

Appendix

Certain troubleshooting aids of the Cisco NCS 540 enable you to perform these tasks that assist the troubleshooting process:

- LEDs, on page 1
- System Specifications, on page 4

LEDs

Note The Cisco NCS 540 Router LEDs are similar for most of the variants, and any differences between the routers are specifically called out.

Router LEDs

All the data port LEDs in the Cisco NCS 540 Router are at the front panel. There are five LEDs that reflect the different statuses of the system.

Table 1: Router LED Descriptions

LED Label	Color	Status
PS0 and PS1	Off	This indicates that there is no AC or DC input.
	Red	This indicates 12V output failure. If one of the input feeds is switched off when both the feeds are connected, then that particular feed shows as red.
	Green	This indicates 12V output is active.

LED Label	Color	Status
STS	Off	the system is placed in shutdown mode; only standby power mode is available.
	Flashing Amber (Slow)	The module is booting up.
	Flashing Amber (Fast)	The module is booting up, shutting down, or is being reloaded.
	Amber	Host kernel is booted and is ready to start SysAdmin VM.
	Green	The module is operational and has no active major or critical alarms.
	Flashing Red	The router has active major or critical alarms.
ALM	Off	No alarm
	Red	Critical alarm - system scope, critical temperature
	Flashing Red	Critical alarm - Relating to voltage rail failures
	Amber	Major alarm - system-scope
	Flashing Amber	Minor alarm - system-scope
SYNC	Off	Time core clock synchronization is disabled or in free-running state.
	Green	Time core is synchronized to an external source including IEEE1588.
	Flashing Green	System is in Synchronous Ethernet mode.
	Amber	Acquiring state or Holdover: Time core is in acquiring state or holdover mode.

Fan Assembly LEDs

Table 2: Fan Assembly LEDs

LED Label	Color	Status
FAN	Off	Sytem is powered off.
	Green	Fans are operating normally.
	Amber	Single fan failure
	Red	More than one fan failure

Power Status LEDs

Table 3: Power Status LEDs

LED Label	Color	Status
PWR	Off	Sytem is powered off
	Green	All the power supplies are on and operating normally.
	Amber	Standby FPGA upgrade is in progress (this is expected to take about three to five minutes).
	Red	Power redundancy is lost due to a power feed failure or an internal power supply failure.

Combination of LEDs

Table 4: Fan and Power Status LED Combination

FAN	PWR	Status
For all the conditions below, the system will not boot.		
Flashing Red	Flashing Red	Thermal shutdown at Power Up
Flashing Red	Flashing Amber	MSS Ready Failure
Flashing Amber	Flashing Green	TAM Init Failure
Flashing Amber	Flashing Red	TAM Ready Failure
Flashing Amber	Flashing Amber	Secure JTAG Failure

SFP and SFP+ Port LED

Table 5: SFP and SFP+ Port LEDs

LED Label	Color	Status
STATUS	Off	Admin is down
	Green	Link is up in 1G/10G ports.
	Yellow	Fault or Error or Link Down

Management Port LEDs

Table 6: Management Port LEDs

LED Label	Color	Status
Left LED	Green	Link is up in 1000 Mbps
	Blinking Green	Activity in 1000 Mbps
	Amber or Orange	Link is up in 100/10Mbps
	Blinking Amber or Orange	Activity in 100/10Mbps
	Off	Link is down
Right LED	Off	Unused

System Specifications

Certain troubleshooting aids of the Cisco NCS 540 enable you to perform these tasks that assist the troubleshooting process:

Weight and Power Consumption

For information on physical specifications and power consumption, see table *Cisco NCS 540 chassis specification* on the Cisco Network Convergence System 540 Small Density Router Data Sheet.

Environmental Specifications

For information on environmental specifications, see table *Environmental properties for NCS 540 fixed systems* on the Cisco Network Convergence System 540 Small Density Router Data Sheet.

Thermal limitations

This table describes the maximum operating temperature range supported for the NCS 540 chassis when using specific optics modules, identified by their product IDs (PIDs). It details:

- Optics module: The model of the optics module.
- Chassis PID: The specific chassis or system product IDs that support these optics modules.
- System maximum and minimum operating temperature supported at MSL: Maximum operating temperature supported by the NCS 540 system at Mean Sea Level (MSL).
- Ports supported: The specific ports on the chassis where the optics modules can be installed.

Table 7: Thermal limitations

Optics module	Chassis PID	Maxiimum operating temperature at MSL	Ports supported
S10G-LR-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	• +55C	• P24 to P31 • P18 to P23 • P18 to P23
S10G-SR-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	• +55C	• P24 to P31 • P18 to P23 • P18 to P23
S10G-ER-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	• +45C	• P24 to P31 • P18 to P23 • P18 to P23

EMC compliance

This table describes the maximum number of ports supported on various NCS 540 small density router models when using specific optics modules. It details:

- Optics module: The model of the optics module.
- Chassis PID: The specific chassis or system product IDs that support these optics modules.
- Maximum number of supported ports: Refers to the highest number of ports on a chassis that can be supported to meet electromagnetic compatibility (EMC) and electromagnetic interference (EMI) compliance.

