Cisco ASR 9000 Modular Line Card and Modular Port Adapters

In this section you will identify the following aspects of the Modular Line Card:

- Part number and description
- Location
- Status LEDs

Part number and description

The modular line card is available in two versions, 80 Gb/s throughput and 160 Gb/s throughput. Each version is available in -SE (Service Engine Optimized) and -TR (Packet Transport Optimized) variants. The two variants are functionally equivalent, but vary in configuration scale and buffer capacity.
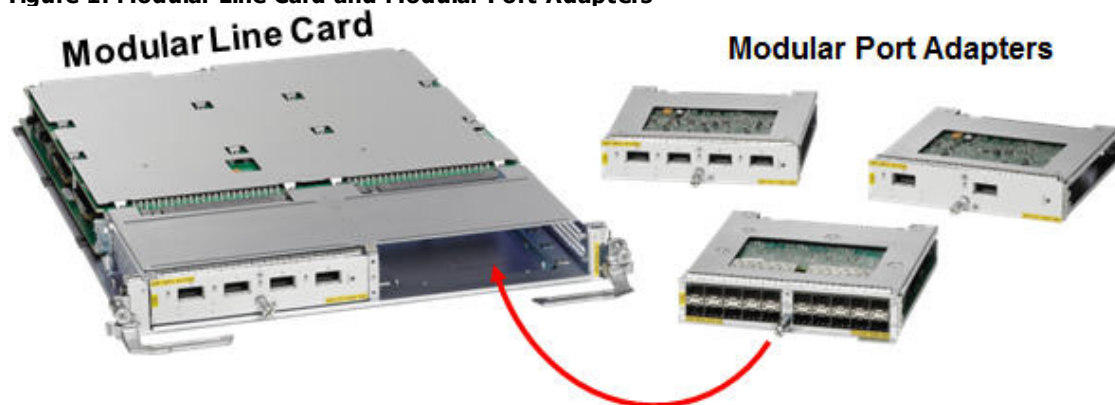
- A9K-MOD80-SE: Mod80 Modular Line Card, Service Edge Optimized
- A9K-MOD80-TR: Mod80 Modular Line Card, Packet Transport Optimized
- A9K-MOD160-SE: Mod160 Modular Line Card, Service Edge Optimized
- A9K-MOD160-TR: Mod160 Modular Line Card, Packet Transport Optimized

The modular line card provides two bays that support the following modular port adapters (MPAs):

- 20-Port GE MPA (A9K-MPA-20X1GE)
- 2-Port 10-GE MPA (A9K-MPA-2X10GE)
- 4-Port 10-GE MPA (A9K-MPA-4X10GE)
- 1-Port 40-GE MPA (A9K-MPA-1x40GE, 160 Gb/s throughput version only)
- 2-Port 40-GE MPA (A9K-MPA-2X40GE, 160 Gb/s throughput version only)

Figure 1 shows the modular line card and modular port adapters.

Figure 1: Modular Line Card and Modular Port Adapters

Table 1 provides comparative information about the modular line card and modular port adapters.

Table 1: Cisco ASR 9000 Modular Line Cards and Modular Port Adapters Part number and description

Part Number	Description
Modular Line Card	
A9K-MOD80-SE	ASR 9000 Mod80 Modular Line Card, Service Edge Optimized, requires modular port adapters
A9K-MOD80-TR	ASR 9000 Mod80 Modular Line Card, Packet Transport Optimized, requires modular port adapters
A9K-MOD160-SE	ASR 9000 Mod160 Modular Line Card, Service Edge Optimized, requires modular port adapters
A9K-MOD160-TR	ASR 9000 Mod160 Modular Line Card, Packet Transport Optimized, requires modular port adapters
Modular Port Adapters	
A9K-MPA-20X1GE	ASR 9000 20-port 1-Gigabit Ethernet Modular Port Adapter, requires SFP optics
A9K-MPA-2X10GE	ASR 9000 2-port 10-Gigabit Ethernet Modular Port Adapter, requires XFP optics
A9K-MPA-4X10GE	ASR 9000 4-port 10-Gigabit Ethernet Modular Port Adapter, requires XFP optics
A9K-MPA-1X40GE	ASR 9000 1-port 40-Gigabit Ethernet Modular Port Adapter, requires QSFP optics
A9K-MPA-2X40GE	ASR 9000 2-port 40-Gigabit Ethernet Modular Port Adapter, requires QSFP optics (160G Modular Line card only)

20-Port Gigabit Ethernet Modular Port Adapter

The 20-Port Gigabit Ethernet modular port adapter provides 10 double-stacked SFP (20 total) cages that support either fiber-optic or copper Gigabit Ethernet transceivers.

