

# Cisco NCS 1001 Overview

This chapter provides an overview of Cisco NCS 1001.


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# Cisco NCS 1001 Overview

Cisco NCS 1001 (NCS1001-K9) is 1 RU chassis that addresses the growing bandwidth needs of data center DWDM applications. It provides a DWDM line system that is optimized for data center environments and is optimized for point-to-point applications at maximum capacity. NCS 1001 supports up to three optical modules. The modules can be amplifiers or protection switching modules.

NCS 1001 has the following components:

- Removable control card
- Four removable fans
- Two removable 600W AC/DC or DC/DC power supply modules (PSU)
- Three slots for optical modules. Two Optical Amplifier Modules ( NCS1K-EDFA) and a Protection Switching Module (NCS1K-PSM) can be inserted in these slots.

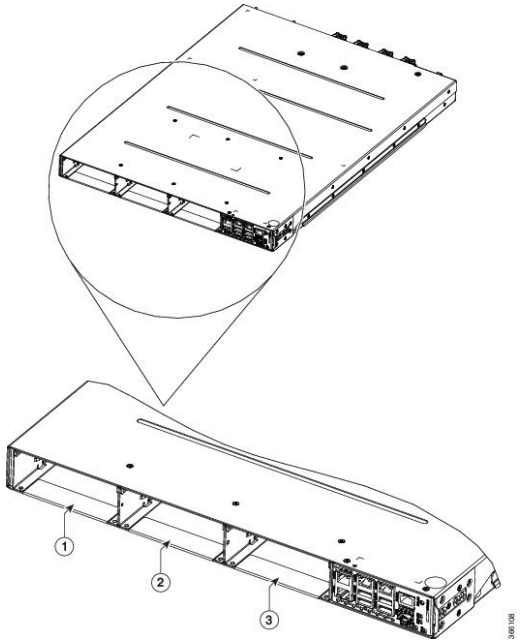
  The optical modules can be inserted in slots 1 to 3 as shown in the following figure. The optical modules can be inserted and removed from the slots while the system is operational. In amplified configuration, the Optical Amplifier module can be inserted in any slot. In (section) protected configuration, the protect Optical Amplifier module is inserted in slot 1, Protection Switching Module in slot 2, and working Optical Amplifier module in slot 3.

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**Caution** Each optical module must be inserted in a slot only when the module in the adjacent slot is completely inserted and seated or the adjacent slot is empty. If an optical module is inserted in a slot without seating the adjacent module, the ejector might interfere with the adjacent module.

**Caution** The empty slots must be inserted with the filler optical modules or filler PSUs as appropriate to guarantee safety and system cooling compliance. See Figure 1: Cisco NCS 1001 Front View, on page 2 and Figure 3: Cisco NCS 1001 Rear View, on page 3 to identify the slots for optical modules and PSUs respectively.

***Figure 1: Cisco NCS 1001 Front View***

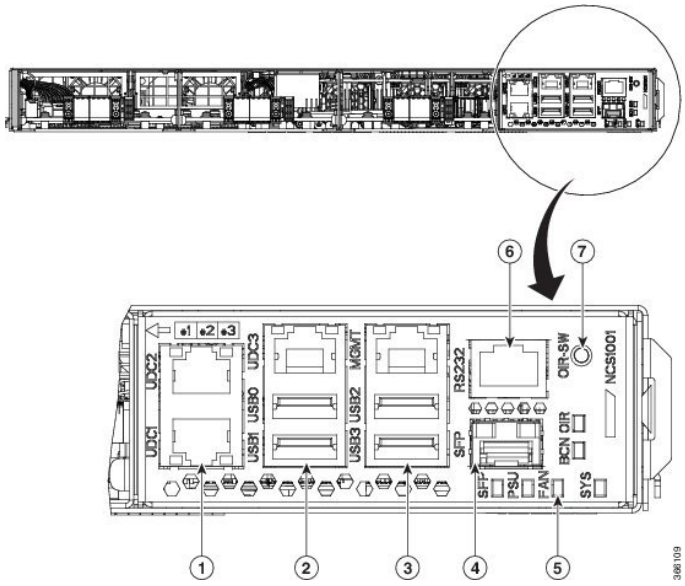



| | |
|---|---|
| 1 | Optical Module Slot 1 |
| 2 | Optical Module Slot 2 |
| 3 | Optical Module Slot 3 |

The slot numbers are also specified on the front panel label.

