



# NCS 5500 Series Modular Router Overview

- [Cisco NCS 5500 Series Modular Routers, on page 1](#)
- [Slot Numbering for Cisco NCS 5500 Series Modular Routers, on page 3](#)
- [Line Card Overview, on page 9](#)
- [Modular Port Adapters, on page 20](#)
- [Route Processor Card Overview, on page 27](#)
- [Environmental and Physical Specifications, on page 29](#)
- [Weight, Quantity and Power Consumption, on page 29](#)
- [Airflow Direction, on page 30](#)
- [Maximum Power Available to the Router, on page 30](#)
- [Transceivers, Connectors, and Cables, on page 33](#)
- [Pinouts, on page 34](#)
- [Power Supply Power Cord Specifications, on page 36](#)

## Cisco NCS 5500 Series Modular Routers

The following table lists the various components and its quantity as supported on Cisco NCS 5500 series modular routers.

| Component  | NCS 5504                                     | NCS 5508 | NCS 5516 |
|--|--|----------|----------|
| Line cards – see <a href="#">Line Card Overview, on page 9</a> | 4  | 8        | 16       |
| Route Processors   | 1 or 2 – NC55-RP or NC55-RP-E, or NC55-RP2-E |          |          |
| System Controllers   | 1 or 2 – NC55-SC                             |          |          |

| Component   | NCS 5504   | NCS 5508  | NCS 5516  |
|---|--|---|---|
| Fabric Cards  | 3 to 6<br>NC55-5504-FC<br><b>Caution</b> Use only with NC55-5504-FAN.  | 3 to 6<br>NC55-5508-FC<br><b>Caution</b> Use only with NC55-5508-FAN.   | 3 to 6<br>NC55-5516-FC<br><b>Caution</b> Use only with NC55-5516-FAN.   |
|   | 3 to 6<br>NC55-5504-FC2<br><b>Caution</b> Use only with NC55-5504-FAN2.<br><br>Minimum requirements for the Cisco NCS 5504 chassis to operate with NC55-5504-FC2 cards are: <ul style="list-style-type: none"> <li>• At least three NC55-5504-FC2 fabric cards and all three NC55-5504-FAN2 fan trays</li> <li>• NC55-5504-FC2 fabric cards must be inserted in slots FM1, FM3, and FM5</li> </ul> | 3 to 6<br>NC55-5508-FC2<br><b>Caution</b> Use only with NC55-5508-FAN2.<br><br><b>Note</b> During a system upgrade from Release 7.0.1 or Release 7.0.2 to any future release, the NC55-5508-FC2 card reloads twice. The reboot history can be verified using the <b>show reboot-history card location &lt;node-id&gt;</b> command, in the System Admin Config mode. | 3 to 6<br>NC55-5516-FC2<br><b>Caution</b> Use only with NC55-5516-FAN2. |
| Fan trays   | 3<br>NC55-5504-FAN<br><b>Caution</b> Use only with NC55-5504-FC.   | 3<br>NC55-5508-FAN<br><b>Caution</b> Use only with NC55-5508-FC.  | 3<br>NC55-5516-FAN<br><b>Caution</b> Use only with NC55-5516-FC.        |
|   | 3<br>NC55-5504-FAN2<br><b>Caution</b> Use only with NC55-5504-FC2.   | 3<br>NC55-5508-FAN2<br><b>Caution</b> Use only with NC55-5508-FC2.  | 3<br>NC55-5516-FAN2<br><b>Caution</b> Use only with NC55-5516-FC2.      |
| Power supplies:<br><ul style="list-style-type: none"> <li>• NC55-PWR-3KW-AC</li> <li>• NC55-PWR-3KW-DC</li> <li>• NC55-PWR-3KW-2HV (3.15-kW HVAC/HVDC dual-input)</li> <li>• NC55-PWR-4.4KW-DC</li> </ul> | 4  | 8   | 10  |

**Caution**

The system does not support a mix of 1st generation fans and fabric cards (NC55-55xx-FAN/NC55-55xx-FC) and 2nd generation fans and fabric cards (NC55-55xx-FAN2 and NC55-55xx-FC2). Attempting to mix 1st generation and 2nd generation components could result in equipment damage.

## Slot Numbering for Cisco NCS 5500 Series Modular Routers

### Cisco NCS 5504 Modular Router

In Cisco NCS 5504 modular router chassis, the line card slot number starts from 0 through 3. Slot 0 is located at the top of the chassis and slot 3 at the bottom. The fan tray and fabric cards are located at the rear of the chassis. The fabric cards are installed behind the fan trays. These illustrations show the NCS 5504 modular router slot numbering:

*Figure 1: Cisco NCS 5504 Router Slot Numbering - Front View*

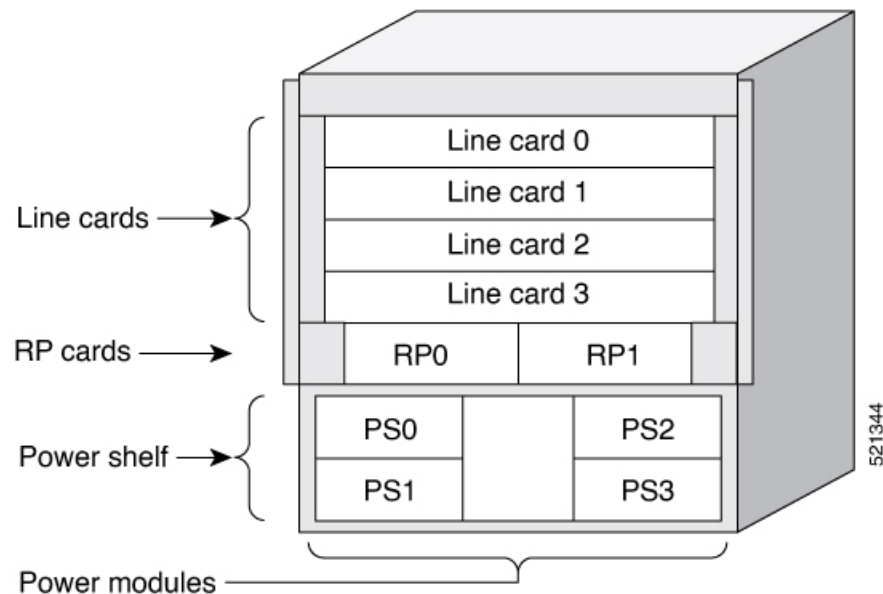
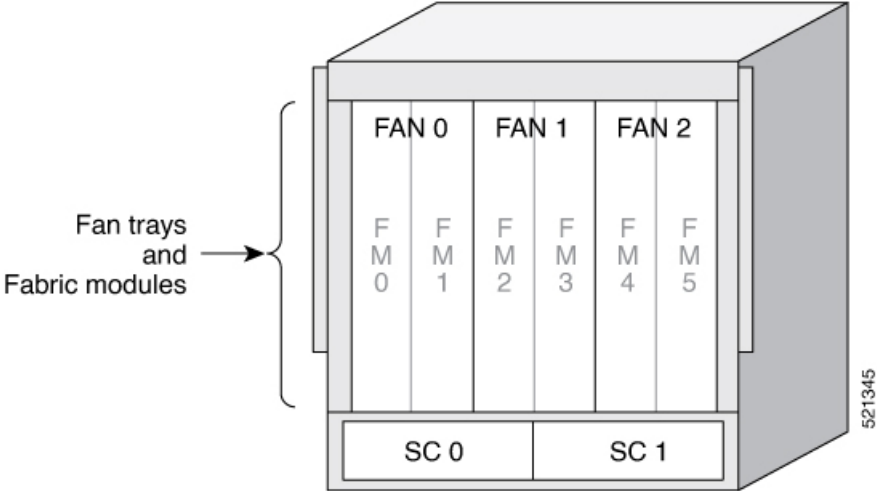


Figure 2: Cisco NCS 5504 Router Slot Numbering - Rear View



**Cisco NCS 5508 Modular Router**

In Cisco NCS 5508 modular router chassis, the line card slot number starts from 0 through 7. Slot 0 is located at the top of the chassis and slot 7 at the bottom. The fan tray and fabric cards are located at the rear of the chassis. The fabric cards are installed behind the fan trays. These illustrations show the NCS 5508 modular router slot numbering:

Figure 3: Cisco NCS 5508 Router Slot Numbering - Front View

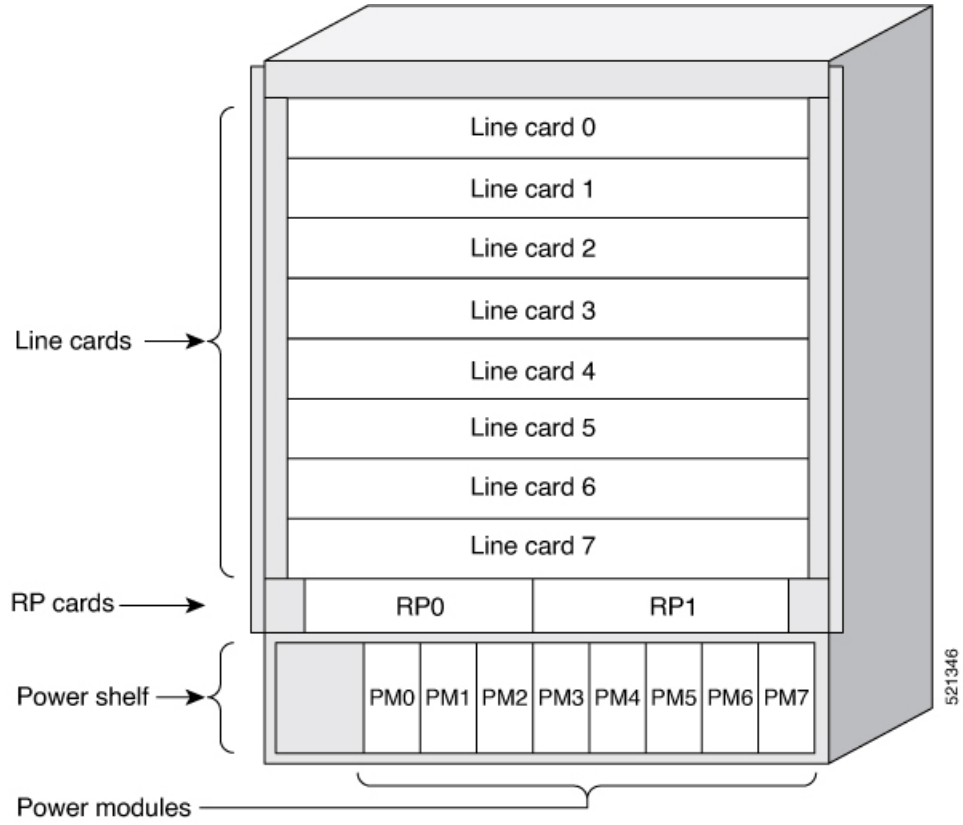
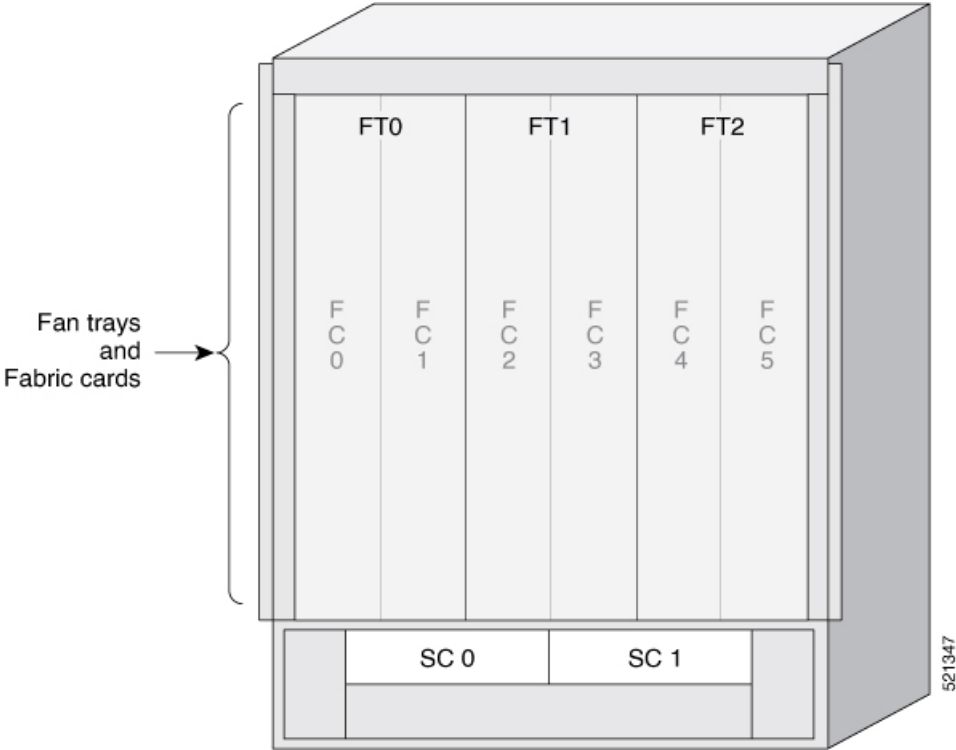


