



# Specifications

This appendix provides system and component specifications for the Cisco 7401ASR router.

The following topics are found in this appendix:

- [System Specifications, page A-1](#)
- [Software Requirements, page A-2](#)
- [Processor Specifications, page A-3](#)
- [Memory Specifications and Configurations, page A-3](#)
- [Gigabit Ethernet GBIC Configurations and Port and Cabling Specifications, page A-4](#)
- [Fast Ethernet/Ethernet RJ-45 Port Pinouts, page A-6](#)
- [Console and Auxiliary Port Signals and Pinouts, page A-8](#)
- [Alarm Port, page A-9](#)
- [Lithium Battery Caution, page A-9](#)

## System Specifications

*Table A-1 Cisco 7401ASR System Specifications*

Description	Specification
System	Two primary PCI buses with an aggregate bandwidth of 600 Mbps <sup>1</sup>
Dimensions (H x W x D)	1.72 in. x 17.3 in. x 11.80 in. (4.37 cm x 43.9 cm x 30 cm)
Weight	Chassis fully configured with a port adapter ~ 10.5 lb (4.76 kg)
Heat dissipation	50W (170 BTU <sup>2</sup> ) typical, 75W (255 BTU) maximum
Power dissipation	75W maximum configuration
<b>AC Power Supply Information</b>	
AC-input power	75W maximum (single supply configuration)
AC-input voltage rating	100–240 VAC <sup>3</sup> wide input with power factor correction
AC-input current rating	Rated for 2A  Not to exceed 1.0A <sup>4</sup> maximum at 100 VAC and .05A maximum at 240 VAC
AC-input frequency rating	50–60 Hz <sup>5</sup>

**Table A-1 Cisco 7401ASR System Specifications (continued)**

Description	Specification
AC-input cable	18 AWG <sup>6</sup> three-wire cable, with a three-lead IEC-320 receptacle on the power supply end, and a country-dependent plug on the power source end
<b>DC Power Supply Information</b>	
DC-input power	75W maximum configuration
24V DC-input voltage ratings	+24 VDC nominal. Maximum range +20 to +36 VDC
24V DC-input current ratings	Rated for 5A. 3.0A at +24 VDC, 3.75A at +20 VDC (50VA/28 VDC = 1.8A typical draw)
24V DC-input cable	18 AWG recommended minimum, with at least 2 conductors rated for at least 140°F (60°C)
<b>48V Single and Dual DC Power Supply Information</b>	
48V DC-input voltage rating	–48 VDC <sup>7</sup> nominal in North America, –60 VDC nominal in some areas of the European Community. Maximum range is –40.5 to 72 VDC (75 VDC for 5 mA).
48V DC-input current rating	Rated for 3A. Not to exceed 1.6A max. at –48 VDC. Not to exceed 2.0A max. at –40.5 VDC (50VA/–54 VDC = 1.0A typical draw)
48V DC-input cable	18 AWG stranded recommended minimum, rated for at least 140°F (60°C)
Temperature	32 to 104°F (0 to 40°C) operating; –4 to 149°F (–20 to 65°C) nonoperating
Humidity	10% to 90% noncondensing

1. Mbps = megabits per second
2. BTU = British thermal units
3. VAC = volts alternating current
4. A = amperes
5. Hz = hertz
6. AWG = American Wire Gauge
7. VDC = volts direct current

## Software Requirements

The minimum software requirements for the Cisco 7401ASR router are:

- Cisco IOS Release 12.2 DX
- Cisco IOS Release 12.2(1)DD
- Cisco IOS Release 12.2(4)B
- Cisco IOS Release 12.2(9)YE
- To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the [Software Advisor](#) tool on Cisco.com. This tool does not verify whether modules within a system are compatible, but it does provide the minimum IOS requirements for individual hardware modules or components.



### Note

Access to this tool is limited to users with Cisco.com login accounts.

