



Introduction

The Cisco ASR 901 10G router is a cell site gateway platform specifically designed to provide transport for both legacy TDM and Ethernet traffic over a single converged network. The Cisco ASR 901 10G router is used at the cell site as a part of a 2G, 3G, or 4G radio access network (RAN) traffic. This router is a small form factor, fixed, low cost platform/solution that seeks to complement the current Cisco portfolio in the IP-RAN segment.

This chapter includes the following sections:

- [Hardware Description, page 1-1](#)
- [Power Supply, page 1-5](#)
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- [Router Interface Numbering, page 1-9](#)
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Hardware Description



Note

This equipment is suitable for installation in Network Telecommunications Facilities and locations where the NEC applies. The equipment is suitable for installation as part of the Common Bonding Network (CBN).

Contained in a standard shelf-rack enclosure, the Cisco ASR 901 10G router weighs approximately 10 pounds (4 kg). It measures 1.7 inches high x 17.5 inches wide x 9.1 inches deep (43.2 x 444.5 x 231 mm), 1RU. These dimensions do not include the rack-mount brackets.

You can mount the router in a standard (ETSI) 19-inch (48.3 cm) equipment rack or 600mm ETSI rack or a 23-inch ETSI rack.

The Cisco ASR 901 10G router includes the following hardware features:

- Eight T1/E1 RJ45 ports.
- Four ports of 100/1000 Copper Ethernet including auto-MDIX (RJ45 connector)
- Four ports of SFP only
- Two ports of 10G SFP+ only
- Four combo ports (SFP/Copper)

- Dual feed supply with redundant DC inputs plus built in redundant power supply (RPS) or single AC input.
- Three fans placed in the chassis
- Chassis: 1 RU, 10 inch depth (Cisco ASR 901 10G router)
- Operating temperature range is -40 to +149°F (-40°C to +65°C).
- Airflow is left to right
- Four solid state alarm inputs
- A single built-in 1Gigabit (128 MB) Flash memory. For A901-6CZ-FS-D and A901-6CZ-FS-A PIDs, the memory requirement is 256MB.
- Two management ports: RS-232 serial console and 10/100 Base-T Ethernet ports
- One BITS clock port (RJ45) and 1 ToD port (RJ45)
- Two miniature coaxial connectors for 10Mhz and 1PPS timing (input or output). You can use these interfaces with an external GPS device to send or receive clocking from the router.
- A single USB port
- Two LEDs for each T1/E1 port
 - C—indicates out of service or not configured, carrier condition, and loop condition
 - AL—no alarm, or alarm condition
- Two LEDs for each Ethernet port
 - L—indicates activity, lack of activity, or no link
 - S—indicates speed (100 or 1000) or off
- One System LED:
 - Solid Green—System Healthy (normal operation)
 - Solid RED—System Faulty

Cisco ASR 901 10G Router—Front View of TDM Version

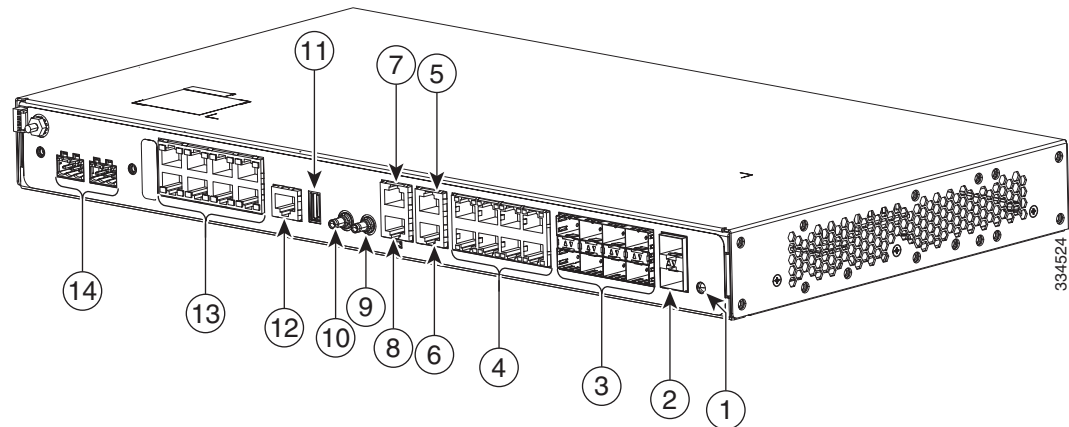
The front panel of the Cisco ASR 901 10G (TDM version) router has the following components:

