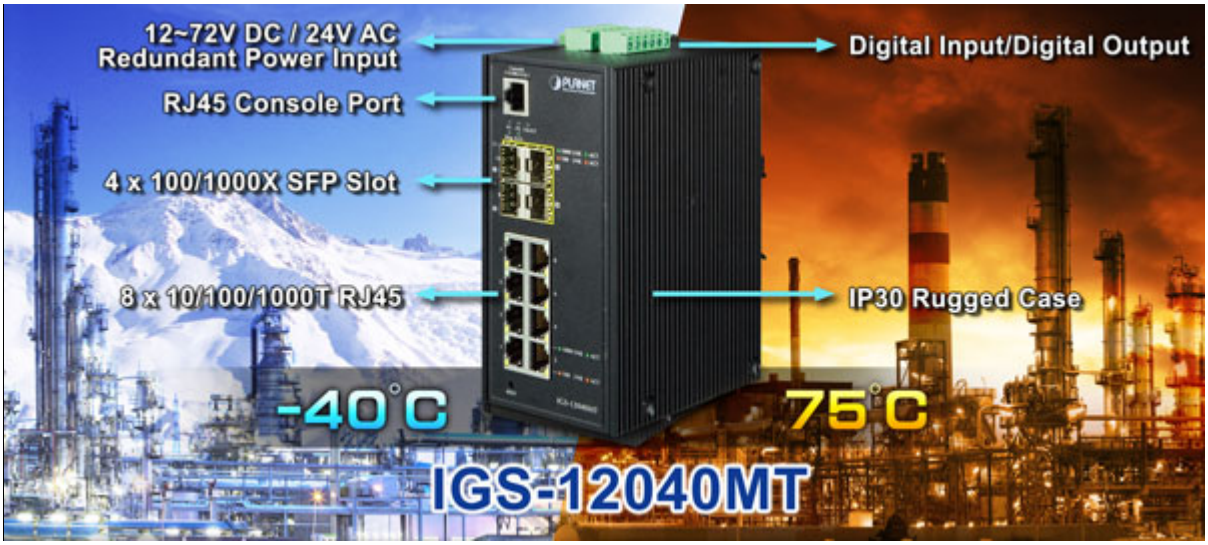
Change History:

Revision	Date	Author	Change List
Version 1.0	03/19/2015	Neo Tsai	Initial release

Author	Neo Tsai	**Editor:**	Neo Tsai
Reviewed by:	Kent Kang	**Approved by:**	Tom Shih

1. PRODUCT DESCRIPTION

PLANET IGS-12040MT is an **Industrial 12-port Full Gigabit Managed Ethernet Switch** specially designed to build a full Gigabit backbone to transmit reliable and high speed data in heavy industrial demanding environments and forward data to remote network through fiber optic. It provides **eight 10/100/1000BASE-T copper ports** and **4 extra 100/1000BASE-X SFP fiber optic interfaces** delivered in an IP30 rugged strong case with redundant power system. Besides support for 24Gbps switch fabric to handle extremely large amounts of video, voice and important data in a secure topology, the IGS-12040MT provides user-friendly but advanced **IPv6 / IPv4 management** interfaces and abundant L2 / L4 switching functions. It is the best investment for industrial business expanding or upgrading its network infrastructure.

