

Troubleshooting

This chapter provides information for troubleshooting problems on the Cisco NCS 4206.

- Pinouts, on page 1
- LED Summary, on page 14

Pinouts

The following sections describe the pinouts for the Cisco NCS 4206 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	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

Wire Wrap Adapter Pinouts

Table 2: Wire Wrap Adapter Pinouts

Wire Wrap Pin Numbers	Signals
1	RX_RING
2	RX_TIP
3	GND
4	GND
5	TX_RING
6	TX_TIP

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 3: GPS Port Pinout for RSP

	10 Mhz (input and output)	1PPS (input and output)
Waveform	Input—Sine wave Output—Sine and 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 Port Pinout

The table below summarizes the TOD pinout for NCS420X-RSP modules.

Note This port requires the use of SHIELDED cable for GR-1089-core “Intra-Bldg lightning surge” protection. RS422 interface is per industry standard EIA-422 /RS422 specification.

Table 4: RJ48 IPPS/ToD Port Pinout

Pin	Signal Name	Direction	Description
1	RESERVED	Output or Input	V.11 Cable Corporation
2	RESERVED	Output or Input	
3	1PPS_N	Input	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

Alarm Port Pinout

The table below summarizes the external alarm input pinout.

Table 5: External Alarm Input Pinout

Pin	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

Pin	Signal Name	Description
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	Signal Name	Direction	Description
1	RTS	Output	Request to send
2	DTR	Output	Data Terminal Ready (always On).
3	TXD	Output	Transmit data
4	RI		Ring Indicator
5	GND		
6	RXD	Input	Receive data
7	DSR/DCD	Input	Data set ready/Data Carrier detect
8	CTS	Input	Clear to send

8 T1/E1 Interface Module RJ48C Port Pinnouts

Table 7: RJ48C Connector Pin-out for 8 T/E1 Interface Module

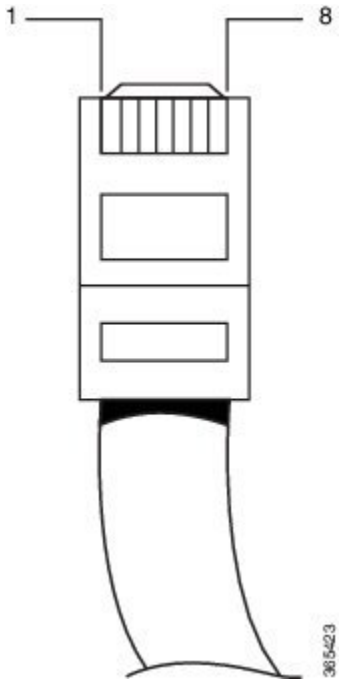
Pin	Signal	Direction	Description
1	RX_TIP	Input	Receive Tip
2	RX_RING	Output	Receive Ring
3	—	—	Not Connected
4	TX_TIP	Input	Receive Tip
5	TX_RING	Output	Receive Ring
6	—	—	Not Connected
7	—	—	Not Connected
8	—	—	Not Connected

T1/E1 Port Pinout

RJ48 T1/E1 Port Pinouts

The figure below shows the RJ48 connector wiring for the T1/E1 cable for the interface module. The table shows the pinout configuration for the RJ4C connectors for both the shielded and unshielded cables for either T1 or E1.

Figure 1: RJ48 Connector Wiring



The table below summarizes the RJ48 port pinout.

Table 8: RJ48 Port Pinouts

Shielded	**Unshielded**		
Pin	Description	Pin	Description
1	Receive Ring	1	Receive Ring
2	Receive Tip	2	Receive Tip
3	Receive Shield	3	
4	Transmit Ring	4	Transmit Ring
5	Transmit Tip	5	Transmit Tip
6	Transmit Shield	6	
7	Not Used	7	

Shielded	Unshielded		
8	Not Used	8	

The table below summarizes the RJ45 port pinout.

Table 9: RJ45 Port Pinout

Pin	Signal Name	Direction	Description
1	1PPS_P	Output or Input	1PPS RS422 signal
2	1PPS_N	Output or Input	1PPS RS422 signal
3	RESERVED	Output	Do NOT connect
4	GND		
5	GND		Time of Day character
6	RESERVED	Input	Do NOT connect
7	TOD_P	Output or Input	Time of Day character
8	TOD_N	Output or Input	Time of Day character

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Table 10: Port 0-23 RX

Pin Number	Signal Name	Pin	Signal
1	RX Ring Port 0	33	RX Tip Port 0
2	RX Ring Port 1	34	RX Tip Port 1
3	RX Ring Port 2	35	RX Tip Port 2
4	RX Ring Port 3	36	RX Tip Port 3
5	RX Ring Port 4	37	RX Tip Port 4
6	RX Ring Port 5	38	RX Tip Port 5
7	RX Ring Port 6	39	RX Tip Port 6
8	RX Ring Port 7	40	RX Tip Port 7
9	RX Ring Port 8	41	RX Tip Port 8
10	RX Ring Port 9	42	RX Tip Port 9
11	RX Ring Port 10	43	RX Tip Port 10

