

# MDS-G4020シリーズ

20Gポートレイヤ2フルギガビットモジュールマネージド・イーサネット・スイッチ



## 機能とメリット

- 多様なインターフェースタイプモジュールで汎用性向上
- ツール不要の設計で、スイッチの電源を切ることなくモジュールの追加や交換が容易
- 超小型サイズと多様な設置オプションで柔軟な設置が可能
- パッシブバックプレーンでメンテナンスの手間を最小限に抑える
- 過酷な環境でも使用できる堅牢なダイキャスト設計
- 直感的なHTML5ベースのWebインターフェースで、異なるプラットフォーム間でシームレスな操作性を実現
- IEC 61850-3およびIEEE 1613に準拠した高いEMC耐性
- ハードウェアベースのIEEE 1588 PTPで高精度な時刻同期を実現
- IEC 62439-3 Clause 4 (PRP) およびClause 5 (HSR) 準拠

## 認証



## 製品紹介

MDS-G4020シリーズのモジュール式スイッチは、4つの組み込みポート、4つのインターフェースモジュール拡張スロット、2つの電源モジュールスロットを含む最大20個のギガビットポートに対応し、様々なアプリケーションに十分な柔軟性を確保します。非常にコンパクトなMDS-G4000シリーズは、進化するネットワーク要件を満たすように設計されており、設置とメンテナンスが簡単に行えます。また、ホットスワップ可能なモジュール設計を採用しているため、スイッチをシャットダウンしたりネットワーク操作を中断したりすることなく、モジュールを簡単に変更または追加できます。

複数の種類のインターフェースモジュール（RJ45、SFP、PoE+、PRP/HSR）と電源ユニット（24/48 VDC、110/220 VAC/VDC）により、柔軟性と様々な動作条件に対する適合性がさらに高まり、イーサネットアグリゲーション/エッジスイッチとして機能するために必要な汎用性と帯域幅を提供する適応型のフルギガビットプラットフォームが実現します。MDS-G4000シリーズスイッチは、限られたスペースに収まるコンパクトな設計、複数の設置方法、便利なツール不要のモジュール取り付けを特徴としており、高度なスキルを持つエンジニアを必要とせずに、多用途かつ簡単に導入できます。MDS-G4000シリーズは、複数の業界認証を取得し、耐久性の高い筐体を採用しているため、変電所、採掘現場、ITS、石油・ガスアプリケーションなど、過酷で危険な環境でも確実に動作します。デュアル電源モジュールのサポートにより、高い信頼性と可用性を実現する冗長性が提供され、LVおよびHV電源モジュールオプションにより、様々なアプリケーションの電力要件に対応できる柔軟性がさらに高まります。

さらに、MDS-G4000シリーズはHTML5ベースのユーザーフレンドリーなWebインターフェースを備えており、様々なプラットフォームやブラウザで応答性に優れたスムーズなユーザーエクスペリエンスを提供します。

## 仕様

### Ethernet Interface

|                       |                                    |
|-----------------------|------------------------------------|
| Pre-installed Modules | 4 embedded Gigabit ports           |
| Module                | 4 slots for optional FE/GE modules |

|                  |  |
|------------------|--|
| Slot Combination | <p>See the LM-7000H module series datasheet for more information.</p> <p>Note: The required power module depends on the choice of LM-7000H module. Refer to the following power/module combination requirements.</p> <p>LM-7000H non-PoE modules:<br/>Any power module</p> <p>Note: LM-7000H-2GPHR module must be used with MDS-G4000 v2.0.0 or above.</p> <p>Note: The LM-7000H-2GPHR module can only be installed in one unit in slot M3.</p> <p>LM-7000H PoE modules:<br/>PWR-HV-P48, PWR-LV-P48 only</p> |
| Standards        | <p>IEEE 802.3 for 10BaseT<br/>IEEE 802.3u for 100BaseT(X) and 100BaseFX<br/>IEEE 802.3ab for 1000BaseT(X)<br/>IEEE 802.3z for 1000BaseX<br/>IEEE 802.3x for flow control<br/>IEEE 802.3ad for Port Trunk with LACP<br/>IEEE 802.1Q for VLAN Tagging<br/>IEEE 802.1D-2004 for Spanning Tree Protocol<br/>IEEE 802.1w for Rapid Spanning Tree Protocol<br/>IEEE 802.1p for Class of Service<br/>IEEE 802.1X for authentication</p>   |