Table 8: EMC compliance

Optics module	Chassis PID	Maximum number of supported ports
S10G-LR-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	6
S10G-SR-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	6
S10G-ER-PM-D-I	• N540X-8Z16G-SYS-A/D • N540-6Z18G-SYS-A/D • N540X-6Z18G-SYS-A/D	6

RJ45 Connectors

The RJ45 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:

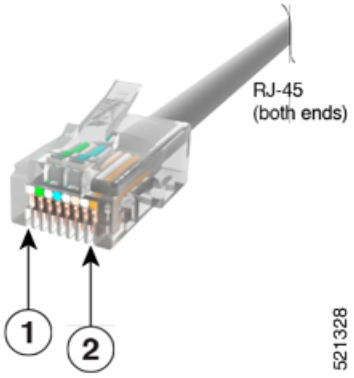
- Router chassis
  - CONSOLE port
  - MGMT ETH port



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 RJ45 connector.

Figure 1: RJ45 Connector



1	Transmit data (bidirectional)
2	NC (Not Connected)

Transceiver and Cable Specifications

To determine which transceivers and cables are supported by this router, see Cisco Transceiver Modules Compatibility Information.

To see the transceiver specifications and installation information, see Cisco Transceiver Modules Install and Upgrade Guides.

RJ-45 ToD or 1-PPS Port Pinouts

Note This section is not applicable to Cisco N540-6Z18G-SYS-A/D router.

This summarizes the RJ-45 ToD or 1-PPS port pinouts:

Table 9: RJ-45 ToD or 1-PPS Port Pinouts

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

Pin	Signal Name	Direction	Description
8	TOD_P	Output or Input	Time-of-Day character

Console Port Pinouts

This summarizes the Console port pinouts:

Table 10: Console Port Pinouts

Pin	Signal Name	Direction	Description
1	ACONS-TX	Output	Aux Consoles transmit output, RS232
2	NC	NA	NA
3	CONS-TX	Output	Console RS232 transmit
4	GND	NA	Ground
5	GND	NA	Ground
6	CONS-RX	Input	Console RS232 receive
7	ACONS-RX	Input	Aux Consoles receive input, RS232
8	NC	NA	NA

Alarm Port Pinouts

This summarizes the alarm port pinouts:

Table 11: Alarm Port Pinouts

Pin	Signal Name	Description
1	ALARM1_IN	Alarm input 1
2	ALARM2_IN	Alarm input 2
3	NC	NA
4	ALARM3_IN	Alarm input 3
5	ALARM4_IN	Alarm input 4
6	NC	NA
7	NC	NA
8	ALARM_I_COMMON	Alarm input COM

To set the description of the alarm:

```
RP/0/RP0/CPU0:ios(config)# environment alarm-contact contact-number description
description
```

To set the severity of the alarm:

```
RP/0/RP0/CPU0:ios(config)# environment alarm-contact contact-number severity
[critical | major | minor] [
```

To set the trigger for the alarm:

```
RP/0/RP0/CPU0:ios(config)# environment alarm-contact contact-number trigger [open
 | closed]
```



Note You can configure up to four external alarms.

The *contact-number* is the pin number of the connected alarm port, that is Alarm input 1 to Alarm input 4.

The **description** string can be up to 80 alphanumeric characters in length and is included in any generated system messages.

For **severity**, enter any one of: **critical**, **major**, or **minor**.

Description and severity are both mandatory values.

Use the **show alarms** command in admin mode to view the alarm details. Use the **show logging** command to view the displays the state of syslog error and event logging.

An SNMP trap is sent for every external alarm that is raised or cleared on the system.

USB Port Console Pinouts

This table summarizes the USB port console pinouts:

Table 12: USB Port Console Pinouts

Pin	Signal Name	Description
A1	VCC	+5 VDC
A2	D–	Data–
A3	D+	Data+
A4	GND	Ground

USB Port Memory Pinouts

This table summarizes the USB port memory pinouts:

Table 13: USB Port Memory Pinouts

Pin	Signal Name	Description
A1	VCC	+5 VDC
A2	D–	Data–
A3	D+	Data+
A4	GND	Ground

Management Ethernet Port Pinouts

This table summarizes the management ethernet port pinouts:

Table 14: Management Ethernet Port Pinouts

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

GPS Port Pinouts

The table below summarizes the GPS port pinouts.



Note This section does not apply to Cisco N540-6Z18G-SYS-A/D router.

Table 15: GPS Port Pinouts

Category	10 MHz (Input and Output)	1PPS (Input and Output)
Waveform	Input—Sine wave Output—Sine wave	Input—Rectangular pulse Output—Rectangular pulse

Category	10 MHz (Input and Output)	1PPS (Input and Output)
Amplitude	Input— > 1.7 volts p-p Output— > 2.2 volts p-p	Input— > 1.2V Output— > 2.5V
Impedance	50 ohms	50 ohms
Pulse Width	50% duty cycle	50% duty cycle
Rise Time	Input—AC coupled	Output—5 nanoseconds

AC Power Cord Specifications

For more information on the supported power cables, see *Ordering information for power cables supported on NCS 540* on the Cisco Network Convergence System 540 Small Density Router Data Sheet.