- Eight T1/E1 ports, labelled T1/E1 (positions 0, 1, 2, 3, 4, 5, 6, and 7)
- Eight RJ-45 connectors for copper Ethernet ports, labeled “GE” (positions 0, 1, 2, 3, 4, 5, 6, and 7)
- Eight SFP connectors for optical GE ports (positions 4, 5, 6, 7, 8, 9, 10, and 11)
- Two SFP+ connectors for optical 10 G ports (positions 0 and 1)
- Two miniature coaxial connectors for 10MHZ and 1PPS timing
- A single RJ-45 connector for console, labeled “CONSOLE”
- A single RJ-45 connector for management port, labeled “MGMNT”
- A single RJ-45 connector for the BITS interface, labeled “BITS”
- A single RJ-45 connector for the ToD interface, labeled “TOD”
- A single RJ-45 connector for alarm.
- Dual feed supply with redundant DC inputs or single AC input.
- The following LEDs

- T1/E1 ports
- Ethernet ports
- SFP ports
- Chassis: Single LED for multiple conditions

Figure 1-1 shows the front view of the Cisco ASR 901 10G router (TDM version) with each interface module.

Figure 1-1 Cisco ASR 901 10G Router—Front View of TDM Version



1	Power LED	8	BITS port
2	10G SFP+	9	MINI-coax connector (10MHZ)
3	8 SFP ports	10	MINI-coax connector (1PPS)
4	8 GE port	11	USB port
5	Management port	12	Alarm
6	Console port	13	8 T1/E1 ports
7	ToD port	14	Power connector (DC or AC)

Cisco ASR 901 10G Router—Front View of Ethernet Version

The front panel of the Cisco ASR 901 10G (Ethernet version) router has the following components:

- Two SFP+ connectors for optical 10G ports (positions 0 and 1)
- Eight SFP connectors for optical GE ports (positions 4, 5, 6, 7, 8, 9, 10, and 11)
- Eight RJ-45 connectors for copper Ethernet ports, labeled “GE” (positions 0, 1, 2, 3, 4, 5, 6, and 7)
- A single RJ-45 connector for management port, labeled “MGMT”
- A single RJ-45 connector for console, labeled “CONSOLE”
- A single RJ-45 jack for the BITS interface, labeled “BITS”
- A single RJ-45 jack for the ToD interface, labeled “ToD”

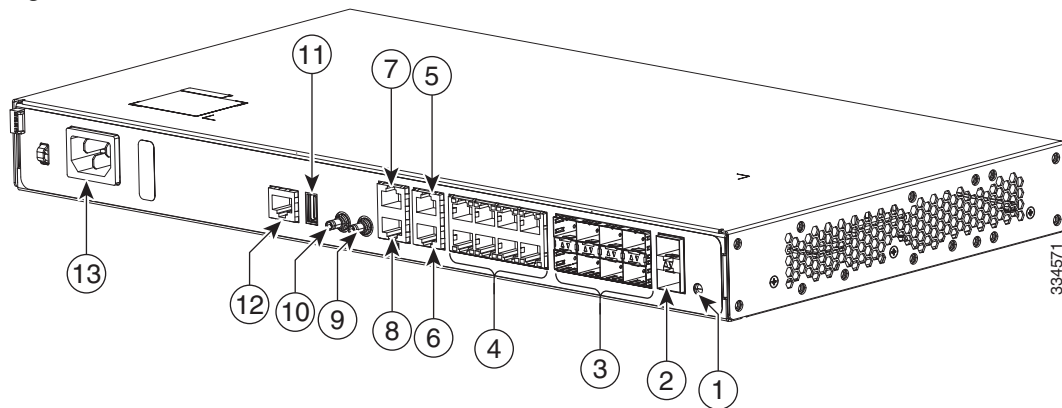
- Two miniature coaxial connectors for 10MHZ and 1PPS timing
- A single alarm port
- A single USB port (for AC version)
- Dual feed supply with redundant DC inputs or single AC input.

The following LEDs

- Ethernet ports
- SFP ports
- Chassis: Single LED for multiple conditions

Figure 1-2 shows the front view of the Cisco ASR 901 10G router (Ethernet version) with each interface module.