Pin Number	Signal Name	Pin	Signal
12	RX Ring Port 11	44	RX Tip Port 11
13	RX Ring Port 12	45	RX Tip Port 12
14	RX Ring Port 13	46	RX Tip Port 13
15	RX Ring Port 14	47	RX Tip Port 14
16	RX Ring Port 15	48	RX Tip Port 15
17	RX Ring Port 16	49	RX Tip Port 16
18	RX Ring Port 17	50	RX Tip Port 17
19	RX Ring Port 18	51	RX Tip Port 18
20	RX Ring Port 19	52	RX Tip Port 19
21	RX Ring Port 20	53	RX Tip Port 20
22	RX Ring Port 21	54	RX Tip Port 21
23	RX Ring Port 22	55	RX Tip Port 22
24	RX Ring Port 23	56	RX Tip Port 23
25	Open	57	Open
26	Open	58	Open
27	Open	59	Open
28	Open	60	Open
29	Open	61	Open
30	Open	62	Open
31	Open	63	Open
32	Open	64	Open

Table 11: Port 24-47 RX

Pin Number	Signal Name	Pin	Signal
1	RX Ring Port 24	33	RX Tip Port 24
2	RX Ring Port 25	34	RX Tip Port 25
3	RX Ring Port 26	35	RX Tip Port 26
4	RX Ring Port 27	36	RX Tip Port 27

Pin Number	Signal Name	Pin	Signal
5	RX Ring Port 28	37	RX Tip Port 28
6	RX Ring Port 29	38	RX Tip Port 29
7	RX Ring Port 30	39	RX Tip Port 30
8	RX Ring Port 31	40	RX Tip Port 31
9	RX Ring Port 32	41	RX Tip Port 32
10	RX Ring Port 33	42	RX Tip Port 33
11	RX Ring Port 34	43	RX Tip Port 34
12	RX Ring Port 35	44	RX Tip Port 35
13	RX Ring Port 36	45	RX Tip Port 36
14	RX Ring Port 37	46	RX Tip Port 37
15	RX Ring Port 38	47	RX Tip Port 38
16	RX Ring Port 39	48	RX Tip Port 39
17	RX Ring Port 40	49	RX Tip Port 40
18	RX Ring Port 41	50	RX Tip Port 41
19	RX Ring Port 42	51	RX Tip Port 42
20	RX Ring Port 43	52	RX Tip Port 43
21	RX Ring Port 44	53	RX Tip Port 44
22	RX Ring Port 45	54	RX Tip Port 45
23	RX Ring Port 46	55	RX Tip Port 46
24	RX Ring Port 47	56	RX Tip Port 47
25	Open	57	Open
26	Open	58	Open
27	Open	59	Open
28	Open	60	Open
29	Open	61	Open
30	Open	62	Open
31	Open	63	Open
32	Open	64	Open

Table 12: Port 0-23 TX

Pin Number	Signal Name	Pin	Signal
1	TX Ring Port 0	33	TX Tip Port 0
2	TX Ring Port 1	34	TX Tip Port 1
3	TX Ring Port 2	35	TX Tip Port 2
4	TX Ring Port 3	36	TX Tip Port 3
5	TX Ring Port 4	37	TX Tip Port 4
6	TX Ring Port 5	38	TX Tip Port 5
7	TX Ring Port 6	39	TX Tip Port 6
8	TX Ring Port 7	40	TX Tip Port 7
9	TX Ring Port 8	41	TX Tip Port 8
10	TX Ring Port 9	42	TX Tip Port 9
11	TX Ring Port 10	43	TX Tip Port 10
12	TX Ring Port 11	44	TX Tip Port 11
13	TX Ring Port 12	45	TX Tip Port 12
14	TX Ring Port 13	46	TX Tip Port 13
15	TX Ring Port 14	47	TX Tip Port 14
16	TX Ring Port 15	48	TX Tip Port 15
17	TX Ring Port 16	49	TX Tip Port 16
18	TX Ring Port 17	50	TX Tip Port 17
19	TX Ring Port 18	51	TX Tip Port 18
20	TX Ring Port 19	52	TX Tip Port 19
21	TX Ring Port 20	53	TX Tip Port 20
22	TX Ring Port 21	54	TX Tip Port 21
23	TX Ring Port 22	55	TX Tip Port 22
24	TX Ring Port 23	56	TX Tip Port 23
25	Open	57	Open
26	Open	58	Open
27	Open	59	Open