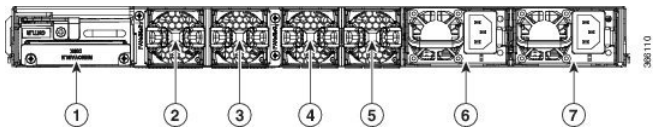
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*Figure 2: Cisco NCS 1001 Front View*




| | |
|---|---|
| 1 | UDC (user data channel) for optical modules 1 and 2 |
| 2 | Two USB 2.0 ports and one UDC for optical module 3 |
| 3 | Two USB 2.0 ports and one 10/100/1000 LAN electrical management interface |
| 4 | 10/100/1000 LAN management interface (optical) |
| 5 | Status LED (SFP link, Power supply, Fan, System, Beacon, OIR) |
| 6 | RS232 console port of the control card |
| 7 | OIR switch |

*Figure 3: Cisco NCS 1001 Rear View*




| | |
|---|---|
| 1 | Control card and SSD (Solid State Disk) |
| 2 | Fan 3 |
| 3 | Fan 2 |
| 4 | Fan 1 |
| 5 | Fan 0 |
| 6 | 600W AC/DC or DC/DC redundant power supply module (PSU 1) |

| | |
|---|---|
| 7 | 600W AC/DC or DC/DC redundant power supply module (PSU 0) |

Both the power supply modules shall be AC/DC or DC/DC. Mixed configuration is not allowed.

### Benefits

NCS 1001 provides the following benefits.

- Up to 23dBm output power to allow for +3dBm per channel fiber launch power and maximum optical performance for high baud rate and higher order modulation format transponders.
- Switchable gain pre-amplifier up to 34db.
- Embedded Optical Channel Monitoring (OCM) module to monitor per channel power at all the input and output ports.
- Integrated pluggable optics based OSC and OTDR support.
- OSC supports user data channel transport as well as remote node management.
- Supports 96 channels of C-Band in 1 RU.
- Supports flex grid on OCM module.

### Physical Characteristics

- Width: 17.44” (442.9 mm)
- Depth: 23.64” (600.5 mm)
- Height: 1 RU
- Weight without power supply unit: 8.2 kg
- Weight with two power supply units: 10.5 kg
- Weight of AC PSU: 1.162 kg
- Weight of Fan: 78 gms
- Weight of control card: 1.5 kg

For information about NCS 1001, see the data sheet.

# Safety Labels

Cisco NCS 1000 Series chassis is classified as Hazard Level 1M as per IEC 60825-2 and Laser Class 1M as per IEC 60825-1, since it includes pluggable optical modules Class 1 or Class 1M.

The Class 1/1M Laser Product label is shown in the following figure:

*Figure 4: Class 1/1M Laser Product Label*




This section explains the significance of the safety labels attached to the NCS 1001 chassis. The faceplates of the chassis are clearly labeled with warnings about the laser radiation levels.

You must understand all warning labels before working on the chassis.

*Figure 5: Class 1M Laser Product Label*




### Safety Precaution for Module Installation and Removal

Ensure to observe the following safety precautions when you are working with the chassis modules.

**Invisible laser radiations present.** Statement 1016.

**Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051.

*Figure 6: Class 1/1M Laser Product Label*




### Safety Precaution for Laser Radiation

Cisco NCS 1000 Series chassis is classified as Hazard Level 1M as per IEC 60825-2 and Laser Class 1M as per IEC 60825-1, since it may include embedded or pluggable optical modules Class 1 or Class 1M.

*Figure 7: Class 1M Laser Product Label*



# Optical Amplifier Module

*Table 1: Feature History*

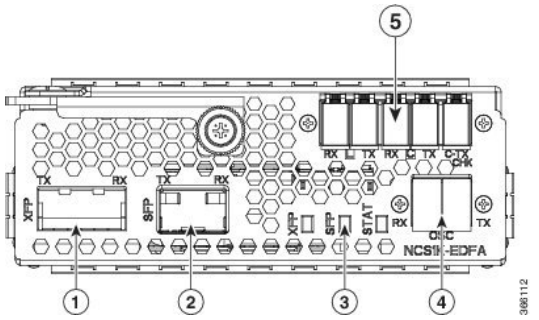
| Feature Name | Release Information | Feature Description |
|---|---|---|
| Amplifier Behaviour | Cisco IOS XR Release 7.3.1 | Grid mode configuration for the optical amplifier has been extended to support 75GHz spaced channels.<br>You can optimize the optical spectrum and granularity using the gridless configuration. You can provision channels with arbitrary channel frequencies and channel widths. Up to 96 channels can be configured using the gridless configuration.<br>Commands modified:<br>• hw-module<br>• show controllers |

The optical amplifier module (NCS1K-EDFA) has pre-amplifier and booster amplifier.

The optical amplifier module provides the following functionality.

- Preamplifier (LINE-RX to COM-TX) - Single preamplifier variant, with switchable gain ranges, according to link loss:
  - Range # 1: 0 to 24 dB gain, Tilt control: 24 to 27 gain, with tilt uncontrolled
  - Range # 2: 20 to 34 dB gain, Tilt control: 34 to 37 dB gain, with tilt uncontrolled
  - 23dBm output power @ COM-TX port
- Booster amplifier (COM-RX to LINE-TX) - True variable gain booster amplifier
  - Gain range: 1 to 20. 20 to 25 uncontrolled tilt.
  - 23dBm output power @ LINE-TX port
- ADD/DROP OSC channel supports both 1510nm and 1610nm +/-10nm
- OCM assesses channel presence and Gain regulation and per channel power monitoring.

