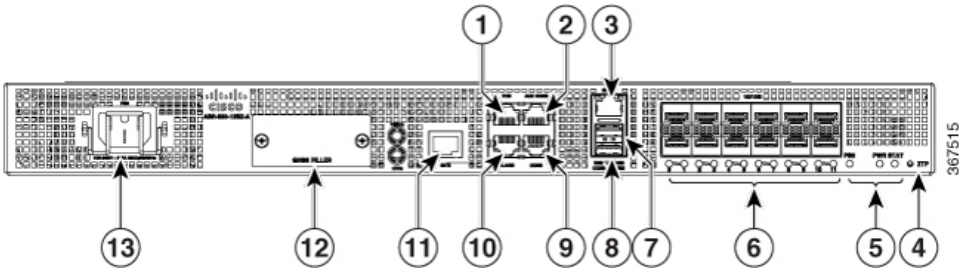
Overview

The Cisco ASR-920-12SZ routers are routers for the mobile backhaul for 5G markets. These 5G-ready routers meet the ITU G.8273.2 Class B Timing specifications and provide better accuracy using the precision timing protocol (PTP) for phase delivery.

The two models in this category are:

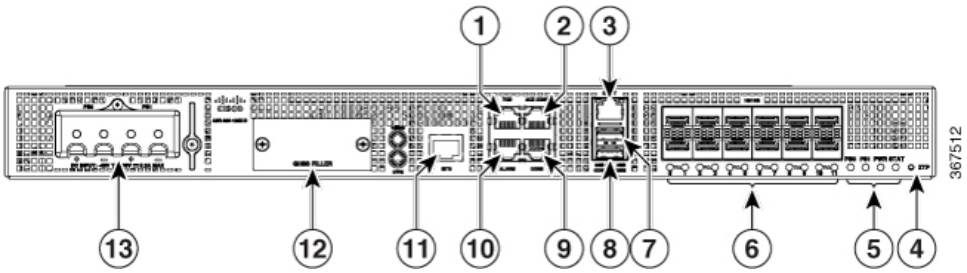
- **Cisco ASR-920-12SZ-A** with a single fixed AC power supply, 12 1/10GE SFP interfaces, Timing (1PPS/10MHz/ToD) interfaces, and pluggable a GNSS module.

Figure 1: Cisco ASR-920-12SZ-A Front Panel View



- **Cisco ASR-920-12SZ-D** with dual fixed DC power supplies, 12 1/10GE SFP interfaces, Timing (1PPS/10MHz/ToD) interfaces, and a pluggable GNSS module.

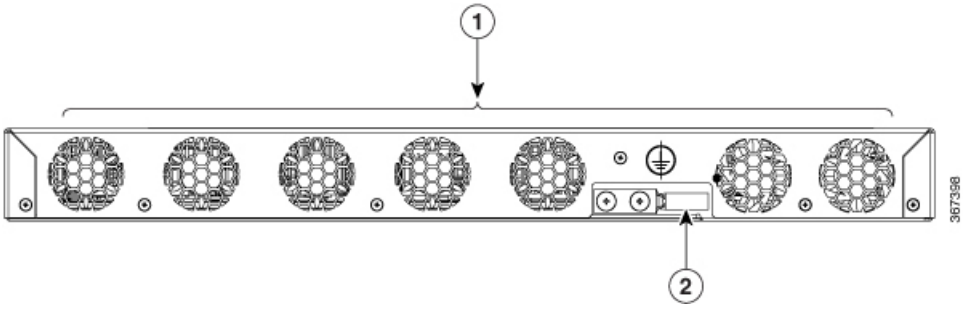
Figure 2: Cisco ASR-920-12SZ-D Front Panel View



1	Time of Day (TOD)	2	Auxiliary Console (AUX CONS)
3	Management port (MGMT)	4	ZTP

5	LEDs for power supply (PS*x*), board power (PWR) and system status STAT)	6	Dual rate SFP ports (1G/10G)
7	USB Memory (USB MEM)	8	USB Console (USB CONS)
9	Console	10	Alarm
11	BITS	12	GNSS Module
13	Power Supply	—	—

Figure 3: Cisco ASR-920-12SZ Rear Panel View



1	Fan Modules	2	Grounding lug

For details on features and specifications, see the *Cisco ASR 920 Series Aggregation Services Class B Compliance Routers: High-Port-Density Models* datasheet.

Power Supply

The Cisco ASR-920-12SZ-A router has one fixed power supply module for AC input. The Cisco ASR-920-12SZ-D router has dual fixed redundant power supply modules for DC input.

The Cisco ASR-920-12SZ-A router support AC and DC power supplies in a 1+1 redundant configuration.

One AC and one DC power supply in the same router is also a supported configuration.

GNSS Module

The GNSS module (PID=A920-CM-GNSS) provides the time-of-day (ToD), 1PPS, and 10MHz network synchronization signals. The GNSS module is *not* hot swappable.

Network Timing Interfaces

- 1PPS—1PPS input for GPS Synchronization. This connector on the front panel can provide 1PPS output as well from Cisco ASR-920-12SZ router. The input or output direction can be configured using software.
- 10MHZ—10MHz input for GPS Synchronization. This connector, present on the front panel, can also provide 1PPS output from the Cisco ASR-920-12SZ router. The input or output direction can be configured using IOS-XE software.
- BITS—The BITS interfaces support clock recovery from either a T1 at 1.544 MHz or an E1 at 2.048 MHz, configurable by software. BITS interface is provided through a standard RJ-48 connector on the front panel.
- ToD—The time-of-day interface can output the ToD in a format configurable by software. However, this interface can be configured as an input interface also. In this case, the router can read the ToD information from the external GPS unit.

