

# EDR-G9010 Series

8 GbE copper + 2 GbE SFP multiport industrial secure router



## Features and Benefits

- Marine cybersecurity certified (IACS UR E27 Rev.1 & IEC 61162-460 Ed. 3.0), supporting 460-gateway, forwarder and switch roles
- Developed according to the IEC 62443-4-1 and compliant with the IEC 62443-4-2 industrial cybersecurity standards
- 10-port Gigabit all-in-one firewall/NAT/VPN/router/switch
- Next-generation industrial firewall with Intrusion Prevention/Detection System (IPS/IDS)
- Visualize OT security with the MXsecurity management software
- Secure remote access tunnel with VPN
- Examine industrial protocol data with Deep Packet Inspection (DPI) technology
- Easy network setup with Network Address Translation (NAT)
- RSTP/Turbo Ring redundant protocol enhances network redundancy
- Supports Secure Boot for checking system integrity
- -40 to 75°C operating temperature range (-T model)

## Certifications



## Introduction

The EDR-G9010 Series is a set of highly integrated industrial multi-port secure routers with firewall/NAT/VPN and managed Layer 2 switch functions. These devices are designed for Ethernet-based security applications in critical remote control or monitoring networks. These secure routers provide an electronic security perimeter to protect critical cyber assets including substations in power applications, pump-and-treat systems in water stations, distributed control systems in oil and gas applications, and PLC/SCADA systems in factory automation. Furthermore, with the addition of IDS/IPS, the EDR-G9010 Series is an industrial next-generation firewall, equipped with threat detection and prevention capabilities to further protect critical infrastructure from cybersecurity attacks.

## MX-ROS Addresses Growing Cybersecurity Threats

Moxa's MX-ROS (<https://www.moxa.com/en/spotlight/portfolio/mx-ros/index>) is a software platform for industrial security routers and firewalls. The platform supports the robust security and user-friendly operation of secure routers through simplified web and CLI interfaces. In addition to adhering to IEC 62443-4-2, MX-ROS devices offer a wealth of the latest cross-industry Operational Technology (OT) network management features with each release to safeguard hardware and software.

## Defend Against Malicious Threats With Advanced Cybersecurity Features

The EDR-G9010 Series' embedded firewall uses policy rules to control network traffic between trusted zones while Network Address Translation (NAT) shields the internal network from unauthorized access by outside hosts. The Virtual Private Networking (VPN) functionality further provides users with secure communication tunnels when accessing the private network from the public Internet. To help protect your OT assets from cyberattacks, the EDR-G9010 Series supports Deep Packet Inspection (DPI) to examine the data portion of network packets for various OT-specific protocols.

## Simplify Configurations With the User-friendly Interface and Quick Settings

The EDR-G9010 Series' Setup Wizard provides an easy way for users to set up WAN, LAN, and Bridge ports for routing functionality in just four steps. In addition, the object-based firewall management feature gives engineers a simple way to configure and maintain firewall filtering for IP addresses and subnets, network services, industrial application services, and user-defined services.

## Industrial-grade Design to Ensure Uninterrupted Network Connectivity

The EDR-G9010 Series' rugged hardware makes these secure routers ideal for harsh industrial environments, featuring wide-temperature models that are built to operate reliably in hazardous conditions and extreme temperatures of -40 up to 75°C. Moreover, the EDR-G9010 Series supports comprehensive Layer 2 and Layer 3 redundancy mechanisms to ensure that your network stays connected at all times.

## Virtual Patching and Intelligent Threat Protection

Patching remains a major challenge in OT environments because OT applications cannot afford interrupting operations by shutting down systems to apply patches. Virtual patching technology can help complement existing patch management processes by shielding known and unknown vulnerabilities. In addition, the EDR-G9010 features intelligent IPS functionality for continuous protection against cyberthreats which uses pattern-based detection to identify and block known attacks.

