L2+ 16-Port 100/1000BASE-X SFP + 8-Port 10/100/1000BASE-T Managed Metro Ethernet Switch

Multiple SFP Fiber Port Switch for Long-Reach Network

PLANET MGSW-24160F is ideal for all long-reach network customers, such as enterprises, telecoms, campuses and service providers as it comes with advanced management functions, and 16 100/1000Mbps dual speed SFP Fiber ports and 8 10/100/1000Mbps TP ports with a rugged case. It is capable of providing non-blocking switch fabric and wire-speed throughput of as high as 48Gbps without any packet loss and CRC error. Thus, it is certainly a must for those who want to further upgrade their existing network infrastructures to a level where bandwidth demands can be met. Furthermore, it adopts user-friendly "Front Access" design for easy wiring and maintenance of the MGSW-24160F when placed in the cabinet.

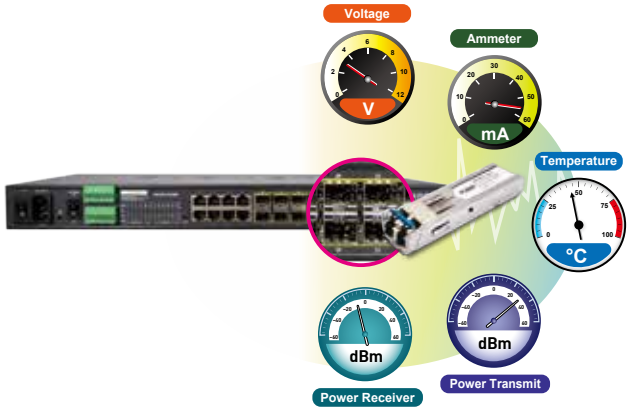
Flexibility and Extension Solution

The 16 mini-GBIC slots built in the MGSW-24160F support dual speed as it features 100BASE-FX and 1000BASE-SX/LX SFP (Small Form-factor Pluggable) fiber-optic modules. The administrator can flexibly choose the suitable SFP transceiver when considering transmission distance and speed. The distance can be extended from 550 meters to 2km for multi-mode fiber, and up to 10/20/30/40/50/70/120 kilometers for single-mode fiber or WDM fiber. The MGSW-24160F is well suited for applications within the enterprise data centers and distributions.

Intelligent SFP Diagnosis Mechanism

The MGSW-24160F 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.

*Digital Diagnostic Monitor **(DDM)***



Physical Port

- 16 100/1000BASE-X mini-GBIC/SFP slots
- 8 10/100/1000BASE-T RJ45 copper ports
- RJ45 to RS232 DB9 console interface for basic management and setup

Hardware Conformance

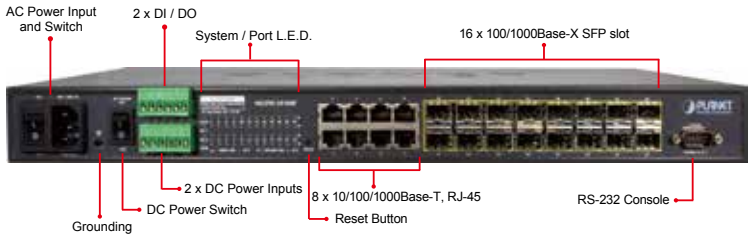
- 36 to 60V DC, redundant power with polarity reverse protect function
- 0 to 60 degrees C operating temperature
- 19-inch rack-mountable
- Relay alarm for port breakdown, power failure
- Two built-in thermal fans

Layer 2 Features

- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- High performance of Store-and-Forward architecture, and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm control support
  - Broadcast / Unicast / 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
  - IP subnet-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, spanning tree by VLAN
  - BPDU Guard
- Supports Link Aggregation
  - 802.3ad Link Aggregation Control Protocol (LACP)