Figure 2 shows the front panel and connectors of the 20-Port Gigabit Ethernet Modular Port Adapter (A9K-MPA-20X1GE).

Figure 2: 20-Port Gigabit Ethernet Modular Port Adapter (A9K-MPA-20X1GE)

2-Port 10 Gigabit Ethernet Modular Port Adapter

The 2-Port 10 Gigabit Ethernet modular port adaptor provides two cages for XFP Ethernet optical interface modules that operate at a rate of 10 Gbps. The two XFP modules can be 10-Gigabit Ethernet multimode or single mode connections.

Figure 3 shows the front panel and connectors of the 2-Port 10 Gigabit Ethernet Modular Port Adapter (A9K-MPA-2X10GE).

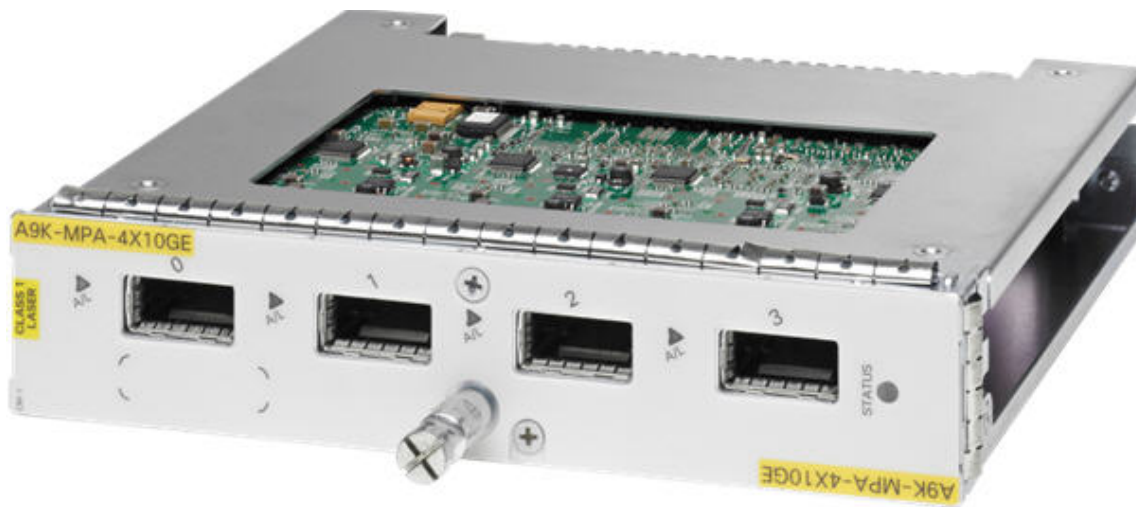**Figure 3: 2-Port 10 Gigabit Ethernet Modular Port Adapter (A9K-MPA-2X10GE)**

4-Port 10 Gigabit Ethernet Modular Port Adapter

The 4-Port 10 Gigabit Ethernet modular port adapter provides four cages for XFP Ethernet optical interface modules that operate at a rate of 10 Gbps. The four XFP modules can be 10-Gigabit Ethernet multimode or single mode connections.

Figure 4 shows the front panel and connectors of the 4-Port 10 Gigabit Ethernet Modular Port Adapter (A9K-MPA-4X10GE).

Figure 3: 4-Port 10 Gigabit Ethernet Modular Port Adapter (A9K-MPA-4X10GE)

1-Port 40 Gigabit Ethernet Modular Port Adapter

The 1-Port 40 Gigabit Ethernet modular port adaptor provides one cage for the QSFP+ Ethernet optical interface module that operates at a rate of 40 Gbps. The QSFP+ module can be 40-Gigabit Ethernet multimode or single mode connection.

Figure 5 shows the front panel and connectors of the 1-Port 40 Gigabit Ethernet Modular Port Adapter (A9K-MPA-1X40GE).

