

# EDR-G902/G903 Series



## Industrial secure routers with firewall/NAT/VPN



- > Firewall/NAT/VPN/Router all-in-one
- > Secure remote access tunnel with VPN
- > Protect critical assets with stateful firewall
- > Inspect industrial protocol with PacketGuard technology
- > Easy network setup with address translation (NAT)
- > Dual WAN redundant interfaces through public networks
- > Support for VLANs in different interfaces
- > -40 to 75°C operating temperature range (T model)
- > ISA99 / IEC 62443 / NERC CIP compliant



### Introduction

The EDR-G903/G902 series is a high-performance, industrial VPN server with a firewall/NAT all-in-one secure router. It is designed for Ethernet-based security applications in sensitive remote control or monitoring networks, and it provides an Electronic Security Perimeter for the protection of critical cyber assets such as pumping stations, DCS, PLC systems on oil rigs, and water treatment systems. The EDR-G902/G903 series includes the following cybersecurity features:

- Virtual Private Network (VPN): VPNs are designed to provide users with secure communication links when accessing a private network from the public Internet. They use IPSec (IP Security) server or client mode for encryption and authentication of all IP packets at the network layer to ensure confidentiality and sender authentication.

- Firewall: Controls network traffic between different trust zones. Network Address Translation (NAT), which shields the internal LAN from unauthorized activity from outside hosts, is included.

The EDR-G902/G903's Quick Automation Profile function supports most common fieldbus protocols, including EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, Modbus/TCP, and PROFINET. Users can easily create a secure Ethernet Fieldbus network from a user-friendly web UI with a single click. In addition, Moxa's PacketGuard technology (Deep Packet Inspection) helps to filter Modbus TCP commands at OSI layer 7. The wide temperature range models that are available operate reliably in hazardous, -40 to 75°C environments.

### 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 1000BaseX

**Protocols:** SNMPv1/v2c/v3, DHCP Server/Client, TFTP, NTP/SNTP server and client, HTTP, HTTPS, Telnet, SSH, Syslog, SMTP, LLDP, PPPoE, PPTP, Dynamic DNS, traffic prioritization

**Routing:** Static routing, RIP V1/V2, OSPF

Throughput:

- EDR-G902: Max. 25000 packets per second (or 300 Mbps)
- EDR-G903: Max. 40000 packets per second (or 500 Mbps)

**Routing Redundancy:** VRRP

**VLAN:** 5 VLANs per interfaces (VLAN ID: 1 to 4094)

**Flow Control:** IEEE 802.3x flow control, back pressure flow control

#### Security Functions

##### Firewall:

Features:

- Stateful inspection
- Router firewall and transparent (bridge) firewall
- Filter: IP and MAC address, ports, ICMP, Ethernet protocols
- Deep Packet Inspection: Modbus TCP/UDP
- Quick Automation Profiles: EtherCAT, EtherNet/IP, FOUNDATION Fieldbus, LonWorks, Modbus/TCP, PROFINET, IEC 60870-104, DNP, FTP, SSH, Telnet, HTTP, IPSec, L2TP, PPTP, RADIUS

Throughput:

- EDR-G902: Max. 25000 packet per second (or 300 Mbps)
- EDR-G903: Max. 40000 packet per second (or 500 Mbps)

**DoS and DDoS Protection:** Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, SYN/RST Scan, NEW-Without-SYN Scan, ICMP-Death, SYN-Flood, ARP-Flood

**NAT:** N-to-1, 1-to-1, bidirectional 1-to-1, and port forwarding

**IPSec VPN:**

Protocols:

- IPSec
- L2TP (server)
- PPTP (client)

Encryption:

- DES, 3DES, AES-128, AES-192, AES-256

Authentication:

- RSA (key size: 1024-bit, 2048-bit)
- X.509 v3 certificate
- MD5 and SHA (SHA-256)

Throughput:

- EDR-G902: Max. 60 Mbps (Condition: AES-246, SHA-256)
- EDR-G903: Max. 150 Mbps (Condition: AES-246, SHA-256)

Concurrent VPN Tunnels:

