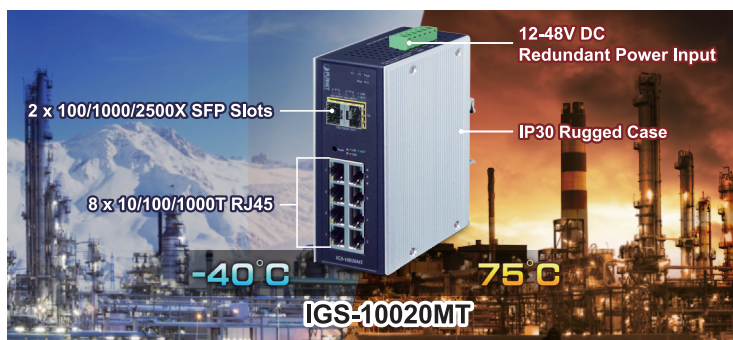


## Industrial 8-port 10/100/1000T + 2-port 1G/2.5G SFP Managed Gigabit Switch



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, 2 100/1000/2500BASE-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. Within such favorable enclosure, 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 2 100/1000/2500BASE-X 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.

### Physical Port

- 8 10/100/1000BASE-T Gigabit Ethernet RJ45 ports
- 2 **100/1000/2500BASE-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) transparent clock

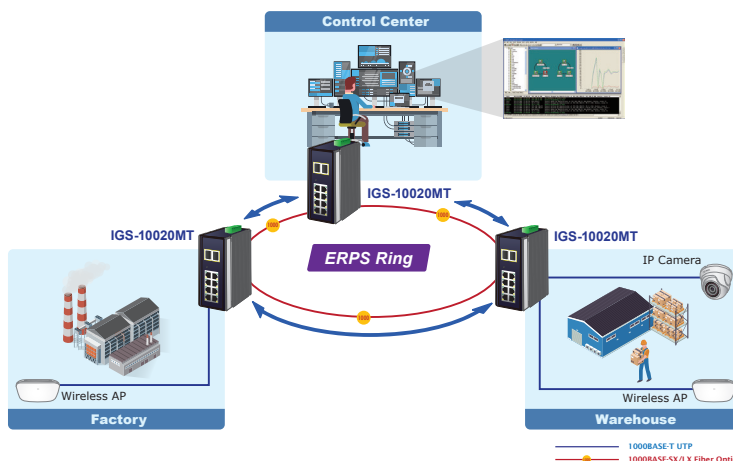
### Layer 2 Features

- 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 4K 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)



### 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

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.

### 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.

- 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

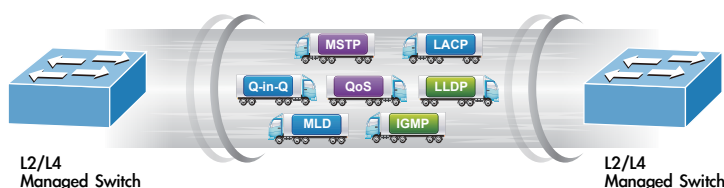
- Supports IPv4 IGMP Snooping v1, v2 and v3
- Supports IPv6 MLD Snooping v1 and v2
- Querier mode support
- IPv4 IGMP Snooping port filtering
- IPv6 MLD Snooping port filtering
- MVR (Multicast VLAN Registration)

### Security

- Authentication
  - IEEE 802.1x Port-based/MAC-based network access authentication
  - Built-in RADIUS client to cooperate with the RADIUS servers

### 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 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. 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 triple-speed 100/1000/2500BASE-X 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.