*Figure 8: EDFA Front View*




| | |
|---|---|
| 1 | XFP for OSC and additional OTDR feature |
| 2 | SFP for OSC (Optical Service Channel) |
| 3 | Status LED |
| 4 | Service Channel input and output port [OSC - RX, TX] |
| 5 | PRE and BST amplifier inputs and output ports<br>[L (LINE) - RX, TX]<br>[C (COM) - RX, TX]<br>[COM - CHECK] |

The following table describes the mapping of controllers and optical ports for the optical amplifier module.

| Controller | Optical Ports |
|---|---|
| Ots 0/slot/0/0 | • COM-RX (booster input)<br>• COM-TX (preamplifier output) |
| Ots 0/slot/0/1 | • LINE-RX (preamplifier input)<br>• LINE-TX (booster output) |
| Ots 0/slot/0/2 | • OSC-RX<br>• OSC-TX |
| Ots 0/slot/0/3 | COM-CHECK |

### COM-CHECK CONFIGURATION

The COM-CHECK configuration is described below.

- Safety must be ensured to protect the fiber intra-node from the pre-amplifier to the Mux or Demux section for the total output power on COM-TX port upto 23 dB. This is required to compensate for an extremely lengthy span.

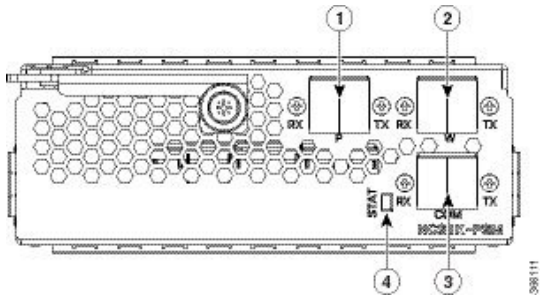
- If the output power on COM-TX is less than or equal to 20 dB, the com-check port may not be used and can be turned off. Also no physical connection between the pre COM-CHECK and Demux monitor port is required.
- Safety on pre is necessary in some cases such as large spans over high power requirements.
- The COM-CHECK PD9 is the safety port.
- The COM-RX like controller Ots 0/s/0/0 is not part of safety.
- The safety restart process is similar to the booster case, with some difference in the **APR Check** phase.

# Protection Switching Module

The protection switching module (NCS1K-PSM) provides the following functionality.

- In TX section:
  - Splits input optical channels to both working and protection lines.
  - Forces the switch in the remote site by opening one of the two line paths (by putting the related VOA in AVS).
- In RX section:
  - Selects the signals from working or protection line. Each line is monitored through a PD.
  - Balances the two line losses by changing the VOA attenuation value at the same time of the switch change of state.

***Figure 9: PSM Front View***




| | |
|---|---|
| 1 | Protected path input and output port [P - RX, TX] |
| 2 | Working path input and output port [W - RX, TX] |
| 3 | COM input and output port [COM - RX, TX] |
| 4 | Status LED |

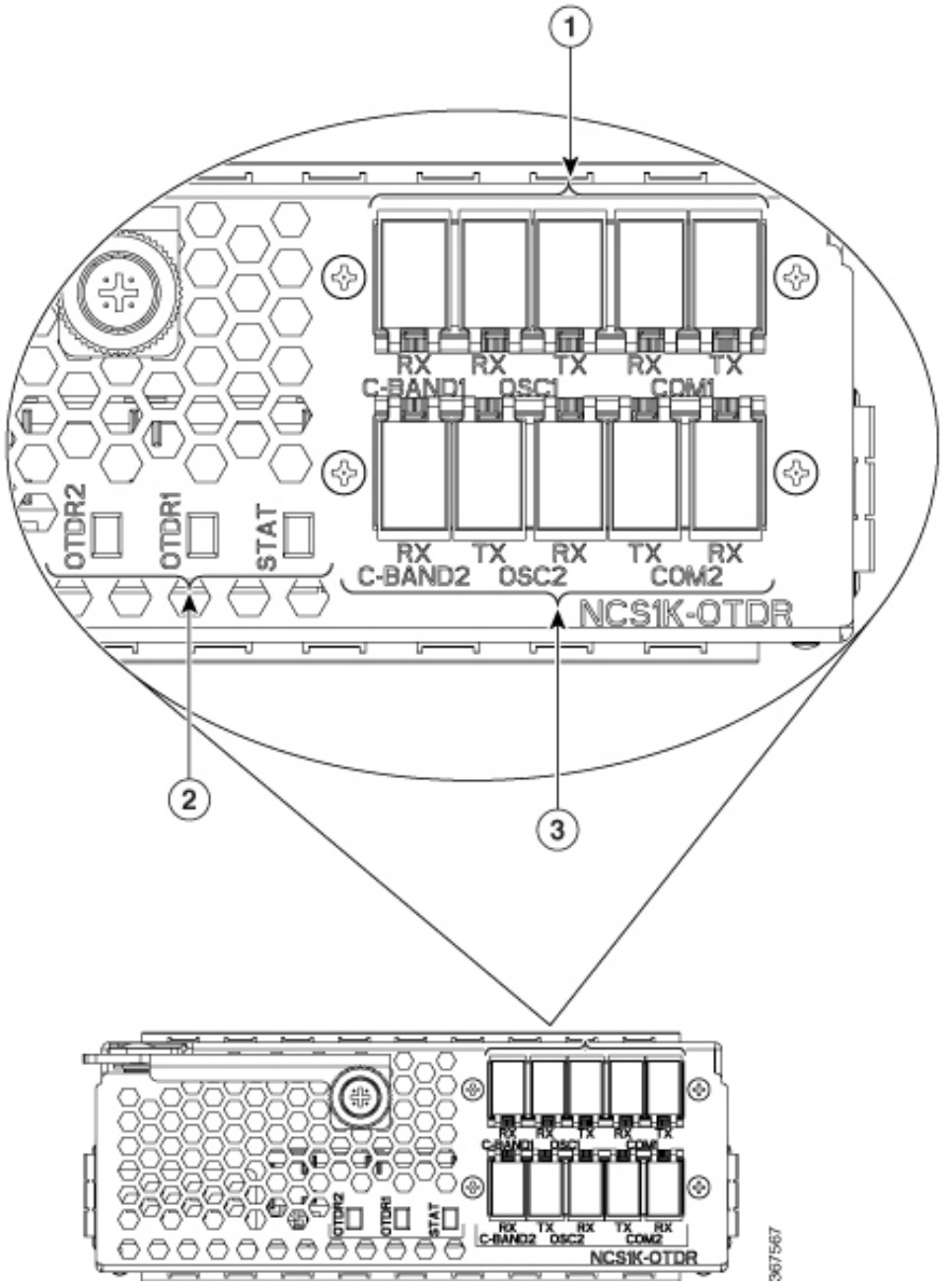
The following table describes the mapping of controllers and optical ports for the protection switching module.

