

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



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 **8-port 10/100/1000BASE-T copper** 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 IP30 aluminum industrial case protection, 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 curb side traffic control cabinets. It also possesses an integrated power supply source with 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.

## Physical Port

- **8-Port 10/100/1000BASE-T** RJ45 copper
- **4 100/1000BASE-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

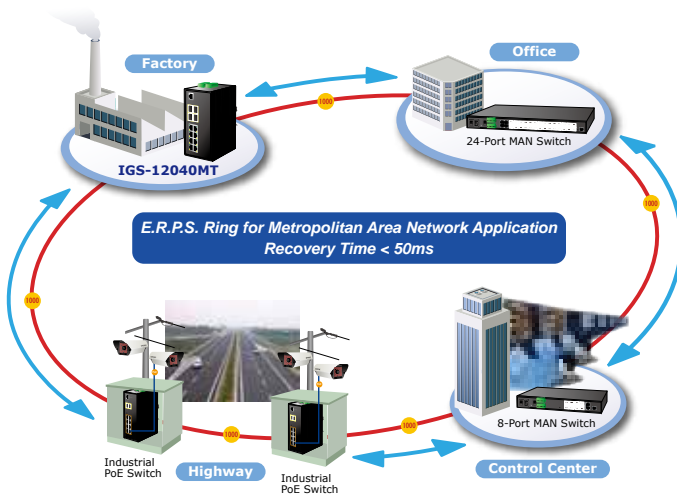
- 2 Digital Input (DI)
- 2 Digital Output (DO)
- Integrates sensors into auto alarm system
- Transfers alarm to IP network via email and SNMP trap

## 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

### Redundant Ring, Fast Recovery for Critical Network Applications

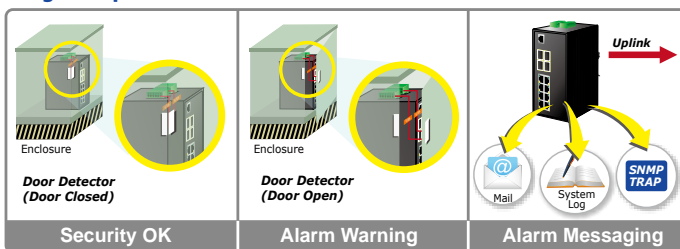
The IGS-12040MT supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant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



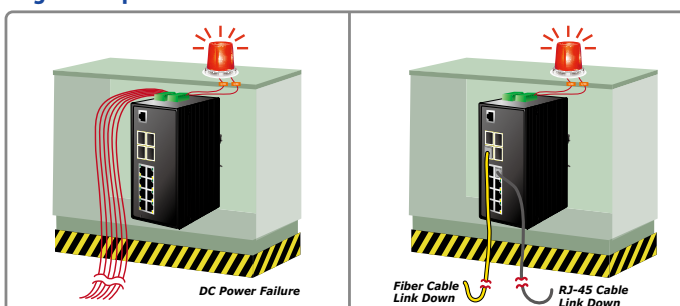
### Digital Input and Digital Output for External Alarm

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.

#### Digital Input



#### Digital Output



- 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

### *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-functioned 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 cross over 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.

- 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 128 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