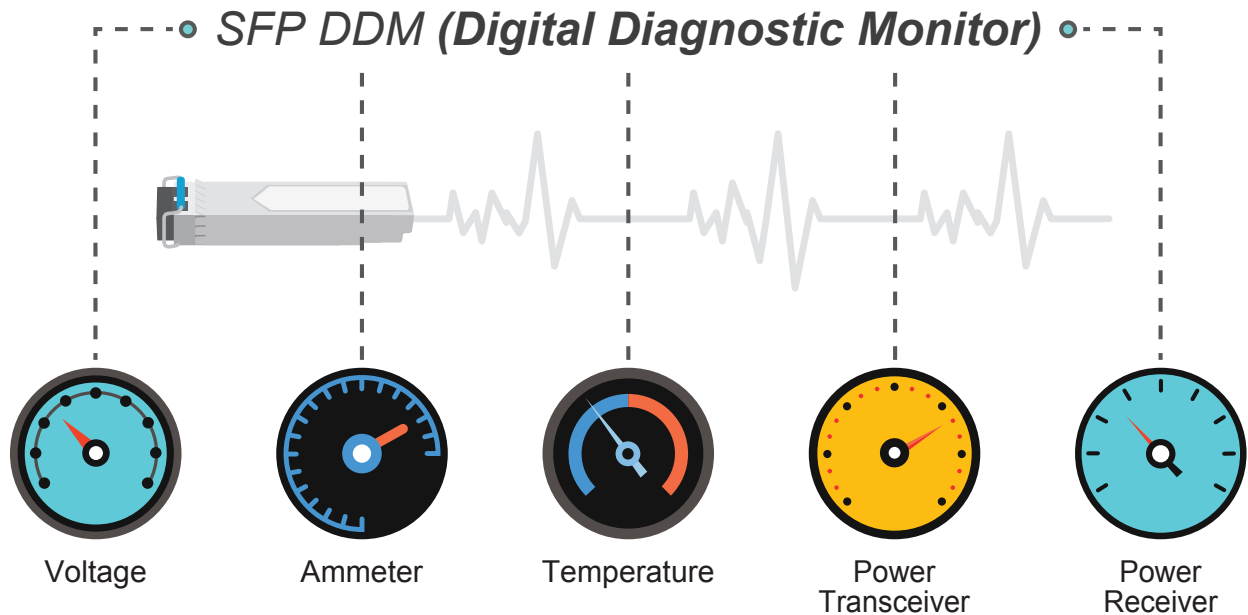
- TACACS+ login users access authentication
- RADIUS/TACACS+ users access authentication
- Access Control List
  - IP-based Access Control List (ACL)
  - MAC-based Access Control List
- Source MAC/IP address binding
- DHCP snooping to filter distrusted DHCP messages
- Dynamic ARP Inspection discards 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 Diagnosis
  - ICMPv6/ICMPv4 Remote Ping
  - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
- PLANET Smart Discovery Utility for deployment management

### Intelligent SFP Diagnosis Mechanism

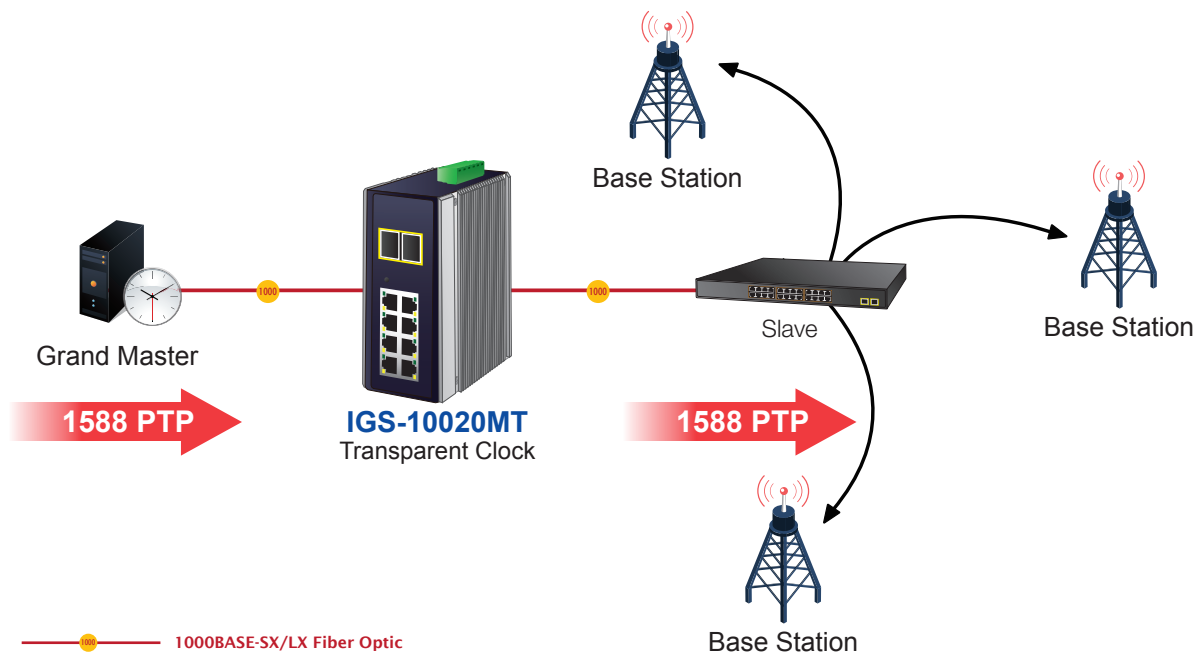
The IGS-10020MT supports SFP-DDM (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.