Figure 4: Cisco NCS 5508 Router Slot Numbering - Rear View



**Cisco NCS 5516 Modular Router**

In Cisco NCS 5516 modular router, the line card slot number starts from 0 through 15. Slot 0 is located at the top of the chassis and slot 15 at the bottom. The fan tray and fabric cards are located at the rear of the chassis. The fabric cards are installed behind the fan trays. These illustrations show the NCS 5516 modular router slot numbering:

Figure 5: Cisco NCS 5516 Router Slot Numbering - Front View

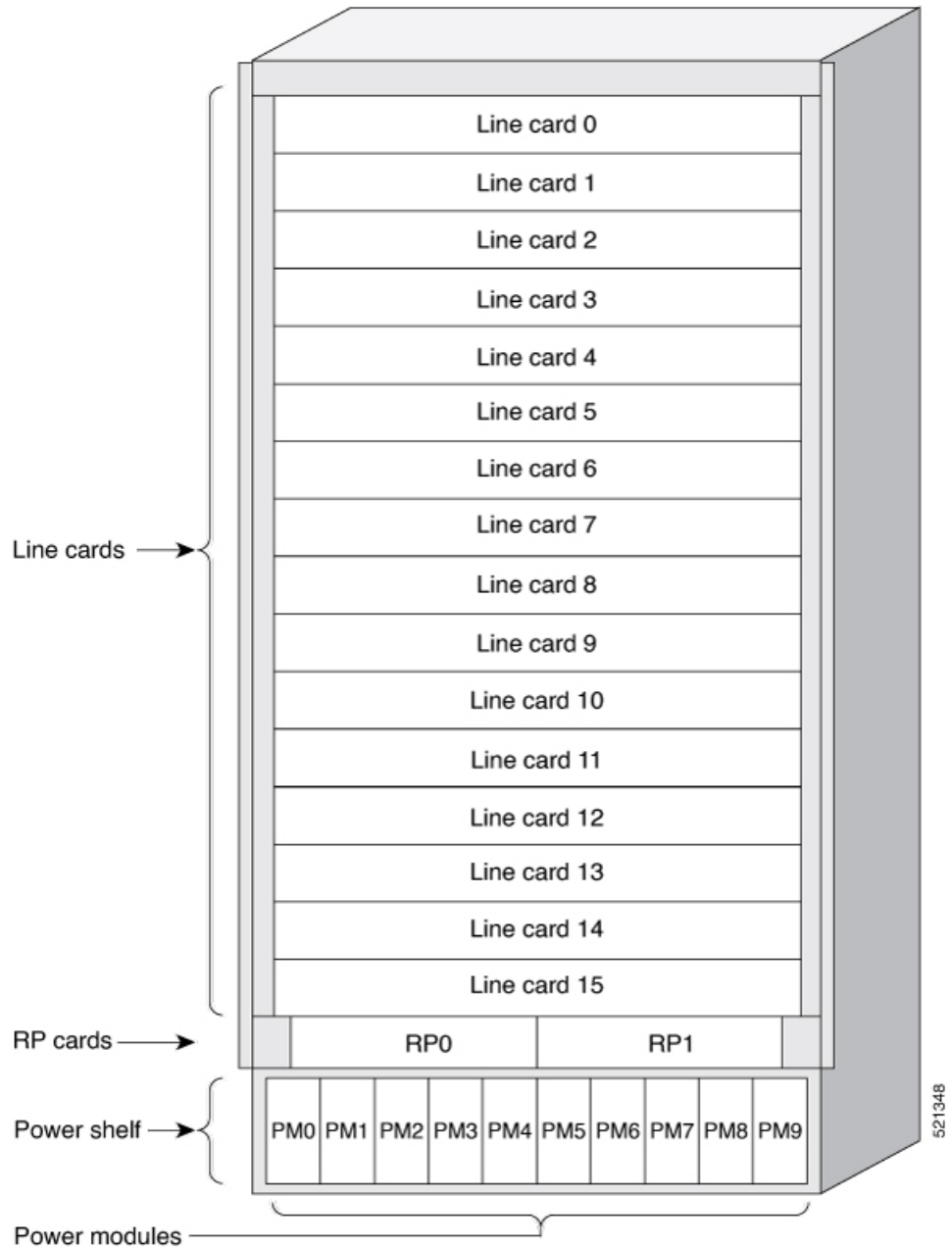
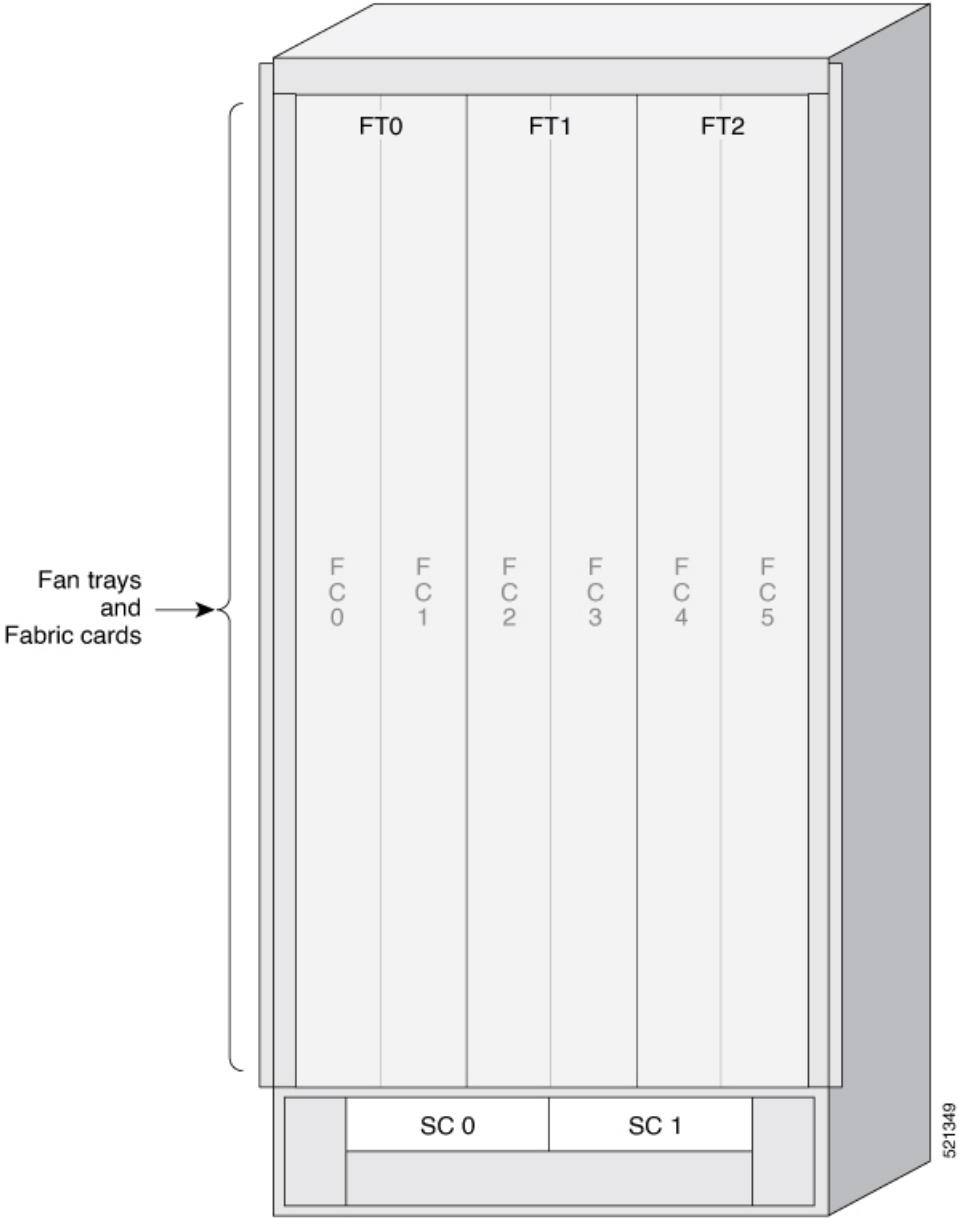


Figure 6: Cisco NCS 5516 Router Slot Numbering - Rear View





# Line Card Overview

*Table 1: Feature History Table*

| Hardware                                    | Release Information | Feature Description  |
|---|---------------------|--|
| NC57-48Q2D-S and NC57-48Q2D-SE-S line cards | Release 7.10.1      | <p>The NC57-48Q2D-S is a modular line card that supports front panel bandwidth of 2.4 Tbps through fixed optics ports. The front panel consists of the following port:</p> <ul style="list-style-type: none"> <li>• Two QSFP-DD ports of 400GbE</li> <li>• 16 SFP56 ports of 50GbE</li> <li>• 32 SFP28 ports of 25GbE</li> </ul> <p>The NC57-48Q2D-SE-S line card has additional TCAM for supporting expanded Forwarding Information Base (FIB), network access control lists (ACLs), and QoS for scale-enhanced configuration needs.</p> <p>The line card can operate in native mode and compatible mode.</p> |

| Hardware               | Release Information             | Feature Description   |
|------------------------|---------------------------------|---|
| NC57-MOD-S line card   | Release 7.6.1                   | <p>The NC57-MOD-S is a modular line card that supports front panel ports through a combination of Modular Port Adapters (MPAs) and fixed optics ports. This line card provides 2.8 Tbps bandwidth through:</p> <ul style="list-style-type: none"> <li>• Two MPA slots, each supporting up to 800GbE MPA</li> <li>• Two QSFP-DD ports of 400GbE</li> <li>• Eight SFP56 ports of 50GbE</li> </ul> <p>The line card can operate in native mode (all line cards in the chassis are Cisco NCS 5700 line cards) and compatible mode (previous generation Cisco NCS 5500 series line cards are present in the chassis).</p> <p>For the compatibility details of Modular Port Adapters (MPAs) on the line cards, see the Cisco Network Convergence System 5700 Series: 400GbE and 100GbE Line Cards data sheet.</p> |
| NC57-36H6D-S line card | Release 7.4.1 and Release 7.3.2 | <p>This release introduces a 100G optimized NCS 5700 combo line card with 4.8-Tbps throughput. It provides a mix of 100GE, 200GE, and 400GE ports with MACSec support. The line card provides flexible port configuration and can be used as 36x100GE or 24x100GE + 12x200GE, or 24x100GE + 6x400GE ports. For ports 0-23, only even numbered ports support 4x25GE and 4x10GE breakout. The line card can be operated in native mode (all NCS 5700 line cards in the chassis) and compatible mode (mix of NCS 5700 series line cards and previous generation NCS 5500 series line cards).</p>   |

| Hardware                  | Release Information | Feature Description   |
|---------------------------|---------------------|---|
| NC57-36H-SE line card     | Release 7.2.2       | This release introduces a 100G optimized NCS 5700 scale line card that provides 36 ports of 100 Gigabit Ethernet with full line rate capacity. All ports support 100GE and 40GE optics. Only even ports support 4x25GE and 4x10GE breakout. The line card works in native and compatibility mode. |
| NC55-32T16Q4H-A line card | Release 7.2.2       | This release introduces a 10G optimized NCS5500 line card that provides 48 ports of 1/10/25 Gigabit Ethernet and 4 ports of 40/100 Gigabit Ethernet. The line card improves port density for low speed interfaces within the family of modular NCS 5500 chassis.                                  |




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**Note** We recommend that you run the NC57 line cards in native mode, except when there is a NCS55 line card in the chassis.