Figure 5: 1-Port 40 Gigabit Ethernet Modular Port Adapter (A9K-MPA-1X40GE)

2-Port 40 Gigabit Ethernet Modular Port Adapter

The 2-Port 40 Gigabit Ethernet modular port adaptor provides two cages for QSFP+ Ethernet optical interface modules that operate at a rate of 40 Gbps. The two QSFP+ modules can be 40-Gigabit Ethernet multimode or single mode connections.

Figure 6 shows the front panel and connectors of the 2-Port 40 Gigabit Ethernet Modular Port Adapter (A9K-MPA-2X40GE).

Figure 6: 2-Port 40 Gigabit Ethernet Modular Port Adapter (A9K-MPA-2X40GE)

Location

Cisco ASR 9922 Router

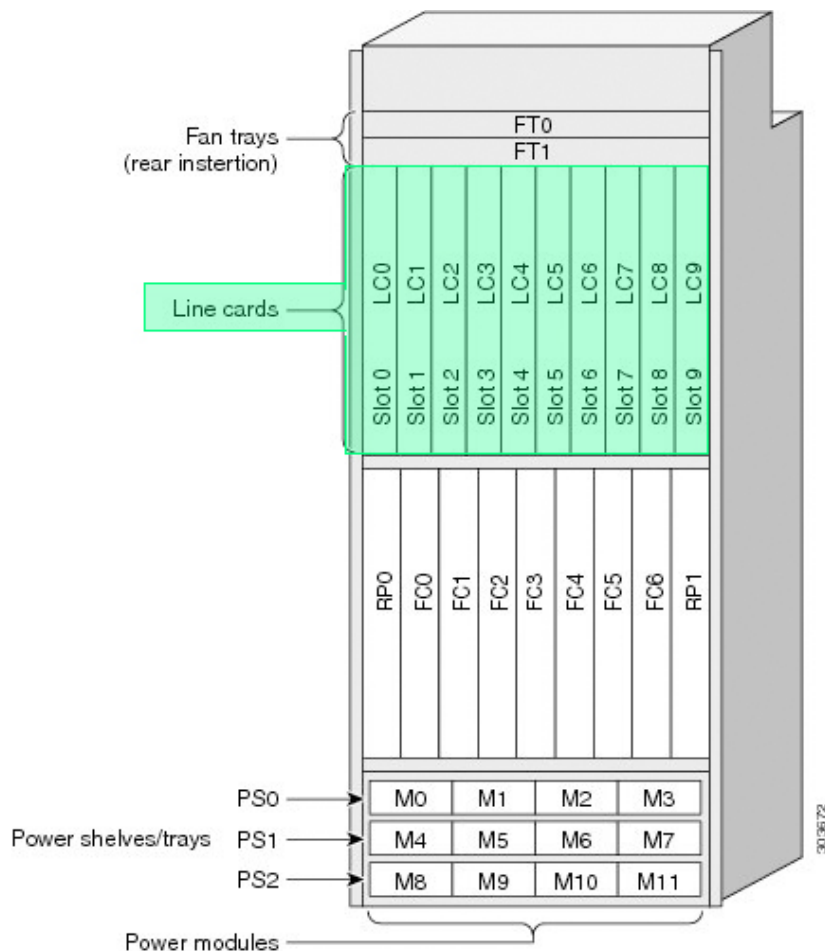The Cisco ASR 9922 Modular line cards are installed in the 20 Line Card Slots 0-19 (Figure 7).

Figure 7: Modular Line Cards in Cisco ASR 9010 Router

Power modules

Power shelves/trays

PS0 →	PM0	PM1	PM2	PM3
PS1 →	PM4	PM5	PM6	PM7
PS2 →	PM8	PM9	PM10	PM11
PS3 →	PM12	PM13	PM14	PM15

Line cards 0-9 — LC0 LC1 LC2 LC3 LC4 LC5 LC6 LC7 LC8 LC9 / Slot 0 Slot 1 Slot 2 Slot 3 Slot 4 Slot 5 Slot 6 Slot 7 Slot 8 Slot 9

Fan trays — FT0 / FT1

RP0 FC0 FC1 FC2 FC3 FC4 FC5 FC6 RP1

Fan trays — FT2 / FT3

Line cards 10-19 — Slot 10 Slot 11 Slot 12 Slot 13 Slot 14 Slot 15 Slot 16 Slot 17 Slot 18 Slot 19 / LC10 LC11 LC12 LC13 LC14 LC15 LC16 LC17 LC18 LC19