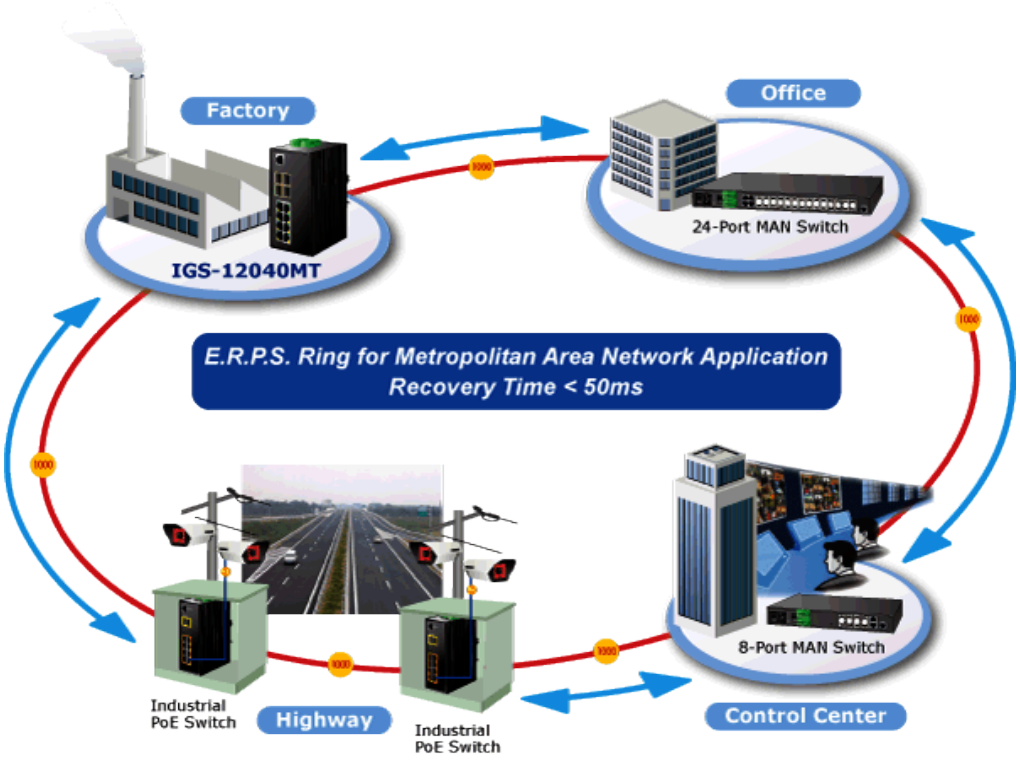


Environmentally Hardened Design

With the IP30 industrial aluminum case, the IGS-12040MT 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. It also possesses an integrated power supply source with a wide range of voltages (**12 to 72V 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-12040MT can be placed in almost any difficult environment.

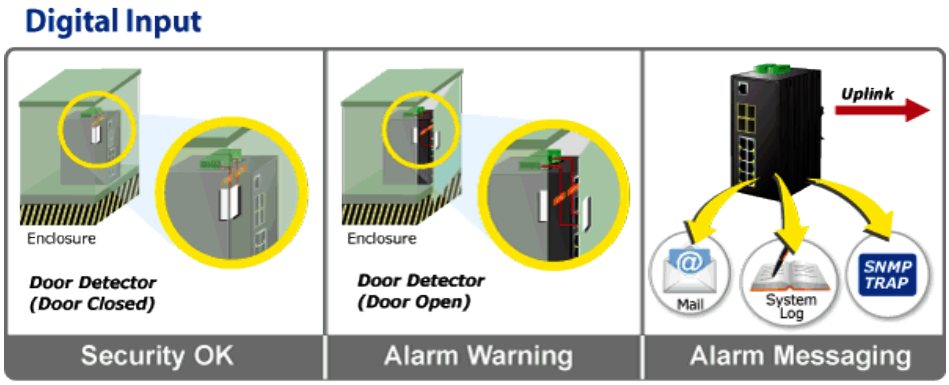
Redundant Ring, Fast Recovery for Critical Network Applications

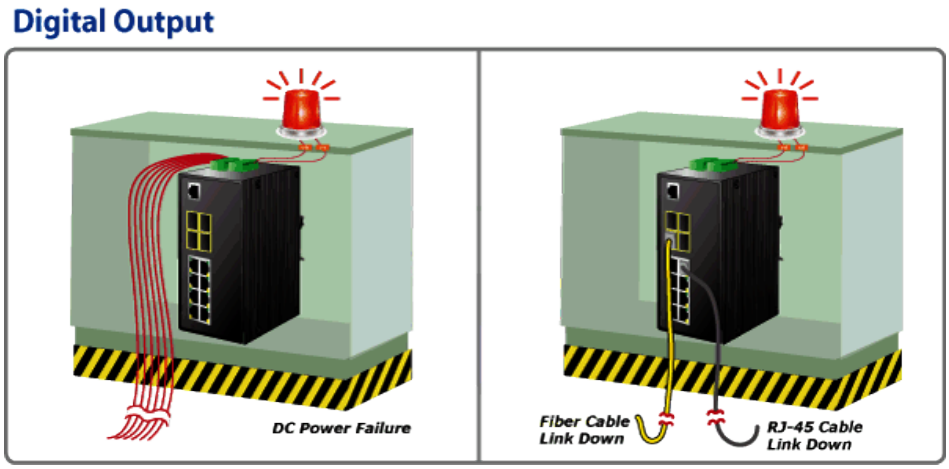
The IGS-12040MT supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant 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 20ms.