# Processor Specifications

**Table A-2 Processor Specifications**

Memory Type	Size	Quantity	Description
SDRAM	128 MB, 256 MB, 512 MB	1	128-MB, 256-MB, or 512-MB DIMM
Boot ROM	512 KB	1	OTP <sup>1</sup> ROM for the ROM monitor program
Primary cache	16 KB (instruction), 16 KB (data)	—	RM7000 processor, internal cache
Secondary cache	256 KB	—	RM7000 processor; internal, unified cache
Tertiary cache	2 MB (fixed)	—	RM7000 processor, external cache <sup>2</sup>

1. OTP = one time programmable
2. Located on the processor engine board

## Memory Specifications and Configurations

**Table A-3 Memory Specifications**

Type	Quantity	Size	Memory Description
Flash memory	1	8 MB	Contains the default boot helper (boot loader) image
CompactFlash Disk	1	64 MB or 128 MB	Contains the default Cisco IOS image
NVRAM	1	512 KB	Nonvolatile EPROM for the system configuration file

**Table A-4 Memory Configurations**

Total SDRAM	Quantity	Product Number
128 MB	1 128-MB DIMM	MEM-7400ASR-128MB=
256 MB	1 256-MB DIMM	MEM-7400ASR-256MB=
512 MB	1 512- MB DIMM	MEM-7400ASR-512MB=

**Table A-5 CompactFlash Disk Configuration**

Memory Size	Product Number
64 MB	MEM-COMP-FLD64M=
128 MB	MEM-COMP-FLD128M=

# Gigabit Ethernet GBIC Configurations and Port and Cabling Specifications

The Gigabit Interface Converter (GBIC) port is a 1000-Mbps optical interface in the form of an SC-type duplex port that supports IEEE 802.3z interfaces compliant with the 1000BASEX standard.



Note

The GBIC is a separately orderable part and does not ship installed in your Cisco 7401ASR router. You must install the GBIC before you connect the cables to it.



Note

Optical fiber cables are commercially available; they are not available from Cisco Systems.

**Table A-6** GBIC Transmit Power, Receive Power, and Power Budget

GBIC	Transmit Power		Receive Power		Power Budget
	Minimum	Maximum	Minimum	Maximum	
GBIC-SX= or WS-G5484=	-9.5 dBm <sup>1</sup>	-4 dBm <sup>1</sup>	-17 dBm	0 dBm	7.5 dBm <sup>2</sup>
GBIC-LX/LH= or WS-G5486=	-9.5 dBm <sup>3</sup> -11.5 dBm <sup>4</sup>	-3 dBm <sup>5</sup>	-20 dBm	-3 dBm	7.5 dBm <sup>6</sup> and 8.0 dBm <sup>7</sup>
GBIC-ZX= or WS-G5487=	0 dBm	5.2 dBm	-24 dBm	-3 dBm	-24 dBm

1. For fiber types 50/125  $\mu\text{m}$ , NA = 0.20 fiber and 62.5/125  $\mu\text{m}$ , NA = 0.275 fiber.
2. For fiber types 50  $\mu\text{m}$  MMF and 62.5  $\mu\text{m}$  MMF.
3. For fiber types 9/125  $\mu\text{m}$  SMF.
4. For fiber types 62.5/125  $\mu\text{m}$  MMF and 50/125  $\mu\text{m}$  MMF.
5. For fiber types 9/125  $\mu\text{m}$  SMF, 62.5/125  $\mu\text{m}$  MMF, and 50/125  $\mu\text{m}$  MMF.
6. For fiber types 50  $\mu\text{m}$  MMF and 62.5  $\mu\text{m}$  MMF.
7. For fiber type 10  $\mu\text{m}$  SMF.

