



Cisco NCS 4202 Overview

The Cisco NCS 4202 Network Convergence Systems are full-featured, compact one-RU high converged access platforms designed for the cost-effective delivery of TDM to IP or MPLS migration services. These temperature-hardened, high-throughput, small-form-factor, low-power-consumption systems are optimized for circuit emulation (CEM) and business applications. NCS 4202 chassis allow service providers to deliver dense scale in a compact form factor and unmatched CEM and Carrier Ethernet (CE) capabilities. They also provide a comprehensive and scalable feature set, supporting both Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) services in a compact package..

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Cisco NCS 4202 Features

The Cisco NCS 4202 provides 1GE/10GE, MPLS, H-QoS, high availability hardware design, advanced Ethernet Operations, Administration, and Maintenance (OAM), as well as advanced timing support, including satellite timing (GNSS) based clocking, and PoE in one platform.

This chassis has fixed Ethernet interfaces (8x1G copper + 4x1G SFP + 4x10G/1G (dual rate))

The following table provides snapshot of the number and type of supported ports:

NCS 4200 Series Sub-family	Dual Rate 1G/10G Port	1 GE Port
Cisco NCS 4202	4 ¹ Te0/0/12 – Te 0/0/15	8 Cu ports Ge0/0/0 – Ge0/0/7 4 SFP ports Ge0/0/8 – Ge0/0/11

¹ Each port can operate at either 1G or 10G, and operates in a mutually exclusive way. You cannot insert both 1G and 10G together.

GigabitEthernet Copper Ports

Fixed copper GigabitEthernet (GE) interfaces are provided through standard RJ-45 connectors. These ports support the following features:

- Standard 10/100/1000Base-T/TX operation with forced or auto-negotiation for speed and duplex.
- Automatic crossover (auto-MDIX) for straight-through and crossover connections.
- Pause flow control as defined by the 802.3x standard.
- Maximum frame size of 9216 bytes.

- Synchronous ENET operation that provides its recovered receive clock as an input clock source for the SETS as well as uses the system-wide reference clock to derive its transmit clock.

GE SFP Ports

The GE SFP ports support the following features:

- 100Base-FX and 1000Base-X SFP modules.
- Digital optical monitoring as specified by the SFP.
- Any mix of SFPs is supported unless specifically noted.
- Pause flow control as defined by the 802.3x standard.
- Maximum frame size of 9216 bytes.
- Synchronous ENET operation that provides its recovered receive clock as an input clock source for the SETS as well as uses the system-wide reference clock to derive its transmit clock.



Note Copper based SFPs do not support synchronous ENET operations.

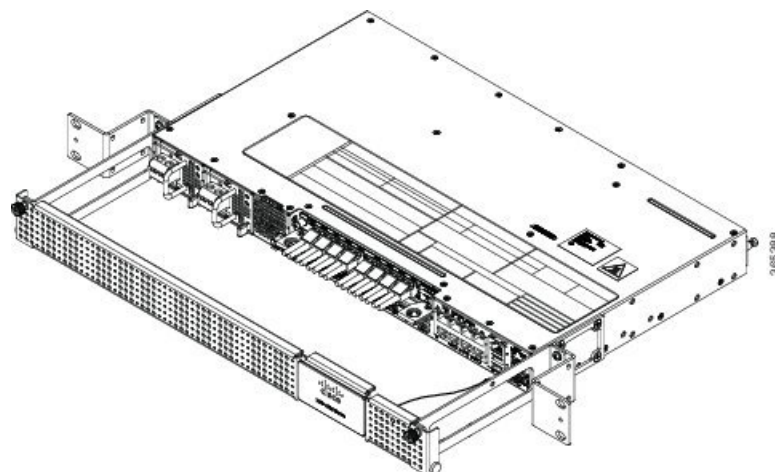
SFP+ Ports

The SFP+ ports support the following features:

- Digital optical monitoring as specified by the optical transceiver module.
- Any mix of SFPs is supported unless specifically noted.
- Pause flow control as defined by the 802.3x standard.
- Maximum frame size of 9216 bytes.