| Controller | Optical Ports |
|---|---|
| Ots 0/slot/0/0 | COM-TX |
| Ots 0/slot/0/1 | Working path input and output port [W - RX, TX] |
| Ots 0/slot/0/2 | Protected path input and output port [P - RX, TX] |

# Optical Time Domain Reflectometer Module

Optical Time Domain Reflectometer (OTDR) is a line card supported in NCS 1001. The line card contains 2x bidirectional OTDRs and 2x filter that combines C-band, OSC, and OTDR filters and splits OSC and OTDR. Each internal OTDR can perform measurements on both TX and RX fiber by using an internal optical switch. OTDR line card is connected to the OSC port on the optical amplifier. The OTDR line card can be inserted in any slot of NCS 1001.

*Figure 10: OTDR Front View*




| | |
|---|---|
| 1 | OTDR1 interface |
| 2 | LED status |
| 3 | OTDR2 interface |

For more information about the OTDR module, see the data sheet.

# Cisco NCS 1000 32-Channel Even Mux/Demux Patch Panel

The Cisco NCS 1000 32-Channel Even Mux/Demux patch panel (PID: N1K-MD-32E-C) is a pair of passive Athermal Arrayed Waveguide Grating (AAWG) based modules.

**Note** "Patch panel" refers to N1K-MD-32E-C Even Mux/Demux patch panel.

The patch panel has 32 channels and works as an add/drop unit for its 32 channels at 140 GBd. Each even patch panel allows the multiplexing and demultiplexing of 32 channels with 150-GHz spacing. The patch panel provides a wide spectrum of optical wavelengths support.

The N1K-MD-32E-C patch panel operates in C-band. This even patch panel is fully passive.

***Figure 11: N1K-MD-32E-C Patch Panel Front View***




### Port Label Descriptions

The even patch panel has 34-port LC-duplex connectors.

***Table 2: Even Mux/Demux Patch Panel Port Interfaces***

| Port | Connector Type | Connector Label | | Operating Frequency Range [THz (nm)] | Note |
|---|---|---|---|---|---|
| COM-RX<br>COM-TX | LC | COM | | 191.3–196.1 (1528.77–1567.13) | — |
| | | TX | RX | | |
| MON-RX<br>MON-TX | LC | MON | | 196.175–191.15 (1528.2–1568.4) | Both are output ports. Replica of COM-RX/TX signals ~20dB attenuated. |
| | | TX | RX | | |
| CH-i TX/RX<br>[i=0–31] | LC | <*frequency*> | | For more information on EVEN channels, see Channel Wavelength Allocation, on page 13 | — |
| | | TX | RX | | |

| Port | Connector Type | Connector Label | Operating Frequency Range [THz (nm)] | Note |
|---|---|---|---|---|
| INV | USB Type A receptacle connector | INV | — | USB inventory port. |

### Channel Wavelength Allocation

The following table describes the C-band channel wavelength plan for the patch panel.