Pin Number	Signal Name	Pin	Signal
28	Open	60	Open
29	Open	61	Open
30	Open	62	Open
31	Open	63	Open
32	Open	64	Open

Table 13: Port 24-47 TX

Pin Number	Signal Name	Pin	Signal
1	TX Ring Port 24	33	TX Tip Port 24
2	TX Ring Port 25	34	TX Tip Port 25
3	TX Ring Port 26	35	TX Tip Port 26
4	TX Ring Port 27	36	TX Tip Port 27
5	TX Ring Port 28	37	TX Tip Port 28
6	TX Ring Port 29	38	TX Tip Port 29
7	TX Ring Port 30	39	TX Tip Port 30
8	TX Ring Port 31	40	TX Tip Port 31
9	TX Ring Port 32	41	TX Tip Port 32
10	TX Ring Port 33	42	TX Tip Port 33
11	TX Ring Port 34	43	TX Tip Port 34
12	TX Ring Port 35	44	TX Tip Port 35
13	TX Ring Port 36	45	TX Tip Port 36
14	TX Ring Port 37	46	TX Tip Port 37
15	TX Ring Port 38	47	TX Tip Port 38
16	TX Ring Port 39	48	TX Tip Port 39
17	TX Ring Port 40	49	TX Tip Port 40
18	TX Ring Port 41	50	TX Tip Port 41
19	TX Ring Port 42	51	TX Tip Port 42
20	TX Ring Port 43	52	TX Tip Port 43

Pin Number	Signal Name	Pin	Signal
21	TX Ring Port 44	53	TX Tip Port 44
22	TX Ring Port 45	54	TX Tip Port 45
23	TX Ring Port 46	55	TX Tip Port 46
24	TX Ring Port 47	56	TX Tip Port 47
25	Open	57	Open
26	Open	58	Open
27	Open	59	Open
28	Open	60	Open
29	Open	61	Open
30	Open	62	Open
31	Open	63	Open
32	Open	64	Open

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.



Note This is not a data plane port.

The table below summarizes the Management Ethernet port pinout.

Table 14: Management Ethernet Port Pinout

Pin	Signal Name	Description
1	TRP0+	
2	TRP0-	
3	TRP1+	
4	TRP1-	
5	TRP2+	
6	TRP2-	

Pin	Signal Name	Description
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.

Table 15: Single USB Console Port

Pin	Signal Name	Direction	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

The table below summarizes the USB flash/MEM port pinout.

Table 16: Single USB Flash/MEM Port

Pin	Signal Name	Direction	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.

Cabling Guidelines

The guidelines are recommended during the installation of fiber cables:

- Avoid the following actions that can stress the cable:
  - Pulling or stretching beyond the specified pulling load rate
  - Bending it beyond the specified bend radius
  - Creating tension in the suspension runs
- Do not touch the fiber tips of fiber cables.
- Use single mode or multi-mode optical fiber cables as per the optical transceiver requirement.
- Use fiber cleaner to clean the fiber tip as well as transceiver before inserting the fiber cable into the optical transceiver during installation.
- To avoid excessive bending of fiber cable and efficient routing of cables, cable guides or cable brackets are recommended to be used with the chassis.

LED Summary

The following sections describe the meanings of the LEDs on the Cisco NCS 4206.

RSP LEDs

The table below summarizes the RSP LEDs for the supported RSP modules.

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 Cisco NCS 4206 software adjusts the fan speed to prevent excessive heat within the chassis.

NCS420X-RSP LED

Table 17: RSP 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

LED	Color/State	Description (two LEDs for each port)
USB flash (MEM)	Flashing green	USB activity
BITS	Off	Out of service/not configured
	Amber	Fault or loop condition
	Green	In frame/working properly

NCS420X-RSP LED Fault Condition

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.

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

Table 18: ASR900-RSP2 and ASR900-RSP3 LED

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.

Interface Module LEDs

The table below summarizes the interface module LEDs. This LED summary applies to the following interface modules:

- SFP Gigabit Ethernet Interface Module
- 8x1 Gigabit Ethernet SFP + 1x10 Gigabit Ethernet SFP+ Interface Module
- 8/16-port 1 Gigabit Ethernet (SFP/SFP) + 1-port 10 Gigabit Ethernet (SFP+) / 2-port 1 Gigabit Ethernet (CSFP) Interface Module

The Status LED is Amber for the 10 Gigabit Ethernet ports when operating in WAN mode for the following IMs:

- 8x1 Gigabit Ethernet SFP + 1x10 Gigabit Ethernet SFP+ Interface Module

The 1-port 100 Gigabit Ethernet (QSFP) Interface Module (2X100GE) does not support the Speed LED.