Cisco ASR 9912 Router

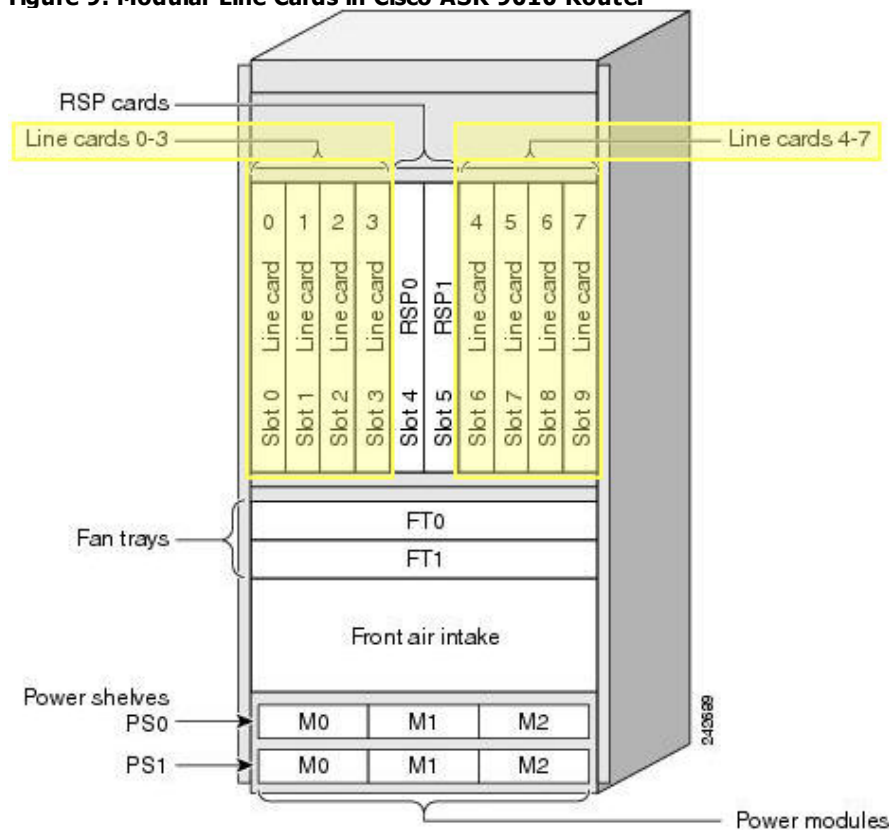The Cisco ASR 9912 Modular line cards are installed in the 10 Line Card Slots 0-9 (Figure 8).

Figure 8: Modular Line Cards in Cisco ASR 9912 Router

Cisco ASR 9010 Router

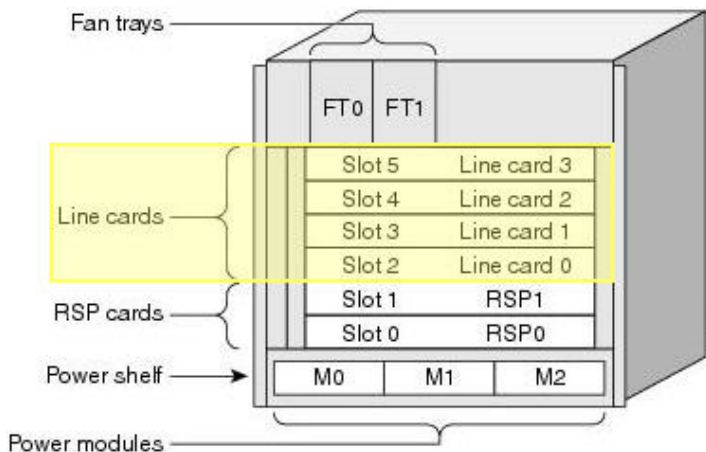The Cisco ASR 9010 Modular line cards are installed in the eight Line Card Slots 0-7 (Figure 9).