### 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.

## Time Synchronization in Network



### 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

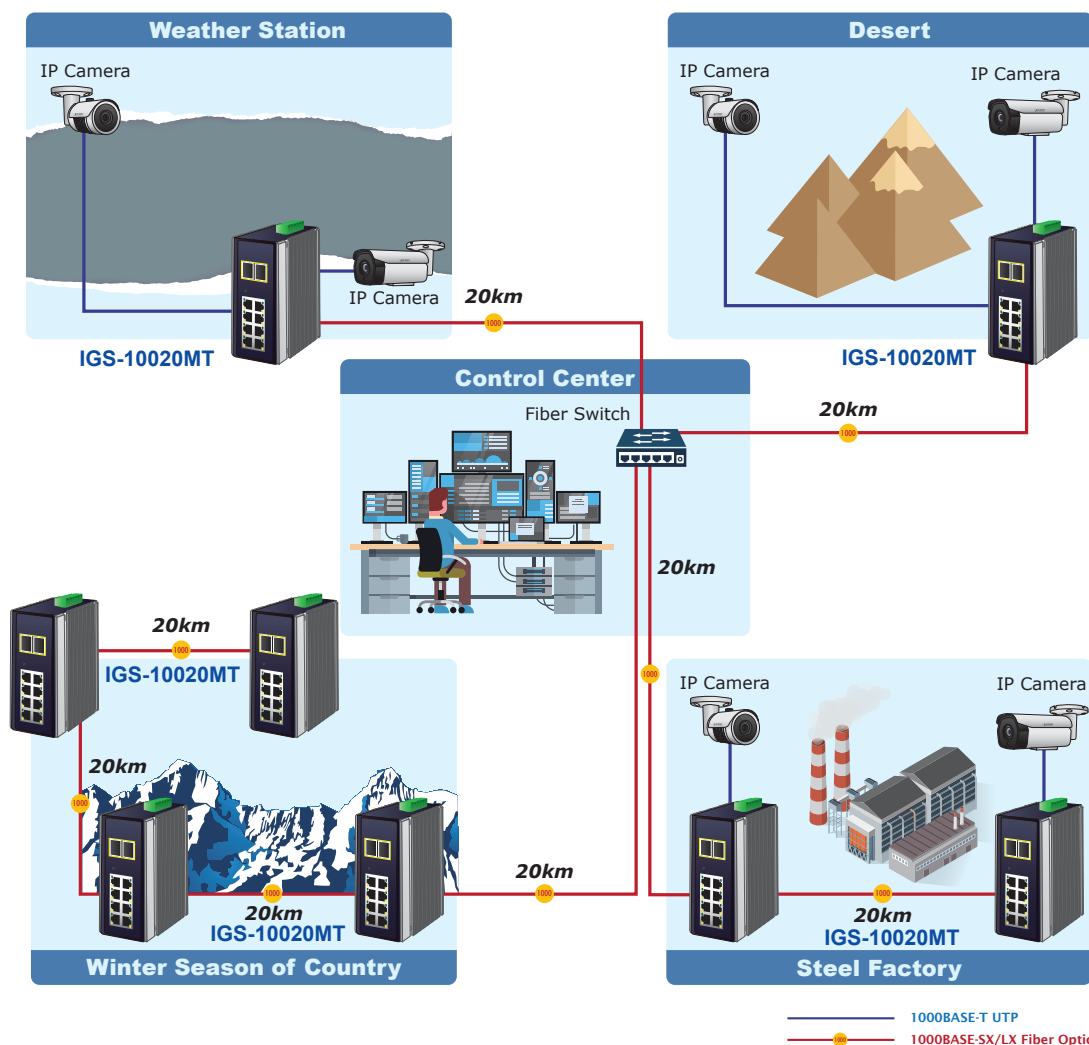
With IP30 aluminum industrial case protection, the IGS-10020MT provides a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curb-side traffic control cabinets. It also possesses an integrated power supply source with 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.