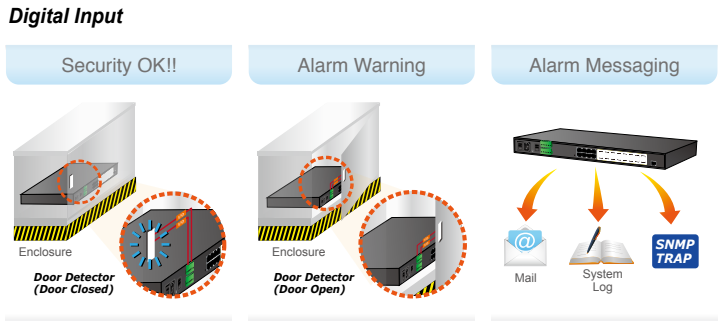
AC and DC Redundant Power to Ensure Continuous Operation

The MGSW-24160F is equipped with one 100~240V AC power supply unit and one additional 36~60V DC power supply unit for redundant power supply installation. A redundant power system is also provided to enhance the reliability with either AC or DC power supply unit. The redundant power system is specifically designed to handle the demands of high-tech facilities requiring the highest power integrity. Furthermore, with the 36~60V DC power supply implemented, the MGSW-24160F can be applied as the telecom level device.



Effective Alarm Alert for Better Protection

The MGSW-24160F supports a Fault Alarm feature which can alert the users when there is something wrong with the switches. With this ideal feature, the users would not have to waste time to find where the problem is. It will help to save time and human resource.



Digital Input and Digital Output for External Alarm

The MGSW-24160F helps the network administrators efficiently manage the unexpected network situations by providing Digital Input and Digital Output for external alarm device on the front panel. The Digital Input can be used to detect and log the status of the external devices such as door intrusion detector. The Digital Output could be used to send alarm whenever the MGSW-24160F has port link-down or power failure.

IPv6 / IPv4 Dual Stack

Supporting both IPv6 and IPv4 protocols, the MGSW-24160F helps data centers, campuses, telecoms, and more to experience the IPv6 era with the lowest investment as its network facilities need not to be replaced or overhauled if the IPv6 FTTx edge network is set up.

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

The MGSW-24160F switch not only provides ultra high transmission performance, and excellent layer 2 and layer 4 technologies, but also layer 3 IPv4/IPv6 VLAN routing feature which allows to crossover different VLANs and different IP addresses for the purpose of having a highly-secured, flexibly-managed and simple networking application.

- Cisco ether-channel (static trunk)
- Maximum 24 trunk groups, with 8 ports for each trunk
- Up to 16Gbps bandwidth (full duplex mode)
- Provides port mirror (many-to-1)
- Port mirroring monitors the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops

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
  - ToS / DSCP / IP Precedence of IPv4/IPv6 packets
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Traffic-policing policies on the switch port
- DSCP remarking

Multicast

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

Security

- Authentication
  - IEEE 802.1x port-based / MAC-based network access authentication
  - IEEE 802.1x authentication with guest VLAN
  - Built-in RADIUS client to cooperate with the RADIUS servers
  - RADIUS / TACACS+ users access authentication
- Access Control List
  - IP-based Access Control List (ACL)
  - MAC-based Access Control List (ACL)
- Source MAC / IP address binding
- DHCP Snooping to filter distrusted DHCP messages

Robust Layer 2 Features

The MGSW-24160F can be programmed for advanced switch management functions such as dynamic port link aggregation, Q-in-Q VLAN, private VLAN, Multiple Spanning Tree Protocol (MSTP), Layer 2 to Layer 4 QoS, bandwidth control and IGMP/MLD Snooping. Via the link aggregation of supporting ports, the MGSW-24160F allows the operation of a high-speed trunk to combine with multiple fiber ports and supports fail-over as well.

Powerful Security

The MGSW-24160F offers a comprehensive layer 2 to layer 4 Access Control List (ACL) for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises 802.1X Port-based and MAC-based user and device authentication. With the private VLAN function, communication between edge ports can be prevented to ensure user privacy. The MGSW-24160F also provides DHCP Snooping, IP Source Guard and Dynamic ARP Inspection functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrators can now construct highly-secured corporate networks with considerably less time and effort than before.

Excellent Traffic Control

The MGSW-24160F is loaded with powerful traffic management and QoS features to enhance connection services by telecoms and ISPs. The QoS features include wire-speed Layer 4 traffic classifiers and bandwidth limit that are particular useful for multi-tenant unit, multi-business unit, Telco, or network service provider's applications. It also empowers the enterprises to take full advantage of the limited network resources and guarantees the best performance in VoIP and video conferencing transmission.