***Table 3: C-Band Channel Wavelength Plan***

| Channel Label | N1K-MD-32E-C | |
|---|---|---|
| | Frequency (THz) | Wavelength (nm) |
| 0 | 196.025 | 1529.36 |
| 1 | 195.875 | 1530.53 |
| 2 | 195.725 | 1531.70 |
| 3 | 195.575 | 1532.88 |
| 4 | 195.425 | 1534.05 |
| 5 | 195.275 | 1535.23 |
| 6 | 195.125 | 1536.41 |
| 7 | 194.975 | 1537.59 |
| 8 | 194.825 | 1538.78 |
| 9 | 194.675 | 1539.96 |
| 10 | 194.525 | 1541.15 |
| 11 | 194.375 | 1542.34 |
| 12 | 194.225 | 1543.53 |
| 13 | 194.075 | 1544.72 |
| 14 | 193.925 | 1545.92 |
| 15 | 193.775 | 1547.12 |
| 16 | 193.625 | 1548.31 |
| 17 | 193.475 | 1549.52 |
| 18 | 193.325 | 1550.72 |

| Channel Label | N1K-MD-32E-C | |
|---|---|---|
| | Frequency (THz) | Wavelength (nm) |
| 19 | 193.175 | 1551.92 |
| 20 | 193.025 | 1553.13 |
| 21 | 192.875 | 1554.34 |
| 22 | 192.725 | 1555.55 |
| 23 | 192.575 | 1556.76 |
| 24 | 192.425 | 1557.97 |
| 25 | 192.275 | 1559.19 |
| 26 | 192.125 | 1560.40 |
| 27 | 191.975 | 1561.62 |
| 28 | 191.825 | 1562.84 |
| 29 | 191.675 | 1564.07 |
| 30 | 191.525 | 1565.29 |
| 31 | 191.375 | 1566.52 |

# NCS1K-MD-32x-CE mux/demux passive patch panels

NCS1K-MD-32x-CE mux/demux passive patch panels are a pair of optical patch panels that

- use passive Athermal Arrayed Waveguide Grating (AAWG) technology to multiplex and demultiplex signals across multiple channels,
- support 32 channels per panel with 150-GHz spacing and offer wide optical pass-band support, and
- enable add/drop functions for the NCS 1001 and NCS 1014 optical line systems and can be paired (ODD and EVEN panels) to achieve 64 channels with 75-GHz spacing.

Supported Panels:

- NCS1K-MD-32E-CE (EVEN panel)
- NCS1K-MD-32O-CE (ODD panel)

Key features and usage:

- Each mux/demux panel allows multiplexing and demultiplexing for 32 channels with a channel spacing of 150 GHz.
- When both ODD and EVEN panels are used together on the same NCS 1001 or NCS 1014 optical line system, the combined capacity becomes 64 channels with 75-GHz spacing.

- Each panel acts as an add/drop unit for 32 channels at 140 GBd in standalone mode.
- The panels operate fully in the C-band and are enhanced versions of the NCS1K-MD-32O/E-C patch panels.

### Front panel of the MD-32x-CE

The interfaces of MD-32E-C patch panel is similar to the MD-32-O-CE patch panel.

***Figure 12: MD-32x-CE interfaces***

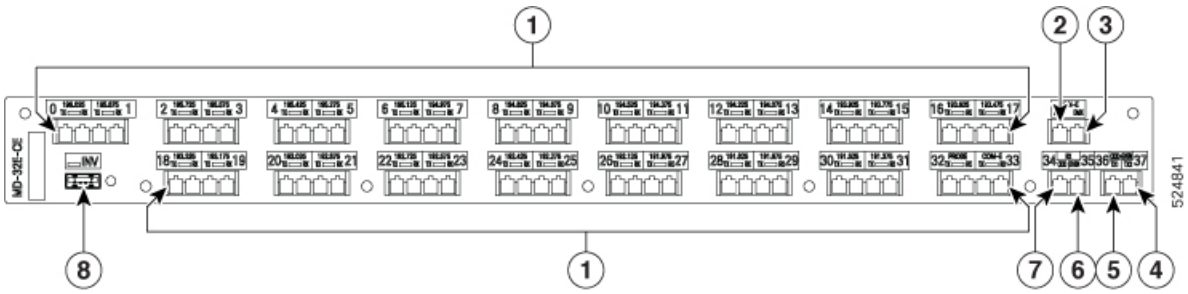



***Table 4: Port Label Descriptions***

| Callout | Port label | Connector type | Description |
|---|---|---|---|
| 1 | CH-i TX/RX [i=0–31] | LC | Transmits and receives data through the 32 optical channels |
| | COM-x-TX/RX | LC | Transmits and receives the combined signals to multiplex or demultiplex. Its operating frequency range is 196.175–191.15 (1528.2–1568.4) [THz (nm)]. |
| | PROBE-TX/RX | LC | Starts the coherent test probe signal in TX port and detects the signal in RX port to verify connection with the host card |
| 2 | MON-x-MUX | LC | Monitors the aggregrated signal flowing out of the patch panel. Its operating frequency range is 196.175–191.15 (1528.2–1568.4) [THz (nm)]. |
| 3 | MON-x-DEMUX | LC | Monitors the aggregrated signal coming into the patch panel to demultiplex the signal. Its operating frequency is the same as MON-x-MUX port. |
| 4 | ODD+EVEN-TX2 | LC | Transmits the ODD and EVEN optical channels |
| 5 | ODD+EVEN TX1 | LC | Transmits the ODD and EVEN optical channels |
| 6 | RX-EVEN | LC | Receives the EVEN optical channels |
| 7 | RX-ODD | LC | Receives the ODD optical channels |

| Callout | Port label | Connector type | Description |
|---|---|---|---|
| 8 | INV | USB Type A receptacle connector | Establishes USB communication channel with the optical line system |