Digital Input and Digital Output for External Alarm

The IGS-12040MT supports Digital Input and Digital Output on its upper panel. The external alarm enables users to use Digital Input to detect external device's 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-12040MT port is link-down, link-up or power-dead.





Robust Layer2 Features

The IGS-12040MT can be programmed for advanced switch management function, such as dynamic port link aggregation, **Q-in-Q VLAN**, **Multiple Spanning Tree Protocol (MSTP)**, Layer 2/4 QoS, bandwidth control and **IGMP/MLD snooping**. The IGS-12040MT allows the operation of a high-speed trunk combining multiple ports. It enables a maximum of up to 6 groups of 8 ports for trunking and supports connection fail-over as well.

IPv6 / IPv4 Full-function Secure Switch for Building Automation Networking

The IGS-12040MT is the ideal solution to fulfilling the demand of IPv6 management Gigabit Ethernet Switch, especially in the Industrial hardened environment. It supports both IPv4 and IPv6 protocols, advanced Layer 2 to Layer 4 data switching and redundancy, QoS traffic control, network access control and authentication, and Secure Management features to protect customer's industrial and building automation network connectivity with reliable switching recovery capability that is suitable for implementing fault tolerant and mesh network architectures.

IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

The IGS-12040MT offers IPv4/IPv6 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.

User-friendly Secure Management

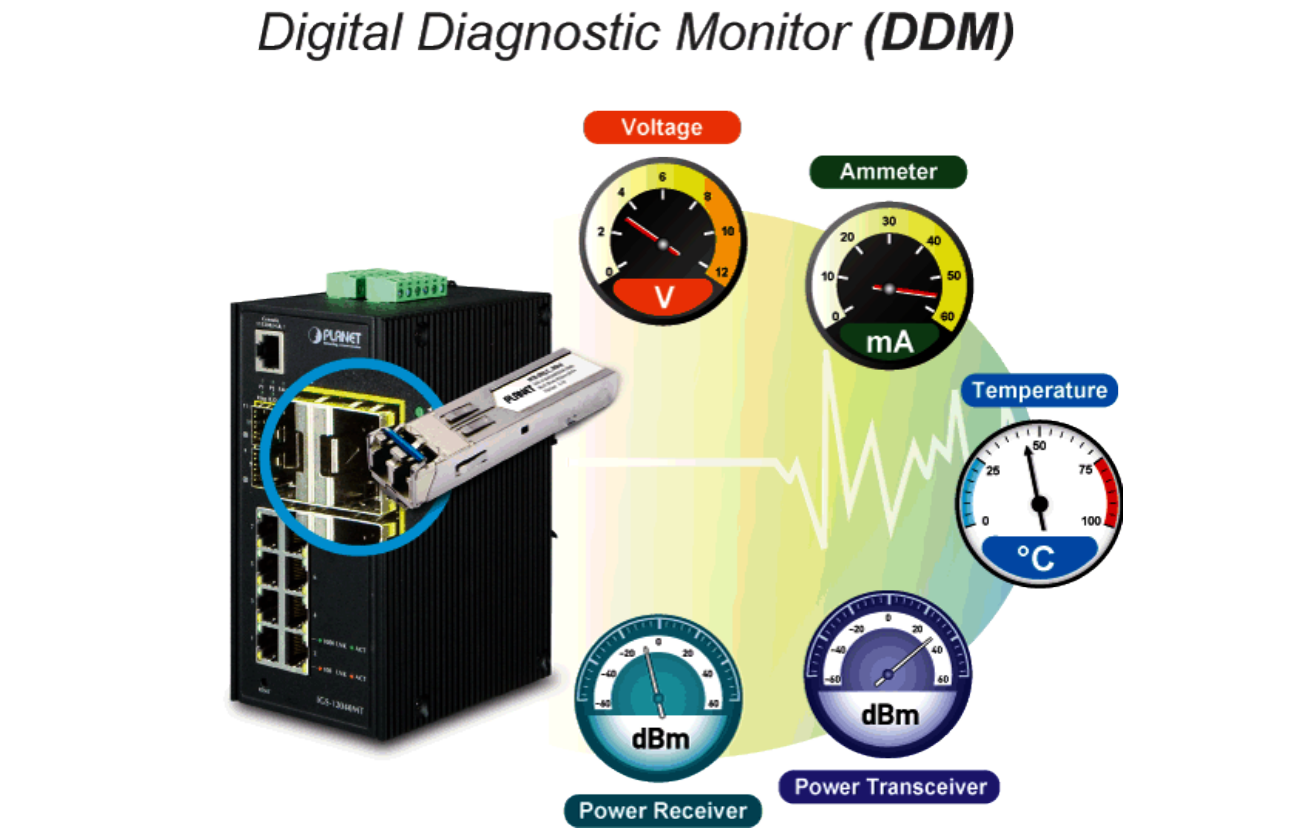
For efficient management, the IGS-12040MT is equipped with console, Web and SNMP management interfaces. With the built-in web-based management interface, the IGS-12040MT offers an easy-to-use, platform independent management and configuration facility. The IGS-12040MT supports SNMP and it can be managed via any management software based on standard of SNMP v1 and v2 protocol. For reducing product learning time, the IGS-12040MT offers Cisco-like command via Telnet or console port and customer doesn't need to learn new command from these switches. Moreover, the IGS-12040MT offers remote secure management by supporting **SSH**, **SSL** and **SNMP v3** connection which can encrypt the packet content at each session.