### Ethernet Software Features

|                      |   |
|----------------------|---|
| Management           | <p>IPv4/IPv6<br/>Flow control<br/>Back Pressure Flow Control<br/>DHCP Server/Client<br/>ARP<br/>RARP<br/>DHCP Relay Agent (Option 82)<br/>Fiber check<br/>Port Mirroring (SPAN, RSPAN)<br/>Linkup Delay<br/>LLDP<br/>SMTP<br/>SNMP Trap<br/>SNMP Inform<br/>SNMPv1/v2c/v3<br/>RMON<br/>TFTP<br/>SFTP<br/>HTTP<br/>HTTPS<br/>Telnet<br/>Syslog<br/>Private MIB</p> |
| Filter               | <p>GMRP<br/>GVRP<br/>GARP<br/>802.1Q VLAN<br/>IGMP Snooping v1/v2/v3<br/>IGMP Querier</p>   |
| Redundancy Protocols | <p>Link Aggregation<br/>MRP<br/>MRP Interconnection<br/>MSTP<br/>Multiple Dual Homing<br/>Multiple Network Coupling<br/>Network Loop Protection<br/>Ring Coupling<br/>RSTP<br/>STP<br/>Tracking<br/>Turbo Chain<br/>Turbo Ring v2</p>   |

|                          |   |
|--------------------------|---|
| Security                 | <ul style="list-style-type: none"> <li>Access control list</li> <li>Broadcast storm protection</li> <li>DHCP Snooping</li> <li>Dynamic ARP Inspection</li> <li>HTTPS/SSL</li> <li>IEEE 802.1AE MAC security</li> <li>IP Source Guard</li> <li>Login and Password Policy</li> <li>MAC authentication bypass</li> <li>MAC Sticky</li> <li>RADIUS</li> <li>Rate Limit</li> <li>SSH</li> <li>Static Port Lock</li> <li>TACACS+</li> <li>Trust access control</li> </ul> |
| Time Management          | <ul style="list-style-type: none"> <li>SNTP</li> <li>IEEE 1588v2 PTP (hardware-based)</li> <li>Supported power profiles: IEEE 1588 Default 2008, IEC 61850-9-3-2016, IEEE C37.238-2017</li> <li>NTP Server/Client</li> <li>NTP Authentication</li> </ul>  |
| Protocols                | <ul style="list-style-type: none"> <li>802.1X</li> <li>ARP</li> <li>DHCP Client</li> <li>DHCP Server</li> <li>DNS</li> <li>HTTP</li> <li>HTTPS</li> <li>ICMP</li> <li>IPv4/IPv6</li> <li>NTP Client</li> <li>QoS</li> <li>RARP</li> <li>RMON</li> <li>SMTP</li> <li>SNMPv1/v2c/v3</li> <li>Syslog</li> <li>TCP/IP</li> <li>Telnet</li> <li>TFTP</li> <li>UDP</li> <li>VLAN Assignment</li> </ul>  |
| Industrial Protocols     | <ul style="list-style-type: none"> <li>EtherNet/IP</li> <li>Modbus TCP</li> <li>PROFINET</li> </ul>   |
| MIB                      | <ul style="list-style-type: none"> <li>P-BRIDGE MIB</li> <li>Q-BRIDGE MIB</li> <li>IEEE8021-SPANNING-TREE-MIB</li> <li>IEEE8021-PAE-MIB</li> <li>IEEE8023-LAG-MIB</li> <li>LLDP-EXT-DOT1-MIB</li> <li>LLDP-EXT-DOT3-MIB</li> <li>SNMPv2-MIB</li> <li>RMON MIB Groups 1, 2, 3, 9</li> </ul>  |
| Power Substation         | <ul style="list-style-type: none"> <li>1588 PTP Power Profile C37.238-2017</li> <li>1588 PTP Power Profile IEC 61850-9-3</li> <li>GOOSE Check</li> <li>MMS</li> </ul>   |
| <b>Switch Properties</b> |   |
| MAC Table Size           | 16 K  |
| Max. No. of VLANs        | 256   |
| VLAN ID Range            | VID 1 to 4094   |