Efficient and Secure Management

With built-in Web-based management interface, the MGSW-24160F L2+ Managed Switch offers an easy-to-use, platform-independent management and configuration facility which includes Console, Web and SNMP management interfaces. The SNMP can be managed via any management software based on the standard of SNMP protocol. For reducing product learning time, it offers Cisco-like command via Telnet or console port and customer does not need to learn new console command. Moreover, it also offers secure remote management by supporting SSH, SSL and SNMP v3 connections which encrypt the packet content at each session.

- 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
  - Console / Telnet command line interface
  - Web switch management
  - SNMP v1, v2c, and v3 switch management
  - SSH / SSL secure access
- IPv6 address / NTP 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 option 82
- User privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Network diagnostic
  - SFP-DDM (Digital Diagnostic Monitor)
  - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
  - ICMPv6 / ICMPv4 remote ping
- SMTP / Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interface link up and link down notification
- System Log
- PLANET Smart Discovery Utility for deploy management

Redundant Power System

- 100~240V AC / 36~60V DC dual power redundancy
- Active-active redundant power failure protection
- Backup of catastrophic power failure on one supply
- Fault tolerance and resilience

Digital Input / Digital Output

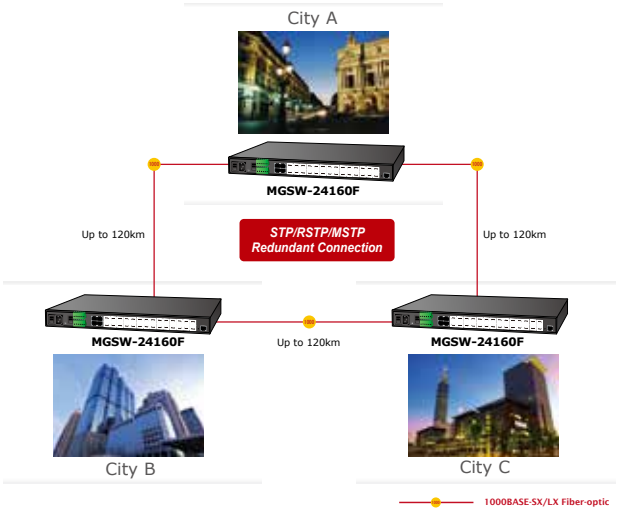
- 2 Digital Input (DI)
- 2 Digital Output (DO)
- Integrates sensors into auto alarm system
- Transfers alarm to IP network via email and SNMP trap

Applications

Optimized Design for Metropolitan Area Network

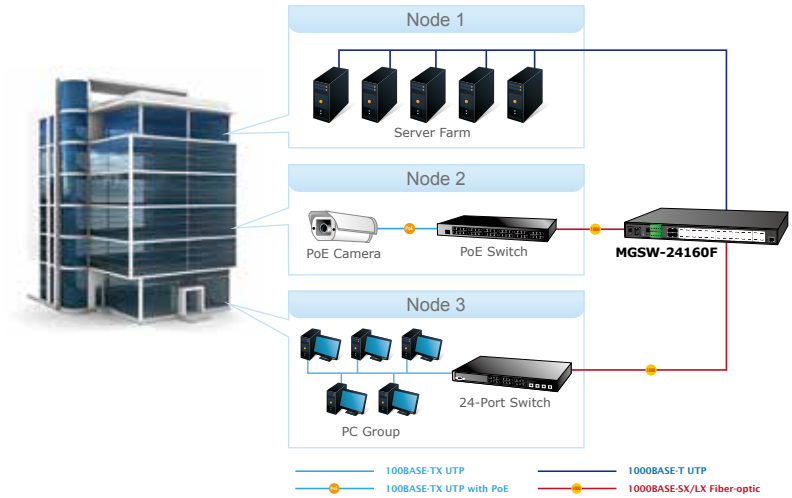
By means of improving the technology of Optical Fiber Ethernet with highly-flexible, highly-extendable and easy-to-install features, the MGSW-24160F offers up to 1Gbps data exchange speed via Optical Fiber interface and an extended transmission distance of up to 120km. The unit is the ideal solution for service providers, such as ISPs and telecoms, to build Metropolitan Area Network (MAN) based on the fiber technology and the WAN Internet Service.