## Specifications

### Input/Output Interface

|                        |                                                                                 |
|------------------------|---------------------------------------------------------------------------------|
| Alarm Contact Channels | Resistive load: 1 A @ 24 VDC                                                    |
| Buttons                | Reset button                                                                    |
| Digital Input Channels | +13 to +30 V for state 1<br>-30 to +3 V for state 0<br>Max. input current: 8 mA |

### Ethernet Interface

|                                            |                                                                                                                                                                                                                                                       |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/100/1000BaseT(X) Ports (RJ45 connector) | 8                                                                                                                                                                                                                                                     |
| 1000/2500BaseSFP Ports                     | 2                                                                                                                                                                                                                                                     |
| Standards                                  | IEEE 802.1Q for VLAN Tagging<br>IEEE 802.3 for 10BaseT<br>IEEE 802.3ab for 1000BaseT(X)<br>Static Port Trunk<br>IEEE 802.3u for 100BaseT(X)<br>IEEE 802.3x for flow control<br>IEEE 802.3z for 1000BaseSX/LX/LHX/ZX<br>IEEE 802.1X for authentication |
| DMZ                                        | User-configurable DMZ ports                                                                                                                                                                                                                           |

### Ethernet Software Features

|                        |                                                                                                                                                                |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Broadcast Forwarding   | IP directed broadcast, broadcast forwarding                                                                                                                    |
| Management             | Back Pressure Flow Control<br>DDNS<br>DHCP Server/Client<br>Web Console (HTTP/HTTPS)<br>LLDP<br>QoS/CoS/ToS<br>SNMPv1/v2c/v3<br>Telnet<br>TFTP<br>HTTPS<br>SSH |
| Redundancy Protocols   | RSTP<br>STP<br>Turbo Ring v2<br>Turbo Chain                                                                                                                    |
| Routing Throughput     | Max. 350K packets per second / 2 Gbps (based on RFC 2544)                                                                                                      |
| Routing Table          | Max. 4K routing rules                                                                                                                                          |
| Concurrent Connections | Max. 400K (based on RFC 3511)                                                                                                                                  |
| Connections Per Second | Max. 20K (based on RFC 3511)                                                                                                                                   |
| Routing Redundancy     | VRRP                                                                                                                                                           |
| Security               | Secure Boot<br>IPsec<br>L2TP (server)<br>RADIUS<br>Trust access control                                                                                        |

|                                |                                                                                                                                                                                                                                               |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | TACACS+<br>SCP<br>SFTP<br>NTP authentication<br>Syslog Authentication                                                                                                                                                                         |
| Time Management                | NTP Server/Client<br>SNTP                                                                                                                                                                                                                     |
| Unicast Routing                | OSPF<br>RIPV1/V2<br>Static Route                                                                                                                                                                                                              |
| Multicast Routing              | Static Route                                                                                                                                                                                                                                  |
| Filter                         | IGMP v1/v2/v3                                                                                                                                                                                                                                 |
| <b>Switch Properties</b>       |                                                                                                                                                                                                                                               |
| VLAN ID Range                  | VID 1 to 4094                                                                                                                                                                                                                                 |
| IGMP Groups                    | 1000                                                                                                                                                                                                                                          |
| Max. No. of VLANs              | 32                                                                                                                                                                                                                                            |
| <b>LED Interface</b>           |                                                                                                                                                                                                                                               |
| LED Indicators                 | PWR1, PWR2, STATE, MSTR/H.TC, CPLR/T.TC, VRRP/HA, VPN, USB                                                                                                                                                                                    |
| <b>DoS and DDoS Protection</b> |                                                                                                                                                                                                                                               |
| Technology                     | ARP-Flood<br>FIN Scan<br>ICMP Flood<br>TCP Sessions Without SYN<br>NMAP-ID Scan<br>NMAP-Xmas Scan<br>Null Scan<br>SYN/FIN Scan<br>SYN/RST Scan<br>SYN-Flood<br>Xmas Scan                                                                      |
| <b>Firewall</b>                |                                                                                                                                                                                                                                               |
| Filter                         | DDoS<br>Ethernet protocols<br>ICMP<br>IP address<br>MAC address<br>Ports                                                                                                                                                                      |
| Stateful Inspection            | Router firewall<br>Transparent (bridge) firewall                                                                                                                                                                                              |
| Deep Packet Inspection         | DNP3<br>EtherNet/IP<br>IEC 60870-5-104<br>IEC 61850 MMS<br>MELSEC<br>Modbus TCP<br>Modbus UDP<br>Omron FINS<br>OPC UA<br>Siemens S7 Comm.<br>Siemens S7 Comm. Plus<br>Additional protocols will be supported through future firmware updates. |