Figure 9: Modular Line Cards in Cisco ASR 9010 Router

Cisco ASR 9006 Router

The Cisco ASR 9006 Modular line cards are installed in the four Line Card Slots 2-5 (Figure 10).
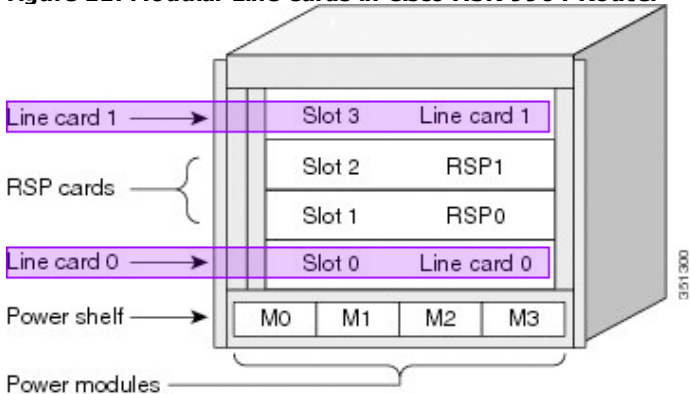
Figure 10: Modular Line Cards in Cisco ASR 9006 Router

Cisco ASR 9904 Router

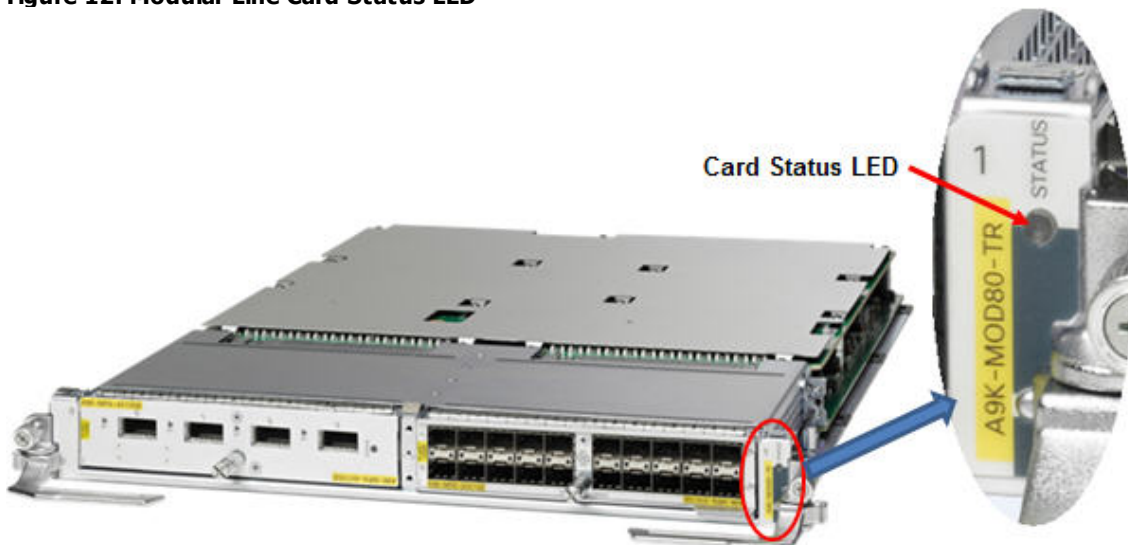The Cisco ASR 9904 Modular line cards are installed in the 2 Line Card Slots 0-1 (Figure 11).

Figure 11: Modular Line Cards in Cisco ASR 9904 Router

Status LEDs

The modular line card has a single tristate Status LED to display card status (see Figure 12).

Figure 12: Modular Line Card Status LED

The display and meaning of the modular Line card Status LED is described in Table 2 .