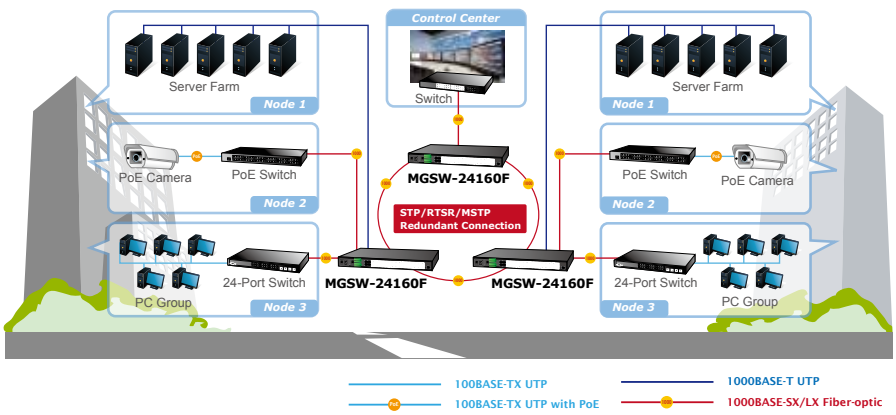
Metropolitan Area Network Application



Excellent Solution to Core / Department Switch

The MGSW-24160F is an excellent choice of core layer switch for a Gigabit network. With 24 Gigabit ports, the MGSW-24160F is able to connect up to 24 edge switches in the Ethernet environment. Moreover, it also provides 48 Gigabit per second switch fabric and high bandwidth for backbone connection.

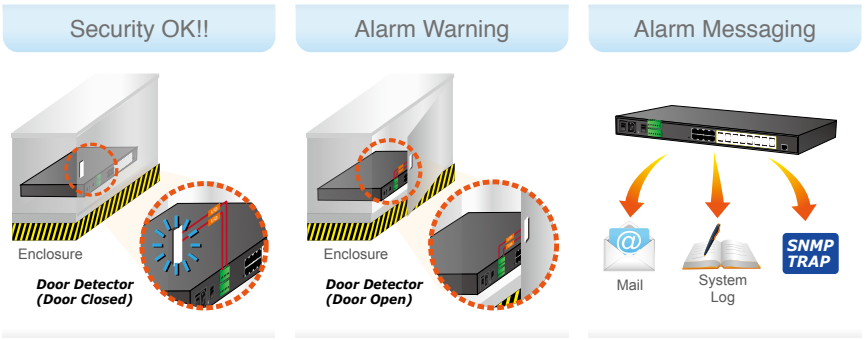




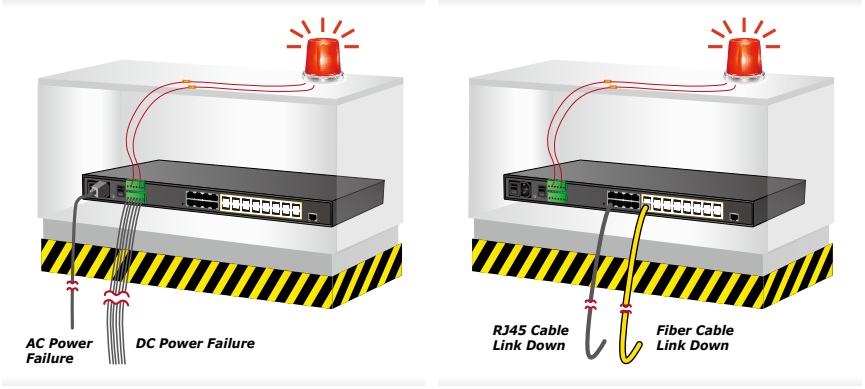
Enhanced Protection via Digital Input and Digital Output

The MGSW-24160F features digital input and digital output functions that greatly help the administrator efficiently react to the emergency events. The digital input can be set up to indicate urgent events and send the messages or alarm to the network system once an unusual event is detected by an external device such as door or window open detector. The digital output function can define the immediate response such as port failure or power failure to the related urgent events.