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The following table describes the line cards supported on the NCS 5500 series modular routers:

| Line Card  | Ports/Adapters   | Transceivers |
|--|--|--------------|
| NC55-24X100-SE   | <ul style="list-style-type: none"> <li>• 24 x 100GE–100GE, 40GE, or 4x10GE via breakout cable</li> <li>• QSFP-to-SFP adapter (QSA) with 1GE SFP (GLC-SX-MMD, GLC-LH-SMD) and 10 GE SFP+ (ER, ER-S, ZR, ZR-S, DWDM fixed-wavelengths)</li> </ul>  | QSFP28/QSFP+ |
| NC55-36X100G   | <ul style="list-style-type: none"> <li>• 36 x 100GE–100GE, 40GE, or 4x10GE via breakout cable</li> <li>• QSFP-to-SFP adapter (QSA) with 1GE SFP (GLC-SX-MMD, GLC-LH-SMD) and 10 GE SFP+ (ER, ER-S, ZR, ZR-S, DWDM fixed-wavelengths)</li> </ul>  |              |
| NC55-36X100G-S<br>Supports MACsec and offers 3.6 Tbps Ethernet traffic on the front panel to Fabric that support 5.4 Tbps.   | <ul style="list-style-type: none"> <li>• 36 x 100GE–100GE, 40GE, 4x25GE via breakout cable, or 4x10GE via breakout cable</li> </ul>  |              |
| NC55-36X100G-A-SE<br>Has external TCAM for supporting expanded Forwarding Information Base (FIB), network access control lists (ACLs), and QoS for scale-enhanced configuration needs. | <ul style="list-style-type: none"> <li>• 36 x 100GE–100GE, 40GE, 4x25GE via breakout cable, or 4x10GE via breakout cable</li> <li>• QSFP-to-SFP adapter (QSA) with 10 GE SFP+ (ER, ER-S, ZR, ZR-S, DWDM fixed-wavelengths)</li> </ul>  |              |
| NC55-18H18F  | <ul style="list-style-type: none"> <li>• 18 x 100GE–100GE, 40GE, or 4x10GE via breakout</li> <li>• 18 x 40GE–40GE or 4x10GE via breakout</li> </ul>  |              |
| NCS55-24H12F-SE  | <ul style="list-style-type: none"> <li>• 24 x 100GE–100GE, 40GE, or 4x10GE via breakout</li> <li>• 12 x 40GE–40GE or 4x10GE via breakout</li> <li>• QSFP-to-SFP adapter (QSA) with 1GE SFP (GLC-TE, GLC-SX-MMD, GLC-LH-SMD) and 10 GE SFP+ (ER, ER-S, ZR, ZR-S, DWDM fixed-wavelengths)</li> </ul> |              |

| Line Card  | Ports/Adapters  | Transceivers   |
|--|---|--|
| <p>NC55-6X200-DWDM-S</p> <p>Adds DWDM capabilities to the NCS 5500 series modular chassis.</p> <p>Along with the ONS-CFP2-WDM long-haul optics, this line card eliminates the need to connect short-range grey optics to a dedicated optical platform between NCS 5500 series modular chassis. Thus reducing operating expenses and capital costs.</p>   | <p>6 x 100GE—Supports 100 Gbps (DWDM QPSK), 150 Gbps (DWDM 8 QAM), or 200 Gbps (DWDM 16 QAM) WDM signals with full line-rate MACsec capability.</p>   | <p>Second-generation Coherent Transceiver Pluggable (CTP2) optics modules (in CFP2 form-factor).</p> |
| <p>NC55-MOD-A-S</p> <p>NC55-MOD-A-SE-S— has external TCAM for supporting expanded Forwarding Information Base (FIB), network access control lists (ACLs), and QoS for scale-enhanced configuration needs.</p>  | <ul style="list-style-type: none"> <li>• 12 x 1GE/10GE</li> <li>• 2 x 40GE</li> <li>• 2 modular port adapters (MPAs) See the <a href="#">Modular Port Adapters</a> section for port details.</li> </ul> <p><b>Note</b> QDD-400G-ZR-S and QDD-400G-ZRP-S optical modules are supported on all 400G ports of the MPA(NC57-MPA-2D4H-S).</p>  | <p>SFP/SFP+</p> <p>QSFP+</p> <p>QSFP-DD</p>  |
| <p>NC-55-32T16Q4H-A</p>  | <ul style="list-style-type: none"> <li>• 4 x 100GE/40GE QSFP ports</li> <li>• 16 x 10GE/25GE SFP ports</li> <li>• 32 x 1GE/10GE SFP ports</li> </ul> <p><b>Restrictions</b></p> <ul style="list-style-type: none"> <li>• 1G optical modules aren't supported on ports starting from 32 through 47.</li> <li>• Dual rate optics are only supported in higher speed mode. For example, SFP-10/25G-LR-S is only supported in 25G mode.</li> <li>• Breakout operation isn't supported.</li> </ul> | <p>QSFP28 /QSFP+</p> <p>SFP28/SFP+</p> <p>SFP+/SFP</p>   |
| <p>NC57-24DD</p> <p>Supported in the NCS 5508 and NCS 5516 chassis with second-generation fabric cards (NC55-5508-FC2/NC55-5516-FC2) and fan trays (NC55-5508-FAN2/NC55-5516-FAN2). Requires Cisco IOS XR 7.0.2 or later.</p> <p>Supported in the NCS 5504 chassis with second-generation fabric cards (NC55-5504-FC2) and fan trays (NC55-5504-FAN2). Requires Cisco IOS XR 7.2.2 or later.</p> | <ul style="list-style-type: none"> <li>• 24 ports x 400GE</li> <li>• 40GE (4x10GE) and 100GE (4x25GE) with QSFP28 optics</li> <li>• 400GE (4x100GE) and 200GE (2x100GE) with QSFPDD optics</li> </ul> <p><b>Note</b> To ensure proper airflow and to minimize potential over temperature conditions, the NC57-24DD line card supports up to twelve QDD-400G-ZR-S/QDD-400G-ZRP-S optical modules only installed in the top ports (0 and even-numbered ports).</p>                              | <p>QSFP+</p> <p>QSFP28</p> <p>QSFP-DD</p>  |

| Line Card   | Ports/Adapters  | Transceivers                              |
|---|---|---|
| <p>NC57-18DD-SE</p> <p>Supported in the NCS 5508 and NCS 5516 chassis with second-generation fabric cards (NC55-5508-FC2/NC55-5516-FC2) and fan trays (NC55-5508-FAN2/NC55-5516-FAN2). Requires Cisco IOS XR 7.0.2 or later.</p> <p>Supported in the NCS 5504 chassis with second-generation fabric cards (NC55-5504-FC2) and fan trays (NC55-5504-FAN2). Requires Cisco IOS XR 7.2.2 or later.</p> | <ul style="list-style-type: none"> <li>• 18 x 400GE (12 ports unused)</li> <li>Or</li> <li>30 x 200GE – 200GE, 100GE</li> <li>• 40GE (4x10GE) and 100GE (4x25GE) with QSFP28 optics</li> <li>• 400GE (4x100GE) and 200GE (2x100GE) with QSPDD optics</li> </ul> <p><b>Note</b> Due to power limitations, the NC57-18DD-SE line card supports up to nine QDD-400G-ZR-S optical modules, or a combination of six QDD-400G-ZR-S and QDD-400G-ZRP-S optical modules. Install QDD-400G-ZR-S and QDD-400G-ZRP-S optics only in the top ports (0 and even-numbered ports).</p> | <p>QSFP+</p> <p>QSFP28</p> <p>QSFP-DD</p> |
| <p>NC57-36H-SE</p>  | <ul style="list-style-type: none"> <li>• 36 x 100GE/40GE/10GE ports</li> <li>• All 36 ports support QSFP28/QSFP+ optics.</li> <li>• 6 ports (even-numbered ports 24-35) have additional capability to support QSFP-DD 100G ZR optics.</li> <li>• Breakout supported with 4x25G or 4x10G on the even-numbered ports (top row) with the odd-numbered ports (bottom row) disabled</li> </ul> <p><b>Note</b> NC57-36H-SE doesn't support 400G.</p>  | <p>QSFP+</p> <p>QSFP28</p> <p>QSFP-DD</p> |

| Line Card   | Ports/Adapters   | Transceivers  |
|---|--|---|
| <p>NC57-36H6D-S line card is supported in the following chassis with second generation fabric cards and fan trays:</p> <ul style="list-style-type: none"> <li>• Cisco NCS 5504</li> <li>• Cisco NCS 5508</li> <li>• Cisco NCS 5516</li> </ul> <p>The second-generation fabric cards are:</p> <ul style="list-style-type: none"> <li>• NC55-5504-FC2</li> <li>• NC55-5508-FC2</li> <li>• NC55-5516-FC2</li> </ul> <p>The second-generation fan trays are:</p> <ul style="list-style-type: none"> <li>• NC55-5504-FAN2</li> <li>• NC55-5508-FAN2</li> <li>• NC55-5516-FAN2</li> </ul> | <p>Flexible port configuration supports the following options:</p> <ul style="list-style-type: none"> <li>• 36 ports of 100GE/40GE</li> <li>• 24 ports (ports 0-23) of 100GE</li> <li>• 12 ports (ports 24-35) of 200GE, using 2x100GE</li> <li>• 24 ports (ports 0-23) of 100GE and 6 ports (even-numbered ports in 24-34) of 400GE</li> <li>• Ports 0-23 supports 4x10GE or 4x25GE breakout on even-numbered (ports in the top row of the card) only.</li> <li>• Ports 24-35 supports 4x10GE or 4x25GE breakout on all ports.</li> <li>• Ports 24-34 supports 4x100GE breakout on even-numbered ports only.</li> </ul> | <p>QSFP+</p> <p>QSFP28</p> <p>QSFP-DD</p> <p>SFP+</p>                           |
| <p>NC57-MOD-S</p>   | <ul style="list-style-type: none"> <li>• Two MPA slots</li> <li>• Eight ports of 10GE/25GE/50GE SFP optics</li> <li>• Two ports of 40GE/100GE/400GE QSFP-DD optics</li> </ul>  | <p>SFP+</p> <p>SFP28</p> <p>SFP56</p> <p>QSFP+</p> <p>QSPF28</p> <p>QSFP-DD</p> |

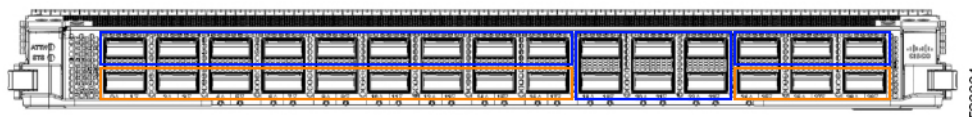
**NC57-18DD-SE Line Card**

In NC57-18DD-SE line card, there are eighteen 400GE ports which are the even-numbered ports between Port 0 and Port 29, Port 19, Port 21, and Port 23. The 400GE ports are marked on the front panel with blue indicator (see) [Figure 7: NC57-18DD-SE Line Card, on page 15](#).

In 400GE configuration, the odd-numbered ports (except Port 19, Port 21, and Port 23) marked in orange at the bottom row (see) [Figure 7: NC57-18DD-SE Line Card, on page 15](#) aren't used.

The NC57-18DD-SE supports 200GE optics or 100GE optics in all 30 ports.

*Figure 7: NC57-18DD-SE Line Card*



Port 0 to 17 and Port 24 to 29 can only be used in pairs (one top port and its respective bottom port make a pair), with the following restrictions:

- If the top port has 400GE optic, then the bottom ports can't be used.
- If the top port has 200GE, 100GE, or 40GE optic, the respective bottom port in the pair should also be 200GE, 100GE, or 40GE optic.

### NC57-36H-SE Line Card

The line card can operate in routers with the previous generation Cisco NCS 5500 series line cards (in compatibility mode) in the same modular chassis and can also operate in a chassis with all Cisco NCS 5700 series line cards (in native mode).



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**Note** NC57-36H-SE line card doesn't support 400G QSFP-DD transceivers.

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Supported in the NCS 5504, NCS 5508, and NCS 5516 chassis with second-generation fabric cards (NC55-5504-FC2/NC55-5508-FC2/NC55-5516-FC2) and fan trays (NC55-5504-FAN2/NC55-5508-FAN2/NC55-5516-FAN2). Requires Cisco IOS XR 7.2.2 or later.

For more details, refer to the [data sheet](#).

Even-numbered ports 24 to 35 have additional capability to support QSFP-DD 100G ZR optics and are marked in purple.

