

Appendix

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

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

LEDs

The details of LEDs are listed in this section.

Router LEDs

All the data port LEDs in the Cisco NCS 540 Router is at the front panel. There are 5 LEDs that reflect the different statuses of the system.

Table 1: Router LED Descriptions

LED	Color	Status
Alarm	Red	Critical alarm - system-scope (including RP0).
	Amber	Major alarm - system-scope (including RP0).
	Flashing Amber	Minor alarm - system-scope (including RP0).
	Off	No alarm.
Status	Green	The module is operational but has no active major or critical alarms.
	Amber	Host kernel booted and XR is booting.
	Flashing Red	Not Applicable.

LED	Color	Status
SYNC	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.
	Off	Time core clock synchronization is disabled or in free-running state.
GNSS	Off	GNSS is not configured.
	Green	GNSS Normal State. Self-survey is complete.
	Red	Power up. GNSS is not tracking any satellite.
	Amber	Auto holdover.
	Flashing Green	Learning state–normal. Self-survey is not completed.

System Fans LED

Cisco NCS 540 large density router has six fans at the back panel.

Table 2: Fan Assembly LED Descriptions

LED	Color	Status
STATUS	Green	Fans are operating normally.
	Amber	Single fan failure.
	Red	More than one fan failure or a single PSU fan failure.
	Off	Fan tray is not receiving power.

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.

Power Supply LEDs (PM0/PM1)

Table 4: Power Supply LED (PM0/PM1) Descriptions

POWER LED	FAIL LED	Power Supply Condition
Green	Off	Power Supply ON; valid input/output.
Amber 1Hz flashing	Red 1Hz flashing	PSU Warning due to: • Over current • Over temperature • Under voltage • Over voltage • Over power • Fan failure
Off	On	PSU failure due to: • Over current • Over temperature • Under voltage • Over voltage • Over power • Fan failure

POWER LED	FAIL LED	Power Supply Condition
Green 1Hz flashing	Off	Power supply is not plugged in to the chassis or shutdown by the system.
Off	Off	No valid power input.
Amber	Off	Low input voltage.

Front Panel Power LED and Fan LED Combination

Table 5: Front Panel Power LED and Fan LED Combination

Fan LED	Power LED	Status
Off	Red	Power failure with one of the input power feeds failed or one of the on-board voltage rails has failed.
—	Amber	STDBY FPGA upgrade is in progress due to post Reload/Power cycle after HW FPD upgrade All. **Note** Upgrade of the STDBY FPGA takes 3–5 minutes.
Green	Flashing Amber	Thermal shutdown with no fan
Flashing Red	Flashing Red	Thermal shutdown
Flashing Red	Flashing Amber	MSS Ready=0
Flashing Amber	Flashing Green	TAM init fail
Flashing Amber	Flashing Red	TAM Not Ready
Flashing Amber	Flashing Amber	SECURE JTAG Fail
Flashing Green	Flashing Green	BIOS Validation Failure
Off	Green	Power Supply ON and operating normally.

System Specifications

For information on the system specifications, see the Cisco Network Convergence System 540 Large Density Routers Data sheet.

Weight and Power Consumption

For information on physical specifications and power consumption, see the Cisco Network Convergence System 540 Large Density Routers Data sheet.

Environmental Specifictaions

For information on environmental specifications, see table Environmental properties for NCS 540 fixed systems on the Cisco Network Convergence System 540 Large Density Routers 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 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 6: Thermal limitations

Optics module	Chassis PID	Maximum operating temperature at MSL	Ports supported
SFP-10G-OLT20-X	N540-24Q8L2DD-SYS	+45C	P2, P4, P6, P8, P10, P12, P14, P16, P17, P18, P20, P22, P24, P25, P26, P28, P30, P31, P33
QDD-400G-DR4	N540-24Q8L2DD-SYS	+50C	Two QDD ports
S10G-LR-PM-D-I	N540-24Q8L2DD-SYS	+65C	Bottom and top ports (P10-33)
S10G-SR-PM-D-I	N540-24Q8L2DD-SYS	+65C	Bottom and top ports (P10-33)
S10G-ER-PM-D-I	N540-24Q8L2DD-SYS	+65C	Bottom and top ports (P10-33)

EMC compliance

This table describes the maximum number of ports supported on various NCS 540 large 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 7: EMC compliance

Optics module	Chassis PID	Maximum number of supported ports
S10G-LR-PM-D-I	N540-24Q8L2DD-SYS	6
S10G-SR-PM-D-I	N540-24Q8L2DD-SYS	6
S10G-ER-PM-D-I	N540-24Q8L2DD-SYS	6

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.

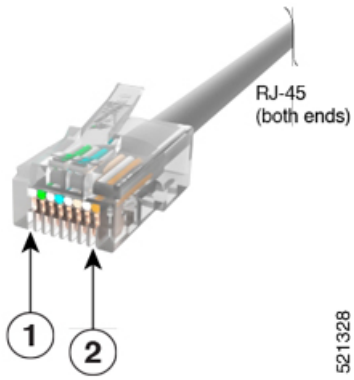
RJ-45 Connectors

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

The following figure shows the RJ-45 connector.

Figure 1: RJ-45 Connector



Console Port Pinouts

This following table summarizes the Console port pinouts:

Table 8: 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-RTX	Input	Aux Consoles receive input, RS232
8	NC	NA	NA

Management Ethernet Port Pinouts

This following table summarizes the Management Ethernet port pinouts:

Table 9: Management and PTP Ethernet Port Pinouts

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

Timing Port Pinouts

The platform is capable of receiving or sourcing timing 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.

This table below summarizes the timing port pinouts:

Table 10: Timing Port Pinouts

	10 MHz (Input and Output)	**1PPS (Input and Output)**
Waveform	Input—Sine wave Output—Square wave	Input—Rectangular pulse Output—Rectangular pulse
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 Port Pinouts

This table summarizes the ToD/1-PPS port pinouts:

Table 11: 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

USB Port Pinouts

This following table summarizes the USB port pinouts:

Table 12: USB Port Pinouts

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

Alarm Port Pinouts

This following table summarizes the external alarm input pinouts:

Table 13: External Alarm Input Pinouts

Pin	Signal Name	Description
1	ALARM0_IN	Alarm input 0
2	ALARM1_IN	Alarm input 1
3	—	—
4	ALARM2_IN	Alarm input 2
5	ALARM3_IN	Alarm input 3
6	—	—
7	—	—
8	ALARM_IN_COMMON	Alarm Input Common

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 Large Density Routers Data sheet.