### Characteristics of MD-32x-CE

The MD32x-CE patch panel operates in C-band. It is the enhanced version of the NCS1K-MD-32O/E-C patch panel.

| Functionalities | NCS1K-MD-32E-CE | NCS1K-MD-32O-CE |
|---|---|---|
| Band type | C-band | |
| Loopback | Loopback is not supported. | |
| Frequency range (THz) | 191.375 - 196.025 | 191.450 - 196.100 |
| Embedded optical modules | optical coupler | optical splitter |
| Coherent probe testing | MD32x-CE patch panel has a dedicated PROBE port to detect test probe signal to verify connection with the host card. | |

### Communication with the NCS 1001 and NCS 1014 optical line system

The MD32x-CE patch panels communicate to the optical line system using a USB communication channel. The INV port is the dedicated USB 2.0 port in the patch panels that connect to the controllers to communicate.

The USB communication channel helps to retrieve the inventory data and the insertion loss of the optical paths.

### Channel wavelength allocation

The table shows the frequency and wavelength allocated to each channel for both ODD and EVEN version of the MD-32x-C patch panels.

***Table 5: C-Band channel wavelength allocation***

| Channel Label | NCS1K-MD-32E-CE | | NCS1K-MD-32O-CE | |
|---|---|---|---|---|
| | Frequency (THz) | Wavelength (nm) | Frequency (THz) | Wavelength (nm) |
| 0 | 196.025 | 1529.36 | 196.100 | 1528.77 |
| 1 | 195.875 | 1530.53 | 195.950 | 1529.94 |
| 2 | 195.725 | 1531.70 | 195.800 | 1531.12 |
| 3 | 195.575 | 1532.88 | 195.650 | 1532.29 |
| 4 | 195.425 | 1534.05 | 195.500 | 1533.47 |

| Channel Label | NCS1K-MD-32E-CE | | NCS1K-MD-32O-CE | |
|---|---|---|---|---|
| | Frequency (THz) | Wavelength (nm) | Frequency (THz) | Wavelength (nm) |
| 5 | 195.275 | 1535.23 | 195.350 | 1534.64 |
| 6 | 195.125 | 1536.41 | 195.200 | 1535.82 |
| 7 | 194.975 | 1537.59 | 195.050 | 1537.00 |
| 8 | 194.825 | 1538.78 | 194.900 | 1538.19 |
| 9 | 194.675 | 1539.96 | 194.750 | 1539.37 |
| 10 | 194.525 | 1541.15 | 194.600 | 1540.56 |
| 11 | 194.375 | 1542.34 | 194.450 | 1541.75 |
| 12 | 194.225 | 1543.53 | 194.300 | 1542.94 |
| 13 | 194.075 | 1544.72 | 194.150 | 1544.13 |
| 14 | 193.925 | 1545.92 | 194.000 | 1545.32 |
| 15 | 193.775 | 1547.12 | 193.850 | 1546.52 |
| 16 | 193.625 | 1548.31 | 193.700 | 1547.72 |
| 17 | 193.475 | 1549.52 | 193.550 | 1548.91 |
| 18 | 193.325 | 1550.72 | 193.400 | 1550.12 |
| 19 | 193.175 | 1551.92 | 193.250 | 1551.32 |
| 20 | 193.025 | 1553.13 | 193.100 | 1552.52 |
| 21 | 192.875 | 1554.34 | 192.950 | 1553.73 |
| 22 | 192.725 | 1555.55 | 192.800 | 1554.94 |
| 23 | 192.575 | 1556.76 | 192.650 | 1556.15 |
| 24 | 192.425 | 1557.97 | 192.500 | 1557.36 |
| 25 | 192.275 | 1559.19 | 192.350 | 1558.58 |
| 26 | 192.125 | 1560.40 | 192.200 | 1559.79 |
| 27 | 191.975 | 1561.62 | 192.050 | 1561.01 |
| 28 | 191.825 | 1562.84 | 191.900 | 1562.23 |
| 29 | 191.675 | 1564.07 | 191.750 | 1563.45 |
| 30 | 191.525 | 1565.29 | 191.600 | 1564.68 |
| 31 | 191.375 | 1566.52 | 191.450 | 1565.90 |

# Cisco ONS 15216 4 channel optical add/drop multiplexers

A Cisco ONS 15216 4 channel optical add/drop multiplexer is a passive optical networking device that

- enables the Cisco ONS 15454 Multiservice Transport Platform (MSTP) to address the network edge cost-effectively without sacrificing operational ease,
- is well suited for applications with minimal wavelength requirements and tight space and power constraints, such as cell site and customer premises terminations, and
- offers ten models covering a 40-channel 100-GHz channel plan.