- EDR-G902: 50 IPSec VPN Tunnels (Max. 15 start in initial mode)
- EDR-G903: 100 IPSec VPN Tunnels (Max. 30 start in initial mode)

**OpenVPN:**

Protocols:

- OpenVPN (client and server), UDP and TCP
- Tunnel mode (routing) and TAP mode (bridge)

Encryption:

- Blowfish CBC, DES CBC, DES-EDE3 CBC, AES-128/192/256 CBC

Authentication:

- User password by MD5 and SHA1

Concurrent VPN Tunnels:

- Server mode: max. 5 external clients
- Client mode: max. 2 external servers

**Real-Time Firewall / VPN Event Log:**

- Event Type: Firewall Event, VPN Event, System Security Event
- Media: Local storage, Syslog server, and SNMP trap

**Interface**

**WAN/WAN1:** 1 RJ45/Fiber combo port

**WAN2/DMZ:** 1 RJ45/Fiber combo port

**LAN:**

EDR-G903: RJ45/SFP combo port

EDR-G902: RJ45

**RJ45 Ports:** 10/100/1000BaseT(X) auto negotiation speed

**Fiber Ports:** 100/1000BaseSFP slot

**LED Indicators:** PWR1, PWR2, FAULT, 10/100/1000M

**Alarm Contact:** One relay output with current-carrying capacity of 1 A @ 24 VDC

**Digital Inputs:** 1 input

- +13 to +30 V for state "1"
- -30 to +3 V for state "0"
- Max. input current: 8 mA