|                               |   |
|-------------------------------|---|
| IGMP Groups                   | 1024  |
| Jumbo Frame Size              | 9.216 KB  |
| Priority Queues               | 8   |
| Packet Buffer Size            | 12 Mbits  |
| <b>LED Interface</b>          |   |
| LED Indicators                | PWR, EPS, STATE, SYNC, FAULT, MSTR/HEAD, CPLR/TAIL  |
| <b>Serial Interface</b>       |   |
| Console Port                  | RS-232 (RJ45)   |
| <b>USB Interface</b>          |   |
| USB Connector                 | USB Type A  |
| <b>Input/Output Interface</b> |   |
| Digital Input Channels        | 1 (On MGMT Module)  |
| Digital Inputs                | +13 to +30 V for state 1<br>-30 to +3 V for state 0<br>Max. input current: 8 mA   |
| Alarm Contact Channels        | 3 (On MGMT, PWR1, PWR2 Module)<br>Relay output with current carrying capacity of 2 A @ 30 VDC   |
| Buttons                       | Reset button  |
| <b>Power Parameters</b>       |   |
| Input Voltage                 | With PWR-HV-P48 installed:<br>110/220 VDC, 110 VAC, 60 HZ, 220 VAC, 50 Hz, PoE: 48 VDC<br><br>With PWR-LV-P48 installed:<br>24/48 VDC, PoE: 48 VDC<br><br>With PWR-HV-NP installed:<br>110/220 VDC, 110 VAC, 60 HZ, 220 VAC, 50 Hz<br><br>With PWR-LV-NP installed:<br>24/48 VDC  |
| Operating Voltage             | With PWR-HV-P48 installed:<br>88 to 300 VDC, 90 to 264 VAC, 47 to 63 Hz, PoE: 46 to 57 VDC<br><br>With PWR-LV-P48 installed:<br>18 to 72 VDC (24/48 VDC for hazardous location), PoE: 46 to 57 VDC (48 VDC for hazardous location)<br><br>With PWR-HV-NP installed:<br>88 to 300 VDC, 90 to 264 VAC, 47 to 63 Hz<br><br>With PWR-LV-NP installed:<br>18 to 72 VDC |
| Input Current                 | With PWR-HV-P48/PWR-HV-NP installed:<br>Max. 0.30 A @ 110 VDC<br>Max. 0.15 A @ 220 VDC<br>Max. 0.60 A @ 110 VAC<br>Max. 0.40 A @ 220 VAC<br><br>With PWR-LV-P48/PWR-LV-NP installed:<br>Max. 1.5 A @ 24 VDC<br>Max. 0.75 A @ 48 VDC<br><br>EPS (PoE models only):<br>Max. 8.2 A @ 48 VDC  |

|                                |   |
|--------------------------------|---|
|                                | Note: These are the input current ratings for the device with the maximum number of modules installed.  |
| Power Consumption (Max.)       | <p>With PWR-HV-P48/PWR-HV-NP installed:<br/> Max. 33.0 W @ 110 VDC<br/> Max. 34.0 W @ 220 VDC<br/> Max. 35.8 W @ 110 VAC<br/> Max. 38.0 W @ 220 VAC</p> <p>With PWR-LV-P48/PWR-LV-NP installed:<br/> Max. 36.0 W @ 24 VDC<br/> Max. 36.0 W @ 48 VDC</p> <p>Note: These are the maximum power consumption ratings for the device with the maximum number of modules installed.</p>   |
| Max. PoE Power Output per Port | 36 W  |
| Total PoE Power Budget         | <p>Max. 360 W (with one power supply) for total PD consumption at 48 VDC input for PoE systems</p> <p>Max. 360 W (with one power supply) for total PD consumption at 53 to 57 VDC input for PoE+ systems</p> <p>Max. 720 W (with two power supplies) for total PD consumption at 48 VDC input for PoE systems</p> <p>Max. 720 W (with two power supplies) for total PD consumption at 53 to 57 VDC input for PoE+ systems</p> |
| Overload Current Protection    | Supported   |
| Reverse Polarity Protection    | Supported   |

### Physical Characteristics

|              |   |
|--------------|---|
| IP Rating    | IP40  |
| Dimensions   | 176 x 115 x 163.25 mm (6.93 x 4.53 x 6.44 in)   |
| Weight       | 2500 g (5.51 lb)  |
| Installation | DIN-rail mounting<br>Wall mounting (with optional kit)<br>Rack mounting (with optional kit) |

### Environmental Limits

|  |   |
|--|---|
| Operating Temperature                  | Standard Temperature: -10 to 60°C (14 to 140°F)<br>Wide Temperature: -40 to 75°C (-40 to 167°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F)  |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)   |

