▶ *Award-winning Product*

ICS-G7848/G7850/G7852 Series

48G/48G+2 10GbE/48G+4 10GbE-port Layer 3 full Gigabit modular managed Ethernet switches

> Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
> Up to 52 optical fiber connections (SFP slots)
> Fanless, 0 to 60°C operating temperature range
> Modular design for maximum flexibility and hassle-free future expansion
> Hot swap interface and power modules for continuous operation
> Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
> Isolated redundant power inputs with universal 110/220 VAC power supply range
> Layer 3 routing interconnects multiple LAN segments

Turbo Ring — Self-Healing Ethernet

Turbo Chain — Beyond Redundant Rings

cULus LISTED   EN 50121   CE   FC

Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7848/G7850/G7852 series full Gigabit backbone switches' modular design makes network planning easy, and allows greater flexibility by letting you install up to 48 Gigabit Ethernet ports plus 4 10 Gigabit Ethernet ports. The ICS-G7848/G7850/G7852 series also supports Layer 3 routing functionality to facilitate the deployment of applications across networks, making the switches ideal for large scale industrial networks, and the switches' full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy protocols, and are fanless and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- Software based IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP and Modbus/TCP protocols for device management and monitoring
- Compatible with EtherNet/IP and PROFINET protocols for transparent data transmission
- Redundant Gigabit Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual AC power inputs

MOXA®

: Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
IEEE 802.3ae for 10 Gigabit Ethernet
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588 PTP V2, EtherNet/IP, Modbus/TCP, SNMP Inform, NTP Server/Client
Layer 3 Switching: Static routing, RIP V1/V2, OSPF, DVMRP, PIM-DM
Layer 3 Switching Redundancy: VRRP
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 8
Max. Number of Available VLANs: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups and Multicast Route: 1000
MAC Table Size: 16 K
Packet Buffer Size: 12 Mbit
DRAM Size: 128 MB
Flash Size: 16 MB
Jump Frame Size: 9.6 KB
Switching Fabric Capacity:
ICS-G7848: 96 Gbps
ICS-G7850: 136 Gbps
ICS-G7852: 176 Gbps
Forwarding Rate: Max. 130.95 Mpps (packets per second)

Interface

Gigabit Ethernet: 12 slots for 4-port interface modules, 10/100/1000BaseT(X) or 100/1000BaseSFP slots
Note: See page below for IM-G7000 Gigabit Ethernet module product information.
10 Gigabit Ethernet: 2 or 4 10GbE SFP+ slots (ICS-G7850 and ICS-G7852 only)
Console Port: RS-232 (RJ45 connector)
LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 1/2/3/4 for 10GbE port (ICS-G7850 and ICS-G7852 only)
Alarm Contact: 1 relay output with current carrying capacity of 2 A @ 30 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA

Power Requirements

Input Voltage: 110/220 VAC (85 to 264 VAC)
Input Current:
ICS-G7848: Max. 1.02/0.6 A @ 110/220 VAC
ICS-G7850: Max. 1.1/0.64 A @ 110/220 VAC
ICS-G7852: Max. 1.19/0.68 A @ 110/220 VAC
Overload Current Protection: Present
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection
Dimensions: 440 x 176 x 523.8 mm (17.32 x 6.93 x 20.62 in)
Weight: 12.9 kg
Installation: 19'' rack mounting

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 60950-1, EN 60950-1
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3,
EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3, EN 61000-4-8, EN 61000-4-11
Rail Traffic: EN 50121-4
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

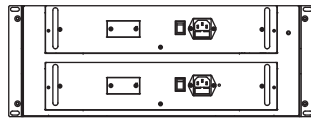**Time:** 202,175 hrs
Database: Telcordia (Bellcore), GB
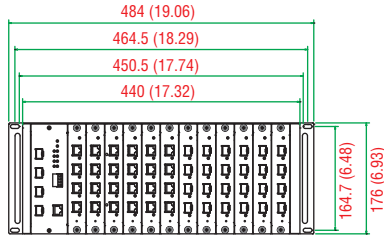
Warranty