Flexible and Extendable Solution

The 4 mini-GBIC slots built in the IGS-12040MT support dual-speed as it features **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 the transmission distance or the transmission speed required to extend the network efficiently.

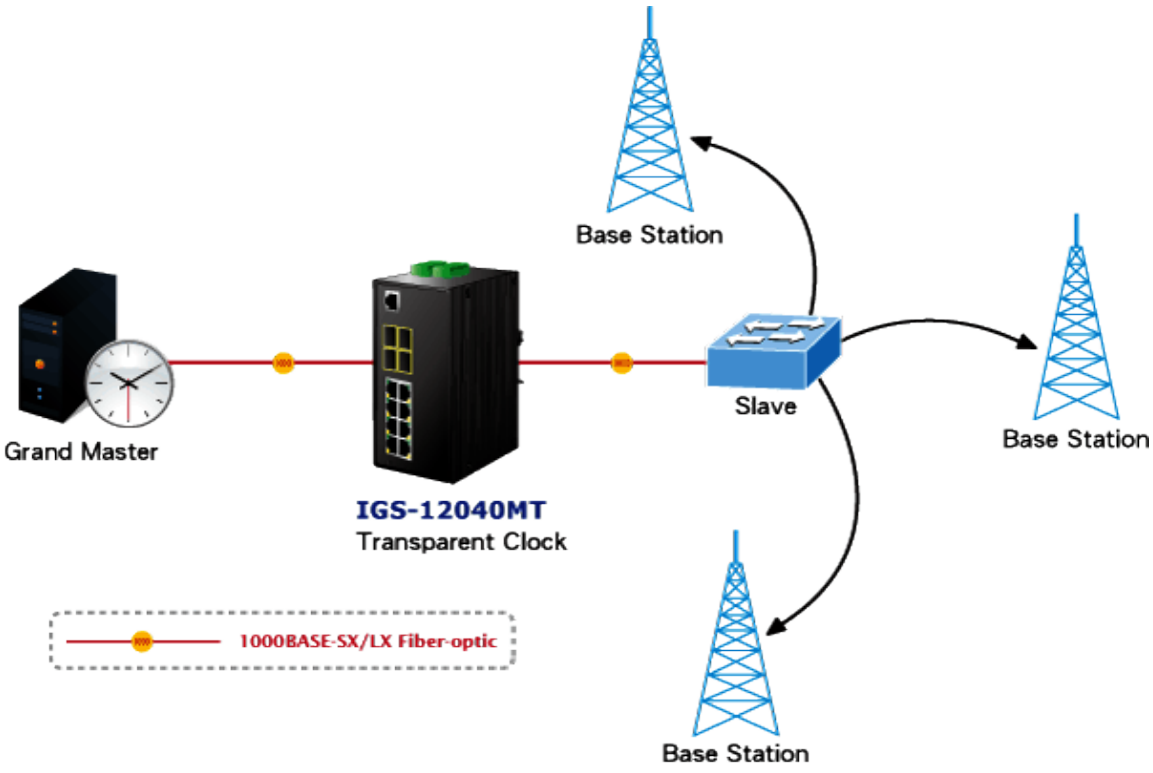
Intelligent SFP Diagnosis Mechanism

The IGS-12040MT supports SFP-**DDM** (**Digital Diagnostic Monitor**) function that can easily monitor real-time parameters of the SFP for network administrator, 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-12040MT is intended 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**
  - **Eight 10/100/1000BASE-T** RJ45 copper ports
  - **Four 100/1000BASE-X mini-GBIC/SFP** slots, SFP type auto detection
  - One RJ45 console interface for basic management and setup

- **Industrial Case / Installation**
  - IP30 aluminum case protection
  - DIN-rail and wall-mount design
  - Redundant power design
    - 12 to **72V** DC, redundant power with polarity reverse protect function
    - AC 24V power adapter acceptable
  - Supports EFT protection for 6000V DC power and 6000V DC Ethernet ESD protection
  - -40 to 75 degrees C operating temperature

- **Digital Input / Digital Output**
  - 2 Digital Input (DI)
  - 2 Digital Output (DO)
  - Integrates sensors into auto alarm system
  - Transfers alarm to IP network via email and SNMP trap

- **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 / 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
  - Supports **Spanning Tree Protocol**
    - STP, IEEE 802.1D Spanning Tree Protocol
    - RSTP, IEEE 802.1w Rapid Spanning Tree Protocol
    - MSTP, IEEE 802.1s Multiple Spanning Tree Protocol by VLAN
    - BPDU Guard
  - Supports **Link Aggregation**
    - 802.3ad Link Aggregation Control Protocol (LACP)
    - Cisco ether-channel (static trunk)

- Maximum 6 trunk groups, up to 8 ports per trunk group
- Up to 16Gbps bandwidth (duplex mode)

- Provides port mirror (many-to-1)
- Port Mirroring of the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports E.R.P.S. **(Ethernet Ring Protection Switching)**
- IEEE 1588 and Synchronous Ethernet network timing

➢ **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
- IGMP Snooping port filtering
- 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 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
- Auto DoS rule to defend DoS attack
- IP address access management to prevent unauthorized intruder

➢ **Layer 3 IP Routing Features**

- Supports maximum 32 static routes and route summarization

➢ **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 / SSL 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 / TFTP
  - Reset button for system reboot or reset to factory default
  - Dual Images
- DHCP Relay and DHCP Option82
- User Privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- SFP-**DDM** (Digital Diagnostic Monitor)
- Network Diagnostic
  - ICMPv6 / ICMPv4 Remote Ping
  - Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues
- SMTP / Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interfacing Link Up and Link Down notification
- System Log
- PLANET Smart Discovery Utility for deploy management

3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Switch ASIC:	Vitesse VSC7429	x 1
CPU:	MIPS 416MHz (integrated with VSC7429)	x 1
PHY:	Vitesse VSC8504XKS-04	x 2
Flash Size	128M-bit	x 1
DRAM Size	128MB	x 1