## Applications

### Industrial Area Manageable Switch for Data Collection and Forwarding

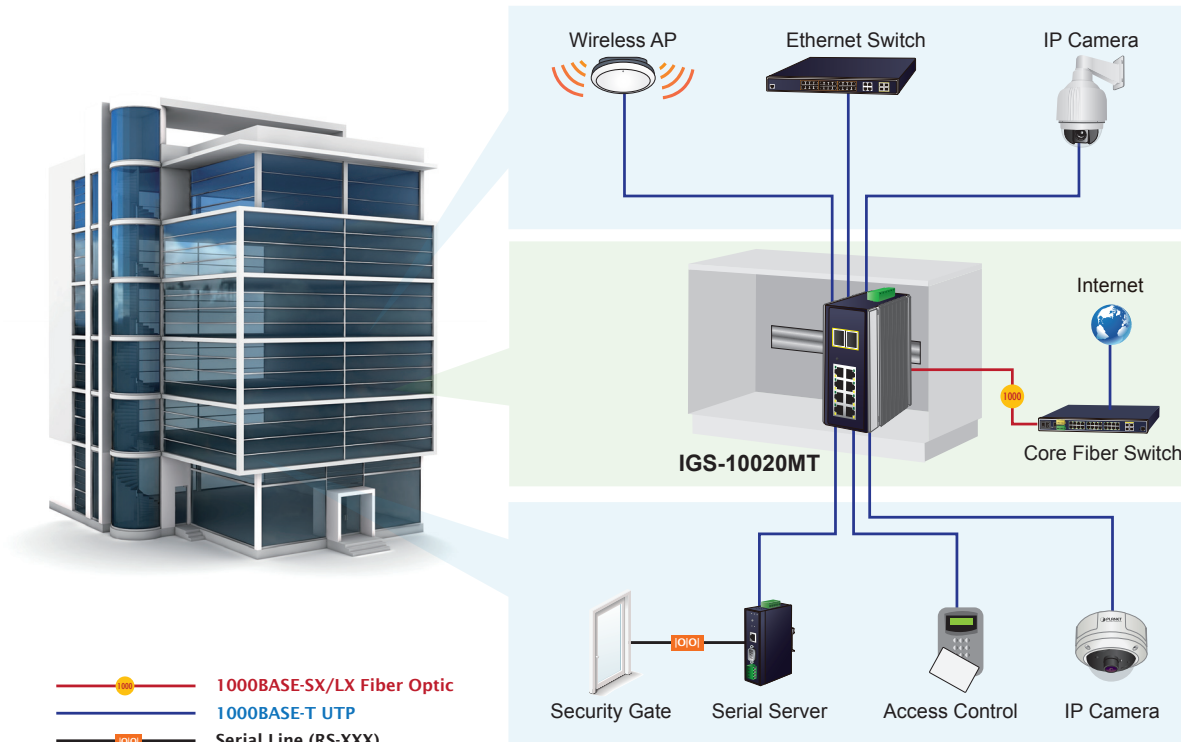
The IGS-10020MT offers **high performance and high reliability** to make sure the continuous industrial operation in harsh environments such as traffic control cabinets, factory floors, and the outdoor places where temperature is extremely low or high. With a non-blocking design and desktop size, the installation of the IGS-10020MT is easy and helpful to build a Gigabit high-bandwidth network quickly.

To further expand the current network, the IGS-10020MT provides advanced Web and SNMP management interface to fulfill this kind of demand. With its built-in Web-based management function, the IGS-10020MT offers an easy-to-use, platform-independent management and configuration facility. It supports standard Simple Network Management Protocol (SNMP) that makes the managed switch able to be monitored via any standard-based management software. By adopting the IGS-10020MT which complies with all the requirements of industrial applications, customers may enjoy high reliability, fast recovery capability, and safe Ethernet network operation.