Table 19: Interface Module LEDs

LED	Color/State	Description
Power (PWR)	Off	Disabled/no power to IM
	Green	Enabled and power rails on IM in range
Status (STAT)	Off	Disabled/power-down
	Red	Failure (on at reset)
	Flashing Red	Booting (if local CPU)
	Green	Operational
Link status (L)	Off	Inactive or no connection
	Amber	Fault/loop condition
	Green	Ok with activity or no activity
Speed (S)	Off	Inactive port status
	Green	Activity or no activity

OC-192 Interface Module + 8-Port Low Rate Interface Module LEDs

The following table summarizes the LEDs for the OC-192 interface module + 8-port Low Rate interface module.

Table 20: Interface Module LEDs

LED	Color or State	Description
Power (PWR)	Green	All power rails are within specification
	Red	Disabled
	Off	No power to IM
Status (STAT)	Green	Operational
	Red	Failure
	Off	Disabled
SFP Link (left LED)	Green	Link is up
	Yellow	Fault/Error/Alarm
	Off	Disabled
SFP speed mode (right LED)	Yellow	SONET/SDH
	Off	Disabled
10G SFP+ Link (left LED)	Green	Link is up
	Yellow	Fault/Error/Alarm
	Off	Disabled
10G SFP+ Speed mode (right LED)	Yellow	SONET/SDH
	Off	Disabled

48 T1/E1 and 48 T3/E3 Interface Module LEDs

The table below summarizes the LEDs for the 48 T1/E1 and 48 T3/E3 interface module.

Table 21: 48 T1/E1 and 48 T3/E3 Interface Module LEDs

LED	Color/State	Meaning (Default=off)
Power (PWR)	Green	All power rails are within spec
	Red	Disabled
	Off	No power to Interface Module
Operating Status (STATUS)	Green	Operational
	Red	Failure
	Off	Disabled or power-down

LED	Color/State	Meaning (Default=off)
Port Status (PORT)	Green	All ports are UP
	Amber	All least one port is down
	Off	All ports are disabled or shut down
Activity Status (ACT)	Green	Interface Module is Active or Standby
	Off	Interface Module is disabled or shut down

8-port 10 Gigabit Ethernet Interface Module LEDs

The table below summarizes the 8-port 10 Gigabit ethernet interface module.

Table 22: 8-port 10 Gigabit ethernet Interface Module LEDs

LED	Color/State	Description
Power (PWR)	Green	All power rails are within specification
	Red	Disabled
	Off	No power to Interface Module
Operating Status (STAT)	Red	Failure
	Off	Disabled or Power-Down
	Green	Operational
10G SFP+ Link (Left LED)	Off	Disabled or No link
	Yellow	Fault or Error
	Green	Link with no activity
	Green	Link with activity
10G SFP+ Speed/Mode (Right LED)	Yellow	10Gbps WAN
	Green	10 Gbps LAN
	Alternating Yellow or Green	10 Gbps OTN
	Off	Disabled

1-port 100 Gigabit Ethernet Interface Module LEDs

The table below summarizes the 1-port 100 Gigabit ethernet interface module.

Table 23: 1-port 100 Gigabit Ethernet Interface Module LEDs

LED	Color/State	Description
Power (PWR)	Green	All power rails are within specification
	Red	Disabled
	Off	No power to Interface Module
Operating Status (STAT)	Red	Failure
	Off	Disabled or Power-Down
	Green	Operational
100G CPAK Link LED	Off	Disabled or No link
	Yellow	Fault or Error
	Green	Link with activity
	Green	Link with no activity

2-port 40 Gigabit Ethernet Interface Module LEDs

The table below summarizes the 2-port 40 Gigabit ethernet interface module.

Table 24: 2-port 40 Gigabit Ethernet Interface Module LEDs

LED	Color/State	Description
Power (PWR)	Green	All power rails are within spec
	Red	Disabled
	Off	No power to Interface Module
Operating Status (STAT)	Red	Failure
	Off	Disabled or Power-Down
	Green	Operational
40G QSFP+ Link LED	Off	Disabled or No link
	Yellow	Fault or Error
	Green	Link with activity
	Green	Link with no activity

Power Supply LEDs

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

Table 25: A900-PWR-1200-D DC Power Supply LEDs

LED	Color/State	Description
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

Fan Tray LEDs

The table below summarizes the fan tray LEDs.

Table 26: Fan Tray LEDs

LED	Color/State	Description
Status (TEMP)	Off	Disabled/power down
	Amber	Over temperature
	Green	OK
Fan (FAN)	Green	Fan rotation in range
	Amber	Single 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)

Alarm Conditions

The table below summarizes the meaning of alarm conditions on the Cisco NCS 4206.

Table 27: 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