3.2 FUNCTION SPECIFICATIONS

Model Name	**IGS-12040MT**
Hardware Specifications	
Copper Ports	8 10/ 100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	4 1000BASE-SX/LX/BX SFP interfaces (Port-9 to Port-12) Compatible with 100BASE-FX SFP
Console	1 x RJ45 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	24Gbps / non-blocking
Throughput (packet per second)	17.85Mpps@64Bytes
Address Table	8K entries, automatic source address learning and ageing
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
EFT 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 0 & DI 1, Pin 3/4 for DO 0 & DO 1, Pin 5/6 for GND
Alarm	One relay output for power failure. Alarm Relay current carry ability: 1A @ 24V AC
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) R.O. (Green)	Per 10/100/1000T RJ45 Port: 1000 LNK/ACT (Green) 10/100 LNK/ACT (Orange) Per SFP Interface: 1000 LNK/ACT (Green) 100 LNK/ACT (Orange)
Dimensions (W x D x H)	72 x 107 x 152 mm	
Weight	1010g	
Power Requirements	12V to 72V DC 24V AC	
Power Consumption	6.5 watts / 22.18BTU (System on) 12 watts / 40.95BTU (Full loading)	
Layer 2 Functions		
Basic Management Interfaces	Web browser, Telnet, SNMP v1, v2c, local console	
Secure Management Interface	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 Many 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 4095 VLAN IDs	
Link Aggregation	IEEE 802.3ad LACP / static trunk Supports 6 groups of 8-port trunk	
QoS	Traffic classification based, strict priority and WRR 8-level priority for switching - Port number - 802.1p priority - 802.1Q VLAN tag - DSCP/TOS field in IP packet	

IGMP Snooping	IGMP (v1 / v2 / v3) snooping, up to 255 multicast groups IGMP Querier mode support	
MLD Snooping	MLD (v1 / v2) snooping, up to 255 multicast groups MLD Querier mode support	
Access Control List	IP-based ACL / MAC-based ACL Up to 256 entries	
Bandwidth Control	Per port bandwidth control Ingress: 500 Mbps ~1000Mbps Egress: 500 Mbps ~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 RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB
Layer 3 Functions		
IP Interfaces	Max. 8 VLAN interfaces	
Routing Table	Max. 32 routing entries	
Routing Protocols	IPv4 software static routing IPv6 software static routing	
Standards Conformance		
Regulation Compliance	FCC Part 15 Class A, CE	
Stability Testing	IEC 60068-2-32 (free fall) IEC 60068-2-27 (shock) IEC 60068-2-6 (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	IEEE 802.1Q VLAN tagging IEEE 802.1x Port Authentication Network Control IEEE 802.1ab LLDP IEEE 1588v2 RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP version 1 RFC 2236 IGMP version 2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1

	Tree Protocol IEEE 802.1p Class of service	FRC 3810 MLD version 2
Environment		
Operating	Temperature: -40 ~ 75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

3.3 PHYSICAL SPECIFICATIONS:

Dimensions:

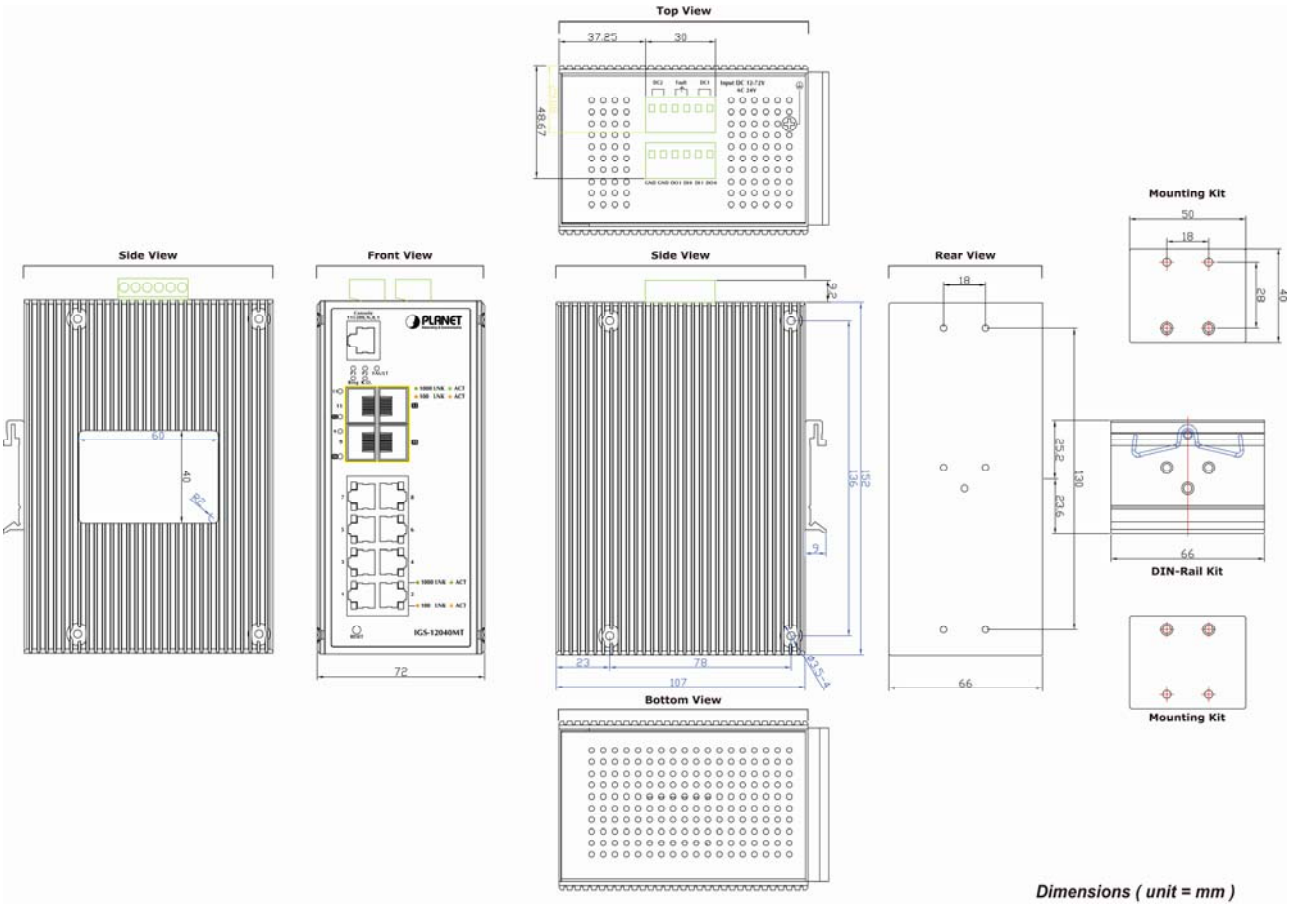
72 x 107 x 152 mm (W x D x H)

Weight:

1010g

Diagram:

Dimensions (W x D x H): 72 x 107 x 152 mm



LED Definition:

■ **System**

LED	Color	Function
P1	**Green**	Lights to indicate power 1 has power.
P2	**Green**	Lights to indicate power 2 has power.
Fault	**Green**	Lights to indicate either power 1 or power 2 has no power.
Ring	**Green**	Lights to indicate that the ERPS Ring has been created successfully.