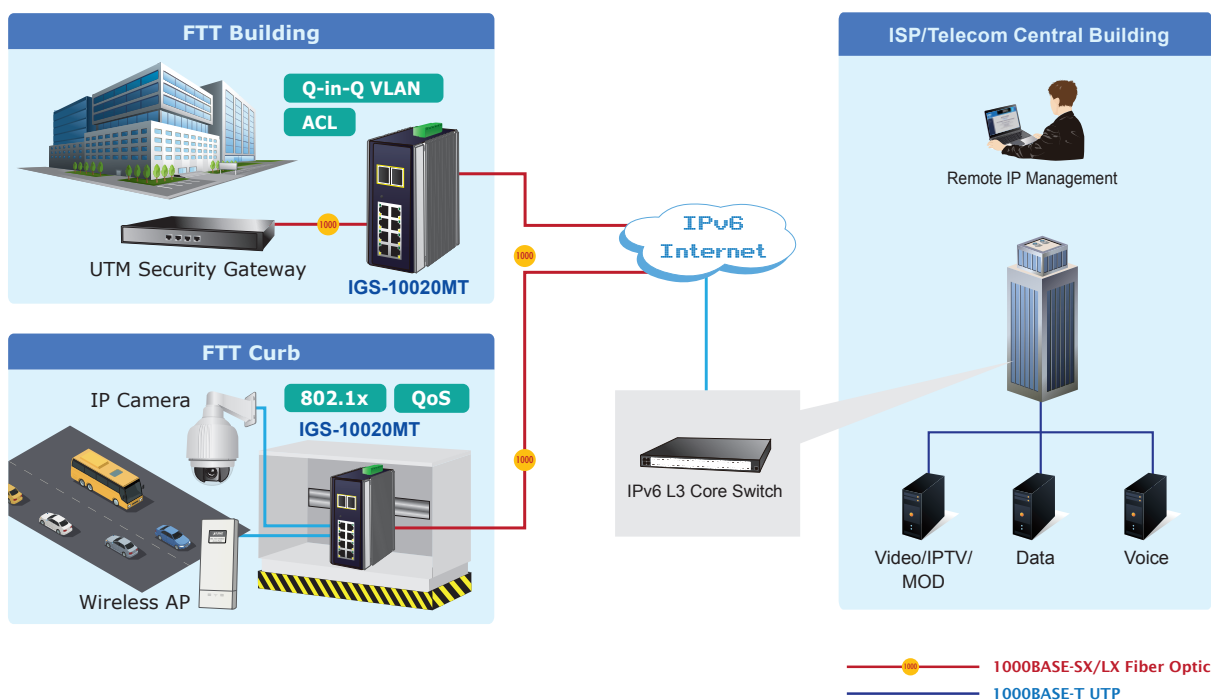
## Security Building Automation Switch

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. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.



## FTTx / MAN Edge Switch

The IGS-10020MT provides a high-performance edge service for FTTx network solutions, such as FTTH (Fiber to the Home) or FTTC (Fiber to the Curb) for ISPs and FTTB (Fiber to the Building) for enterprises.



