EDR-G902/G903 Series

Industrial secure routers with firewall/NAT/VPN

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 100BaseTX and 100BaseFX
- IEEE 802.3ab for 1000BaseTX
- 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

Your Authorized Distributor is: Controller Service and Sales - www.controllerservice.com - sales@controllerservice.com - (800)584-5565
Industrial Network Security and Management

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
### 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

### 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.

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### 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**

<table>
<thead>
<tr>
<th>Transceiver Type</th>
<th>SFP-SX</th>
<th>SFP-LSX</th>
<th>SFP-LX</th>
<th>SFP-LH</th>
<th>SFP-LHX</th>
<th>SFP-ZX</th>
<th>SFP-EZX</th>
<th>SFP-EZX-120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Distance</td>
<td>300 m</td>
<td>550 m</td>
<td>1 km</td>
<td>2 km</td>
<td>10 km</td>
<td>30 km</td>
<td>40 km</td>
<td>80 km</td>
</tr>
</tbody>
</table>

**Interface**
Ethernet Ports: 1
Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

**Optical Fiber**

<table>
<thead>
<tr>
<th>Transceiver Type</th>
<th>SFP-10A</th>
<th>SFP-10B</th>
<th>SFP-20A</th>
<th>SFP-20B</th>
<th>SFP-40A</th>
<th>SFP-40B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Distance</td>
<td>10 km</td>
<td>20 km</td>
<td>40 km</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.

**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

**Dimensions**

<table>
<thead>
<tr>
<th>SFP-1G Series</th>
<th>SFP-1G Series (WDM Type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top View</td>
<td>Top View</td>
</tr>
<tr>
<td>Side View</td>
<td>Side View</td>
</tr>
<tr>
<td>Rear View</td>
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</tr>
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</table>

**Ordering Information**

<table>
<thead>
<tr>
<th>Standard Temperature Models (0 to 60°C)</th>
<th>Wide Temperature Models (-40 to 85°C)</th>
<th>Transceiver Type</th>
<th>Typical Distance</th>
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<th>Wide Temperature (-40 to 85°C)</th>
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<th>Typical Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFP-1GSXLC</td>
<td>SFP-1GSXLC-T</td>
<td>Multi-Mode</td>
<td>300/550 m</td>
<td>SFP-1G10ALC</td>
<td>SFP-1G10ALC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1GLSXLCL</td>
<td>SFP-1GLSXLCL-T</td>
<td>Multi-Mode</td>
<td>1/2 km</td>
<td>SFP-1G10BLC</td>
<td>SFP-1G10BLC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
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<td>10 km</td>
<td>SFP-1G20ALC</td>
<td>SFP-1G20ALC-T</td>
<td>Single-Mode</td>
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</tr>
<tr>
<td>SFP-1GLHLCL</td>
<td>SFP-1GLHLCL-T</td>
<td>Single-Mode</td>
<td>30 km</td>
<td>SFP-1G20BLC</td>
<td>SFP-1G20BLC-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1GLHCLXL</td>
<td>SFP-1GLHCLXL-T</td>
<td>Single-Mode</td>
<td>40 km</td>
<td>SFP-1G40ALC</td>
<td>SFP-1G40ALC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GZXLCL</td>
<td>SFP-1GZXLCL-T</td>
<td>Single-Mode</td>
<td>80 km</td>
<td>SFP-1G40BLC</td>
<td>SFP-1G40BLC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GEZXLCL</td>
<td>–</td>
<td>Single-Mode</td>
<td>110 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>SFP-1GEXXLCL-129</td>
<td>–</td>
<td>Single-Mode</td>
<td>120 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Package Checklist**

- SFP-1G module
- Warranty card

**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

**Dimensions**

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<td>300/550 m</td>
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<td>SFP-1G10ALC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1GLSXLCL</td>
<td>SFP-1GLSXLCL-T</td>
<td>Multi-Mode</td>
<td>1/2 km</td>
<td>SFP-1G10BLC</td>
<td>SFP-1G10BLC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1GLXLC</td>
<td>SFP-1GLXLC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
<td>SFP-1G20ALC</td>
<td>SFP-1G20ALC-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1GLHLCL</td>
<td>SFP-1GLHLCL-T</td>
<td>Single-Mode</td>
<td>30 km</td>
<td>SFP-1G20BLC</td>
<td>SFP-1G20BLC-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1GLHCLXL</td>
<td>SFP-1GLHCLXL-T</td>
<td>Single-Mode</td>
<td>40 km</td>
<td>SFP-1G40ALC</td>
<td>SFP-1G40ALC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GZXLCL</td>
<td>SFP-1GZXLCL-T</td>
<td>Single-Mode</td>
<td>80 km</td>
<td>SFP-1G40BLC</td>
<td>SFP-1G40BLC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GEZXLCL</td>
<td>–</td>
<td>Single-Mode</td>
<td>110 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>SFP-1GEXXLCL-129</td>
<td>–</td>
<td>Single-Mode</td>
<td>120 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Transceiver Type</th>
<th>Fast Ethernet SFP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SFP-M</td>
</tr>
<tr>
<td>SSFP-M</td>
<td>Multi-Mode</td>
</tr>
<tr>
<td>Fiber Cable Type</td>
<td>OM1/OM2</td>
</tr>
<tr>
<td>Typical Distance</td>
<td>2 km</td>
</tr>
<tr>
<td>Wave-length</td>
<td>TX Range (nm)</td>
</tr>
<tr>
<td></td>
<td>RX Range (nm)</td>
</tr>
<tr>
<td>Optical Power</td>
<td>TX Range (dBm)</td>
</tr>
<tr>
<td></td>
<td>RX Range (dBm)</td>
</tr>
<tr>
<td>Link Budget (dB)</td>
<td>14</td>
</tr>
</tbody>
</table>

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

Dimensions

Unit: mm (inch)

Ordering Information

<table>
<thead>
<tr>
<th>Available Models</th>
<th>Port Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFP-1FEMLC-T</td>
<td>100BaseFX, Multi-Mode, LC Connector, 4 km</td>
</tr>
<tr>
<td>SFP-1FELLC-T</td>
<td>100BaseFX, Single-Mode, LC Connector, 40 km</td>
</tr>
<tr>
<td>SFP-1FESSLC-T</td>
<td>100BaseFX, Single-Mode, LC Connector, 80 km</td>
</tr>
</tbody>
</table>

Package Checklist
- SFP-1FE module
- Warranty card