R.O.*	**Green**	Lights to indicate that Switch has enabled Ring Owner.

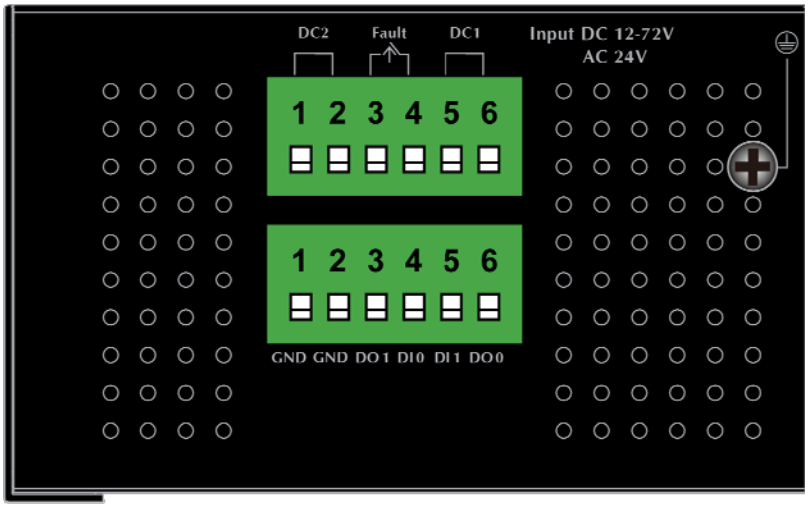
■ **Per 10/100/1000BASE-T Port**

LED	Color	Function	
1000 LNK / ACT	**Green**	**Lights**	Indicating the port is running in **1000Mbps** speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.
10/100 LNK/ACT	**Orange**	**Lights**	Indicating the port is running in **10/100Mbps** speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.