Figure 1-2 Cisco ASR 901 Router—Front View of Ethernet Version



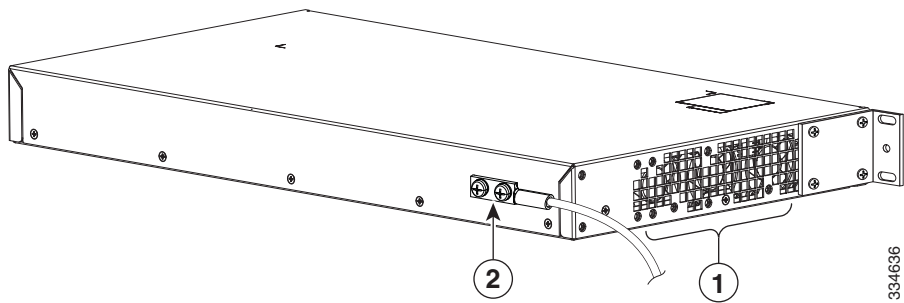
1	Power LED	8	BITS port
2	10G SFP+ ports	9	MINI-coax connector (10MHZ)
3	8 SFP ports	10	MINI-coax connector (1PPS)
4	8 GE ports	11	USB port
5	Management port	12	Alarm
6	Console port	13	Power connector (AC or DC)
7	ToD port	14	—

Cisco ASR 901 10G Router—Rear View

Figure 1-3 shows the rear view of the Cisco ASR 901 10G router, including the orientation of the following components:

- Three blowing fans
- Mounting point for the 2-hole lug. For more information, see the [Connecting the Chassis Ground and Power, page 3-10](#)

Figure 1-3 Cisco ASR 901 10G Router—Rear View



1	Fan	2	Grounding Point Lug
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Note

The grounding architecture of this product is DC-isolated (DC-I) for DC-powered products. DC-powered products have a nominal operating DC voltage of 48 VDC. Minimal steady state DC operating voltage is 19.2 VDC.

LEDs

The Cisco ASR 901 10G chassis and interface modules contain LEDs to assist in troubleshooting. For more detailed description of the LEDs, see the [“Reading the LEDs, page A-4.”](#)

Power Supply

The Cisco ASR 901 10G router is equipped with an internal -24/-60 Volts Direct Current (VDC). The router is provided with a single AC power supply or DC (1+1 Redundant) power supply. The power input connectors are located at the front left-side side of the router. The DC power connector has the standard A and B feeds for DC redundancy. The DC power supply is compatible with the range of DC input voltages specifically available at cell sites.

See [Table 1-1](#) for the DC power supply specifications and [Table 1-2](#) for the AC power supply specifications.

Safety Precautions

Observe the following general safety precautions and recommendations in planning the source power requirements for the Cisco ASR 901 10G router (for additional safety information, see the [“Safety Guidelines”](#) section on [page 2-1](#):

- Check the power at your site before router installation (and periodically after installation) to ensure clean power (free of spikes and noise) is being received.
- Always disconnect the power source and unplug the power cable before working on the router.

- Install proper grounding for the site to avoid damage from lightning and power surges.



Warning

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021



Warning

There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Statement 1015



Warning

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028



Warning

The intrabuilding ports of the equipment or subassembly **MUST NOT** be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use only as intrabuilding interfaces (Type 2 or Type 4 ports as described in GR-1089-CORE), and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.



Warning

To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the (Management Ethernet) ports only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to OSP wiring.

Table 1-1 lists the DC power supply specifications for the Cisco ASR 901 10G router.

Table 1-1 Cisco ASR 901 10G Router DC Power Supply Specifications

Specification	Value
DC power supply input voltage	-24/-60 VDC
Maximum input current	4A
Wire gauge for DC input power connections	16 AWG
Power dissipation	<ul style="list-style-type: none"> • A901-6CZ-F-D: 58W • A901-6CZ-FS-D: 59W • A901-6CZ-FT-D: 67W

Table 1-2 lists the AC power supply specifications for the Cisco ASR 901 10G router.

**Warning**

This product requires surge protection as part of the building installation. To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, an external surge protective device (SPD) is required at the AC or DC power service equipment.

Table 1-2 *Cisco ASR 901 10G Router AC Power Supply Specifications*

Specification	Value
Power supply	115 to 230 V
Power dissipation	<ul style="list-style-type: none">A901-6CZ-F-A: 57WA901-6CZ-FS-A: 58WA901-6CZ-FT-A: 65W
Input voltage rating	100V-240V, 1A-0.5A, 50-60Hz
Operating voltage rating	85~264 VAC at 47/63Hz
AC current rating	1A at 100 VAC and 60 Hz.

The Cisco ASR 901 10G router uses two 3-pin connectors (part number 27-1892-01) for DC input to the power supply. The terminal block is part of the accessory kit (part number 53-3438-01), which ships with the Cisco ASR 901 10G router.