If you have already inserted a NC57-36H-SE line card on a router that is running a lower version than Cisco IOS XR Release 7.2.2 and the line card fails to boot, then use the following method to boot the line card:

1. Power off the router.
2. Remove the NC57-36H-SE line card after the router is powered off.
3. Power up the router.
4. Upgrade the router to release 7.2.2 or later.
5. After the software is upgraded, insert the line card.

The line card boots up with release 7.2.2 or later.

6. iPXE boot the line card.

For more information about iPXE boot, see the *System Setup and Software Installation Guide for Cisco NCS 5500 Series Routers*.

### NC57-36H6D-S Line Card

The line card can operate in routers with the previous generation Cisco NCS 5500 series line cards (in compatibility mode) in the same modular chassis and can also operate in a chassis with all Cisco NCS 5700 series line cards (in native mode).



**Figure 8: Port Numbering on NC57-36H6D-S Line Card**

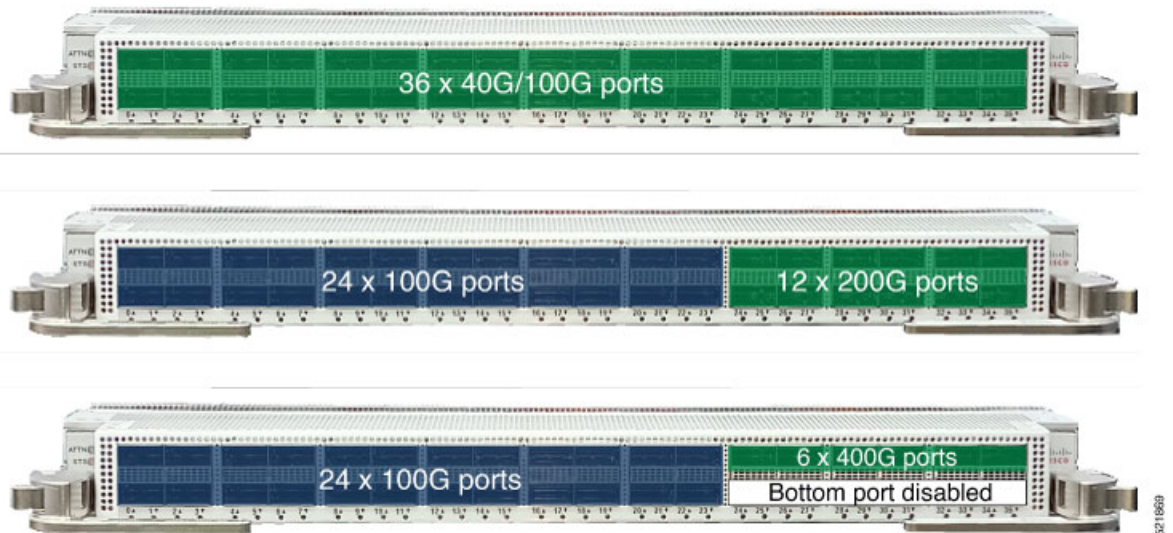


The line card is supported in the Cisco NCS 5504, Cisco NCS 5508 and Cisco NCS 5516 chassis with second-generation fabric cards and fan trays. To support the line card, the chassis must be running Cisco IOS XR 7.3.2, 7.4.1, or later versions.

For more details on features, benefits, and ordering information, see the [data sheet](#).

This figure shows flexible port configuration options:

**Figure 9: Flexible Port Configuration**



A group of four sequential ports form a quad group (ports 0-3, ports 4-7, ports 8-11 and so on). Quad groups in the port range 0-23 have limitations in terms of breakout support; that is, a combination of 40GE and 4x10GE optics or a combination of 4x10GE and 4x25GE is not supported within a quad group.



**Note** In ports 24-35, the combination of 2x100G and 40G in the same quad group isn't supported.



**Note** The combination of 4x25G and QSFP+ (40G/4x10G) optics in a given quad group isn't supported.

A group of two ports form a quad group on ports 24-25, 26-27, and so on. Each quad group consists of two ports each on ports 24-35. There is no restriction on combination of 4x10GE or 4x25GE breakout support on the ports 24-35.

To configure 4x25, or 4x10 breakout on ports 0-23, use the **hw-mod port-range** command. However, the 4x100 breakout isn't supported.

On ports 24-35:

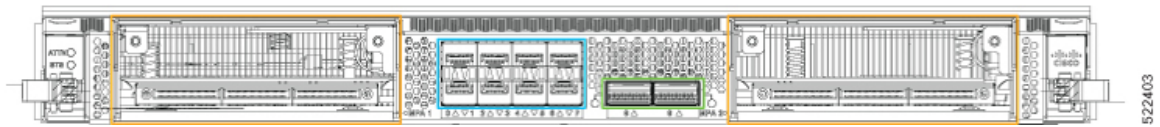
- To configure 4x25, or 4x10 breakout, use the **controller optics** command.
- To configure 4x100 breakout, use the **hw-mod port-range** command.

### NC57-MOD-S Line Card

The NC57-MOD-S line card operates in routers with the previous generation Cisco NCS 5500 series line cards (in compatibility mode) in the same router. It also operates in a router with all line cards that are Cisco NCS 5700 series line cards in native mode.

The line card supports two MPA slots marked in orange, eight 50 GE SFP56 optics ports marked in blue and two 400 GE QSFP-DD optics ports marked in green (See [NC57-MOD-S line card](#)).

**Figure 10: NC57-MOD-S Line Card**



Two QSFP-DD ports support 4x100G, or 4x25G, or 4x10G and 2x100G breakout modes.

This line card is supported in the NCS 5504, NCS 5508, and NCS 5516 chassis with second-generation fabric cards (NC55-5504-FC2/NC55-5508-FC2/NC55-5516-FC2) and fan trays (NC55-5504-FAN2/NC55-5508-FAN2/NC55-5516-FAN2). To support the line card, the chassis must run Cisco IOS XR Release 7.6.1.



**Note** All fixed ports (eight SFP56 ports and two QSFP-DD ports) of the NC57-MOD-S line card support MACsec.

For more details on features, benefits, and ordering information, see the [Cisco Network Convergence System 5700 Series: 400GE and 100GE Line Cards data sheet](#).

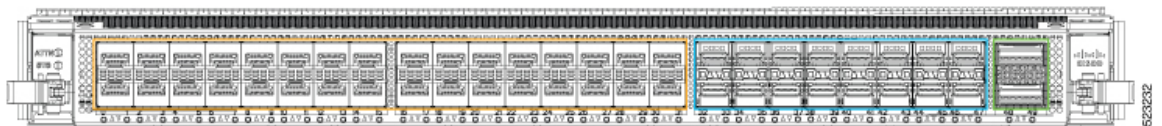
### NC57-48Q2D-S and NC57-48Q2D-SE-S Line Card

The NC57-48Q2D-S and NC57-48Q2D-SE-S line cards operate in a router with all line cards that are Cisco NCS 5700 series line cards in native mode. Additionally, they can also operate in routers with the previous generation Cisco NCS 5500 series line cards (in compatibility mode) in the same router.

The NC57-48Q2D-SE-S line card includes additional TCAM to support expanded Forwarding Information Base (FIB), network access control lists (ACLs), and QoS for scale-enhanced configuration requirements.

The line cards support two QSFP-DD ports of 400GbE speed marked in green, 16 SFP56 ports of 50GbE speed marked in blue, and 32 SFP28 ports of 25GbE speed marked in orange (See [NC57-48Q2D-S line card](#)).

**Figure 11: NC57-48Q2D-S Line Card**



**Table 2: Port description**

| Port Number | Port Type |
|-------------|-----------|
| 0 to 31     | SFP28     |
| 32 to 47    | SFP56     |
| 48 and 49   | QSFPDD    |

The following optics speeds and breakout configurations are supported by the fixed optic ports:

| Optics   | SFP28 | SFP56 | QSFPDD           |
|----------|-------|-------|------------------|
| 1GbE     | Yes   | Yes   | No               |
| 10GbE    | Yes   | Yes   | No               |
| 25GbE    | Yes   | Yes   | No               |
| 40GbE    | No    | No    | Yes              |
| 50GbE    | No    | Yes   | No               |
| 100GbE   | No    | No    | Yes              |
| 200GbE   | No    | No    | Yes              |
| 400GbE   | No    | No    | Yes              |
| 4x10GbE  | No    | No    | Yes              |
| 4x25GbE  | No    | No    | Yes              |
| 4x100GbE | No    | No    | Yes              |
| 400G ZR  | No    | No    | Only top port-48 |
| 400G ZRP | No    | No    | Only top port-48 |

This line card is supported in the NCS 5504, NCS 5508, and NCS 5516 router with second-generation fabric cards (NC55-5504-FC2/NC55-5508-FC2/NC55-5516-FC2) and fan trays (NC55-5504-FAN2/NC55-5508-FAN2/NC55-5516-FAN2). To support the line card, the router must run Cisco IOS XR Release 7.10.1.



**Note** The NC57-48Q2D-S and NC57-48Q2D-SE-S line cards fully support MACsec and PTP-Class-C timing on all fixed ports. The PTP Class-C timing is exclusively supported in compatible mode. However, please note the following limitations when operating 1GbE optics:

- PTP Class-C timing cannot be achieved when MACsec or Auto-negotiation is enabled.
- For IOS XR software release 7.10.1, ports 32 to 47 do not support 1GbE optics.




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**Note** The 400G ZR/ZRP is exclusively compatible with Port 48 and is not supported on Port 49.

---

For more details on features, benefits, and ordering information, see the [Cisco Network Convergence System 5700 Series: 400GE and 100GE Line Cards data sheet](#).

#### Limitations on NCS 5700 line cards breakout support

The NCS 5700 line cards group the ports in sets of quad ports (ports 0-3, 4-7, 8-11, 12-15, 16-19, and more) to support different SFP/QSFP and breakout configurations.

Each quad has two port pairs. The first and second ports are in pair 1, and the third and fourth are in pair 2. For example, in quad port 0-3, 0-1 are pair 1, and 2-3 are pair 2.

The line cards does not support changing the speed of a port in the port pair when the other port is UP. As a result, you cannot insert a new SFP into a port in a pair when the other port already has an SFP and is UP. To change the speed of a port in a pair, you must first bring down the other port, then change the speed as needed, and finally bring up both ports.

For example, within quad 16-19, the SFPs must be inserted in pairs 16-17 and 18-19. If you want to change the speed of port 17 while port 16 is UP, you must bring down port 16 before inserting the optics in port 17.

## Modular Port Adapters

The modular port adapters (MPAs) are supported in the NC57-MOD-S, NC55-MOD-A-S and NC55-MOD-A-SE-S line card. Each MPA has a STATUS and ATTN (attention) LED, and each port on the MPA has an adjacent A/L (Active/Link) LED.

To determine which transceivers and cables are supported by these MPAs, see [Cisco Transceiver Modules Compatibility Information](#).




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**Note** Before replacing an MPA card remove the port-range configurations that are applied on that MPA. If these configurations are not removed, interfaces in the new MPA card are not available.

---

#### 4-Port 40GE/100GE MPA with QSFP+/QSFP28

The 4-port 40GE/100GE MPA (NC55-MPA-4H-S/NC55-MPA-4H-HD-S/NC55-MPA-4H-HX-S) provides 4 ports for 4x25GE (via cable breakout), QSFP+ (40Gbps) or QSFP28 (100Gbps) transceivers.




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**Note** The temperature-hardened NC55-MPA-4H-HD-S MPA operates within industrial temperature range when installed in the temperature-hardened routers.

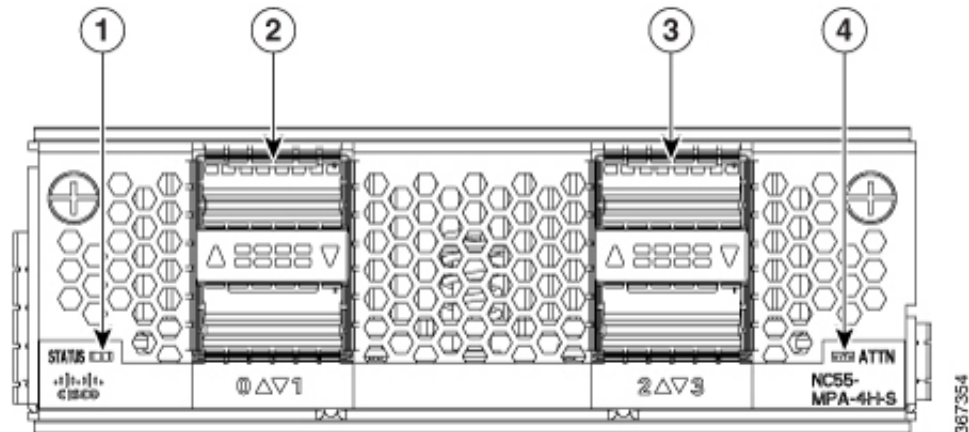
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**Note** The temperature-hardened conformal-coated NC55-MPA-4H-HX-S MPA operates within industrial temperature range when installed in the temperature-hardened routers.