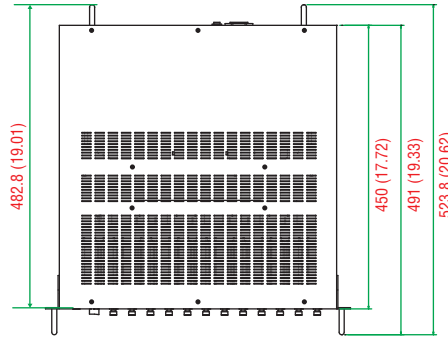**Warranty Period:** 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

Rear View

484 (19.06)
464.5 (18.29)
450.5 (17.74)
440 (17.32)

164.7 (6.48)
176 (6.93)

Front View

482.8 (19.01)
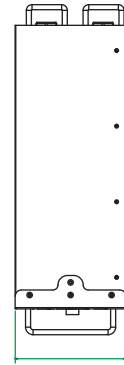
450 (17.72)
491 (19.33)
523.8 (20.62)

Top View

176 (6.93)

Side View

: Ordering Information

Step 1: Select Ethernet switch system

ICS-G7848/G7850/G7852
with power supply

Step 2: Select interface modules

IM-G7000
(Gigabit Ethernet)

Note: The ICS-G7848/G7850/G7852 Ethernet switch system is delivered without interface modules. See below to determine which IM-G7000 interface modules are suitable for your application.

Available Models

ICS-G7848-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G ports, 0 to 60°C operating temperature

ICS-G7850-2XG-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 2 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 2 10GbE ports, 0 to 60°C operating temperature

ICS-G7852-4XG-HV-HV: Layer 3 full Gigabit modular managed Ethernet switch system with 4 10GbE SFP+ slots, 12 slots for 4-port Gigabit Ethernet interface modules, 2 isolated power supplies (85 to 264 VAC), for a total of up to 48G + 4 10GbE ports, 0 to 60°C operating temperature

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, or 1000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
Power Cords: See website accessories pages for details

Package Checklist

- ICS-G7848/G7850/G7852 switch
- 12 interface cover plates
- RJ45 to DB9 console port cable
- 2 power cords (EU and US)
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

IM-G7000 Series

4G-port Gigabit Ethernet interface modules for ICS-G7700/G7800 series modular managed Ethernet switches

⦂ Specifications

Gigabit Ethernet Interface Modules, IM-G7000 Series

IM-G7000-4GTX

IM-G7000-4GSFP

Interface
Fiber Ports: 100/1000BaseSFP slot
RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
LED Indicators: STAT, 10/100/1000 for TP port, 100/1000 for fiber port
Hot Swap Button: Push this button prior to swapping IM-G7000 modules

Power Requirements
Power Consumption:
IM-G7000-4GTX: 4.1 W
IM-G7000-4GSFP: 3.3 W

Physical Characteristics
Housing: IP30 protection
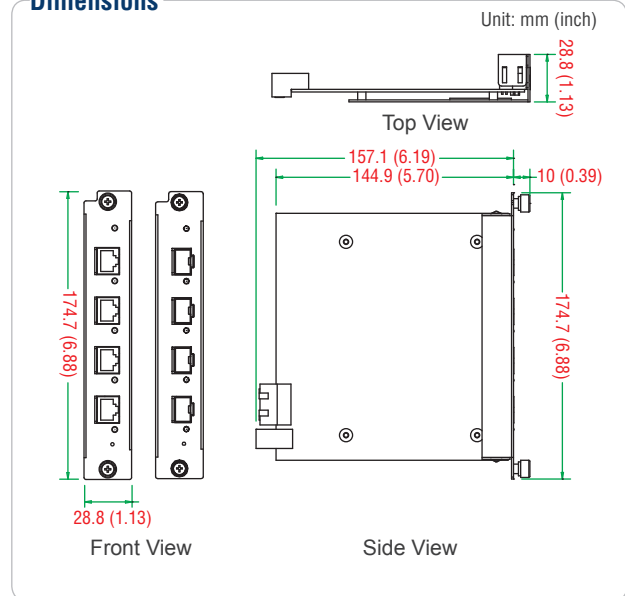**Dimensions:** 28.8 x 174.7 x 166.8 mm (1.13 x 6.88 x 6.57 in)
Weight: 220 g