  ToD interface is provided through a standard RJ-48 connector on the front panel.

Management Interfaces

Alarm

The router supports four dry contact alarm inputs through an RJ-45 jack on the front panel.

- Normally Open—indicates that no current flows through the alarm circuit and the alarm is generated when the current is flowing.

Each alarm input can be provisioned as critical, major, or minor.

Console

The RS232 console port provides transmission (Tx), reception (Rx), and ground (Gnd).

Auxiliary Console

The Auxiliary Console port provides transmission (Tx), reception (Rx), and ground (Gnd).

USB Console

A single USB 2.0 Type-A receptacle on the front panel of the router provides console access to ROMMON, Cisco IOS-XE, and diagnostics. While it uses the Type-A connector, it operates as a USB peripheral only for connection to an external host computer. This interface requires the use of a Type-A to Type-A connector instead of a standard USB cable.

Note Use of the USB console is mutually exclusive of the RS232 console port. This interface requires the use of a Type-A to Type-A USB cable.

USB Memory

A single USB 2.0 Type-A receptacle on the front panel of the router allows external USB mass storage devices, such as standard USB flash drives. This interface is used to load images, load or store configurations, write logs, and so on.

Note More than 8 GB is not supported in ROMMON mode.

Management Port

A single management copper ENET port supporting 10/100/1000 operation is provided on the front panel. It uses a standard RJ-45 jack.

Dual Rate Ports—1GE/10GE SFP+ Ports

The Gigabit Ethernet SFP ports support the following features:

- 100BASE-FX and 1000Base-X SFP modules.
- Digital optical monitoring as specified by the SFP.
- Any mix of SFPs is supported unless specifically noted.
- Pause flow control as defined by the 802.3x standard.
- Frame size of 9216 bytes.
- Synchronous ENET operation that provides its recovered receive clock as an input clock source for the SETS and uses the system-wide reference clock to derive its transmit clock.

Note Copper-based SFPs do not support synchronous ENET operations.

LED Indicators

Power Supply LEDs—There is one fixed power supply LED (PS0) on the ASR-920-12SZ-A and two fixed power supply LEDs (PS0 and PS1) on the ASR-920-12SZ-D router.

Table 1: Power Supply LEDs

Power Supply LED (PS0 and PS1)	Power Supply Condition
Off	No valid AC or DC input is detected.
Green	12 Volt output is ok.
Red	12 Volt output failure (caused due to power supply switched off, a fault condition, or in case of a dual DC feed, the absence of an input feed)

System Power LED—The PWR LED provide indication of power on the board status.

Table 2: System Power LED

System Power LED	System Power Condition
Off	No input power is connected.
Green	Power on board is ok.
Red	Board is powered off by ADM.
Blinking Red	0.5 second blinking red suggests the system is off due to external factors, such as overheated system, multiple fan failures, or user-initiation.
Amber	Reserved

Status LED—During power-up state, this LED provides booting status and report errors.

Table 3: Status LED

Status LED	System Status
Off	FPGA is being configured. **Note** Permanently off indicates the FPGA configuration has failed.
Blinking Green	Secure boot FPGA validation and ROMMON validation are successful.
Blinking Red	Secure boot FPGA validation error.
Green	IOS booted up, no alarms, operating normally.

Status LED	System Status
Amber	Any one of: minor alarm, synchronization in holdover, or free-running mode.
Red	Any major or critical alarm (high temperature reported for any sensor) or multiple fan failures.
Blinking Green and Red alternately	Short press ZTP is initiated and this status continues until ZTP is initiated.

GNSS LED—The LED is present on the GNSS module.

Table 4: GNSS LED

GNSS LED	GNSS Condition
Off	GNSS is not configured or GNSS is shut down.
Green	GNSS is in normal state; self survey is complete
Orange	GNSS is in powerup state; GNSS is not tracking any satellite.
Amber	Auto holdover
Blinking green	Learning state is normal, self survey is in progress.

Management Port LED

The LED for the 10/100/1000 Management port is integrated on the connector itself. There are two LEDs in the connector—the LED on the left indicates the Link/Activity status and the LED on the right is non-functional.

Note The CPU management port LED on the right is non-functional and hence doesn't indicate any port status.

Table 5: Management Port LED

Management Port LED		Management Port Condition
Left LED	Green	Link up in 1000 Mbps
	Blinking green	Activity in 1000 Mbps
	Amber/Orange	Link up in 100/10 Mbps
	Blinking Amber/Orange	Activity in 100/10 Mbps
	Off	Link down

SFP+ LEDs

Table 6: SFP+ LEDs

SFP+ LED	SFP+ Condition
Green	Link up in 1G or 10G.
Orange	Loss of signal, fault, or link down.
Blinking green	Activity in 10G mode.
Off	SFP module is not supported.

Fan Module

There are seven fixed fans that provide front-to-back airflow. The system is designed to operate at its maximum operating temperature of 70º C. It is designed to operate at 65º C in case of failure of a single fan, for a maximum of four hours.

Licensing the Router

The Cisco ASR-920-12SZ routers support the following licenses:

- Port Licensing—Port Upgrade license is available as a "Pay as you Grow" model.
- 10G upgrade license

Note The Cisco ASR-920-12SZ routers do not support 1G port upgrade licenses.

- Timing license (1588)—Timing license is required if the router is used as a master clock.
- Advanced Metro IP Access (Default)
- Metro IP Access
- Metro Access
- Cisco Smart Licensing—Smart Licensing is usage-based licensing where devices register with the Cisco Secure server.