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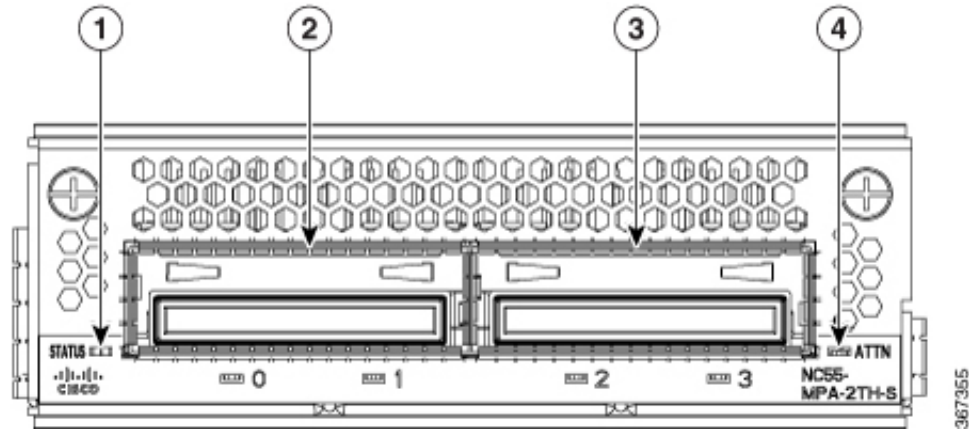
|   |                              |   |                              |
|---|------------------------------|---|------------------------------|
| 1 | STATUS LED                   | 3 | QSF port and Active/Link LED |
| 2 | QSF port and Active/Link LED | 4 | ATTN LED                     |

**2-Port 100GE/200GE with CFP2-DCO**

The 2-port 100GE/200GE MPA (NC55-MPA-2TH-S/NC55-MPA-2TH-HX-S) provides 2 ports for CFP2-DCO transceivers.



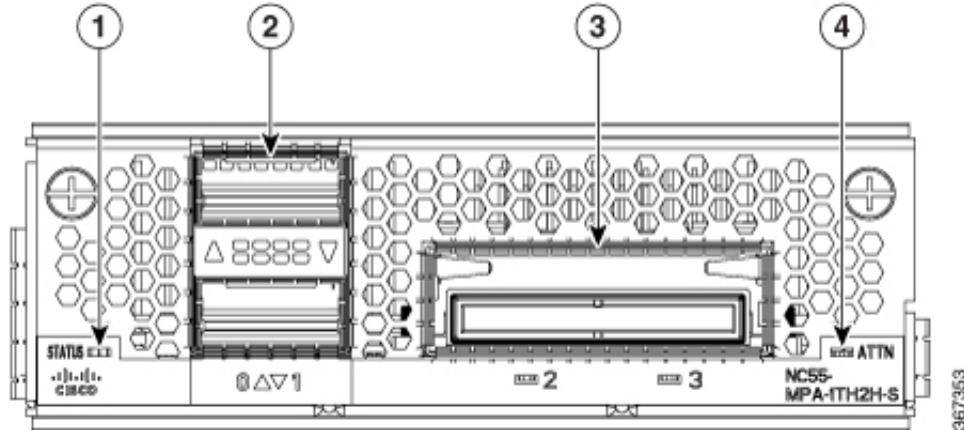
**Note** The temperature-hardened conformal-coated NC55-MPA-2TH-HX-S MPA operates within industrial temperature range when installed in the temperature-hardened routers.



|   |                                   |   |                                   |
|---|-----------------------------------|---|-----------------------------------|
| 1 | STATUS LED                        | 3 | CFP2-DCO port and Active/Link LED |
| 2 | CFP2-DCO port and Active/Link LED | 4 | ATTN LED                          |

**1-port 100GE/200GE with CFP2-DCO + 2-Port 40GE or 100GE with QSFP+/QSFP28**

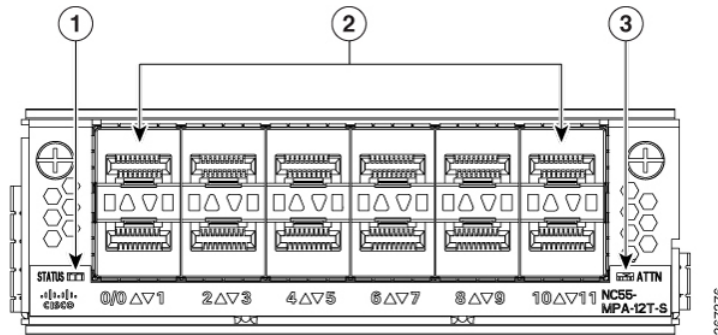
The 1-port 100GE/200GE + 2-Port 40GE/100GE combination MPA (NC55-MPA-1TH2H-S) provides 1 port for CFP2-DCO transceivers and 2 ports for 4x25GE (via cable breakout), QSFP+ (40Gbps) or QSFP28 (100Gbps) transceivers.



|   |                               |   |                                   |
|---|-------------------------------|---|-----------------------------------|
| 1 | STATUS LED                    | 3 | CFP2-DCO port and Active/Link LED |
| 2 | QSFP port and Active/Link LED | 4 | ATTN LED                          |

**12-Port 10GE with SFP+**

The 12-port 10GE MPA (NC55-MPA-12T-S) provides 12 ports for SFP+ transceivers.



|   |                     |   |          |
|---|---------------------|---|----------|
| 1 | STATUS LED          | 3 | ATTN LED |
| 2 | SFP+ ports and LEDs |   |          |



**Note** The NCS-57C3 routers support 12-port 10GE MPA (NC55-MPA-12T-S); however, MPA slots 2 and 3 do not support 1G interfaces. On slot 1, ports 0-3 and 8-11 only support 1G. MACSec is not supported on these 1G interfaces.

#### 4-Port 800GE MPA with QSFP28/QSFP-DD

**Table 3: Feature History Table**

| Hardware  | Release Information | Description   |
|---|---------------------|---|
| NC57-MPA-2D4H-S modular port adapter                                      | Release 7.4.1       | This release introduces a 4-port 800GE modular port adapter (NC57-MPA-2D4H-S) that supports QSFP28 and QSFP-DD optical transceivers. This MPA is supported in the NCS-55A2-MOD and NCS-57C3-MOD routers. This is the first modular port adapter to support the QSFP-DD optical transceiver. |
| NC57-MPA-2D4H-S Modular Port Adapter Support on NC55-MOD-A-SE-S Line Card | Release 7.9.1       | The 4-port 800GE modular port adapter (NC57-MPA-2D4H-S) is now supported on NC55-MOD-A-SE-S line card.  |

The NC57-MPA-2D4H-S modular port adapter supports QSFP28 and QSFP-DD optical transceivers in the following configurations:

- All 4 ports support QSFP28-100GE transceivers.
- Ports 0 and 2 (even-numbered ports) support two QDD-2x100GE transceivers at the same time. This configuration is supported in both the MPA slots of the NCS-55A2-MOD-HD-S, NC55-55A2-MOD-SE-S, NCS-55A2-MOD-S, or NCS-55A2-MOD-HX-S chassis.



**Note** When QDD-2x100GE transceivers are installed in ports 0 and 2, ports 1 and 3 (odd-numbered ports) cannot be used.

- Only one QDD-400GE transceiver is supported through port 0 in both the MPA slots of the NCS-55A2-MOD-HD-S, NC55-55A2-MOD-SE-S, NCS-55A2-MOD-S, or NCS-55A2-MOD-HX-S chassis.

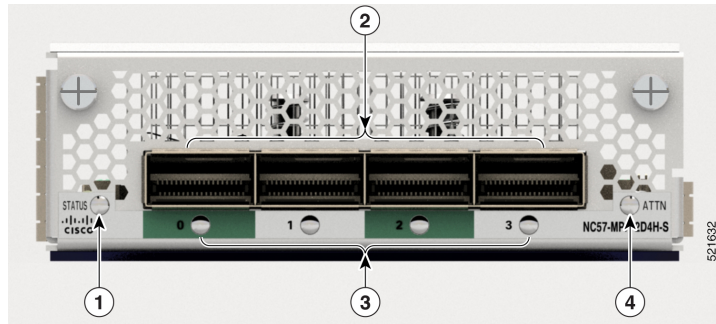
The NC57-MPA-2D4H-S modular port adapter supports the following configurations of optical transceivers while operating on NC55-MOD-A-SE-S and NC57-MOD-S line cards.

| Transceiver         | MPA slot 1  | MPA slot 2  |
|---------------------|---|---|
|                     | <ul style="list-style-type: none"> <li>• Max bandwidth on NC55-MOD-A-SE-S line card = 400GE</li> <li>• Max bandwidth on NC57-MOD-S line card = 800GE</li> </ul> | <ul style="list-style-type: none"> <li>• Max bandwidth on NC55-MOD-A-SE-S line card = 400GE</li> <li>• Max bandwidth on NC57-MOD-S line card = 800GE</li> </ul> |
| <b>QSFP28-100GE</b> | All ports   | All ports   |

| Transceiver        | MPA slot 1  | MPA slot 2  |
|--------------------|---|---|
| <b>QDD-2x100GE</b> | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-2x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - All ports</li> </ul>  | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-2x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - All ports</li> </ul>  |
| <b>QDD-3x100GE</b> | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Port 0</li> </ul> <p><b>Note</b> When QDD-3x100GE transceivers are installed in port 0, then ports 1, 2 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-3x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Port 0</li> </ul> <p><b>Note</b> When QDD-3x100GE transceivers are installed in port 0, then ports 1, 2 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-3x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> |
| <b>QDD-400GE</b>   | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Not supported</li> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-400GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p>   | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Not supported</li> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-400GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p>   |
| <b>QDD-4x100GE</b> | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Port 0</li> </ul> <p><b>Note</b> When QDD-4x100GE transceivers are installed in port 0, then ports 1, 2 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-4x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> | <ul style="list-style-type: none"> <li>On NC55-MOD-A-SE-S line card - Port 0</li> </ul> <p><b>Note</b> When QDD-4x100GE transceivers are installed in port 0, then ports 1, 2 and 3 cannot be used.</p> <ul style="list-style-type: none"> <li>On NC57-MOD-S line card - Ports 0 and 2</li> </ul> <p><b>Note</b> When QDD-4x100GE transceivers are installed in ports 0 and 2, then ports 1 and 3 cannot be used.</p> |



Figure 12: NCS57-MPA-2D4H-S Modular Port Adapter (MPA)



|   |                             |   |                 |
|---|-----------------------------|---|-----------------|
| 1 | STATUS LED                  | 3 | Active/Link LED |
| 2 | QSFP28/QSFP-DD port and LED | 4 | ATTN LED        |

12-Port 10GE/25GE/50GE MPA with SFP+/SFP28/SFP56

Table 4: Feature History Table

| Hardware                             | Release Information | Feature Description  |
|--------------------------------------|---------------------|--|
| NCS57-MPA-12L-S modular port adapter | Release 7.6.1       | <p>A 12-port 600GE modular port adapter that supports SFP+, SFP28, and SFP56 optical transceivers, the NCS57-MPA-12L-S operates in 10GE, 25GE, and 50GE modes.</p> <p>The following command is modified to add support for the 50GE mode for even-numbered ports (port 4, port 6, port 8, and port 10):</p> <ul style="list-style-type: none"> <li>• <b>hw-module port-range</b></li> </ul> <p>For more information, see the Cisco Network Convergence System 5700 Series: Modular Port Adapters Data Sheet.</p> |