*Intelligent SFP Diagnosis Mechanism*

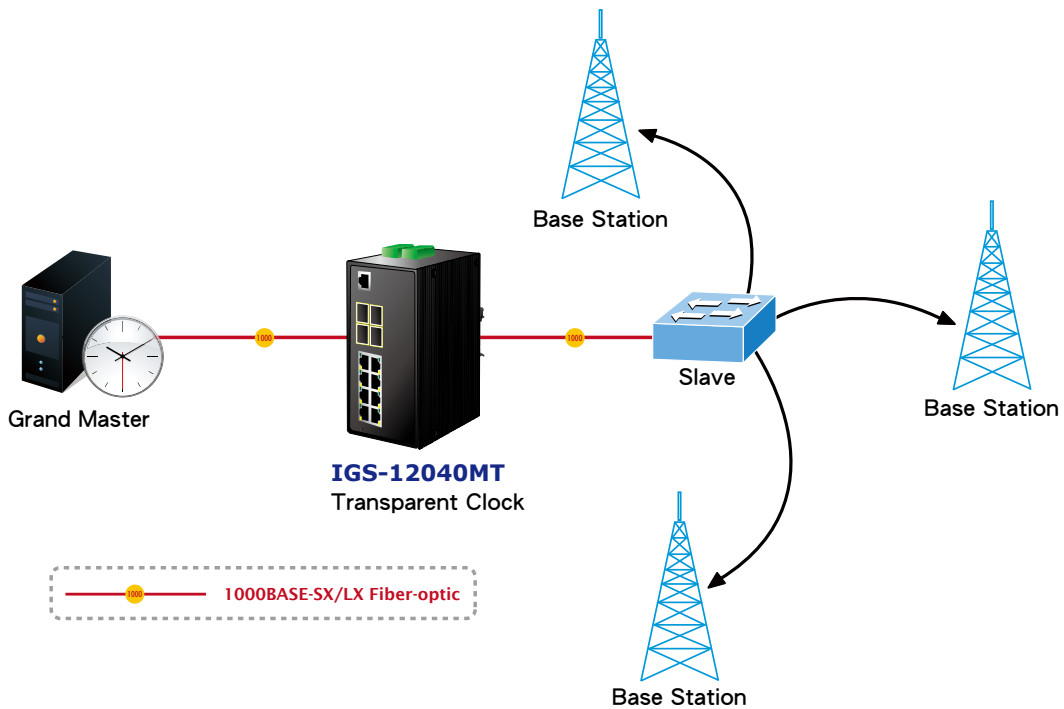
The IGS-12040MT supports SFP-DDM (Digital Diagnostic Monitor) function that can easily monitor real-time parameters of the SFP for network administrator, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

**Digital Diagnostic Monitor (DDM)**



*1588 Time Protocol for Industrial Computing Networks*

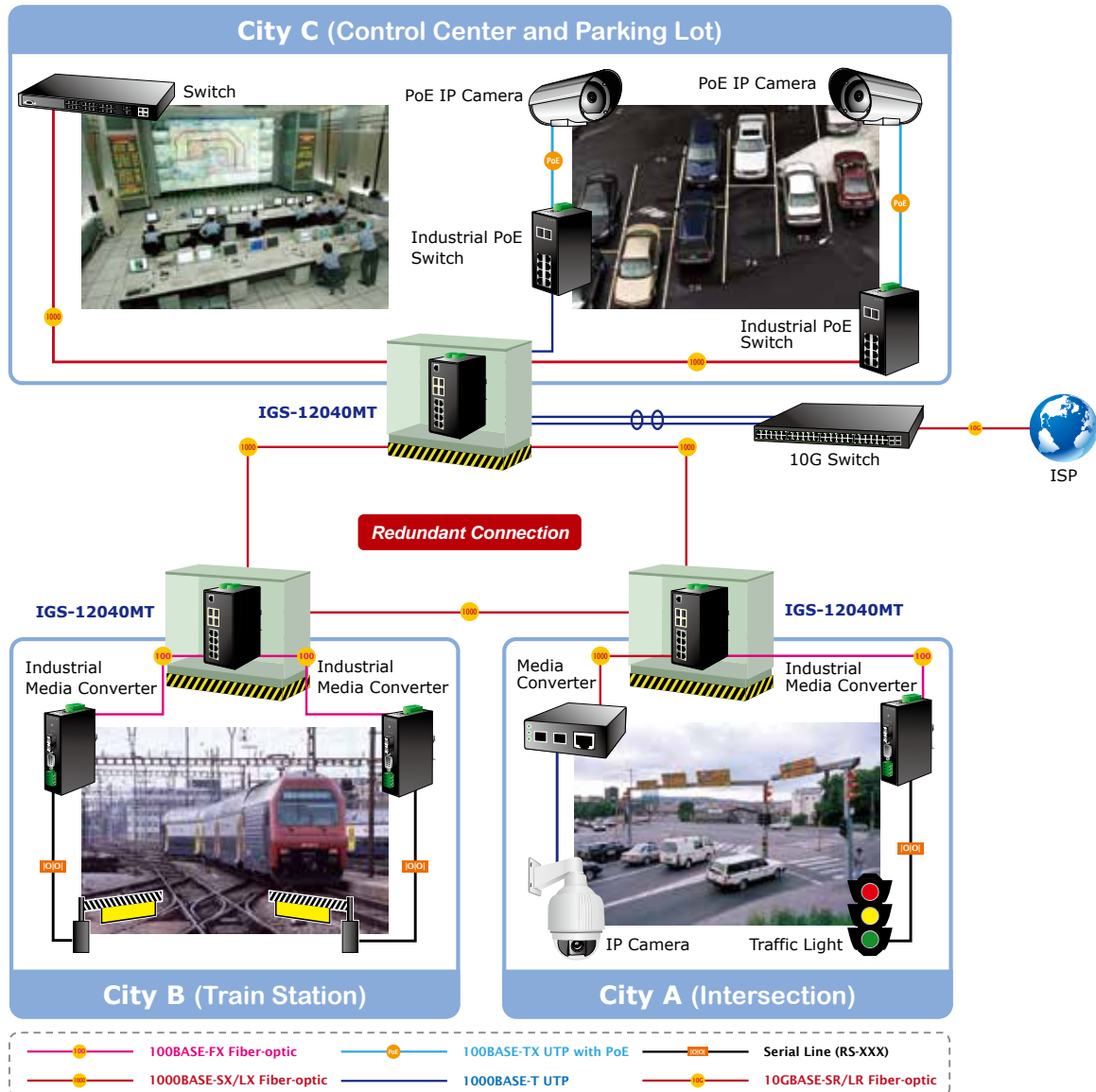
The IGS-12040MT is intended for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.