The Cisco ONS 15216 4 channel OADMs support flexible deployment, especially where space and power are limited. These models allow edge optical networking to be extended economically, meeting both operational and environmental constraints.

In Release 25.4.1, NCS 1001 supports USB inventory only for Cisco ONS 15216 4 channel optical add/drop multiplexer.

# USB passive inventories

A USB passive inventory is a system feature that

- automatically detects and collects key parameters (such as Product ID, Description, Serial Number, and Version ID) from passive optical modules when connected via USB,
- enables real-time inventory visibility and management for network administrators,
- ensures compatibility and traceability of passive modules within NCS 1001 hardware environments.

***Table 6: Feature History***

| Feature Name | Release | Description |
|---|---|---|
| Inventory Support | Cisco IOS XR Release 7.3.1 | A new passive device with PID NCS1K-MD-64-C (NCS 1000 64 channels Odd Multiplexer or Demultiplexer Patch Panel-C-band) is supported. |

*Table 7: Feature History*

| Feature Name | Release | Description |
|---|---|---|
| USB inventory support | Cisco IOS XR Release 25.4.1 | NCS 1001 can now retrieve information from additional passive devices connected to its USB ports. The feature extends support beyond previously supported passive devices, allowing you to access data from a wider range of connected equipment. The passive devices include:<br>• NCS 1000 32 chs Even Mux/Demux Patch Panel (NCS1K-MD-32E-CE )<br>• NCS 1000 32 chs Odd Mux/Demux Patch Panel (NCS1K-MD-32O-CE)<br>• Cisco ONS 15216 4 Channel OADMs |

### How USB passive inventories work

When a supported passive unit is physically connected to one of the four available USB ports on the controller card of the NCS 1001, the inventory system automatically queries and retrieves the module's parameters. This information includes PID, Description, Serial Number, and Version ID. Only one passive unit can be inventoried at a time per USB port.

The inventory data is immediately accessible through operational commands such as show inventory in XR or through admin sessions. These commands provide clear module identification directly from the system interface. Inventory records can also be accessed through SNMP “entPhysicalEntity” objects, telemetry, and NETCONF using the yang model Cisco-IOS-XR-invmgr-oper.yang. This enables automated network management and monitoring.

From Release 25.4.1, NCS 1001 supports USB inventory management for these devices:

- NCS 1000 32 chs Even Mux/Demux Patch Panel (NCS1K-MD-32E-CE )
- NCS 1000 32 chs Odd Mux/Demux Patch Panel (NCS1K-MD-32O-CE)
- Cisco ONS 15216 4 Channel OADMs

**Note** For the MD32 patch panel, NCS1001 can only retrieve data from the inventory. It cannot access LED or photodiode status, nor can it configure the device in any way.

*Table 8: Passive modules supported in NCS 1001*

| PID | Description |
|---|---|
| 15216-MD-48-ODDE | ONS Multiplexer/Demultiplexer Patch Panel Even Extended |
| 15216-MD-48-EVENE | ONS Multiplexer/Demultiplexer Patch Panel Odd Extended |
| 15216-MD-48-CME | ONS Coupler and Splitter |
| 15216-FLD-OSC | OSC Combiner and Splitter |
| NCS1K-MD-64-C | NCS 1000 64 channels Odd Multiplexer/Demultiplexer Patch Panel-C-band |
| N1K-MD-32E-C | NCS 1000 32 channels Even Multiplexer/Demultiplexer Patch Panel, No-loopback - 150GHz - C-band |
| 15216-FLD-4-30.3=<br>15216-FLD-4-33.4=<br>15216-FLD-4-36.6=<br>15216-FLD-4-39.7=<br>15216-FLD-4-42.9=<br>15216-FLD-4-46.1=<br>15216-FLD-4-49.3=<br>15216-FLD-4-52.5=<br>15216-FLD-4-55.7=<br>15216-FLD-4-58.9= | Cisco ONS 15216 4 Channel OADM |
| NCS1K-MD-32E-CE | NCS 1000 32 chs Even Mux/Demux Patch Panel |
| NCS1K-MD-32O-CE | NCS 1000 32 chs Odd Mux/Demux Patch Panel |

**Remember** **N1K-MD-32E-C** and **NCS1K-MD-32E-C** are 32-channel even multiplexer/demultiplexer patch panels. The **N1K-MD-32E-C** does not have a loopback function and is compatible only with the NCS 1001. The **NCS1K-MD-32E-C** supports a loopback function and is compatible only with the NCS 1010.