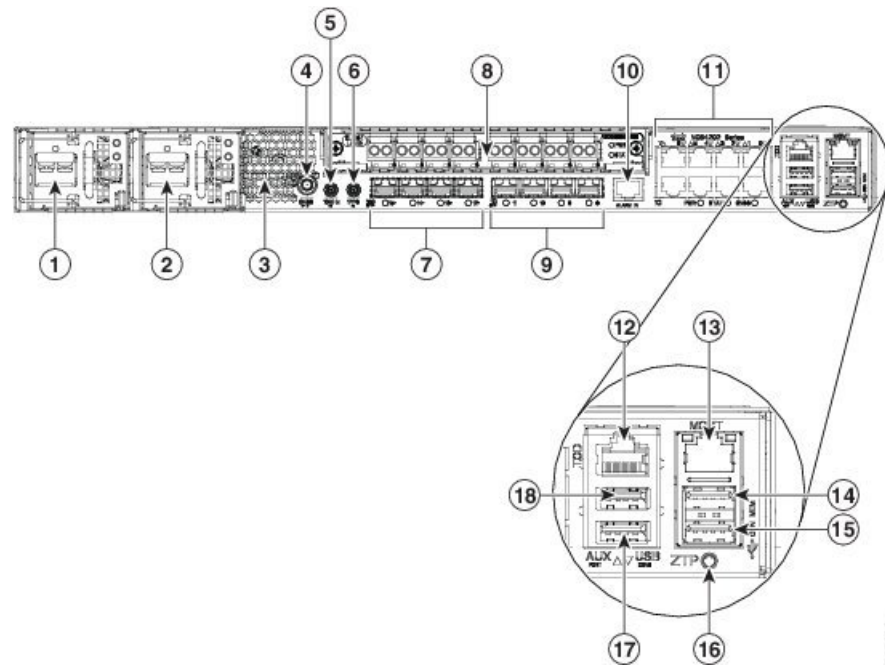
The following figure shows the 3D image of the Cisco NCS 4202:

Figure 1: Figure 3D Image of the Cisco NCS 4202



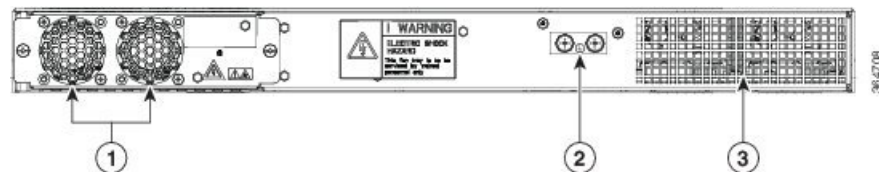
The following figures show the port numbering for the Cisco NCS 4202:

Figure 2: Front Panel of Cisco NCS 4202 —With DC Power Supply



1	Power Supply 0 (AC or DC)	10	Alarm port
2	Power Supply 1 (AC or DC)	11	Eight Copper port (1G PoE)
3	Front Air-Inlet Area	12	ToD port
4	GNSS RF IN (SMA threaded connector)	13	Management Port
5	SMB Snap-in connector (10MHZ)	14	USB Memory port
6	SMB Snap-in connector (1PPS)	15	USB Console port
7	Four 1G/10G SFP+	16	Zero Touch Provisioning button
8	Interface Module Slot	17	RS232 Console port
9	Four 1G SFP	18	RS232 Aux Console port