## 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            | 2 100/1000/2500BASE-X mini-GBIC SFP ports (Port-9 and Port-10)                                                                                                                                                                     |                                                                                                                                                        |
| 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<br>> 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<br>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.<br>Alarm relay current carry ability: 1A @ DC 24V                                                                                                                                              |                                                                                                                                                        |
| LED Indicator                  | System:<br>Power 1 (Green)<br>Power 2 (Green)<br>Fault Alarm (Green)<br>Ring (Green)<br>R.O.(Green)                                                                                                                                | Per 10/100/1000T RJ-45 Ports:<br>LNK/ACT (Green)<br>1000 (Orange)<br><br>Per 100/1000/2500BASE-X SFP Interface:<br>LNK/ACT (Green)<br>1G/2.5G (Orange) |
| Dimensions (W x D x H)         | 56 x 86.1 x 135 mm                                                                                                                                                                                                                 |                                                                                                                                                        |
| Weight                         | 720g                                                                                                                                                                                                                               |                                                                                                                                                        |
| Power Requirements             | Dual 12~48V DC<br>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    | SSHv2, TLSv1.2, SNMPv3                                                                                                                                                                                                             |                                                                                                                                                        |
| Port Configuration             | Port disable/enable<br>Auto-negotiation 10/100/1000Mbps full and half duplex mode selection<br>Flow Control disable / enable<br>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<br>Many to 1 monitor                                                                                                                                                                                                    |                                                                                                                                                        |
| VLAN                           | 802.1Q tagged VLAN ,up to 255 VLAN groups<br>Q-in-Q tunneling<br>Private VLAN Edge (PVE)<br>MAC-based VLAN<br>Protocol-based VLAN<br>Voice VLAN<br>MVR (Multicast VLAN Registration)<br>Up to 4K VLAN groups, out of 4095 VLAN IDs |                                                                                                                                                        |
| Link Aggregation               | IEEE 802.3ad LACP / static trunk<br>Support 5 trunk groups with 10 ports per trunk                                                                                                                                                 |                                                                                                                                                        |
| QoS                            | Traffic classification based, strict priority and WRR<br>8-level priority for switching<br>- Port number<br>- 802.1p priority<br>- 802.1Q VLAN tag<br>- DSCP/TOS field in IP packet                                                |                                                                                                                                                        |
| IGMP Snooping                  | IGMP (v1/v2/V3) Snooping, up to 255 multicast groups<br>IGMP Querier mode support                                                                                                                                                  |                                                                                                                                                        |
| MLD Snooping                   | MLD (v1/v2) Snooping, up to 255 multicast groups<br>MLD Querier mode support                                                                                                                                                       |                                                                                                                                                        |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                 |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Access Control List   | IP-based ACL / MAC-based ACL<br>Up to 123 entries                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                 |
| Bandwidth Control     | Per port bandwidth control<br>Ingress:<br>Kbps: 100 to 3276700 kbps<br>Mbps: 1 to 3276 Mbps<br>fps: 100 to 3276700 fps<br>kfps: 1 to 3276 kfps<br>Egress:<br>Kbps: 100 to 3281943 kbps<br>Mbps: 1 to 3281 Mbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |
| SNMP MIBs             | RFC-1213 MIB-II<br>IF-MIB<br>RFC-1493 Bridge MIB<br>RFC-1643 Ethernet MIB<br>RFC-2863 Interface MIB<br>RFC-2665 Ether-Like MIB<br>RFC-2819 RMON MIB (Groups 1, 2, 3 and 9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RFC-2737 Entity MIB<br>RFC-2618 RADIUS Client MIB<br>RFC-2933 IGMP-STD-MIB<br>RFC3411 SNMP-Frameworks-MIB<br>IEEE 802.1X PAE<br>LLDP<br>MAU-MIB |
| Layer 3 Function      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                 |
| IP Interfaces         | Max. 8 VLAN interfaces                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                 |
| Routing Table         | Max. 32 routing entries                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                 |
| Routing Protocols     | IPv4 software static routing<br>IPv6 software static routing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                 |
| Standards Conformance |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                 |
| Regulatory Compliance | FCC Part 15 Class A, CE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                 |
| Stability Testing     | IEC 60068-2-32 (free fall)<br>IEC 60068-2-27 (shock)<br>IEC 60068-2-6 (vibration)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                 |
| Standards Compliance  | IEEE 802.3 10BASE-T<br>IEEE 802.3u 100BASE-TX/100BASE-FX<br>IEEE 802.3ab Gigabit 1000T<br>IEEE 802.3z Gigabit SX/LX<br>IEEE 802.3bz 2.5GBASE-X<br>IEEE 802.3x flow control and back pressure<br>IEEE 802.3az Energy-Efficient Ethernet<br>IEEE 802.3ad port trunk with LACP<br>IEEE 802.1D Spanning Tree Protocol<br>IEEE 802.1w Rapid Spanning Tree Protocol<br>IEEE 802.1s Multiple Spanning Tree Protocol<br>IEEE 802.1p Class of Service<br>IEEE 802.1Q VLAN tagging<br>IEEE 802.1ad Q-in-Q VLAN stacking<br>IEEE 802.1X Port Authentication Network Control<br>IEEE 802.1ab LLDP<br>IEEE 802.3ah OAM<br>IEEE 802.1ag Connectivity Fault Management(CFM)<br>IEEE 1588 PTPv2<br>RFC 768 UDP<br>RFC 793 TFTP<br>RFC 791 IP<br>RFC 792 ICMP<br>RFC 2068 HTTP<br>RFC 1112 IGMP v1<br>RFC 2236 IGMP v2<br>RFC 3376 IGMP version 3<br>RFC 2710 MLD version 1<br>RFC 3810 MLD version 2<br>ITU-T G.8032 ERPS Ring |                                                                                                                                                 |
| Environment           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                 |
| Operating             | Temperature: -40 ~ 75 degrees C<br>Relative Humidity: 5 ~ 95% (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |
| Storage               | Temperature: -40 ~ 75 degrees C<br>Relative Humidity: 5 ~ 95% (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |



## Available 100Mbps Modules

### 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 degrees C |
| MFB-F20  | 100          | LC                  | Single Mode | 20km     | 1310nm          | 0 ~ 60 degrees C |
| MFB-F40  | 100          | LC                  | Single Mode | 40km     | 1310nm          | 0 ~ 60 degrees C |
| MFB-F60  | 100          | LC                  | Single Mode | 60km     | 1310nm          | 0 ~ 60 degrees C |
| MFB-F120 | 100          | LC                  | Single Mode | 120km    | 1310nm          | 0 ~ 60 degrees C |

| Model    | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (nm) | Operating Temp.    |
|----------|--------------|---------------------|-------------|----------|-----------------|--------------------|
| MFB-TFX  | 100          | LC                  | Multi-mode  | 2km      | 1310nm          | -40 ~ 75 degrees C |
| MFB-TF20 | 100          | LC                  | Single Mode | 20km     | 1310nm          | -40 ~ 75 degrees 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 | 100          | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | 0 ~ 60 degrees C |
| MFB-FB20 | 100          | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | 0 ~ 60 degrees C |

| Model     | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (TX) | Wavelength (RX) | Operating Temp.    |
|-----------|--------------|---------------------|-------------|----------|-----------------|-----------------|--------------------|
| MFB-TSA   | 100          | WDM(LC)             | Multi-mode  | 2km      | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MFB-TSB   | 100          | WDM(LC)             | Multi-mode  | 2km      | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MFB-TFA20 | 100          | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MFB-TFB20 | 100          | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MFB-TFA40 | 100          | WDM(LC)             | Single Mode | 40km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MFB-TFB40 | 100          | WDM(LC)             | Single Mode | 40km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |

## Available 1000Mbps Modules

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

| Model        | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (nm) | Operating Temp.  |
|--------------|-----|--------------|---------------------|-------------|----------|-----------------|------------------|
| MGB-GT       | --  | 1000         | Copper              | --          | 100m     | --              | 0 ~ 60 degrees C |
| MGB-SX(V2)   | YES | 1000         | LC                  | Multi-mode  | 550m     | 850nm           | 0 ~ 60 degrees C |
| MGB-SX2(V2)  | YES | 1000         | LC                  | Multi-mode  | 2km      | 1310nm          | 0 ~ 60 degrees C |
| MGB-LX(V2)   | YES | 1000         | LC                  | Single Mode | 20km     | 1310nm          | 0 ~ 60 degrees C |
| MGB-L40      | YES | 1000         | LC                  | Single Mode | 40km     | 1310nm          | 0 ~ 60 degrees C |
| MGB-L80      | YES | 1000         | LC                  | Single Mode | 80km     | 1550nm          | 0 ~ 60 degrees C |
| MGB-L120(V2) | YES | 1000         | LC                  | Single Mode | 120km    | 1550nm          | 0 ~ 60 degrees C |

| Model    | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (nm) | Operating Temp.    |
|----------|-----|--------------|---------------------|-------------|----------|-----------------|--------------------|
| MGB-TGT  | --  | 1000         | Copper              | --          | 100m     | --              | -40 ~ 75 degrees C |
| MGB-TSX  | YES | 1000         | LC                  | Multi-mode  | 550m     | 850nm           | -40 ~ 75 degrees C |
| MGB-TSX2 | YES | 1000         | LC                  | Multi-mode  | 2km      | 1310nm          | -40 ~ 75 degrees C |
| MGB-TLX  | YES | 1000         | LC                  | Single Mode | 20km     | 1310nm          | -40 ~ 75 degrees C |
| MGB-TL40 | YES | 1000         | LC                  | Single Mode | 40km     | 1310nm          | -40 ~ 75 degrees C |
| MGB-TL80 | YES | 1000         | LC                  | Single Mode | 80km     | 1550nm          | -40 ~ 75 degrees C |

### Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-directional SFP)