**Power Requirements**

**Input Voltage:** 12/24/48 VDC, redundant dual inputs

**Input Current:** 0.45 A @ 24 V

**Overload Current Protection:** Present

**Connection:** Removable terminal block

**Reverse Polarity Protection:** Present

**Physical Characteristics**

**Housing:** Metal, IP 30 protection

**Dimensions:** 51 x 152 x 131.1 mm (2.01 x 5.98 x 5.16 in)

**Weight:** 1250 g (2.82 lb)

**Installation:** DIN-rail mounting, wall mounting (with optional kit)

**Environmental Limits**

**Operating Temperature:**

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

**Ambient Relative Humidity:** 5 to 95 % (non-condensing)

**Standards and Certifications**

**Safety:** UL 508

**EMC:** EN 55032/24

**EMI:** CISPR 32, FCC Part 15B Class A

**EMS:**

IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m

IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV

IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV

IEC 61000-4-6 CS: Signal: 10 V

IEC 61000-4-8

**Power Automation:** IEC 61850-3 (EDR-G903)

**Marine:** DNV (EDR-G902)

**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:** 530,000 hrs

**Standard:** Telcordia (Bellcore), GB

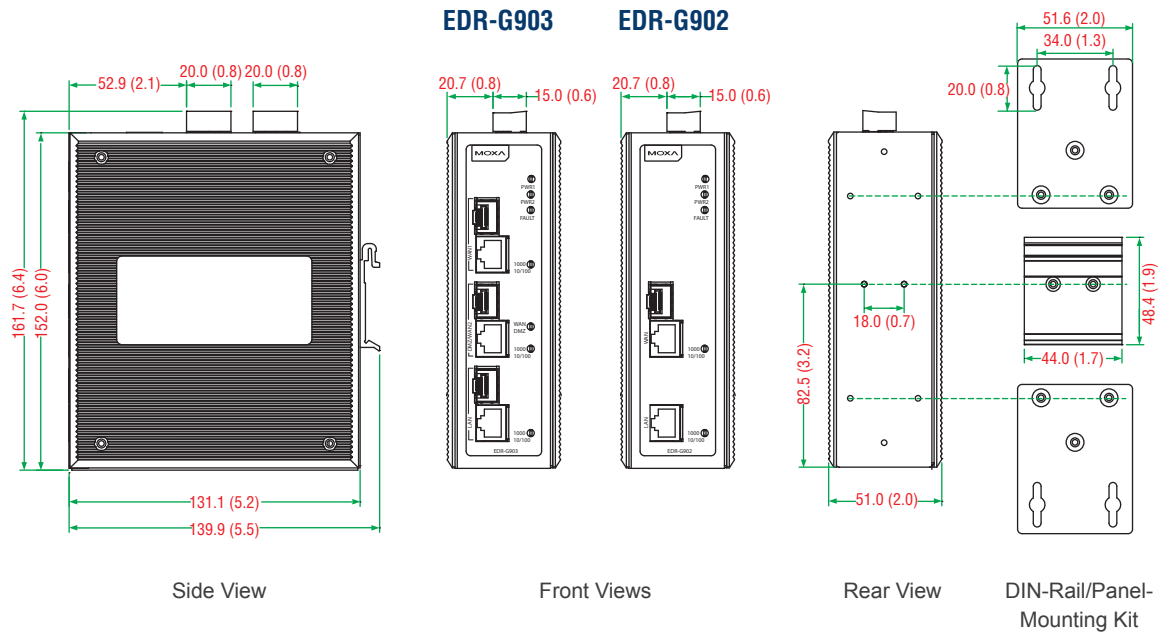
**Warranty**

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

Unit: mm (inch)



## Ordering Information

### Available Models

**EDR-G902:** Industrial secure routers with 1 WAN, firewall/NAT/VPN, 0 to 60°C operating temperature

**EDR-G902-T:** Industrial secure routers with 1 WAN, firewall/NAT/VPN, -40 to 75°C operating temperature

**EDR-G903:** Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, 0 to 60°C operating temperature

**EDR-G903-T:** Industrial secure router with 2 WAN/1 DMZ, and firewall/NAT/VPN, -40 to 75°C operating temperature

Note: The EDR-G903/G902 series secure routers support 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit/Fast Ethernet SFP module product information.

### Optional Accessories (can be purchased separately)

**DR-4524/75-24/120-24:** 45/75/120 W DIN-rail 24 VDC power supplies

**MDR-40-24/60-24:** 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature

**WK-51-01:** Wall-mounting kit, 2 plates with 6 screws

**RK-4U:** 4U-high 19-inch rack-mounting kit

### Package Checklist

- EDR-G903/G902 secure router
- Serial Cable: CN20070
- Documentation and software CD
- Hardware installation guide (printed)
- Warranty card

# SFP-1G Series

## 1-port Gigabit Ethernet SFP modules



- > Digital Diagnostic Monitor Function
- > -40 to 85°C operating temperature range (T models)
- > 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



### Specifications

#### Interface

Ethernet Ports: 1

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

#### Optical Fiber

		Gigabit Ethernet SFP									
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	1	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommended using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP									
		SFP-10A		SFP-10B	SFP-20A		SFP-20B	SFP-40A		SFP-40B	
Transceiver Type		Single-Mode			Single-Mode			Single-Mode			
Fiber Cable Type		G.652			G.652			G.652			
Typical Distance		10 km			20 km			40 km			
Wave-length	Typical (nm)	TX 1310, RX 1550		TX 1550, RX 1310		TX 1310, RX 1550		TX 1550, RX 1310		TX 1310, RX 1550	
	TX Range (nm)	1270 to 1355		1530 to 1570		1270 to 1355		1530 to 1570		1290 to 1330	
	RX Range (nm)	1480 to 1580		1260 to 1360		1480 to 1580		1260 to 1360		1480 to 1580	
Optical Power	TX Range (dBm)	-3 to -9			-2 to -8			+2 to -3			
	RX Range (dBm)	-3 to -21			-2 to -23			-1 to -23			
	Link Budget (dB)	12			15			20			
	Dispersion Penalty (dB)	2			3			1			

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)

Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

**Typical Distance:** To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

### Power Requirements

Power Consumption: Max. 1 W

### 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:** CE, FCC, TÜV (EN 60825), UL 60950-1

**Marine:** DNV, GL

### Warranty

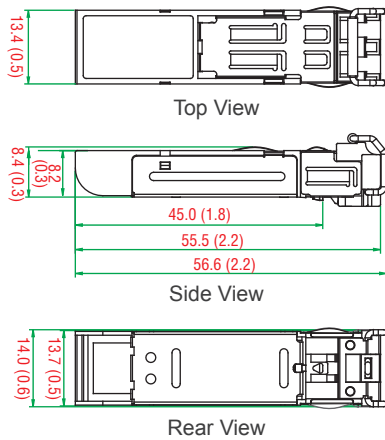
Warranty Period: 5 years

Details: See [www.moxa.com/warranty](http://www.moxa.com/warranty)