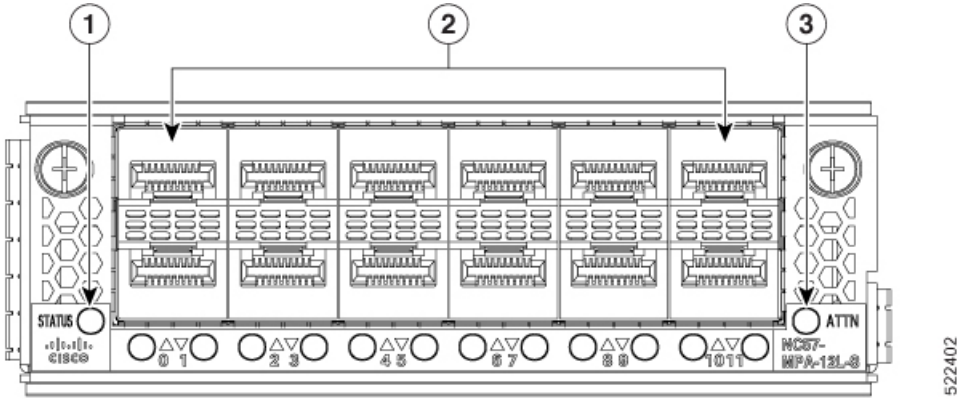
The NCS57-MPA-12L-S modular port adapter supports SFP+, SFP28 and SFP56 optical transceivers in these configurations:

Table 5: Supported SFP optical transceiver configurations

| Port | MPA in NC55-MOD-A-S/NC55-MOD-A-SE-S | MPA in NC57-MOD-S                 |
|------|-------------------------------------|-----------------------------------|
|      | Maximum bandwidth per MPA = 400GE   | Maximum bandwidth per MPA = 600GE |

|                 |   |   |
|-----------------|---|---|
| 0 and 1         | <ul style="list-style-type: none"> <li>• 10G using <b>hw-module quad</b> command</li> <li>• 25G</li> <li>• 50G</li> <li>• Combination of 25G and 50G</li> </ul> <p><b>Note</b> Combination of 10G with 25G or 50G is not supported.</p>   | <ul style="list-style-type: none"> <li>• 10G</li> <li>• 25G</li> <li>• 50G</li> <li>• Combination of 10G and 25G</li> <li>• Combination of 25G and 50G</li> </ul> <p><b>Note</b> Combination of 10G and 50G or 10G, 25G and 50G is not supported.</p> |
| 2 and 3         |   |   |
| 4, 5, 6 and 7   | <ul style="list-style-type: none"> <li>• 10G using <b>hw-module quad</b> command</li> <li>• 25G</li> <li>• Combination of 25G and 50G</li> </ul> <p><b>Note</b> 50G can be enabled on even-numbered ports using <b>hw-module port-range</b> and the subsequent odd port will be disabled.</p> <p><b>Note</b> Combination of 10G with 25G or 50G is not supported.</p> |   |
| 8, 9, 10 and 11 |   |   |

Figure 13: NCS57-MPA-12L-S Modular Port Adapter (MPA)



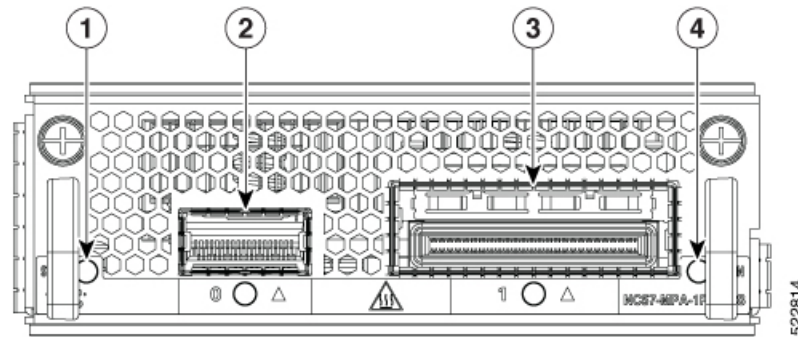
|   |                      |   |          |
|---|----------------------|---|----------|
| 1 | STATUS LED           | 3 | ATTN LED |
| 2 | SFP56 ports and LEDs |   |          |

**1-port 400GbE with CFP2-DCO + 1-Port 400GbE with QSFP-DD MPA**

*Table 6: Feature History Table*

| Hardware                               | Release Information | Feature Description  |
|--|---------------------|--|
| NCS57-MPA-1FH1D-S Modular Port Adapter | Release 7.8.1       | <p>This release introduces NCS57-MPA-1FH1D-S, a 2-port 800GbE modular port adapter with one port supporting QSFP-DD and the other supporting CFP2-DCO optical transceivers.</p> <p>This MPA is supported in the NCS-57C3-MODS-SYS router and NCS57-MOD-S line card.</p> <p>For more information, see the <a href="#">Cisco Network Convergence System 5700 Series: Modular Port Adapters Data Sheet</a>.</p> |

The 2-port 800GbE MPA (NCS57-MPA-1FH1D-S) provides one port for QSFP-DD and one port for CFP2-DCO transceivers. The QSFP-DD port operates in 400GbE mode and supports 4x100G breakout mode, and the CFP2-DCO port operates in 400GbE mode and supports 4x100G, or 3x100G, or 2x100G, or 1x100G breakout modes.

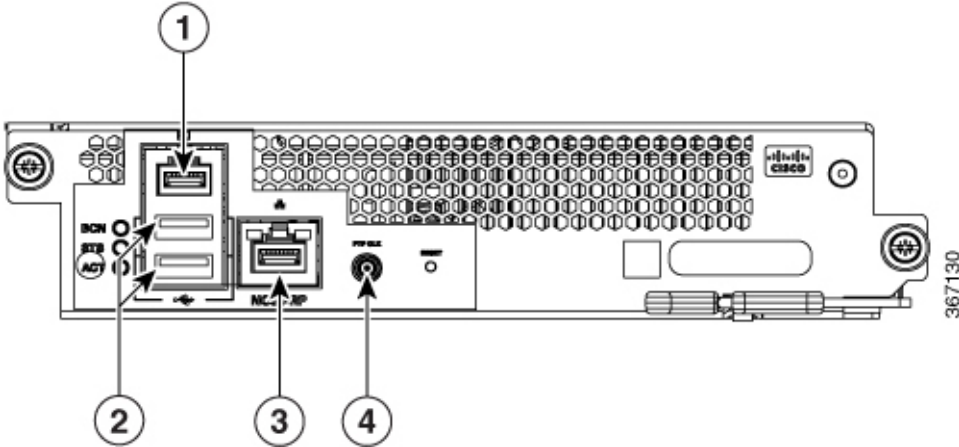


|   |                      |   |                       |
|---|----------------------|---|-----------------------|
| 1 | STATUS LED           | 3 | CFP2-DCO port and LED |
| 2 | QSFP-DD port and LED | 4 | ATTN LED              |

## Route Processor Card Overview

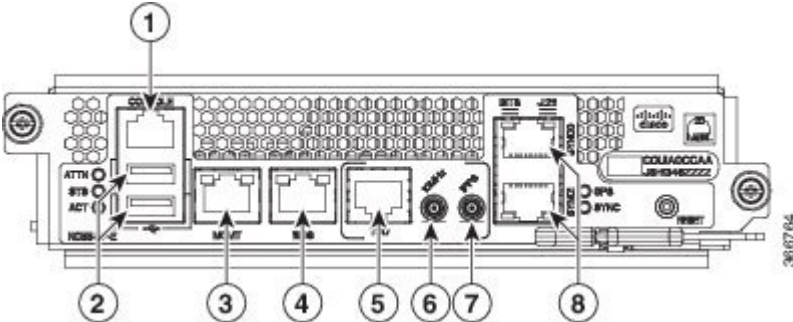
Route processor cards manage all routing operations on the Cisco NCS 5500 Series modular chassis.

NC55-RP



|   |         |   |  |
|---|---------|---|--|
| 1 | Console | 3 | Management Ethernet                            |
| 2 | USB (2) | 4 | Mini coax connector for 1 PPS input and output |

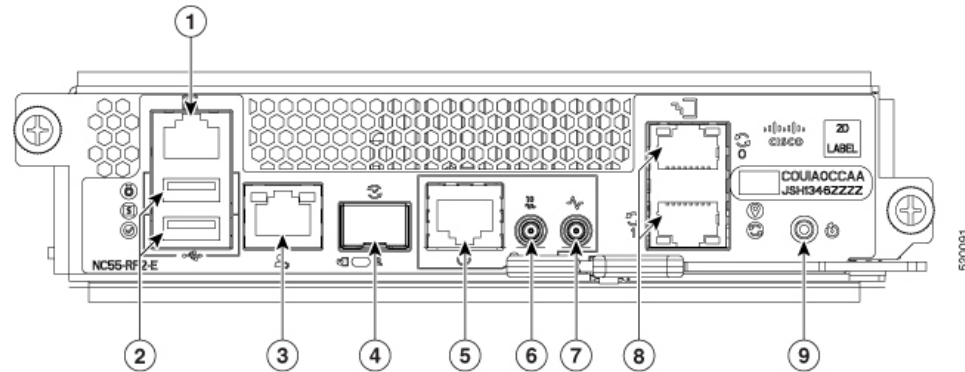
NC55-RP-E



**Note** The NC55-RP-E supports Class-B timing.

|   |  |   |  |
|---|--|---|--|
| 1 | Console  | 5 | Shielded RJ-45 connector for Time-of-Day (TOD) interface, input and output |
| 2 | USB (2)  | 6 | Mini coax connector for 10 MHz, input and output                           |
| 3 | Management Ethernet  | 7 | Mini coax connector for 1 PPS, input and output                            |
| 4 | 10/100/1000-Mbps Ethernet RJ-45 (Copper) port, supports 1588 Precision Time Protocol (PTP) | 8 | RJ-48 connector for BITS interface, input and output                       |

## NC55-RP2-E



**Note** The NC55-RP2-E supports Class-B and Class-C timing.



**Note** Using a combination of RP2-E and RP-E is not supported on the same router.

|   |   |   |  |
|---|---|---|--|
| 1 | Console   | 6 | Mini coaxial connector for 10 MHz, input, and output |
| 2 | USB Port Type-A (2-ports). Only the USB drive that is inserted first gets detected. | 7 | Mini coaxial connector for 1 PPS, input, and output  |
| 3 | Management Ethernet (10/100/1000-Mbps)  | 8 | SyncE BITS/DTI/J.211                                 |
| 4 | IEEE 1588 Precision Time Protocol (PTP)   | 9 | Recessed reset button                                |
| 5 | G.703 Time-of-Day (TOD)   |   |  |

## Environmental and Physical Specifications

For environmental and physical specifications, refer to the *Environmental Properties* table in the [Cisco Network Convergence System 5500 Series Data Sheet](#).

## Weight, Quantity and Power Consumption

For environmental and physical specifications, refer to the *Weight and Power Consumption* table and the *Cisco NCS 5500 Series Line Cards* table in the [Cisco Network Convergence System 5500 Series Data Sheet](#).

## Airflow Direction

The airflow through the fan trays and power supplies on the Cisco NCS 5500 series modular router is from the port side intake (front-to-back cooling). To ensure proper airflow, you must make sure that when you install the router its air intake is positioned in a cold aisle and the air exhaust is positioned in a hot aisle.

## Maximum Power Available to the Router

The maximum power available for operations depends on the input power from your power source, the number and output capabilities of your power supplies, and the power redundancy mode that you use.

The following table lists the amount of power available for power supplies depending on power inputs, numbers of power supplies, and the mode used.