## Applications

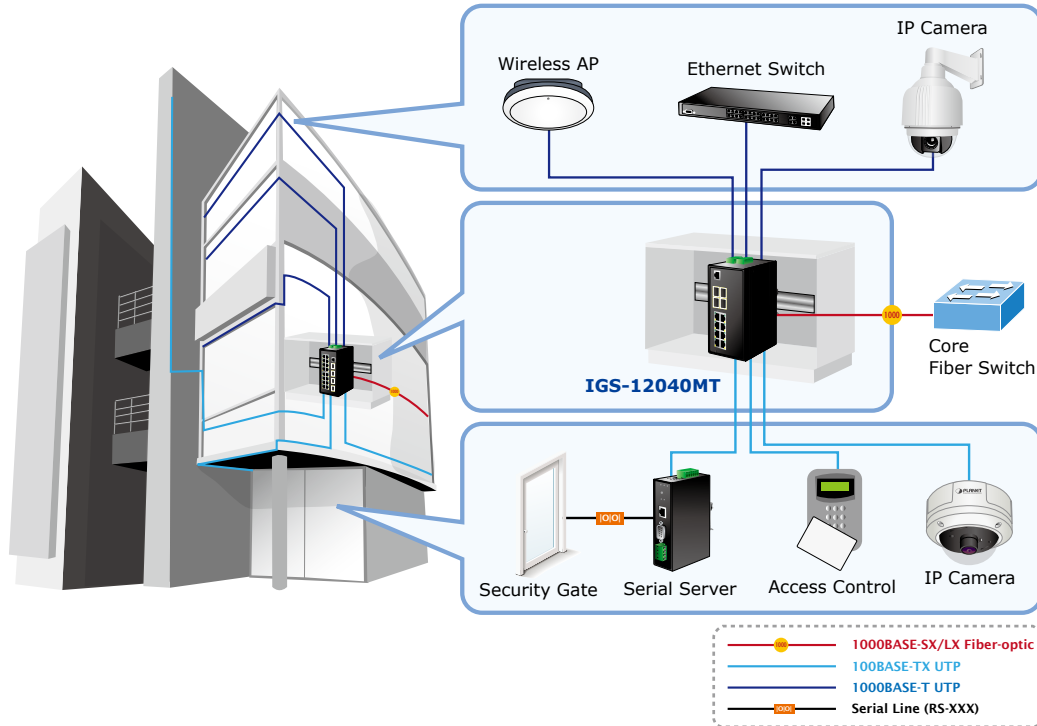
### FTTx / MAN Edge Switch

To improve the technology of Optical Fiber Ethernet with highly-flexible, highly-extendable and easy-to-install features, the IGS-12040MT offers up to 1Gbps data exchange speed via Optical Fiber interface and the transmission distance can be extended to 120km. The IGS-12040MT is the ideal solution for service providers such as ISPs and telecoms to build Metropolitan Area Network (MAN) based on the fiber technology.



**Security Building Automation Switch**

The IGS-12040MT 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. The network administrators can now construct highly-secured corporate networks with considerably less time and effort than before.



