



## Pinout and LED Details

The following sections provide information for troubleshooting problems on the Cisco NCS 560-4 Router.

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## Pinouts

The following sections describe the pinouts for the Cisco NCS 560-4 Router interfaces:

### BITS Port Pinout

The table below summarizes the BITS port pinout of the Front Panel “Building Integrated Timing Supply” RJ48 port.

**Table 1: BITS Port Pinout**

Pin Number	Signal Name	Direction	Description
1	RX Ring	Input	Receive Ring
2	RX Tip	Input	Receive Tip
3	—	—	Not used
4	TX Ring	Output	TX Ring
5	TX Tip	Output	TX Tip
6	—	—	Not used
7	—	—	Not used
8	—	—	Not used

## GPS Port Pinout

The platform is capable of receiving or sourcing GPS signals of 1 PPS & 10 MHz. These interfaces are provided by two mini-coax 50-Ohm, 1.0/2.3 DIN series connector on the front panel. Similarly there are two mini-coax 50-Ohm connectors provided in the front panel to output this 1PPS and 10MHz.

The table below summarizes the GPS port pinouts.

**Table 2: GPS Port Pinout**

Category	10 Mhz (input and output)	1PPS (input and output)
Waveform	Input—Sine wave Output—Square wave	Input—Pulse shape Output—Pulse shape
Amplitude	Input— > 1.7 volt p-p(+8 to +10 dBm) Output— > 2.4 volts TTL compatible	Input— > 2.4 volts TTL compatible Output— > 2.4 volts TTL compatible
Impedance	50 ohms	50 ohms
Pulse Width	50% duty cycle	26 microseconds
Rise Time	Input—AC coupled Output—5 nanoseconds	40 nanoseconds

## Time of Day Pinout

**Table 3: ToD pinouts**

Pin Number	Signal Name	Direction	Description
1	RESERVED	Output or Inputs	Do Not Connect
2	RESERVED	Output or Inputs	
3	1PPS_N	Output	1PPS RS422 signal
4	GND	—	—
5		—	—
6	1PPS_P	Input	1PPS RS422 signal
7	TOD_N	Output or input	Time of Day R422 output or input signal
8	TOD_P	Output or input	Time of Day R422 output or input signal

Use a 4-port EIA-232 DCE, 10 feet, Female DB-25, and CAB-HD4-232FC. Pinout of the DB25 connector to be connected to the RS232-to-RS422 converter.

**Table 4: RS422 Pinout**

Pin Number	Signal Name	Description
4	TXD+	RTS pin for RS232
20	TXD-	DTR pin for RS232
5	RXD+	CTS pin for RS232
6	RXD-	DSR pin for RS232

## Alarm Port Pinout

The table below summarizes the external alarm input pinout.

**Table 5: External Alarm Input Pinout**

Pin Number	Signal Name	Description
1	ALARM0_IN	Alarm input 0
2	ALARM1_IN	Alarm input 1
3		No connect
4	ALARM2_IN	Alarm input 2
5	ALARM3_IN	Alarm input 3
6		No connect
7		No connect
8	COMMON	Alarm common

## Console/Aux RJ45 RS232 Serial Port Pinout

The table below summarizes the console/aux RJ45 RS232 serial port pinout.

**Table 6: Console/Aux RJ45 RS232 serial port**

Pin Number	Signal Name	Direction	Description
1	RTS	Not Used	—

Pin Number	Signal Name	Direction	Description
2	DTR	Not Used	—
3	TXD	Output	Transmit data
4	RI	Not Used	—
5	GND		
6	RXD	Input	Receive data
7	DSR/DCD	Not Used	—
8	CTS	Not Used	—

## Management Ethernet Port Pinout

A single management copper ENET port supporting 10/100/1000Base-T operation exists on each RSP. There is no direct access to the CPU of the other RSP. It uses a standard RJ45 jack.




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**Note** This is not a data plane port.

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The table below summarizes the Management Ethernet port pinout.

**Table 7: Management Ethernet Port Pinout**

Pin Number	Signal Name
1	TRP0+
2	TRP0-
3	TRP1+
4	TRP1-
5	TRP2+
6	TRP2-
7	TRP3+
8	TRP3-

## USB Console Port Pinout

Two individual Type-A USB connector are used for USB console and USB mass storage. One single USB 2.0 Type-A receptacle is provided on the RSP front panel for providing console access to ROMMON, IOS-XE and diagnostics. It operates as a USB peripheral only for connection to an external host PC. This requires the use of a Type-A to Type-A connector instead of a standard USB cable.