Figure 3: Rear View of the Cisco NCS 4202



1	Fan tray	3	Air vents
2	Grounding lug	—	

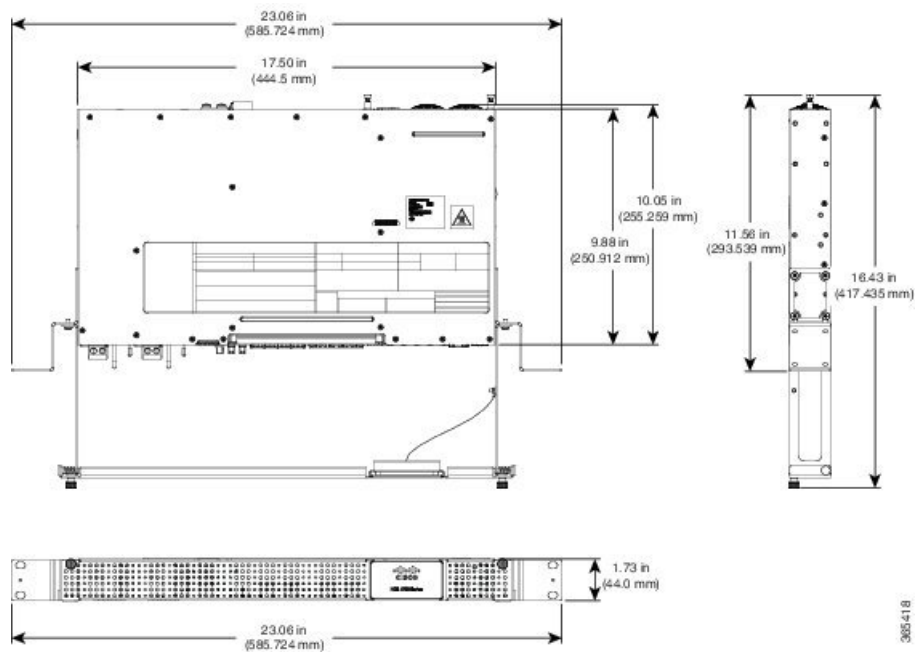
Table below describes the other features of Cisco NCS 4202 (AC and DC).

Table 1: Cisco NCS 4202 Specifications

Specification	NCS 4202
Dimension Width x Depth x Height	23.06 x 16.43 x 1.73 inches
Weight	Total weight: 5.63 kg Weight of PSU: 0.59 kg Weight of Fan: 0.33 kg
Rack Unit	EIA one RU
Airflow	Front to back
Cable access	Front cable access
System throughput	60 Gbps, 95 Mpps
Power Supply	
Redundant	Yes
AC	Yes
Voltage Range	85V AC to 264V AC, nominal 100/240 VAC
Frequency Range	47 Hz to 63 Hz, nominal 50/60 Hz
Maximum Power	360 W
DC	Yes
Voltage Range	-18 VDC to -32 VDC or -40 VDC to -72 VDC
Nominal Voltage Range	-24 VDC/-48 VDC/-60 VDC
Maximum Power	375 W
Heat Dissipation	—

Specification	NCS 4202
Operating Temperature/Humidity	-40° C to 70° C
Alarms	<ul style="list-style-type: none"> • 4 alarm dry contact inputs (normally open) • LED indicators for critical, major, and minor alarms
Supported Interface Modules	• 8 port RJ48C T1/E1 Interface Module
Mounting option	Front Z-bracket mount for 23 inches rack
Port Configuration	12x1G and 4x10G/1G ports
Port Numbering	4x10G SFP+ – Port [12:15] Note Ports 12 to 15 are Dual Rate ports 4x1G SFP – Port [8:11] 8x1G PoE RJ45/Cu ports [0:7]
Copper/1G/10G Port LEDs	Link/Activity/Fault
Temperature Sensors	Four temperature sensors
1PPS/ToD	External ports for 1PPS/TOD
PoE	Provides power over Ethernet
GNSS	Connects to the external GPS

Figure 4: Cisco NCS 4202-Dimensions



External Interfaces

The external physical interfaces on the front panel of the chassis are given below:

Network Interfaces

The network interfaces are provided through fixed ports.

- GE SFP ports—supports 100/1000 modes
- GE Copper RJ-45 ports—supports 10/100/1000 operation. All eight copper RJ-45 ports support PoE/PoE+/UPoE with overall power budget of 180 W.



Note PoE is not supported when the system is powered with 24 V DC.

- 10GE SFP+—supports 10G/1G mode depending on the SFP+/SFP in the network interface slot.

At 1G mode, it supports only 1000BaseX.

Network Timing Interfaces

- 10MHz input or output—Miniature coaxial connectors for 10MHz timing (input or output). You can use this interfaces with an external GPS device to send or receive clocking from the chassis
- 1PPS input or output and ToD input or output—This interface is used for input or output of time-of-day (ToD) and 1PPS pulses. ToD format includes both NTP and IEEE 1588-2008 time formats.