|                             |                                                                                                                                                 |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Intrusion Prevention System | Requires an additional license.                                                                                                                 |
| Throughput                  | Firewall:<br>Max. 350K packets per second / 2 Gbps (based on RFC 2544)<br><br>IPS:<br>Max. 200K packets per second / 2 Gbps (based on RFC 2544) |

#### IPsec VPN

|                        |                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------|
| Authentication         | MD5 and SHA (SHA-512)<br>RSA (key size: 1024-bit, 2048-bit)<br>X.509 v3 certificate         |
| Concurrent VPN Tunnels | Max. 250 IPsec VPN tunnels                                                                  |
| Encryption             | DES<br>3DES<br>AES-128<br>AES-192<br>AES-256<br>AES-256-GCM                                 |
| Protocols              | IPsec<br>L2TP (server)<br>PPTP (client)                                                     |
| Throughput             | Conditions: AES-256, SHA-256<br>Max. 100K packets per second / 800 Mbps (based on RFC 2544) |

#### NAT

|          |                                                     |
|----------|-----------------------------------------------------|
| Features | 1-to-1<br>N-to-1<br>NAT loopback<br>Port forwarding |
|----------|-----------------------------------------------------|

#### Real-Time Firewall / VPN Event Log

|            |                                             |
|------------|---------------------------------------------|
| Event Type | Firewall event<br>VPN event                 |
| Media      | Local storage<br>SNMP Trap<br>Syslog server |

#### Serial Interface

|              |                                                 |
|--------------|-------------------------------------------------|
| Console Port | RS-232 (TxD, RxD, GND), 3-pin (115200, n, 8, 1) |
| Connector    | USB Type-C                                      |

#### Power Parameters

|                   |                                                                                                                                                                                                     |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection        | Removable terminal block                                                                                                                                                                            |
| Input Voltage     | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>12/24/48 VDC, redundant dual inputs (DNV-certified for 24 VDC)<br><br>EDR-G9010-VPN-2MGSFP-HV(-T) models:<br>120/240 VDC/VAC, redundant dual inputs |
| Operating Voltage | non-HV(-T) models:<br>9.6 to 60 VDC<br><br>-HV(-T) models:<br>88 to 300 VDC, 90 to 264 VAC                                                                                                          |