### Standards and Certifications

|        |   |
|--------|---|
| Safety | EN IEC 62368-1<br>IEC 60950-1<br>IEC 62368-1<br>UL 62368-1  |
| EMC    | EN 55032/35<br>EN 61000-6-2/-6-4  |
| 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 |

|                     |   |
|---------------------|---|
|                     | IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF<br>IEC 61000-4-11 Voltage Dips & Interruptions |
| Railway             | EN 50121-4  |
| Traffic Control     | NEMA TS2  |
| Shock               | IEC 60068-2-27  |
| Freefall            | IEC 60068-2-31  |
| Vibration           | IEC 60068-2-6   |
| Hazardous Locations | ATEX<br>Class I Division 2  |
| Power Substation    | IEEE 1613<br>IEC 61850-3  |

### MTBF

|           |                           |
|-----------|---------------------------|
| Time      | 1,007,790 hrs             |
| Standards | Telcordia Standard SR-332 |

### Warranty

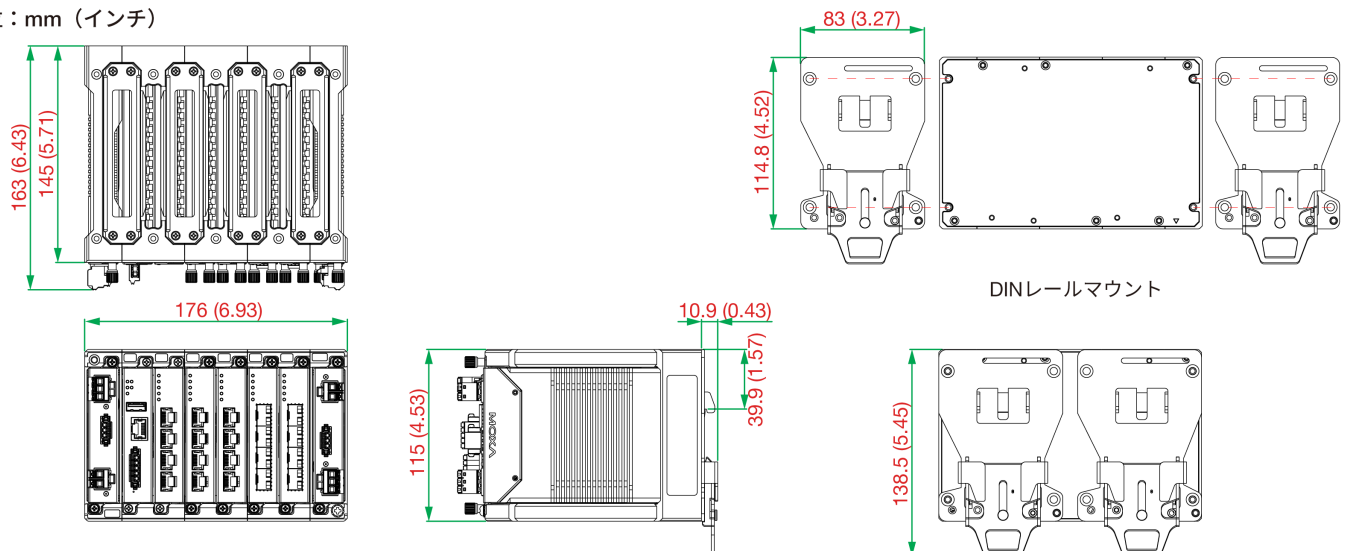
|                 |  |
|-----------------|--|
| Warranty Period | 5 years  |
| Details         | See <a href="http://www.moxa.com/jp/warranty">www.moxa.com/jp/warranty</a> |

### Package Contents

|                  |   |
|------------------|---|
| Device           | 1 x MDS-G4020 Series switch   |
| Installation Kit | Pre-install 2 x DIN-rail kit<br>2 x cap, plastic, for RJ45 port   |
| Documentation    | 1 x quick installation guide<br>1 x product notice, Simplified Chinese<br>1 x product certificates of quality inspection, Simplified Chinese<br>1 x warranty card |
| Note             | This product requires additional modules (sold separately) to function.   |

## 寸法

単位：mm（インチ）



## 注文情報

| Model Name  | Layer | Total No. of Ports | 100/1000Base SFP Slots | 10/100/1000BaseT(X) Ports RJ45 Connector | PoE 10/100/1000BaseT(X) Ports RJ45 Connector | 10/100BaseT(X) Ports RJ45 Connector | PoE 10/100BaseT(X) Ports RJ45 Connector | Operating Temp. |
|-------------|-------|--------------------|------------------------|--|--|-------------------------------------|---|-----------------|
| MDS-G4020   | 2     | 20                 | Up to 16               | Up to 20                                 | Up to 16                                     | Up to 16                            | Up to 16                                | -10 to 60°C     |
| MDS-G4020-T | 2     | 20                 | Up to 16               | Up to 20                                 | Up to 16                                     | Up to 16                            | Up to 16                                | -40 to 75°C     |