The same RS422 pins for 1PPS and TOD are shared between input and output directions. The direction for each can be independently configured through software.

- GNSS RF IN—This interface is used to connect the external GPS antenna to the in-built GPS module.

External Alarm Inputs

The chassis supports four dry contact alarm inputs through an RJ-45 jack on the front panel.

Each alarm input can be provisioned as critical, major, minor, or can be configured for normally open or normally closed.

Management Interfaces

The following management interfaces are supported:

Management ENET Port

A single management copper ENET port supporting 100/1000Base-T operation is provided on the front panel. It uses a standard RJ-45 jack.

RS232 Console Port

The RS232 console port provides transmission (Tx), reception (Rx), and ground (Gnd).



Note The RS232 console port is enabled only through the Cisco-designed cable adapter USB type A cable to RJ-45 adapter cable. To use this port, disable the flow control on the terminal.



Caution Do not plug the USB-to-RJ45 adapter cable in the USB Memory port.

USB Console

A single USB 2.0 Type-A receptacle on the front panel of the chassis provides console access to ROMMON, Cisco IOS-XE and diagnostics. While it uses the Type-A connector, it operates as a USB peripheral only for connection to an external host computer. This interface requires the use of a Type-A to Type-A connector instead of a standard USB cable.



Note Use of the USB console is mutually exclusive of the RS232 console port. This interface requires the use of a Type-A to Type-A USB cable.

USB Mass Storage

A single USB 2.0 Type-A receptacle on the front panel of the chassis allows external USB mass storage devices, such as standard USB flash drives. This interface is used to load images, load or store configurations, write logs, and so on.



Note More than 8 GB is not supported in ROMMON mode,

Zero Touch Provisioning Button

The Zero Touch Provisioning (ZTP) button on the front panel initiates the ZTP process on a short press of less than eight seconds. Pressing the ZTP button for more than eight seconds causes a board reset.

RS232 Auxiliary Console Port

The RS232 Aux console port provides transmission (Tx), reception (Rx), and ground (Gnd).



Note The RS232 Aux console port is enabled only through the Cisco-designed cable adapter from USB type A cable to RJ-45 adapter cable.

This is a debug-only port. It is recommended that this port be used by field service engineers only.

Power Supply and Fans

The chassis supports AC, DC, or a combination of both power supplies in a 1+1 redundant configuration.

Table 2: Power Supply Specification

Specification	AC (A920-PWR400-A)	DC (A920-PWR400-D)
Voltage	100 V – 240 V	24 V – 60 V
Current	5A through a standard C16 type receptacle	20A through a two-position terminal block
Input Power	360 W	375 W



Note This product requires surge protection as part of the building installation. To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, an external surge protective device (SPD) is required at the AC power service equipment.



Note For DC systems, if a surge of more than 500 V is expected, add an appropriate external surge protective device.

The chassis has a single fan-tray with four fans. The system is designed to operate at its maximum operating temperature of 70° C, in case of failure of a single fan operating temperature of 65° C. The fan tray is field-replaceable.

LED Indicators

This section describes the different types of LEDs and their behavior.

PWR and STAT LEDs

The PWR LEDs are available on the front panel. These LEDs provide power on the board (PWR) status. During power up state, these LEDs provide booting status and report errors.



Note The digital code signing functionality validates the integrity and authenticity of the ROMMON image before booting it.

Table 3: PWR and STAT LED Indications

PWR LED State	STAT LED state	Indication	Comment
Amber	Off	Power in the system is all right and FPGA configuration is taking place.	Permanent Amber/Off indicates FPGA configuration failure.
Amber	Red	FPGA Image Validation Error.	System is in unresponsive state.