**Table 7: Feature History Table**

| Feature Name                             | Release Information | Feature Description  |
|--|---------------------|--|
| New DC Power Supply<br>NC55-PWR-4.4KW-DC | Release 7.3.1       | <p>This release introduces a new Power Supply Unit, NC55-PWR-4.4KW-DC.</p> <p>With the new 4.4 KW DC power supply (NC55-PWR-4.4KW-DC), feed redundancy is supported on the Cisco NCS 5504, Cisco NCS 5508, and Cisco NCS 5516 routers. The PSU supplies power to sensors, fan speeds, faults and alarms, and LED indicators. The firmware can detect AC or DC input types through input data sampling.</p> |

Table 8: Maximum Power Available for a Router with 3KW AC Power Supplies

| Power Inputs (220 V) | Power Supplies | Combined Mode | n+1 Redundancy Mode | n+n Redundancy Mode |
|----------------------|----------------|---------------|---------------------|---------------------|
| 1 input per PSU      | 1              | 3000 W        | —                   | —                   |
|                      | 2              | 6000 W        | 3000 W              | 3000 W              |
|                      | 3              | 9000 W        | 6000 W              | 3000 W              |
|                      | 4              | 12000 W       | 9000 W              | 6000 W              |
|                      | 5              | 15000 W       | 12000 W             | 6000 W              |
|                      | 6              | 18000 W       | 15000 W             | 9000 W              |
|                      | 7              | 21000 W       | 18000 W             | 9000 W              |
|                      | 8              | 24000 W       | 21000 W             | 12000 W             |
|                      | 9              | 27000W        | 24000W              | 12000W              |
|                      | 10             | 30000W        | 27000W              | 15000W              |

Table 9: Maximum Power Available for a Router with 3KW DC Power Supplies

| Power Inputs (-48 VDC) | Power Supplies | Combined Mode | n+1 Redundancy Mode | n+n Redundancy Mode |
|------------------------|----------------|---------------|---------------------|---------------------|
| 2 inputs per PSU       | 1              | 3000 W        | —                   | —                   |
|                        | 2              | 6000 W        | 3000 W              | 3000 W              |
|                        | 3              | 9000 W        | 6000 W              | 4500 W              |
|                        | 4              | 12000 W       | 9000 W              | 6000 W              |
|                        | 5              | 15000 W       | 12000 W             | 7500 W              |
|                        | 6              | 18000 W       | 15000 W             | 9000 W              |
|                        | 7              | 21000 W       | 18000 W             | 10500 W             |
|                        | 8              | 24000 W       | 21000 W             | 12000 W             |
|                        | 9              | 27000W        | 24000W              | 13500               |
|                        | 10             | 30000W        | 27000W              | 15000W              |

Table 10: Maximum Power Available for a Router with 3.15KW HVAC/HVDC Power Supplies

| Power Inputs (220 V)  | Power Supplies | Combined Mode | $n+1$ Redundancy Mode | $n+n$ Redundancy Mode |
|-----------------------|----------------|---------------|-----------------------|-----------------------|
| 1 or 2 inputs per PSU | 1              | 3150 W        | —                     | —                     |
|                       | 2              | 6300 W        | 3150 W                | 3150 W                |
|                       | 3              | 9450 W        | 6300 W                | 3150 W                |
|                       | 4              | 12600 W       | 9450 W                | 6300 W                |
|                       | 5              | 15750 W       | 12600 W               | 6300 W                |
|                       | 6              | 18900 W       | 15750 W               | 9450 W                |
|                       | 7              | 22050 W       | 18900 W               | 9450 W                |
|                       | 8              | 25200 W       | 22050 W               | 12600 W               |
|                       | 9              | 28350 W       | 25200 W               | 12600 W               |
|                       | 10             | 31500 W       | 28350 W               | 15750 W               |

Table 11: Maximum Power Available for a Router with 4.4KW DC Power Supplies

| Power Inputs (-48 V DC) | Power Supplies | Combined Mode | $n+1$ Redundancy Mode | $n+n$ Line Redundancy Mode <sup>1</sup> |
|-------------------------|----------------|---------------|-----------------------|---|
| 3 inputs per PSU        | 1              | 4400 W        | —                     | —                                       |
|                         | 2              | 8800 W        | 4400 W                | 6600 W                                  |
|                         | 3              | 13200 W       | 8800 W                | —                                       |
|                         | 4              | 17600 W       | 13200 W               | 13200 W                                 |
|                         | 5              | 22000 W       | 17600 W               | —                                       |
|                         | 6              | 26400 W       | 22000 W               | 19800 W                                 |
|                         | 7              | 30800 W       | 26400 W               | —                                       |
|                         | 8              | 35200 W       | 30800 W               | 26400 W                                 |
|                         | 9              | 39600 W       | 35200 W               | —                                       |
|                         | 10             | 44000 W       | 39600 W               | 33000 W                                 |

<sup>1</sup>  $n+n$  Line Redundancy wired A/B,A/B to 2-inputs of every pair of PSUs (loss of either bus)



Table 12: Maximum Power Available for a Router with 4.4KW Power Supplies (n+n Redundancy Mode with A-Bus Loss)

| Power Inputs (-48 V DC) | Power Supplies | n+n Line Redundancy Mode <sup>2</sup> |
|-------------------------|----------------|---------------------------------------|
| 1 input per PSU         | 1              | —                                     |
| 2 inputs per PSU        | 2              | 6600 W                                |
| 1 input per PSU         | 3              | —                                     |
| 2 inputs per PSU        | 4              | 13200 W                               |
| 1 input per PSU         | 5              | —                                     |
| 2 inputs per PSU        | 6              | 19800 W                               |
| 1 input per PSU         | 7              | —                                     |
| 2 inputs per PSU        | 8              | 26400 W                               |
| 1 input per PSU         | 9              | —                                     |
| 2 inputs per PSU        | 10             | 33000 W                               |

<sup>2</sup> n+n Line Redundancy wired A/B/A, B/A/B to 3-inputs of every pair of PSUs (example: Loss of A-Bus)

### Graceful Shutdown of DC PSU

If the DC input power to the DC PSU falls below 40V, graceful shutdown of the power supply is initiated, and the chassis is shutdown. To power up the chassis again, shut off the DC circuit at the circuit breaker, then turn on the DC circuit. The chassis will power up if the DC input power is above 43.5V.



**Note** You can disable the graceful shutdown of the DC PSU using the **environment graceful-shutdown disable** command in Admin Configuration mode. When graceful shutdown is disabled, the chassis will shut down if the DC input power falls below 38.5V +/- 1V. The chassis will recover (power on again) if the DC input power to the DC PSU is above 43.5V. In this mode, the long-term reliability of the router can be impacted if the DC input power continues to fluctuate between 38.5V and 43.5V (resulting in continuous power-on and power-off cycles).

## Transceivers, Connectors, and Cables

### Transceiver and Cable Specifications

To determine which transceivers and cables are supported by this router, refer to the Transceiver Module Group (TMG) Compatibility Matrix Tool:

<https://tmgmatrix.cisco.com>

To see the transceiver specifications and installation information, see [Cisco Transceiver Modules Install and Upgrade Guides](#).

## RJ-45 Connectors

The RJ-45 connector connects Category 3, Category 5, Category 5e, Category 6, or Category 6A foil twisted-pair or unshielded twisted-pair cable from the external network to the following module interface connectors:

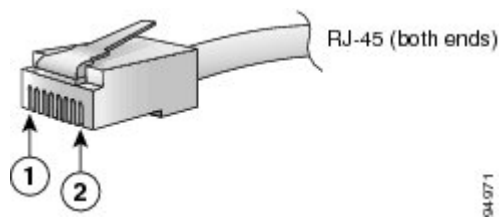
- Router chassis
  - CONSOLE port
  - MGMT ETH port



**Caution** To comply with GR-1089 intrabuilding, lightning immunity requirements, you must use a foil twisted-pair (FTP) cable that is properly grounded at both ends.

The following figure shows the RJ-45 connector.

**Figure 14: RJ-45 Connector**



|   |       |   |       |
|---|-------|---|-------|
| 1 | Pin 1 | 2 | Pin 2 |
|---|-------|---|-------|

## Pinouts

The following sections describe the pinouts for the Cisco NCS 5500 RP-E (NC55-RP-E) interfaces:

### BITS Port Pinouts

The table below summarizes the BITS port pinouts.

**Table 13: BITS Port Pinouts**

| Pin | Signal Name | Direction | Description  |
|-----|-------------|-----------|--------------|
| 1   | RX Ring     | Input     | Receive Ring |
| 2   | RX Tip      | Input     | Receive Tip  |
| 3   | —           | —         | Not used     |

| Pin | Signal Name | Direction | Description |
|-----|-------------|-----------|-------------|
| 4   | TX Ring     | Output    | TX Ring     |
| 5   | TX Tip      | Output    | TX Tip      |
| 6   | –           | –         | Not used    |
| 7   | –           | –         | Not used    |
| 8   | –           | –         | Not used    |

## Time-of-Day Port Pinouts

The table below summarizes the ToD/1-PPS port pinouts.

**Table 14: RJ-45 ToD/1-PPS Port Pinouts**

| Pin | Signal Name | Direction       | Description           |
|-----|-------------|-----------------|-----------------------|
| 1   | –           | –               | –                     |
| 2   | –           | –               | –                     |
| 3   | 1PPS_N      | Output or Input | 1PPS RS422 signal     |
| 4   | GND         | –               | –                     |
| 5   | GND         | –               | –                     |
| 6   | 1PPS_P      | Output or Input | 1PPS RS422 signal     |
| 7   | TOD_N       | Output or Input | Time-of-Day character |
| 8   | TOD_P       | Output or Input | Time-of-Day character |

## Management and PTP Ethernet Port Pinouts

The table below summarizes the Management and Precision Time Protocol (PTP) Ethernet port pinouts.

**Table 15: Management and PTP Ethernet Port Pinouts**

| Pin | Signal Name |
|-----|-------------|
| 1   | TRP0+       |
| 2   | TRP0-       |
| 3   | TRP1+       |
| 4   | TRP1-       |
| 5   | TRP2+       |

| Pin | Signal Name |
|-----|-------------|
| 6   | TRP2-       |
| 7   | TRP3+       |
| 8   | TRP3-       |

## USB Flash or MEM Port Pinouts

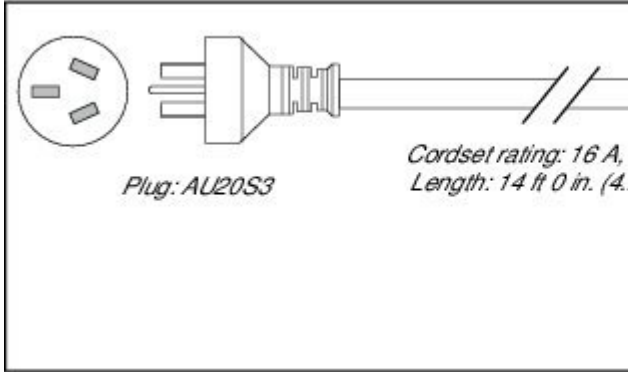
The table below summarizes the USB flash or MEM port pinouts.

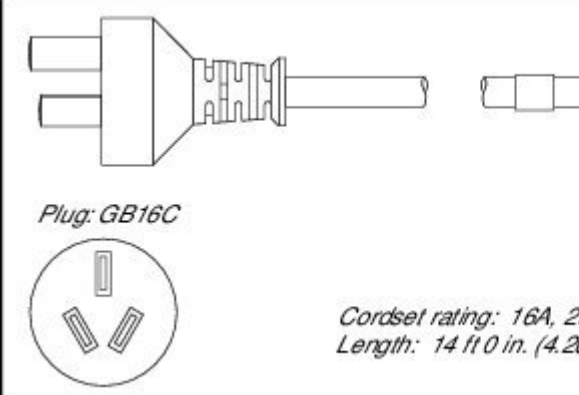
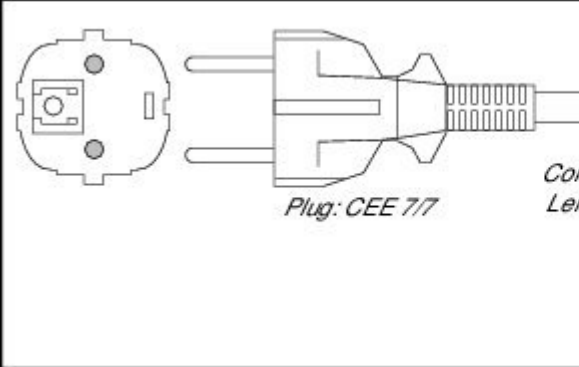
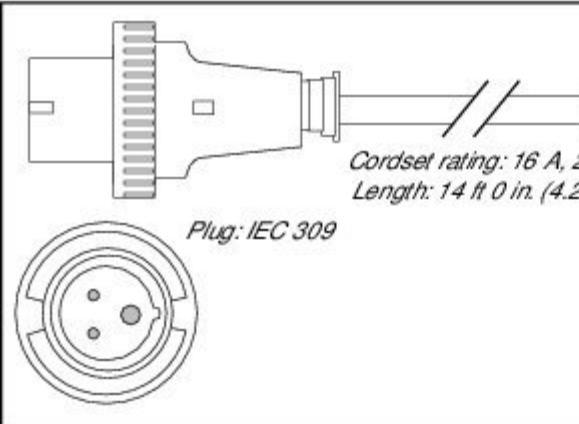
**Table 16: USB Flash or MEM Port Pinouts**

| Pin | Signal Name | Description |
|-----|-------------|-------------|
| A1  | Vcc         | +5 VDC      |
| A2  | D-          | Data -      |
| A3  | D+          | Data +      |
| A4  | Gnd         | Ground      |