## アクセサリ（別売）

### LM-7000H Module Series

|                |   |
|----------------|---|
| LM-7000H-4GTX  | Gigabit Ethernet module with 4 10/100/1000BaseT(X) ports  |
| LM-7000H-4GPoE | Gigabit Ethernet module with 4 10/100/1000BaseT(X) IEEE 802.3af/at PoE+ ports   |
| LM-7000H-4GSFP | Gigabit Ethernet module with 4 100/1000BaseSFP slots  |
| LM-7000H-4TX   | Fast Ethernet module with 4 10/100BaseT(X) ports  |
| LM-7000H-4PoE  | Fast Ethernet module with 4 10/100BaseT(X) IEEE 802.3af/at PoE+ ports   |
| LM-7000H-2GPHR | Gigabit Ethernet module with 2 100/1000BaseT(X) PRP/HSR or 100/1000BaseSFP PRP/HSR combo ports, -40 to 75°C operating temperature |

### Power Modules

|            |   |
|------------|---|
| PWR-LV-P48 | Power supply module (24/48 VDC) with system power input, relay, PoE power input       |
| PWR-HV-P48 | Power supply module (110/220 VAC/VDC) with system power input, relay, PoE power input |
| PWR-LV-NP  | Power supply module (24/48 VDC) with system power input, relay                        |
| PWR-HV-NP  | Power supply module (110/220 VAC/VDC) with system power input, relay                  |

### Wall-Mounting Kits

|           |                                       |
|-----------|---------------------------------------|
| WK-112-01 | Wall-mounting kit, 2 plates, 8 screws |
|-----------|---------------------------------------|

### Rack-Mounting Kits

|          |  |
|----------|--|
| RK-3U-02 | Rack-mounting kit with 4 L-shaped plates for the MDS-G4000 and MDS-G4000-4XGS Series |
|----------|--|

### SFP Modules

|               |  |
|---------------|--|
| SFP-1FEMLC-T  | SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature  |
| SFP-1FESLC-T  | SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature                                      |
| SFP-1FELLC-T  | SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature                                      |
| 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 |
| SFP-1G20BLC   | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |

|                |  |
|----------------|--|
| SFP-1G20BLC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G40ALC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G40ALC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G40BLC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G40BLC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1GSXLC     | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, 0 to 60°C operating temperature  |
| SFP-1GSXLC-T   | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature                                      |
| SFP-1GLSXLC    | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature   |
| SFP-1GLSXLC-T  | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature                                       |
| SFP-1GLXLC     | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature  |
| SFP-1GLXLC-T   | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature  |
| SFP-1GLHLC     | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature  |
| SFP-1GLHLC-T   | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature  |
| SFP-1GLHXL     | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature   |
| SFP-1GLHXL-T   | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature   |
| SFP-1GZXLC     | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature  |
| SFP-1GZXLC-T   | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature  |
| SFP-1GEZXC     | SFP module with 1 1000BaseEZX port with LC connector for 110 km transmission, 0 to 60°C operating temperature  |
| SFP-1GEZXC-120 | SFP module with 1 1000BaseEZX port with LC connector for 120 km transmission, 0 to 60°C operating temperature  |
| SFP-1GTXRJ45-T | SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature   |

## Power Supplies

|            |  |
|------------|--|
| HDR-60-24  | 60 W/2.5 A DIN-rail 24 VDC power supply, universal 85 to 264 VAC or 120 to 370 VDC input voltage, -30 to 70°C operating temperature  |
| NDR-120-24 | 120 W/5.0 A DIN-rail 24 VDC power supply, universal 90 to 264 VAC or 127 to 370 VDC input voltage, -20 to 70°C operating temperature |
| NDR-120-48 | 120 W/2.5 A DIN-rail 48 VDC power supply, universal 90 to 264 VAC or 127 to 370 VDC input voltage, -20 to 70°C operating temperature |
| NDR-240-48 | 240 W/5.0 A DIN-rail 48 VDC power supply, universal 90 to 264 VAC or 127 to 370 VDC input voltage, -20 to 70°C operating temperature |

## Cables

|         |  |
|---------|--|
| CN20070 | 10-pin RJ45 to DB9 female serial cable |
|---------|--|

## 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 |

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