|                                        |                                                                                                                                                                                                                                             |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Current                          | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>1.51 A @ 12 VDC<br>0.70 A @ 24 VDC<br>0.35 A @ 48 VDC<br><br>EDR-G9010-VPN-2MGSFP-HV(-T) models:<br>0.28 A @ 120 VAC<br>0.18 A @ 240 VAC<br>0.15 A @ 120 VDC<br>0.08 A @ 240 VDC            |
| Reverse Polarity Protection            | Supported                                                                                                                                                                                                                                   |
| <b>Physical Characteristics</b>        |                                                                                                                                                                                                                                             |
| Housing                                | Metal                                                                                                                                                                                                                                       |
| IP Rating                              | IP40                                                                                                                                                                                                                                        |
| Dimensions                             | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>58 x 135 x 105 mm (2.28 x 5.31 x 4.13 in)<br><br>EDR-G9010-VPN-2MGSFP-HV(-T) models:<br>64 x 135 x 105 mm (2.52 x 5.31 x 4.13 in)                                                           |
| Weight                                 | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>1030 g (2.27 lb)<br>EDR-G9010-VPN-2MGSFP-HV(-T) models:<br>1150 g (2.54 lb)                                                                                                                 |
| Installation                           | DIN-rail mounting (DNV-certified)<br>Wall mounting (with optional kit)                                                                                                                                                                      |
| Protection                             | -CT models: PCB conformal coating                                                                                                                                                                                                           |
| <b>Environmental Limits</b>            |                                                                                                                                                                                                                                             |
| Operating Temperature                  | Standard models: -10 to 60°C (14 to 140°F)<br>Wide temp. models: -40 to 75°C (-40 to 167°F)<br>EDR-G9010-VPN-2MGSFP(-T, -CT-, CT-T) models: DNV-certified for -25 to 70°C (-13 to 158°F)                                                    |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F)                                                                                                                                                                                                                  |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)                                                                                                                                                                                                                   |
| <b>Standards and Certifications</b>    |                                                                                                                                                                                                                                             |
| Safety                                 | IEC 62368-1<br>UL 62368-1<br>IEC 60950-1<br>UL 60950-1                                                                                                                                                                                      |
| EMC                                    | EN 55032/35                                                                                                                                                                                                                                 |
| EMI                                    | CISPR 32, FCC Part 15B Class A                                                                                                                                                                                                              |
| EMS                                    | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m<br>IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF |
| Industrial Cybersecurity               | IEC 62443-4-1<br>IEC 62443-4-2                                                                                                                                                                                                              |
| Railway                                | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models: EN 50121-4                                                                                                                                                                                     |
| Traffic Control                        | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models: NEMA TS2                                                                                                                                                                                       |

|                     |                                                                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maritime            | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>DNV,<br>DNV IEC 61162-460 Edition 3.0 460-gateway, 460-forwarder and 460-switch,<br>DNV security profile 2,<br>IACS UR E27 Rev.1,<br>IEC 60945 |
| Power Substation    | IEEE 1613<br>IEC 61850-3 Edition 2.0                                                                                                                                                           |
| Hazardous Locations | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models: ATEX, Class I Division 2                                                                                                                          |
| Shock               | IEC 60068-2-27                                                                                                                                                                                 |
| Freefall            | IEC 60068-2-32                                                                                                                                                                                 |
| Vibration           | IEC 60068-2-6                                                                                                                                                                                  |

## MTBF

|           |                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------|
| Time      | EDR-G9010-VPN-2MGSFP(-T, -CT, -CT-T) models:<br>1,080,807 hrs<br>EDR-G9010-VPN-2MGSFP-HV(-T) models:<br>509,714 hrs |
| Standards | Telcordia (Bellcore), GB                                                                                            |

## Warranty

|                 |                                                                      |
|-----------------|----------------------------------------------------------------------|
| Warranty Period | 5 years                                                              |
| Details         | See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a> |