PWR LED State	STAT LED state	Indication	Comment
Flashing Amber and Green alternatively	Amber	Upgrade FPGA image error, continuing with Golden FPGA image.	—
Flashing Amber and Green alternatively	Off	FPGA configuration successful and Digital code signing successfully validated FPGA image. Digital code signing passed the control to Microloader to boot ROMMON.	—
Flashing Amber and Green alternatively	Red	Digital code signing reported failure in ROMMON image validation.	—
Flashing Amber	Flashing Amber	ZTP process has begun. Note A short press of the ZTP button triggers the provisioning. A longer press of more than eight seconds, resets the board.	Both LEDs turn Green once provisioning is complete.
Green	Off	IOS-XE image is booting.	—
Green	Green	Successfully booted and system is operating normally.	—
Green	Amber	A minor alarm or synchronization is in Holdover or free-running mode	—
Green	Red	A major or critical alarm (high temperature reported for any sensor) or multiple fan failure.	—

CPU Management Port LEDs

The LED for the 100/1000 Management port is integrated on the connector itself. There are two LEDs in the connector—the LED on the left indicates the Link/Activity status and the LED on the right is non-functional.



Note The CPU management port LED on the right is non-functional and hence doesn't indicate any port status.

Table 4: CPU Management Port LED Indication

LED	LED State	Indication
Left	Green	Link up in 1000 Mbps
	Blinking Green	Activity in 1000 Mbps
	Amber	Link up in 100 Mbps
	Blinking Amber	Activity in 100 Mbps
	Off	Link down

SFP LEDs

Each SFP port has an LED indicator.

Table 5: SFP Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 1000Base-X/100Base-FX
	Blinking Green	Activity in 1000 Base-X/100Base-FX
	Amber	Fault/Error/Link down
	Off	Administratively down

SFP+ LEDs

Each SFP+ port has an LED indicator.

Table 6: SFP+ Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 10G/1G
	Blinking Green	Activity in 10G/1G
	Amber	Fault/Error/Link down
	Off	Administratively down

RJ-45 LEDs

There is only one LED on each RJ45 port on the fixed slot (slot 0/0) and this indicates only the link or speed status. There is no LED to show the Duplex state. However, there are two LEDs for IM RJ45 ports and they indicate the Link and Duplex state.

Table 7: RJ-45 LED Indication

LED State	Indication
Green	Link up in 10/100/1000Base-T
Blinking Green	Activity in 10/100/1000Base-T
Amber	Fault/Error/Link down
Off	Administratively down

Power Supply Unit LEDs

Each power supply unit has a corresponding LED on the front panel.

Table 8: PSU LED Indication

Power LED	FAIL LED	Power Supply Condition
Green	Off	Power Supply ON; valid input/output
Yellow 1Hz blinking	Red 1Hz blinking	PSU Warning due to OCP, OTP, UV, OV, OP, abnormal fan operation PSU continues to operate
Off	On	PSU failure due to OCP, OTP, UV, OV, OP, abnormal fan operation. No valid output.
Green 1Hz blinking	Off	Valid power present, shutdown by system.
Yellow	Off	Input voltage low
Off	Off	No valid power input.

System–Interface LED Behavior

Table 9: 1G Copper and 1G SFP LED Indication

Event	1G Copper Port LEDs (Link)	1G SFP Port LEDs
ROMMON	Off	Off
IOS Shut	Off	Off
IOS No shut (cable disconnect)	Amber	Amber
IOS No shut (Link Up)	Green	Green

Table 10: Dual Rate Port LED Indication

Event	Dual Rate (1G/10G) Port LEDs
ROMMON	Off
IOS Shut	Off
IOS No shut (cable disconnect)	Amber
IOS No shut (Link Up)	Green

Table 11: Management Port LED Indication

Event	Management Port LEDs (Link/Duplex)
ROMMON	Green/Off
IOS Shut	Off/Off
IOS No shut (cable disconnect)	Amber/Off
IOS No shut (cable connect)	Green/Green in 1G mode Amber/Green in 100M mode

Online Insertion and Removal

This chassis supports the following OIR operations:

- When an SFP is removed, there is no effect on traffic flowing on other ports.
- When an SFP is installed, the system initializes that port for operation based upon the current configuration. If the inserted SFP is incompatible with the current configuration for that port, the port does not become operational until the configuration is updated.
- Both power supplies are installed and active and the load may be shared between them or a single PSU could support the whole load. When a power supply is not working or the input cable is removed, the remaining power supply takes the entire load without disruption.



Caution Do not remove or replace the fan tray with the chassis powered on.