**Note** The use of the USB console is mutually exclusive with the RS232 console/Aux port. While a USB cable is inserted, access is automatically switched to this port.

The other single USB 2.0 Type-A receptacle is provided on the RSP front panel for inserting external USB mass storage devices such as standard USB flash drives. It is used to load images, store configurations, write logs, etc. It supports operation up to 12Mbps

The table below summarizes the USB console port pinout.

Pin Name	Signal Name	Description
A1	Vcc	+5VDC (500mA)
A2	D-	Data -
A3	D+	Data +
A4	Gnd	Ground



**Note** The USB Console port +5VDC is input and operates as an USB peripheral device.

## USB Flash/MEM Port Pinout

*Table 8: Single USB Flash/MEM Port*

Pin Name	Signal Name	Description
A1	Vcc	+5VDC (500mA)
A2	D-	Data -
A3	D+	Data +
A4	Gnd	Ground



**Note** USB TYPE-A receptacle used.



**Note** The USB flash/MEM port +5VDC is output. We provide power for USB flash/MEM, and it operates as a USB host device.

## Fiber-Optic Specifications

The specification for optical fiber transmission defines two types of fiber: single-mode and multimode. Within the single-mode category, three transmission types are defined: short reach, intermediate reach, and long reach. Within the multimode category, only short reach is available. For information about optical SFP modules, see the documentation for the SFP module at

[http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html).

## Alarm Conditions

The table below summarizes the meaning of alarm conditions on the router.

**Table 9: Alarm Condition Summary**

Alarm Type	Alarm Meaning
Critical	RSP OIR
	Power supply OIR
	Port in down state
	Environmental sensor threshold exceeded (voltage, temperature)
	IM OIR
	IM crash
Major	Standby RSP in ROMmon mode
	RSP removed
	RSP failure
Info	Port administratively shut down

## LED Summary

The following sections describe the meanings of the LEDs on the router.

## RSP LEDs

*Table 10: N560-RSP4 and N560-RSP4-E LEDs*

LED	Color/State	Description (Two LEDs for Each Port)
Power (PWR)	Off	Disabled/no power to RSP
	Green	Power rails on RSP in range
Status (STAT)	Off	Disabled/power down
	Red	Failure to boot (lit at reset)
	Yellow	ROMMON booted
	Green	IOS booted and running
Active (ACT)	Off	Not available
	Yellow	Standby (indicates standby RSP)
	Green	Active (indicates active RSP)
Management port (MGMT)	Off	No connection
	Green	Connected with no activity
	Flashing Green	Connected with activity
Sync status (SYNC)	Off	Not enabled
	Yellow	Free run
	Flashing Yellow	Holdover
	Green	Locked to source
BITS	Off	Out of service/not configured
	Amber	Fault or loop condition
	Green	In frame/working properly



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

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

Table 11: Power and Status LEDs Combination

PWR LED State	STAT LED State	Indication	Comment
Light Green	Red	Power is OK and the field-programmable gate array (FPGA) is nfigured successfully, but FPGA image validation failed.	Image validation failed. System is in hung state.
Flashing Light Green and Green alternatively	Off	FPGA configured and core validated successfully. FPGA image passed the control to micro-loader to boot ROMMON.	System is up with ROMMON. Both the FPGA image is validated successfully, but the booted ROMMON (primary or secondary) is undetermined.
	Amber	The digital code signing functionality reported upgrade FPGA image validation error and is continuing with the FPGA image.	System is up with ROMMON. FPGA image is validated successfully, but the booted ROMMON (primary or secondary) is undetermined.
	Red	The digital code signing functionality reported failure in the ROMMON image validation.	FPGA is up but both primary and secondary ROMMON failed. System is in hung state.
Green	Off	IOS is successfully booted	IOS writes into FPGA register to indicate that it has booted, FPGA stops flashing PWR LED and turns Green. Software now controls the STAT LED.

## RSP4 LEDs

Table 12: RSP4 LED Details

PWR	STATS	Active/Standby	SYNC LED	PWR DWN LED	Indication
Light Green	—	—	—	—	Power OK
OFF	Flashing Red	—	—	—	Secure Jtag error
OFF	Amber	—	—	—	BIOS Image validation failure
—	OFF	Yellow	—	—	Micro-controller Sub-system not ready
—	OFF	Amber	—	—	TAM init failure
OFF	OFF	Blinking Yellow	—	—	TAM not ready



PWR	STATS	Active/Standby	SYNC LED	PWR DWN LED	Indication
OFF	Red	—	—	—	FPGA PLL failure
OFF	OFF	OFF	—	Flashing Yellow	Thermal Shutdown
OFF	OFF	OFF	—	Yellow	Software triggered shutdown
OFF	OFF	OFF	—	Green	Peer RSP shutdown