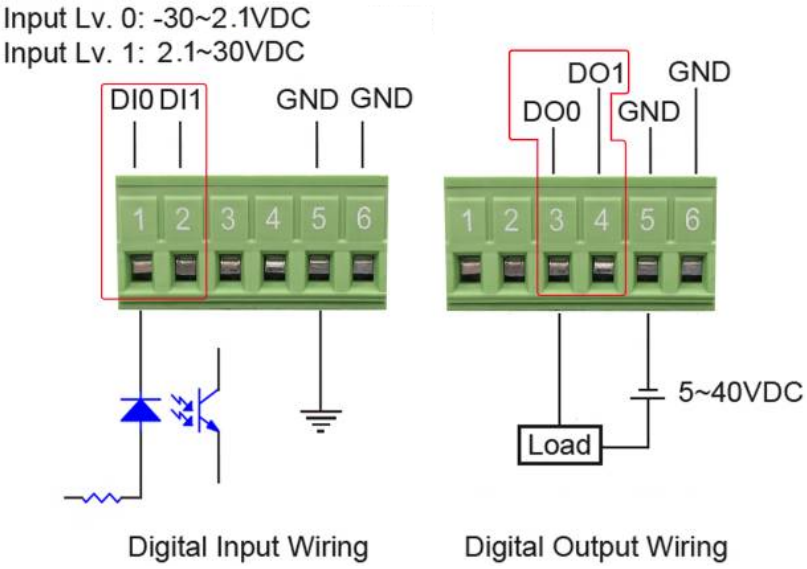
■ **Per SFP Interface**

LED	Color	Function	
1000 LNK / ACT	**Green**	**Lights**	Indicating the port is running in **1000Mbps** speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.
100 LNK/ACT	**Orange**	**Lights**	Indicating the port is running in **100Mbps** speed and successfully established.
		Blinks	Indicating that the switch is actively sending or receiving data over that port.

Upper Panel:



■ **DI/DO connector:**



3.4 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: -40°C ~75 degrees C

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

Storage:

Temperature: -40°C ~75 degrees C

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

3.5 ELECTRICAL SPECIFICATIONS

Power Requirements: 12 to 72V DC, redundant power with polarity reverse protection

AC 24V Power Adapter

Power Consumption:

LOADING / INPUT	System on without any devices attached	Full Loading
12V	4.92 watts	11.04 watts
24V	4.56 watts	9.6 watts
36V	5.04 watts	10.08 watts
48V	5.28 watts	10.56 watts
60V	6.0 watts	11.4 watts
72V	5.88 watts	8.64 watts

3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

EMI:

EN 55022 CLASS A:2006

EN61000-3-2:2006

EN61000-3-3: 1995+1A:2001+A2:2005

EMS:

EN 55024:1998+A1:2001+A2:2003

IEC 61000-4-2:2001

IEC 61000-4-3:2008

IEC 61000-4-4:2004

IEC 61000-4-5:2005

IEC 61000-4-6:2008

IEC 61000-4-8:2001

IEC 61000-4-11:2004

Stability Testing:

- IEC60068-2-32 (Free Fall)
- IEC60068-2-27 (Shock)
- IEC60068-2-6 (Vibration)

3.7 REALIABILITY

MTBF > 100,000Hrs @ 25 degrees C

3.8 BASIC PACKAGING

☑ The Industrial Managed Switch	x 1
☑ Quick Installation Guide	x 1
☑ RJ45-to-DB9 RS232 cable	x 1
☑ DIN Rail Kit	x 1
☑ Wall Mounting Kit	x 1
☑ RJ45 Dust Cap	x 9
☑ SFP Dust Cap	x 4

3.9 PACKING DIMENSIONS

Dimensions:	300 x 170 x 90mm
Weight:	TBD
	10pcs in one carton