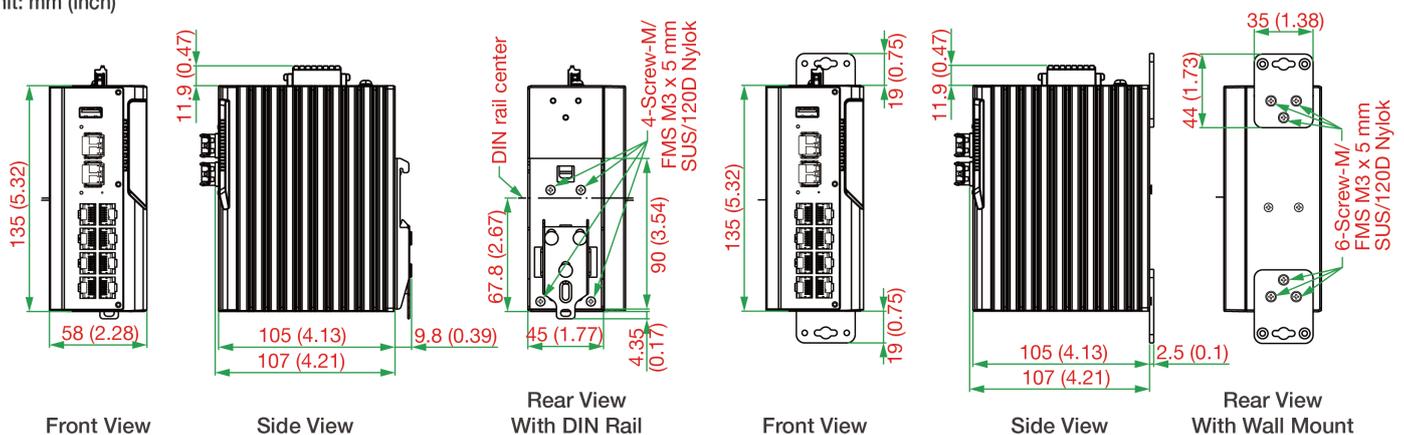
## Package Contents

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| Device           | 1 x EDR-G9010 Series secure router                                     |
| Cable            | 1 x DB9 female to USB Type-C                                           |
| Installation Kit | 4 x cap, plastic, for RJ45 port<br>2 x cap, plastic, for SFP slot      |
| Documentation    | 1 x quick installation guide<br>1 x warranty card                      |
| Note             | SFP modules need to be purchased separately for use with this product. |

## Dimensions

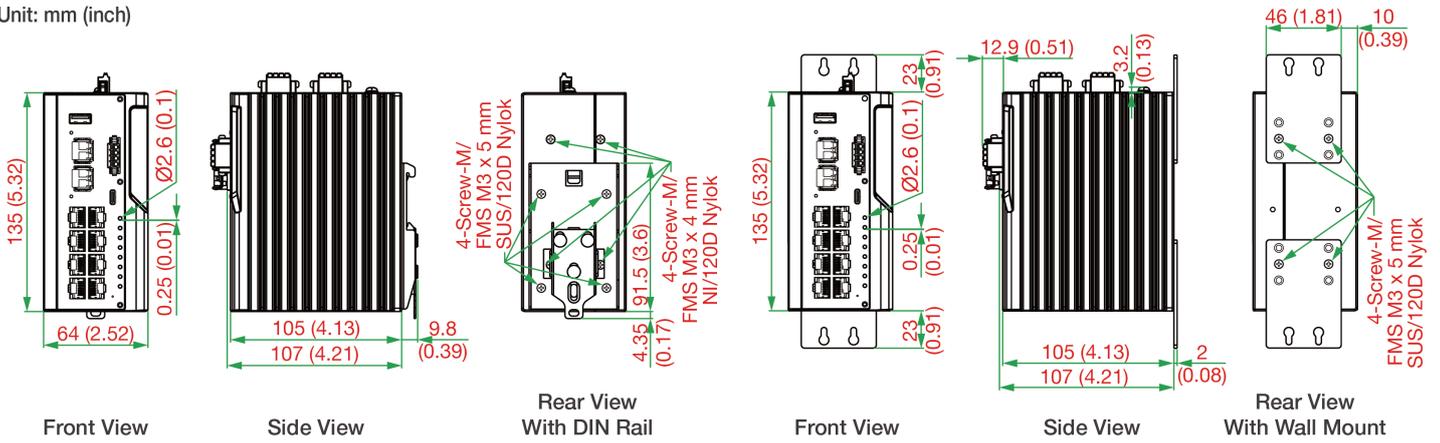
### Standard Models

Unit: mm (inch)



## HV Models

Unit: mm (inch)