Digital Input



Digital Output



Specifications

Model	MGSW-24160F
Hardware Specifications	
Hardware Version	3.0
Copper Ports	8 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	16 100/1000BASE-X SFP interfaces Compatible with 100BASE-FX SFP transceiver
Console	1 x RS232-to-RJ45 serial port (115200, 8, N, 1)
Switch Architecture	Store-and-Forward
Switch Fabric	48Gbps
Throughput	35.6Mpps@64Bytes
Address Table	16K entries, automatic source address learning and ageing
Shared Data Buffer	16M bits
Flow Control	IEEE 802.3x pause frame for full-duplex Back pressure for half-duplex
Jumbo Frame	10K bytes
Reset Button	< 5 sec: System reboot > 5 sec: Factory default
Dimensions (W x D x H)	440 x 200 x 44.5 mm, 1U height
Weight	3kg
LED	System: PWR (Green), DC1 (Green), DC2 (Green), Fault (Red) 10/100/1000T RJ45 Combo Interfaces (Port 1 to Port 8): 1000Mbps LNK/ACT (Green) 10/100Mbps LNK/ACT (Orange) 100/1000Mbps SFP Interfaces (Port 9 to Port 24): 1000Mbps LNK/ACT (Green) 100Mbps LNK/ACT (Orange)
Power Consumption	Max. 38 Watts/130 BTU (AC input) Max. 37.8 Watts/129 BTU (DC input)
Power Requirements – AC	AC 100~240V, 50/60Hz 0.75A
Power Requirements – DC	48V DC @ 1.1A, Range: 36V ~ 60V DC
DI/DO	2 Digital Input (DI): Level 0: -24~2.1V Level 1: 2.1~24V Max. input current: 10mA 2 Digital Output (DO): Open collector to 24VDC, 100mA
ESD Protection	6KV DC
Fan	2 x smart fan
Layer 2 Management Functions	
Port Configuration	Port disable / enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable / enable
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 Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN IP Subnet-based VLAN MVR (Multicast VLAN registration) Up to 255 VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP / static trunk 24 groups of 8-port trunk supported
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

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: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps	
Layer 3 Functions		
IP Interfaces	Max. 128 VLAN interfaces	
Routing Table	Max. 32 routing entries	
Routing Protocols	IPv4 hardware static routing IPv6 hardware static routing	
Management		
Basic Management Interfaces	Console / Telnet / Web browser / SNMP v1, v2c	
Secure Management Interfaces	SSH, SSL, SNMPv3	
SNMP MIBs	RFC 1213 MIB-II 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 2863 IF-MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB RFC 4292 IP Forward MIB RFC 4293 IP MIB RFC 4836 MAU-MIB IEEE 802.1X PAE LLDP
Standards Conformance		
Regulation Compliance	FCC Part 15 Class A, CE	
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 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 FRC 3810 MLD version 2
Environment		
Operating	Temperature: 0 ~ 60 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	
Storage	Temperature: -10 ~ 70 degrees C Relative Humidity: 5 ~ 95% (non-condensing)	

Ordering Information

MGSW-24160F	L2+ 16-Port 100/1000BASE-X SFP + 8-Port 10/100/1000BASE-T Managed Metro Ethernet Switch

Related Products Information

MGSD-10080F	8-Port 100/1000X SFP + 2-Port 10/100/1000T Managed Metro Ethernet Switch
MGSW-28240F	24-Port 100/1000BASE-X SFP + 4-Port 10G SFP+ L2/L4 Managed Metro Ethernet Switch
GS-5220-16S8C / GS-5220-16S8CR	L2+ 24-Port 100/1000X SFP + 8-Port Shared TP Managed Switch
GS-5220-44S4C	L2+ 44-Port 100/1000BASE-X SFP + 4-Port Gigabit TP/SFP Managed Switch with Hardware Layer3 IPv4/IPv6 Static Routing
GS-5220-46S2C4X	L2+ 46-Port 100/1000BASE-X SFP + 2-Port Gigabit TP/SFP + 4-Port 10G SFP+ Managed Switch with Hardware Layer3 IPv4/IPv6 Static Routing

Available Modules for MGSW-24160F

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)	Operating Temp.
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

Gigabit Ethernet Transceiver (1000BASE-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

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