The Cisco ASR 901 10G router uses a single 3-pin connector (29-1609-01) for AC input to the power supply.

The ground wire connects to a 2-hole lug, which connects to the corresponding mounting point. With the connector installed in the chassis, the pins numbered from left to right are 1, 3, and 2, respectively.

Figure 1-4 shows the pinout configurations for the connector, based on the power source.

**Note**

You can use connector A or B or both.

Figure 1-4 Power Supply Connector Pinouts

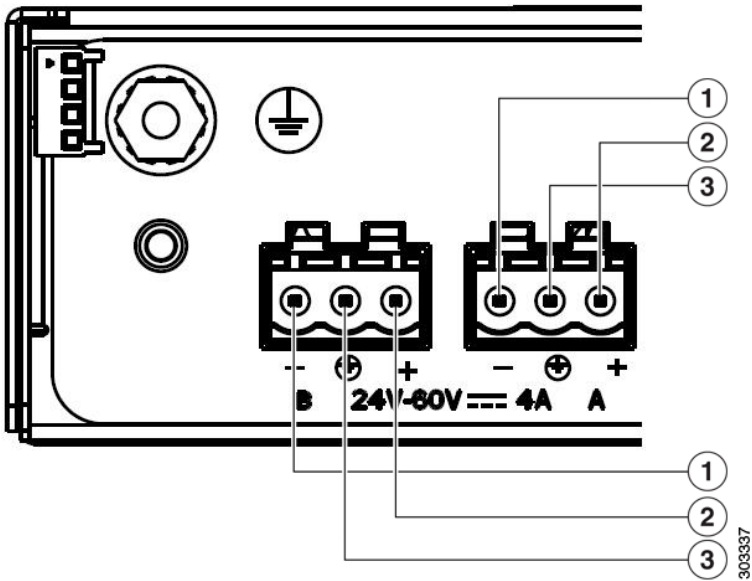


Table 1-3 Power Supply Connector Pinouts (-24/-60 VDC Application)

Pin	Connector A	Connector B
1	VDC (-24 to -60)	VDC (-24 to -60)
2	RTN	RTN
3	Chassis Ground	Chassis Ground

Environmental Monitoring Temperature Sensor

The Cisco ASR 901 10G router has a temperature sensor to detect overtemperature conditions inside the chassis. The overtemperature detection trips at 70°C. This condition is reported to the processor as an interrupt, where the software generates the appropriate alarms. If the router reaches a temperature of 90°C, the power supply cycles itself to prevent the router from exceeding the maximum temperature while being powered up.



Note

Auxiliary port is not supported.

System Specifications

Table 1-4 lists the system specifications for the Cisco ASR 901 10G router.

Table 1-4 Cisco ASR 901 10G Router System Specifications

Description	Specification
Dimensions (H x W x D)	1.7 x 17.5 x 9.1 in. (43.2 x 444.5 x 231 mm) 1 RU (rack unit) in a 19-inch (48.3 cm) rack
Weight	<ul style="list-style-type: none"> A901-6CZ-FT-D: 8.15 lb (3.7 kg) A901-6CZ-F-D: 7.93 lb (3.6 kg) A901-6CZ-FS-D: 7.93 lb (3.6 kg) A901-6CZ-FT-A: 8.15 lb (3.7 kg) A901-6CZ-F-A: 7.93 lb (3.6 kg) A901-6CZ-FS-A: 7.93 lb (3.6 kg)
Console port	RJ-45 connector
Operating Temperature	Operating temperature range is -40°C to +65°C (-40 to +149°F)
Non-Operational Temperature	Temperature: -40°C to +70°C (-40 to +158°F)
Operating Humidity	5% to 85%, noncondensing RH, ±5%
Non-Operational Humidity	Upto 93% RH
Operating Altitude	13,000 ft. (4000 m) with maximum 104°F (40°C) ambient temperature
Operating Vibration	0.15 G, 10 to 500 Hz/100 minutes per axis
Non-Operational Vibration	0.8 G, 10 to 500 Hz/30 minutes per axis
Operating Acoustics	61 dBA with 19 cfm fan
Air Flow	Left to right, 57 cfm