Example:

```
RP/0/RP0/CPU0:ios#show inventory
Wed May 23 08:24:07.350 CEST……

NAME: "0/RP0-USB0", DESCR: "ONS Mux/Demux Patch Panel Even Extended"
PID: 15216-MD-48-EVENE , VID: V01 , SN: NSZ19510021
```

```
NAME: "0/RP0-USB1", DESCR: "OSC Combiner-Splitter Module"
PID: 15216-FLD-OSC=    , VID: V00 , SN: OPL17190305

NAME: "0/RP0-USB2", DESCR: "ONS Mux/Demux Patch Panel Odd Extended"
PID: 15216-MD-48-ODDE  , VID: V01 , SN: NSZ19510003

NAME: "0/RP0-USB3", DESCR: "ONS Coupler and Splitter Pluggable"
PID: 15216-MD-48-CME   , VID: V01 , SN: NSZ20159002


NAME: "0/RP0-USB0", DESCR: "NCS 1000 32 chs Even Mux/Demux Patch Panel - 150GHz - C-band"
PID: NCS1K-MD-32E-CE   , VID: V00 , SN: ACW2804YJ23

NAME: "0/RP0-USB1", DESCR: "NCS 1000 32 chs Odd Mux/Demux Patch Panel - 150GHz - C-band"
PID: NCS1K-MD-32O-CE   , VID: V00 , SN: ACW2804YH08

NAME: "0/RP0-USB0", DESCR: "NCS 1000 4 Channel add drop multiplexer Module"
PID: 15216-FLD-4-55.7=   , VID: V00 , SN: OPL19380046
```

# Product IDs

***Table 9: Feature History***

| Feature Name | Release Information | Feature Description |
|---|---|---|
| ONS-SE-155-1510 Support | Cisco IOS XR Release 7.3.2 | A new SFP pluggable optics module with PID ONS-SE-155-1510 SFP is supported. |

The following table describes the product IDs of the components.

| Product ID | Description |
|---|---|
| NCS1001-K9= | Network Convergence System 1001 line system 3 slots |
| NCS1K-CNTLR2= | Network Convergence System 1001 Control card |
| NCS1K-EDFA= | Network Convergence System 1001 amplifier module |
| NCS1K-PSM= | Network Convergence System 1001 protection module |
| NCS1K-OTDR= | Network Convergence System 1001 OTDR module |
| NCS1K-2KW-AC2= | Network Convergence System 1001 AC power supply unit - 2KW normal operating temperature, 600W short term high temperature |
| NCS1K-2KW-DC= | Network Convergence System 1001 DC power supply unit - 2KW normal operating temperature, 600W short term high temperature |
| NCS1K1-FAN= | Network Convergence System 1001 line system Fan |
| NCS1K-SSD= | SSD with a capacity of 64 GB |
| ONS-SC-Z3-1510= | SFP OC-48/STM-16/GE, CWDM, 1510 nm |
| ONS-SE-155-1510 | SFP OC-3/STM-1, CWDM, 1510 nm EXT; SFP Pluggable Optics Module |
| CWDM-SFP-1510 | CWDM 1510-nm SFP; Gigabit Ethernet 1 and 2 Gb Fibre Channel |

| Product ID | Description |
|---|---|
| CWDM-SFP-1610 | CWDM 1610-nm SFP; Gigabit Ethernet 1 and 2 Gb Fibre Channel |
| ONS-SC-Z3-1610= | SFP OC-48/STM-16/GE, CWDM, 1610 nm |
| ONS-SI-GE-LX= | SFP 1000BASE-LX Gigabit Ethernet, 1310 nm, SM, I-TEMP |
| ONS-SI-GE-SX= | SFP 1000BASE-SX Gigabit Ethernet, 850 nm, MM, I-TEMP |
| ONS-SI-GE-ZX= | SFP 1000BASE-ZX Gigabit Ethernet, 1550 nm, SM, I-Temp |
| ONS-SC-Z3-1510= | SFP OC-48/STM-16/GE, CWDM, 1510 nm |
| ONS-SC-Z3-1610= | SFP OC-48/STM-16/GE, CWDM, 1610 nm |

# LEDs in Cisco NCS 1001

| LED | State | Description |
|---|---|---|
| SYS | Green | The unit is operating correctly. |
| | Yellow | The unit has one or more errors detected. |
| | Off | Power is not applied to the unit. |
| BCN | Blue | The unit needs attention. |
| | Off | The unit does not need attention. |
| SFP | Green | The SFP link is up. |
| | Yellow | The link is down, active alarms are present on this port, or a hardware failure has occurred. |
| | Off | The port is not provisioned by the software, the optics module is missing, or the port does not have power. |
| PSU and FAN | Green | The unit is operating correctly. |
| | Red | The unit has one or more errors detected. |
| OIR | Off | The control card is not present or not properly inserted. |
| | Amber Blinking | The software is not operating correctly as the control card may not be correctly inserted. |
| | Amber Solid | The control card, BIOS, and software are functional. |

### 32-Channel Even Mux/Demux Panel LEDs

The behaviour of the 32-channel even mux/demux pannel LEDs are similar to the 32-channel mux/demux patch panel LEDs. For information, see Mux/Demux Patch Panel LEDs.