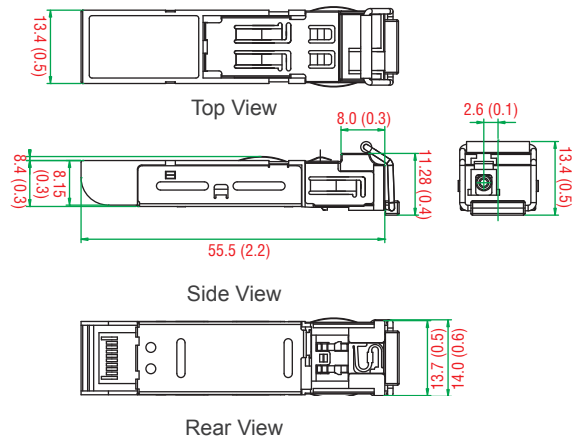
### Dimensions

Unit: mm (inch)

#### SFP-1G Series



#### SFP-1G Series (WDM Type)



### Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Transceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transceiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T*	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 km
SFP-1GLHXL	SFP-1GLHXL-T	Single-Mode	40 km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 km
SFP-1GEZXC	-	Single-Mode	110 km	-	-	-	-
SFP-1GEZXC-120	-	Single-Mode	120 km	-	-	-	-

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

#### Package Checklist

- SFP-1G module
- Warranty card

# SFP-1FE Series

## 1-port Fast Ethernet SFP modules



- > Digital Diagnostic Monitor Function
- > 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



### Specifications

#### Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector

#### Optical Fiber

	Fast Ethernet SFP			
	SFP-M		SFP-S	SFP-L
Transceiver Type	Multi-Mode		Single-Mode	
Fiber Cable Type	OM1/OM2	62.5/125, 50/125 $\mu$ m	G.652	G.652
		800 MHz* km		
Typical Distance	2 km	4 km	40 km	80 km
Wave-length	Typical (nm)	1310	1310	1550
	TX Range (nm)	1280 to 1340	1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1650	1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-8 to -18	0 to -5	0 to -5
	RX Range (dBm)	-3 to -32	-3 to -34	-3 to -34
	Link Budget (dB)	14	29	29
	Dispersion Penalty (dB)	2	3	1

Note: When connecting the SFP-S or L, we recommend using an attenuator to prevent damage caused by excessive optical power.

#### Power Requirements

Power Consumption: Max. 1 W

#### 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

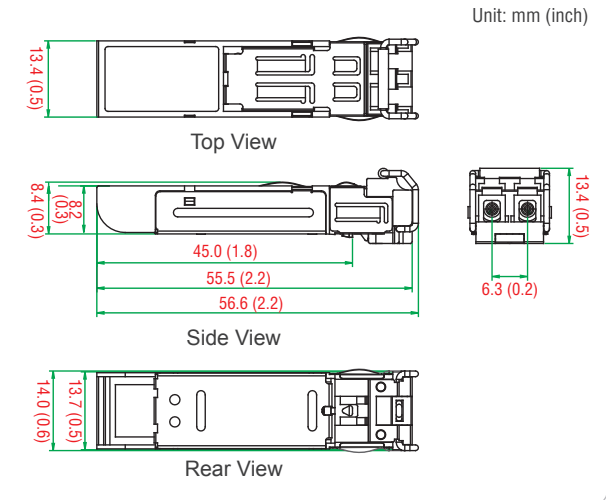
Safety: CE, FCC, TÜV, UL 60950-1  
 Marine: DNV, GL

#### Warranty

Warranty Period: 5 years

Details: See [www.moxa.com/warranty](http://www.moxa.com/warranty)

#### Dimensions



### Ordering Information

Available Models	Port Interface		
	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

#### Package Checklist

- SFP-1FE module
- Warranty card