Router Interface Numbering

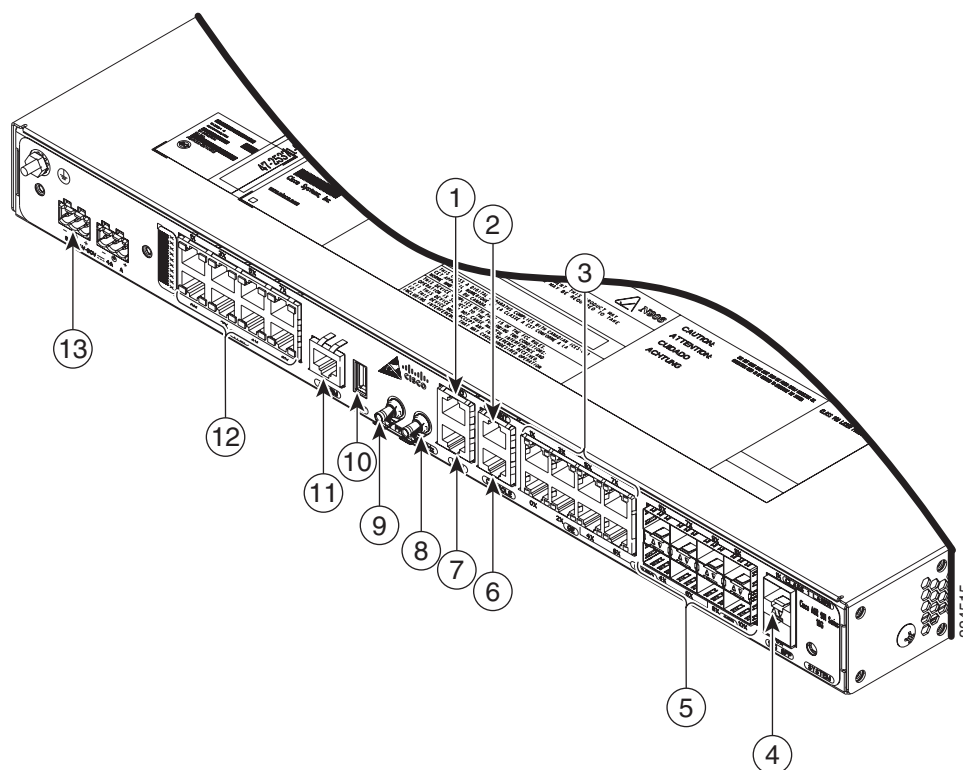
The following section explains router interface numbering and interface labels for the Cisco ASR 901 10G router.

Cisco ASR 901 10G Router

Each network interface on a Cisco ASR 901 10G 10G router is identified by a slot number and a port number, explained in this sequence:

- Logical slot numbers starts from 0 for all built-in interfaces. The numbering format is **Interface type Slot number/Interface number**. Interface (port) numbers begin at logical 0 for each interface type.
- Logical interface numbering for 10G SFP+ ports runs from 0/0 through 0/1. Ports are numbered bottom to top.
- Logical interface numbering for T1/E1 ports on the TDM interface module runs from 0/0 through 0/7. Ports are numbered bottom to top, left to right.
- Logical interface numbering for the built-in ethernet ports runs from g0/0 through g0/3, the combo ports run from g0/4 to g0/7 and the SFP ports run from g0/8 through g0/11. The GE ports are numbered bottom to top, left to right.

Figure 1-5 Cisco ASR 901 10G Router Port Numbers



1	ToD port	7	BITS port
2	Management port	8	MINI-Coax Connector (1PPS)
3	8 GE ports	9	MINI-Coax Connector (10MHZ)

4	SFP+ port	10	USB port
5	8 SFP ports	11	Alarm cable
6	Console port	12	8 T1/E1 ports

Table 1-5 *Cisco ASR 901 10G Router Interface Labels*

Interface	Number	Location	Label
SFP connector for optical 10 GE ports	2	Onboard	10G SFP
SFP connector for optical GE ports	8	Onboard	SFP
RJ45 jacks for copper ethernet ports	8	Onboard	GE
RJ45 connector for console	1	Onboard	CONSOLE
RJ45 connector for management port	1	Onboard	MGMNT
RJ45 jack for BITS interface	1	Onboard	BITS
RJ45 jack for Time-of-Day interface	1	Onboard	TOD
1PPS mini-coax timing connector	1	Onboard	1PPS
10Mhz mini-coax timing connector	1	Onboard	10MHZ
RJ48 jacks for T1/E1 ports	8	T1/E1 interface module	T1/E1
RJ48 jacks for Alarm Cable	1	Onboard	Alarm
Power connector	1	Onboard	Power Connector

Regulatory Compliance

For regulatory compliance and safety information, see [Cisco Regulatory Compliance and Safety Information for Cisco ASR 901 Series Aggregation Services Router](#).