Table 2: Modular Line Card Status LED

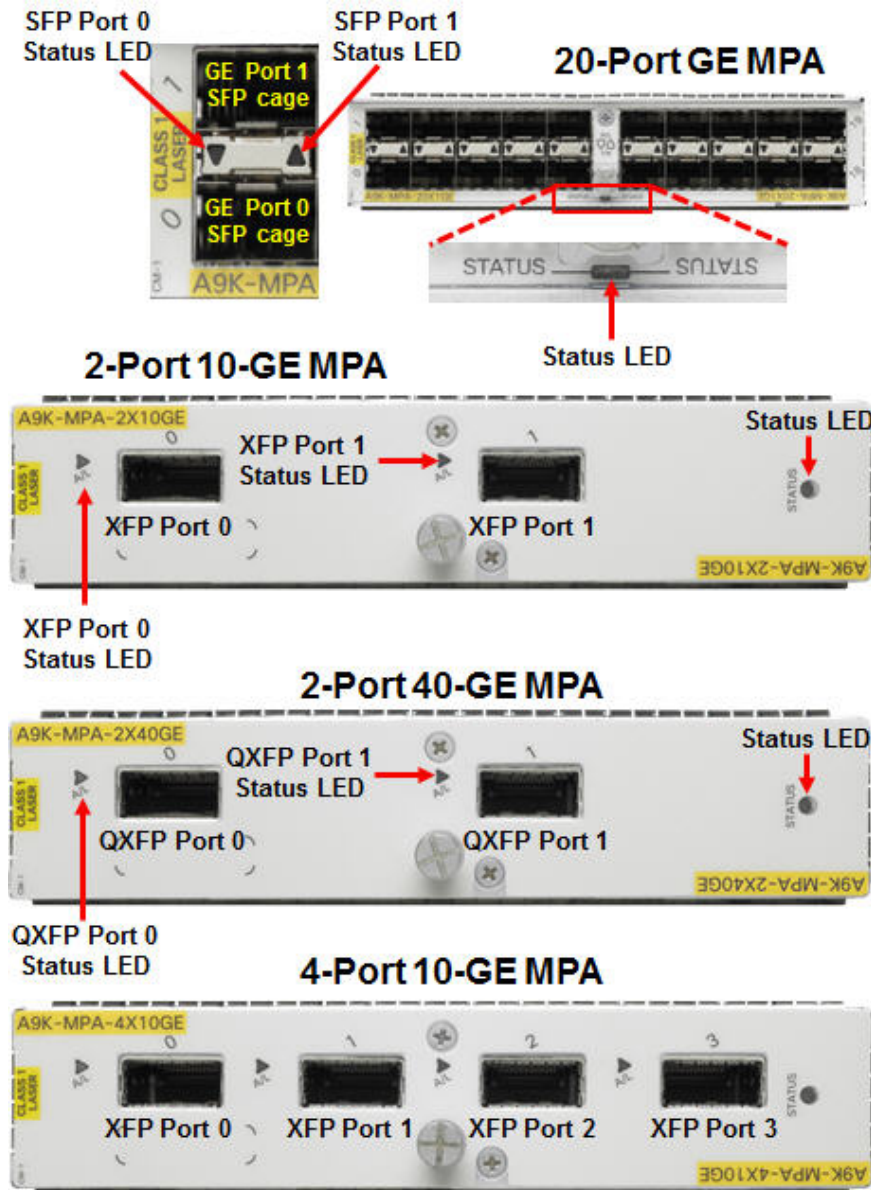| LED Color	Description
Green	Line card has booted properly, and is ready to pass or is passing traffic.
Steady Amber	Line card boot process is underway. When the Cisco IOS XR software finishes loading, the LED turns green.
Blinking Amber	Software configuration error has occurred that prevents the line card from passing traffic. It is possible that the line card is still passing traffic, but there is some degradation.

Red	Line card has encountered a hardware error, and is not passing traffic.
Off	Line card is powered off. The LED might turn off momentarily when switching between the states described above, although the line card has not powered off.

Each modular port adapter on the modular line card has a Status LED to display the adapter status.

In addition, each SFP (A9K-MPA-20X1GE), XFP (A9K-MPA-2X10GE and A9K-MPA-4X10GE), or QXFP (A9K-MPA-2X40GE) port on the modular port adapter has an adjacent LED to indicate the status of the associated port.

Figure 13 shows the Port Status LEDs and adapter Status LED on the modular port adapter.

Figure 11: Port Status LEDs and Adapter Status LED on the Modular Port Adapter

The display and meaning of the Port Status LEDs and adapter Status LED on the modular port adapter are described in Table 3.

Table 3: Port Status LEDs and Adapter Status LED on the Modular Port Adapter

LED Label	Color	State	Meaning
A/L (Active/Link)	Off	Off	Port is not enabled.
	Green	On	Port is enabled and the link is up. The MPA A/L LED will blink green when there is traffic activity.
	Amber	On	Port is enabled and the link is down.
STATUS	Off	Off	Modular port adapter power is off.
	Green	On	Modular port adapter is ready and operational.
	Amber	On	Modular port adapter power is on and good, and modular port adapter is being configured.

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