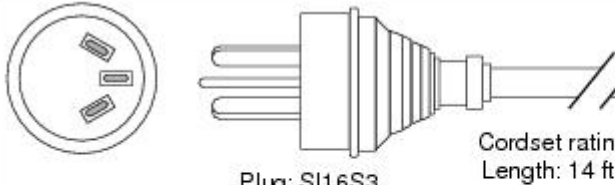
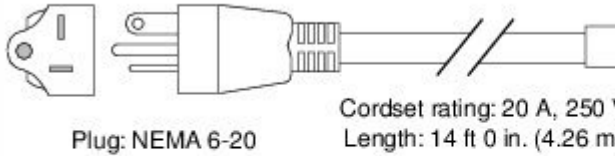
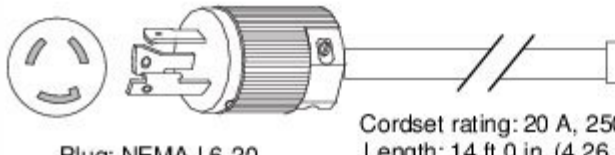
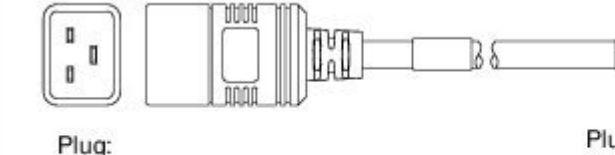
## Power Supply Power Cord Specifications

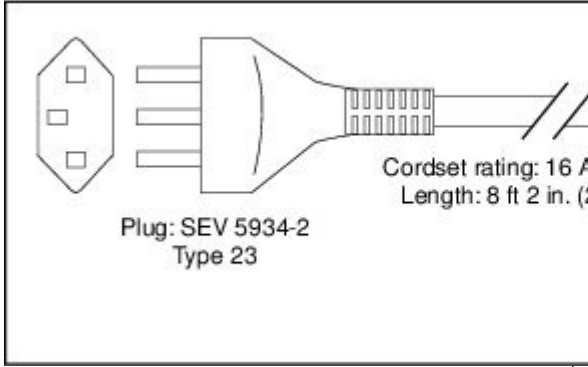
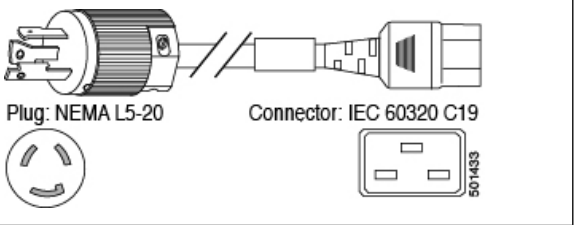
### Standard AC Power Cords

| Locale                    | Part Number    | Cord Set Rating | Power Cord Illustration  |
|---------------------------|----------------|-----------------|--|
| Australia and New Zealand | CAB-AC-16A-AUS | 16A, 250 VAC    |  <p>Plug: AU20S3</p> <p>Cordset rating: 16 A,<br/>Length: 14 ft 0 in. (4.27 m)</p> |

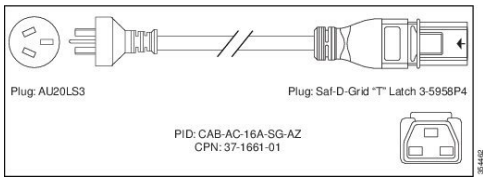
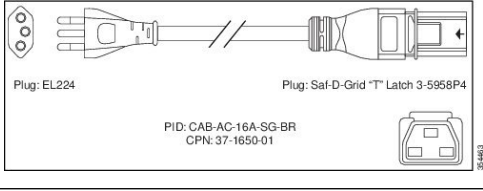
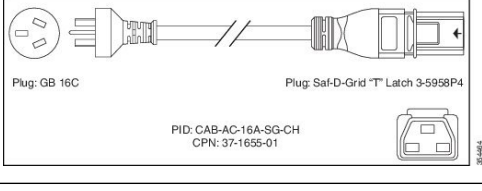
| Locale                    | Part Number      | Cord Set Rating | Power Cord Illustration   |
|---------------------------|------------------|-----------------|---|
| Peoples Republic of China | CAB-AC-16A-CH    | 16A, 250 VAC    |  <p>Plug: GB16C</p> <p>Cordset rating: 16A, 250V<br/>Length: 14 ft 0 in. (4.27m)</p>     |
| Continental Europe        | CAB-AC-2500W-EU  | 16A, 250 VAC    |  <p>Plug: CEE 7/7</p> <p>Cordset rating: 16A, 250V<br/>Length: 14 ft 0 in. (4.27m)</p>  |
| International             | CAB-AC-2500W-INT | 16A, 250 VAC    |  <p>Plug: IEC 309</p> <p>Cordset rating: 16A, 250V<br/>Length: 14 ft 0 in. (4.27m)</p> |

Power Supply Power Cord Specifications

| Locale  | Part Number       | Cord Set Rating | Power Cord Illustration   |
|---|-------------------|-----------------|---|
| Israel  | CAB-AC-2500W-ISRL | 16A, 250 VAC    |  <p>Plug: SI16S3<br/>Cordset rating: 16 A, 250 V<br/>Length: 14 ft</p>                       |
| Japan and North America (non locking) 200-240 VAC operation | CAB-AC-2500W-US1  | 16A, 250 VAC    |  <p>Plug: NEMA 6-20<br/>Cordset rating: 20 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p>     |
| Japan and North America (locking) 200-240 VAC operation     | CAB-AC-C6K-TWLK   | 16A, 250 VAC    |  <p>Plug: NEMA L6-20<br/>Cordset rating: 20 A, 250 V<br/>Length: 14 ft 0 in. (4.26 m)</p>  |
| Power distribution unit (PDU)                               | CAB-C19-CBN       | 16A, 250 VAC    |  <p>Plug: IEC 60320 C20<br/>Cordset rating: 16 A, 250 V<br/>Length: 9 ft 0 in. (2.7 m)</p> |

| Locale        | Part Number      | Cord Set Rating                      | Power Cord Illustration  |
|---------------|------------------|--------------------------------------|--|
| Switzerland   | CAB-ACS-16       | 16A, 250 VAC                         |  <p>Cordset rating: 16 A<br/>Length: 8 ft 2 in. (2.5 m)</p> <p>Plug: SEV 5934-2<br/>Type 23</p> |
| North America | CAB-L520P-C19-US | NEMA L5-20 to IEC-C19 6 feet (1.8 m) |  <p>Plug: NEMA L5-20</p> <p>Connector: IEC 60320 C19</p>  |

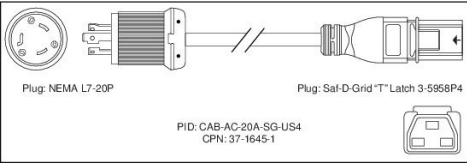
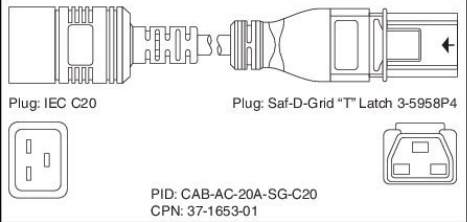
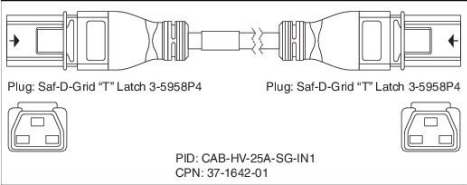
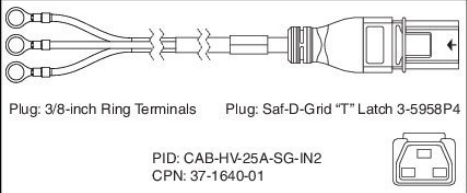
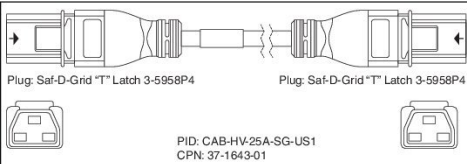
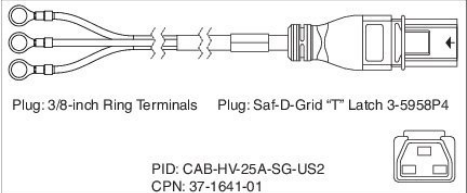
**HVAC/HVDC Power Cords**

| Locale    | Part Number      | Power Cord Set Rating | Power Cord Illustration  |
|-----------|------------------|-----------------------|--|
| Australia | CAB-AC-16A-SG-AZ | 16A, 250 VAC          |  <p>Plug: AU20LS3</p> <p>Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-AC-16A-SG-AZ<br/>CPN: 37-1661-01</p> |
| Brazil    | CAB-AC-16A-SG-BR | 16A, 250 VAC          |  <p>Plug: EL224</p> <p>Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-AC-16A-SG-BR<br/>CPN: 37-1650-01</p>   |
| China     | CAB-AC-16A-SG-CH | 16A, 250 VAC          |  <p>Plug: GB 16C</p> <p>Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-AC-16A-SG-CH<br/>CPN: 37-1655-01</p>  |

Power Supply Power Cord Specifications

| Locale  | Part Number       | Power Cord Set Rating | Power Cord Illustration |
|---|-------------------|-----------------------|-------------------------|
| Europe  | CAB-AC-16A-SG-EU  | 16A, 250 VAC          |                         |
| International/UK                                  | CAB-AC-16A-SG-IN  | 16A, 250 VAC          |                         |
| Italy   | CAB-AC-16A-SG-IT  | 16A, 250 VAC          |                         |
| South Africa                                      | CAB-AC-16A-SG-SA  | 16A, 250 VAC          |                         |
| Switzerland                                       | CAB-AC-16A-SG-SW  | 16A, 250 VAC          |                         |
| North America (non locking) 200-240 VAC operation | CAB-AC-20A-SG-US2 | 20A, 250 VAC          |                         |
| North America (locking) 200-240 VAC operation     | CAB-AC-20A-SG-US3 | 20A, 250 VAC          |                         |



| Locale   | Part Number       | Power Cord Set Rating | Power Cord Illustration   |
|--|-------------------|-----------------------|---|
| North America 277 VAC operation                                    | CAB-AC-20A-SG-US4 | 20A, 277 VAC          |  <p>Plug: NEMA L7-20P      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-AC-20A-SG-US4<br/>CPN: 37-1645-1</p>                      |
| North America Cabinet Jumper Power Distribution unit (PDU)         | CAB-AC-20A-SG-C20 | 20A, 250 VAC          |  <p>Plug: IEC C20      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-AC-20A-SG-C20<br/>CPN: 37-1653-01</p>                         |
| International, Saf-D-Grid/Saf-D-Grid                               | CAB-HV-25A-SG-IN1 | 20A, 400 VDC          |  <p>Plug: Saf-D-Grid "T" Latch 3-5958P4      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-HV-25A-SG-IN1<br/>CPN: 37-1642-01</p>   |
| International, Ring Terminal source plug, Ring Terminal/Saf-D-Grid | CAB-HV-25A-SG-IN2 | 20A, 300 VAC/500 VDC  |  <p>Plug: 3/8-inch Ring Terminals      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-HV-25A-SG-IN2<br/>CPN: 37-1640-01</p>        |
| North America, Saf-D-Grid/Saf-D-Grid                               | CAB-HV-25A-SG-US1 | 20A, 400 VDC          |  <p>Plug: Saf-D-Grid "T" Latch 3-5958P4      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-HV-25A-SG-US1<br/>CPN: 37-1643-01</p> |
| North America, Ring Terminal source plug, Ring Terminal/Saf-D-Grid | CAB-HV-25A-SG-US2 | 20A, 300 VAC/500 VDC  |  <p>Plug: 3/8-inch Ring Terminals      Plug: Saf-D-Grid "T" Latch 3-5958P4</p> <p>PID: CAB-HV-25A-SG-US2<br/>CPN: 37-1641-01</p>       |