## Interface Module LEDs

Table 13: Interface Module LED Details

LED	Color/State	Description (2x100G)	Description (8x10G / 8x25G / 8x50G)	Description (8/16x1G + 1x10G)	Description (1x100G / 200G)
—	—	N560-IMA-2C N560-IMA-2C-DD	A900-IMA-8Z A900-IMA-8Z-L	A900-IMA-8CS1Z-M	N560-IMA-1W
Power (PWR)	Off	Disabled / no power to IM	Disabled / no power to IM	Disabled / no power to IM	No power to IM
	Green	Enabled and power rails on IM in range	Enabled and power rails on IM in range	Enabled and power rails on IM in range	All power rails are in range
Status (STAT)	Off	Disabled / power-down	Disabled / power-down	Disabled / power-down	Disabled / Power down
	Red	—	—	—	IM failure
	Flashing Red	Booting (if local CPU), IM Failure, FPD upgrade in progress, FPD upgrade failure	Booting (if local CPU), IM Failure	Booting (if local CPU), IM Failure	—
	Green	Operational	Operational	Operational	Operational
Link Status (L)	Off	Inactive or no connection	Inactive or no connection	Inactive or no connection <sup>1</sup>	—
	Amber	Fault / loop condition	Fault / loop condition	Fault / loop condition	—
	Green	Ok with activity or no activity	Ok with activity or no activity	Ok with activity or no activity	—

LED	Color/State	Description (2x100G)	Description (8x10G / 8x25G / 8x50G)	Description (8/16x1G + 1x10G)	Description (1x100G / 200G)
Speed (S)	Off	Inactive port status	Inactive port status	Inactive port status <sup>**</sup>	—
	Green	Activity or no activity	Activity or no activity	Activity or no activity	—
CFP0	Off	—	—	—	Laser Off – Controller down / shutdown
	Yellow	—	—	—	Link Down – Controller / HuGig SubPort 0 is “Operational Down”
	Green	—	—	—	Link Up – Controller / HuGig SubPort 0 is “Operational Up”
CFP1	Off	—	—	—	Laser Off – Controller down / shutdown
	Yellow	—	—	—	Link Up – Controller / HuGig SubPort 1 is “Operational Down”
	Green	—	—	—	Link Up – Controller/HuGig SubPort 1 is “Operational Up”
ORI <sup>2</sup>	Off	Optics removal not initiated	—	—	Optics removal not initiated
	Yellow	Optics removal initiated	—	—	Optics removal initiated
	Green	Ready for optical removal in the next 15 seconds	—	—	Ready for optical removal in the next 15 seconds

<sup>1</sup> \*\* CSFP optics is not supported in the 10G port. So the LEDs on port 17 do not function and remain off.

<sup>2</sup> The ORI LED is functional on N560-IMA-1W only from Cisco IOS XR Release 7.2.2 and it is functional on N560-IMA-2C-DD only from Cisco IOS XR Release 7.3.1.

## Fan Tray LEDs



**Note** A major alarm condition indicates the failure of a single fan in the fan tray; a critical alarm indicates the failure of multiple fans. In the event that a single fan fails, the router software adjusts the fan speed to prevent excessive heat within the chassis.

**Table 14: Primary Fan Tray LED Details**

LED	Color/State	Description
Status (TEMP)	Off	Disabled/power down
	Amber	Over temperature
	Green	OK
Fan (FAN)	Green	Fan rotation in range
	Amber	Fan fault
	Red	Two or more fan faults
Minor (MIN)	Off	No minor alarm
	Amber	Minor alarm
Major (MAJ)	Off	No major alarm
	Red	Major Alarm
Critical (CRIT)	Off	No critical alarm
	Red	Critical alarm (defaults to ON upon RSP reset)

**Table 15: Secondary Fan Tray LED Details**

LED Color	Fan Fail Status
Green	All fans working fine
Amber	Single fan failure
Red	Two or more fans have failed

## Power Supply LEDs

The table below summarizes the power supply LEDs for both the AC and DC power supplies.

**Table 16: Power Supply LEDs**

<b>LED</b>	<b>Color/State</b>	<b>Description</b>
Input OK	Off	No Input Voltage
	Amber	Input voltage out of range
	Green	Input voltage within acceptable operating range
Output Fail	Off	Disabled/Forced Shut down/No input power
	Red	Power supply fault (internal failure such as over temperature)
	Green	Operational
	Blinking Red	Output ORING FET Failed