## Ordering Information

| Model Name                | 10/100/1000BaseT(X) Ports (RJ45 Connector) | 10002500 BaseSFP Slots | Firewall | NAT | VPN | Input Voltage   | Conformal Coating | Operating Temp.                             |
|---------------------------|--------------------------------------------|------------------------|----------|-----|-----|-----------------|-------------------|---------------------------------------------|
| EDR-G9010-VPN-2MGSFP      | 8                                          | 2                      | ✓        | ✓   | ✓   | 12/24/48 VDC    | -                 | -10 to 60°C (DNV-certified)                 |
| EDR-G9010-VPN-2MGSFP-T    | 8                                          | 2                      | ✓        | ✓   | ✓   | 12/24/48 VDC    | -                 | -40 to 75°C (DNV-certified for -25 to 70°C) |
| EDR-G9010-VPN-2MGSFP-HV   | 8                                          | 2                      | ✓        | ✓   | ✓   | 120/240 VDC/VAC | -                 | -10 to 60°C                                 |
| EDR-G9010-VPN-2MGSFP-HV-T | 8                                          | 2                      | ✓        | ✓   | ✓   | 120/240 VDC/VAC | -                 | -40 to 75°C                                 |
| EDR-G9010-VPN-2MGSFP-CT   | 8                                          | 2                      | ✓        | ✓   | ✓   | 12/24/48 VDC    | ✓                 | -10 to 60°C                                 |
| EDR-G9010-VPN-2MGSFP-CT-T | 8                                          | 2                      | ✓        | ✓   | ✓   | 12/24/48 VDC    | ✓                 | -40 to 75°C                                 |

## Accessories (sold separately)

### Storage Kits

|              |                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABC-02-USB   | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature   |
| ABC-02-USB-T | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature |

### SFP Modules

|               |                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| SFP-1G10ALC   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G10ALC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G10BLC   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G10BLC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G20ALC   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G20ALC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |



## Software

|                                    |                                                                                                                   |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| LIC-MXsecurity-NEW-XN-SR           | MXsecurity perpetual node license with customizable node quantity (minimum 1 node)                                |
| LIC-IPS-MXsecurity-NEW-1Y-XN-SR    | 1-year IPS license for MXsecurity with customizable node quantity (minimum 1 node)                                |
| LIC-IPS-MXsecurity-NEW-XM-XN-DMR   | IPS license for MXsecurity with customizable duration and node quantity (minimum 1 month, minimum 1 node)         |
| LIC-IPS-MXsecurity-RENEW-1Y-XN-SR  | 1-year IPS renewal license for MXsecurity with customizable node quantity (minimum 1 node)                        |
| LIC-IPS-MXsecurity-RENEW-XM-XN-DMR | IPS renewal license for MXsecurity with customizable duration and node quantity (minimum 1 month, minimum 1 node) |
| LIC-IPS-MXsecurity-ADD-1Q-XN-SR    | 3-month IPS add-on license for MXsecurity with customizable node quantity (minimum 1 node)                        |
| LIC-IPS-MXsecurity-ADD-2Q-XN-SR    | 6-month IPS add-on license for MXsecurity with customizable node quantity (minimum 1 node)                        |
| LIC-IPS-MXsecurity-ADD-3Q-XN-SR    | 9-month IPS add-on license for MXsecurity with customizable node quantity (minimum 1 node)                        |
| LIC-IPS-MXsecurity-ADD-4Q-XN-SR    | 1-year IPS add-on license for MXsecurity with customizable node quantity (minimum 1 node)                         |
| LIC-IPS-MXsecurity-ADD-XM-XN-DMR   | IPS add-on license for MXsecurity with customizable duration and node quantity (minimum 1 month, minimum 1 node)  |
| LIC-IPS-DEVICE-NEW-1Y-1N-MR        | 1-year device-based IPS license                                                                                   |
| LIC-IPS-DEVICE-RENEW-1Y-1N-MR      | 1-year device-based IPS renewal license                                                                           |

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