| Model        | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (TX) | Wavelength (RX) | Operating Temp.  |
|--------------|-----|--------------|---------------------|-------------|----------|-----------------|-----------------|------------------|
| MGB-LA10(V2) | YES | 1000         | WDM(LC)             | Single Mode | 10km     | 1310nm          | 1550nm          | 0 ~ 60 degrees C |
| MGB-LB10(V2) |     | 1000         | WDM(LC)             | Single Mode | 10km     | 1550nm          | 1310nm          | 0 ~ 60 degrees C |
| MGB-LA20(V2) | YES | 1000         | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | 0 ~ 60 degrees C |
| MGB-LB20(V2) |     | 1000         | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | 0 ~ 60 degrees C |
| MGB-LA40(V2) | YES | 1000         | WDM(LC)             | Single Mode | 40km     | 1310nm          | 1550nm          | 0 ~ 60 degrees C |
| MGB-LB40(V2) |     | 1000         | WDM(LC)             | Single Mode | 40km     | 1550nm          | 1310nm          | 0 ~ 60 degrees C |
| MGB-LA80     | YES | 1000         | WDM(LC)             | Single Mode | 80km     | 1490nm          | 1550nm          | 0 ~ 60 degrees C |
| MGB-LB80     |     | 1000         | WDM(LC)             | Single Mode | 80km     | 1550nm          | 1490nm          | 0 ~ 60 degrees C |

| Model      | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (TX) | Wavelength (RX) | Operating Temp.    |
|------------|-----|--------------|---------------------|-------------|----------|-----------------|-----------------|--------------------|
| MGB-TSA    | YES | 1000         | WDM(LC)             | Multi-mode  | 2km      | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TSB    |     | 1000         | WDM(LC)             | Multi-mode  | 2km      | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MGB-TLA10  | YES | 1000         | WDM(LC)             | Single Mode | 10km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TLB10  |     | 1000         | WDM(LC)             | Single Mode | 10km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MGB-TLA20  | YES | 1000         | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TLB20  |     | 1000         | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MGB-TLA40  | YES | 1000         | WDM(LC)             | Single Mode | 40km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TLB40  |     | 1000         | WDM(LC)             | Single Mode | 40km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |
| MGB-TLA80  | YES | 1000         | WDM(LC)             | Single Mode | 80km     | 1490nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TLB80  |     | 1000         | WDM(LC)             | Single Mode | 80km     | 1550nm          | 1490nm          | -40 ~ 75 degrees C |
| MGB-TLA120 | YES | 1000         | WDM(LC)             | Single Mode | 120km    | 1490nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-TLB120 |     | 1000         | WDM(LC)             | Single Mode | 120km    | 1550nm          | 1490nm          | -40 ~ 75 degrees C |

## Available 2500Mbps Modules

### Gigabit Ethernet Transceiver (2500BASE-X SFP)

| Model      | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (nm) | Operating Temp.  |
|------------|-----|--------------|---------------------|-------------|----------|-----------------|------------------|
| MGB-2GSR   | YES | 2500         | LC                  | Multi-mode  | 300m     | 850nm           | 0 ~ 70 degrees C |
| MGB-2GLR2  | YES | 2500         | LC                  | Single mode | 2km      | 1310nm          | 0 ~ 70 degrees C |
| MGB-2GLR20 | YES | 2500         | LC                  | Single mode | 20km     | 1310nm          | 0 ~ 70 degrees C |

| Model       | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (nm) | Operating Temp.    |
|-------------|-----|--------------|---------------------|-------------|----------|-----------------|--------------------|
| MGB-2GTSR   | YES | 2500         | LC                  | Multi-mode  | 300m     | 850nm           | -40 ~ 75 degrees C |
| MGB-2GTLR2  | YES | 2500         | LC                  | Single mode | 2km      | 1310nm          | -40 ~ 75 degrees C |
| MGB-2GTLR20 | YES | 2500         | LC                  | Single mode | 20km     | 1310nm          | -40 ~ 75 degrees C |

### Gigabit Ethernet Transceiver (2500BASE-BX, Single Fiber Bi-directional SFP)

| Model      | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (TX) | Wavelength (RX) | Operating Temp.  |
|------------|-----|--------------|---------------------|-------------|----------|-----------------|-----------------|------------------|
| MGB-2GLA20 | YES | 2500         | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | 0 ~ 70 degrees C |
| MGB-2GLB20 |     | 2500         | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | 0 ~ 70 degrees C |

| Model       | DDM | Speed (Mbps) | Connector Interface | Fiber Mode  | Distance | Wavelength (TX) | Wavelength (RX) | Operating Temp.    |
|-------------|-----|--------------|---------------------|-------------|----------|-----------------|-----------------|--------------------|
| MGB-2GTLA20 | YES | 2500         | WDM(LC)             | Single Mode | 20km     | 1310nm          | 1550nm          | -40 ~ 75 degrees C |
| MGB-2GTLB20 |     | 2500         | WDM(LC)             | Single Mode | 20km     | 1550nm          | 1310nm          | -40 ~ 75 degrees C |