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

28.8 (1.13)

Top View

157.1 (6.19)
144.9 (5.70)
10 (0.39)

174.7 (6.88)

174.7 (6.88)

28.8 (1.13)

Front View

Side View

⦂ Ordering Information

Available Models
IM-G7000-4GTX: Gigabit Ethernet interface module with 4 10/100/1000BaseT(X) ports, 0 to 60°C operating temperature
IM-G7000-4GSFP: Gigabit Ethernet interface module with 4 100/1000BaseSFP slots*, 0 to 60°C operating temperature
*See below for product information related to the SFP-1G/1FE series SFP modules.

Package Checklist
- IM-G7000 interface module
- Warranty card

MOXA®

SFP-1G Series

1-port Gigabit Ethernet SFP modules

> IEEE 802.3z compliant
> Differential LVPECL inputs and outputs
> TTL signal detect indicator
> Hot pluggable LC duplex connector
> Class 1 laser product, complies with EN 60825-1

EN : 60825   cᴿUus

: Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1GXXALC and SFP-1GXXBLC)

Note: When connecting long distance SFP (SFP-ZX, EZX or EZX-120), please ensure at least 5 dB attenuation between both ends. Without attenuation, excessive optical power may damage the transeivers.

Optical Fiber

	Gigabit Ethernet													
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	3 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-2 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-33 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	31 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m[a]	2 km[b]	10 km[c]	30 km[c]	40 km[c]	80 km[c]	110 km[c]	120 km[c]	10 km[c]		20 km[c]		40 km[c]	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 µm, 400 MHz * km or 62.5/125 µm, 500 MHz * km @ 850 nm multi-mode fiber optic cable
b. 62.5/125 µm, 750 MHz * km @ 1310 nm multi-mode fiber optic cable
c. 9/125 µm single-mode fiber optic cable

Note: The actual communication distance depends on many factors, including connector loss, cable deployment, and the age of the cabling system. We recommend doing a link budget analysis and reserving a 3 dB margin for such factors.

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
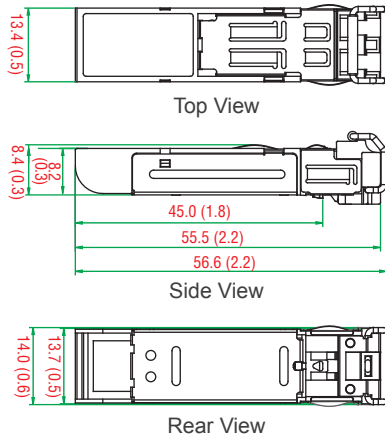
Safety: UL 60950-1, TÜV

Warranty

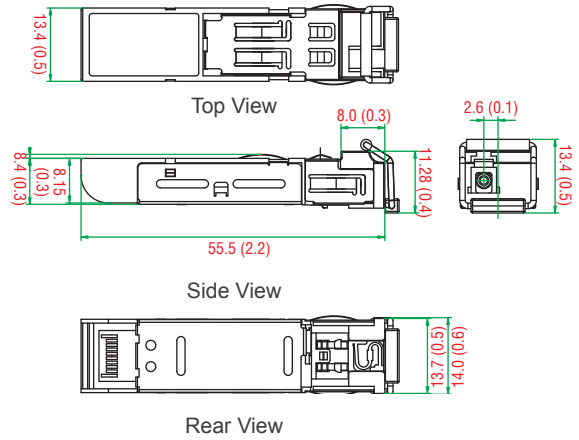**Warranty Period:** 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

SFP-1G Series

Top View

Side View

Rear View

SFP-1G Series (WDM Type)