## Specifications

Product	IGS-12040MT
<b>Hardware Specifications</b>	
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)	107 x 72 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)	
<b>Layer 2 Functions</b>		
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 Support 6 groups of 8-port trunk support	
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
<b>Layer 3 Functions</b>		
IP Interfaces	Max. 128 VLAN interfaces	
Routing Table	Max. 32 routing entries	
Routing Protocols	IPv4 software static routing IPv6 software static routing	
<b>Standards Conformance</b>		
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 Tree Protocol IEEE 802.1p Class of service 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 RFC 3810 MLD version 2
<b>Environment</b>		
Operating	Temperature: -40 ~ 75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -40 ~ 85 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

## Ordering Information

IGS-12040MT	Industrial 8-Port 10/100/1000T + 4-Port 100/1000X SFP Managed Switch
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## Related Products

### Fast Ethernet Transceiver (100BASE-X SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Operating Temp.
MFB-FX	100	LC	Multi-Mode	2km	1310nm	0 ~ 60°C
MFB-F20	100	LC	Single Mode	20km	1310nm	0 ~ 60°C
MFB-F40	100	LC	Single Mode	40km	1310nm	0 ~ 60°C
MFB-F60	100	LC	Single Mode	60km	1310nm	0 ~ 60°C
MFB-F120	100	LC	Single Mode	120km	1550nm	0 ~ 60°C
MFB-TFX	100	LC	Multi-Mode	2km	1310nm	-40 ~ 75°C
MFB-TF20	100	LC	Single Mode	20km	1550nm	-40 ~ 75°C

### Fast Ethernet Transceiver (100Base-BX, Single Fiber Bi-directional SFP)

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-FA20 MFB-FB20	100	WDM (LC)	Single Mode	20km	1310nm 1550nm	1550nm 1310nm	0 ~ 60°C
MFB-TFA20 MFB-TFB20	100	WDM (LC)	Single Mode	20km	1310nm 1550nm	1550nm 1310nm	-40~75°C
MFB-TFA40 MFB-TFB40	100	WDM (LC)	Single Mode	40km	1310nm 1550nm	1550nm 1310nm	-40~75°C

**Gigabit Ethernet Transceiver (1000BASE-X SFP)**

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (nm)	Wavelength
MGB-GT	1000	Copper	--	100m	--	0 ~ 60 °C
MGB-SX	1000	LC	Multi Mode	550m	850nm	0 ~ 60°C
MGB-SX2	1000	LC	Multi Mode	2km	1310nm	0 ~ 60 °C
MGB-LX	1000	LC	Single Mode	10km	1310nm	0 ~ 60°C
MGB-L30	1000	LC	Single Mode	30km	1310nm	0 ~ 60°C
MGB-L50	1000	LC	Single Mode	50km	1550nm	0 ~ 60 °C
MGB-L70	1000	LC	Single Mode	70km	1550nm	0 ~ 60°C
MGB-L120	1000	LC	Single Mode	120km	1550nm	0 ~ 60 °C
MGB-TSX	1000	LC	Multi Mode	550m	850nm	-40 ~ 75 °C
MGB-TLX	1000	LC	Single Mode	10km	1310nm	-40 ~ 75 °C
MGB-TL30	1000	LC	Single Mode	30km	1310nm	-40 ~ 75 °C
MGB-TL70	1000	LC	Single Mode	70km	1550nm	-40 ~ 75 °C

**Fast Ethernet Transceiver (100BASE-BX, Single Fiber Bi-directional SFP)**

Model	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-LA10 MGB-LB10	1000	WDM(LC)	Single Mode	10km	1310nm 1550nm	1550nm 1310nm	0 ~ 60°C
MGB-LA20 MGB-LB20	1000	WDM(LC)	Single Mode	20km	1310nm 1550nm	1550nm 1310nm	0 ~ 60°C
MGB-LA40 MGB-LB40	1000	WDM(LC)	Single Mode	40km	1310nm 1550nm	1550nm 1310nm	0 ~ 60°C
MGB-LA60 MGB-LB60	1000	WDM(LC)	Single Mode	60km	1310nm 1550nm	1550nm 1310nm	0 ~ 60°C
MGB-TLA10 MGB-TLB10	1000	WDM(LC)	Single Mode	10km	1310nm 1550nm	1550nm 1310nm	-40~75°C
MGB-TLA20 MGB-TLB20	1000	WDM(LC)	Single Mode	20km	1310nm 1550nm	1550nm 1310nm	-40~75°C
MGB-TLA40 MGB-TLB40	1000	WDM(LC)	Single Mode	40km	1310nm 1550nm	1550nm 1310nm	-40~75°C
MGB-TLA60 MGB-TLB60	1000	WDM(LC)	Single Mode	60km	1310nm 1550nm	1550nm 1310nm	-40~75°C