Top View

Side View

Rear View

: Ordering Information

SFP Modules

Available Models		Port Interface							
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZX, LC Connector, 110 km	1000BaseEZX, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	–	–	–	–	–	–	–
SFP-1GLSXLC	SFP-1GLSXLC-T	–	1	–	–	–	–	–	–
SFP-1GLXLC	SFP-1GLXLC-T	–	–	1	–	–	–	–	–
SFP-1GLHLC	SFP-1GLHLC-T	–	–	–	1	–	–	–	–
SFP-1GLHXLC	SFP-1GLHXLC-T	–	–	–	–	1	–	–	–
SFP-1GZXLC	SFP-1GZXLC-T	–	–	–	–	–	1	–	–
SFP-1GEZXLC	–	–	–	–	–	–	–	1	–
SFP-1GEZXLC-120	–	–	–	–	–	–	–	–	1

* SFP-1GSXLC-T: -20 to 75˚C operating temperature

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	–	–	–	–	–
SFP-1G10BLC	SFP-1G10BLC-T	–	1	–	–	–	–
SFP-1G20ALC	SFP-1G20ALC-T	–	–	1	–	–	–
SFP-1G20BLC	SFP-1G20BLC-T	–	–	–	1	–	–
SFP-1G40ALC	SFP-1G40ALC-T	–	–	–	–	1	–
SFP-1G40BLC	SFP-1G40BLC-T	–	–	–	–	–	1

Available Models

The SFP-1G series modules can be used with the following products:
ICS-G7826/G7828 series, ICS-G7526/G7528 series, IKS-G6524/G6824 series,
IKS-6726/6728 series, EDS-611/619 series, EDS-G509 series, EDS-518A series, EDS-510A series,
EDS-G308 series, EDS-P510 series, EDS-G205-4PoE series, IM-G7000-4GSFP, IM-2GSFP,
PM-7200-2G/4G series, PT-G7509, EDR-G903/G902 series, IMC-101G series

Package Checklist

- SFP-1G module
- Warranty card

MOXA®

SFP-1FE Series

1-port fast Ethernet SFP modules

> IEEE 802.3u compliant
> Differential PECL inputs and outputs
> TTL signal detect indicator
> Hot pluggable LC duplex connector
> Class 1 laser product; complies with EN 60825-1

EN : 60825

c RU US

: Specifications

Interface
Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-18 dBm	0 dBm	0 dBm
Min. TX	-8 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km [a]	40 km [b]	80 km [b]
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 µm or 62.5/125 µm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
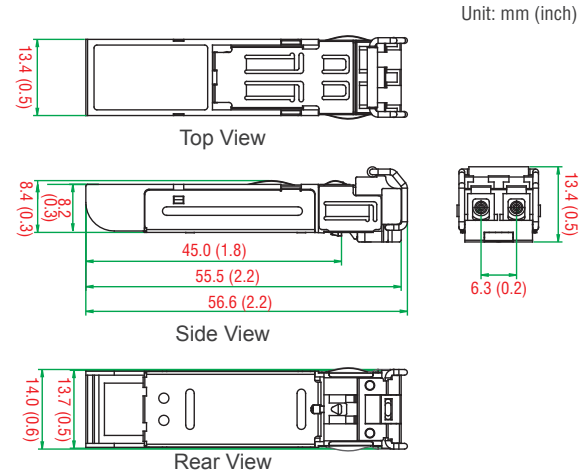b. 9/125 µm single-mode fiber optic cable

Environmental Limits
Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 60950-1, TÜV
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

13.4 (0.5)

Top View

8.4 (0.3)
8.2 (0.3)
45.0 (1.8)
55.5 (2.2)
56.6 (2.2)

Side View

13.4 (0.5)
6.3 (0.2)

14.0 (0.6)
13.7 (0.5)

Rear View

: Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T	1	–	–
SFP-1FESLC-T	–	1	–
SFP-1FELLC-T	–	–	1

Available Models
The SFP-1FE series modules can be used with the following products:
ICS-G7826/G7828 series, ICS-G7526/G7528 series, IKS-G6524/G6824 series,
IKS-6726/6728 series, EDS-611/619 series, EDS-G509 series, EDS-G308-2SFP, EDS-P510 series,
IM-G7000-4GSFP, PM-7200-8SFP, EDR-G903/G902 series, IM-6700-8SFP

Package Checklist
- SFP-1FE module
- Warranty card