## GBIC Cabling and Connection Equipment

[Table A-7](#) provides cabling specifications for the GBICs that you install in Gigabit Ethernet ports. Note that all GBIC ports have SC-type connectors. Also, the minimum cable distance for the WS-G5484= or GBIC-SX and GBIC-LX/LH or WS-G5486 (multimode fiber [MMF] and single-mode fiber [SMF]) is 6.5 feet (2 m), and the minimum link distance for the GBIC-ZX or WS-G5487 is 6.2 miles (10 km) with an 8-dB attenuator installed at each end of the link. Without attenuators, the minimum link distance for the GBIC-ZX or WS-G5487 is 24.9 miles (40 km).

Table A-7 GBIC Port Cabling Specifications

GBIC	Wave-length (nm)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Maximum Cable Distance
GBIC-SX or WS-G5484	850	MMF <sup>1</sup>	62.5	160	722 ft (220 m)
			62.5	200	902 ft (275 m)
			50.0	400	1640 ft (500 m)
			50.0	500	1804 ft (550 m)
GBIC-LX/LH or WS-G5486	1300	MMF <sup>2</sup> and SMF	62.5	500	1804 ft (550 m)
			50.0	400	1804 ft (550 m)
			50.0	500	1804 ft (550 m)
			9/10	—	6.2 miles (10 km)
GBIC-ZX <sup>3,4</sup> or WS-G5487 Extended distance (1000BASEZX) <sup>5</sup>	1550	SMF	9/10	—	43.5 miles (70 km)
		SMF <sup>6</sup>	8	—	62.1 miles (100 km)

- Multimode fiber (MMF) only.
- A mode-conditioning patch cord is required.  
When using the GBIC-LX/LH or WS-G5486 with 62.5-micron diameter MMF, you must install a mode-conditioning patch cord between the GBIC and the MMF cable on both the transmit and the receive ends of the link when link distances are greater than 984 ft (300 m).  
We do not recommend using the GBIC-LX/LH or WS-G5486 and MMF with no patch cord for very short link distances (tens of meters). The result could be an elevated bit error rate (BER).
- You can have a maximum of 12 1000BASEZX GBICs per system to comply with EN55022 Class B regulations and 24 1000BASEZX GBICs per system to comply with FCC Class A regulations.
- The minimum link distance for the GBIC-ZX or WS-G5487 is 6.2 miles (10 km) with an 8-dB attenuator installed at each end of the link. Without attenuators, the minimum link distance for the GBIC-ZX or WS-G5487 is 24.9 miles (40 km).
- Contains a Class 1 laser of 1550 nm for 1000BASEZX (extended wavelength) applications.
- Dispersion-shifted single-mode optical fiber cable.

A mode-conditioning patch cord can be used with the GBIC-LX/LH or WS-G5486 to allow reliable laser transmission between the single-mode laser source on the GBIC and a multimode optical fiber cable.

## GBIC-SX or WS-G5484

The GBIC-SX or WS-G5484 operates on standard multimode fiber-optic link spans of up to 1804 feet (550 m).

## GBIC-LX/LH or WS-G5486

The GBIC-LX/LH or WS-G5486 1000BASELX/LH (long wavelength/long haul) GBIC interfaces fully comply with the IEEE 802.3z 1000BASELX standard. However, their higher optical quality allows them to reach 10 km over single-mode fiber (SMF) versus the 3.1 miles (5 km) specified in the standard.

## GBIC-ZX or WS-G5487

The 1000BASEZX (extended wavelength) GBIC operates on ordinary single-mode fiber-optic link spans of up to 43.5 miles (70 km). Link spans of up to 62.1 miles (100 km) are possible using premium single-mode fiber or dispersion-shifted single-mode fiber (premium single-mode fiber has a lower attenuation per unit length than ordinary single-mode fiber; dispersion-shifted single-mode fiber has both lower attenuation and less dispersion).

The 1000BASEZX GBIC must be coupled to single-mode fiber-optic cable, which is the type of cable typically used in long-haul telecommunications applications. The 1000BASE-ZX GBIC will not operate correctly when coupled to multimode fiber, and it is not intended to be used in environments where multimode fiber is frequently used (for example, building backbones, horizontal cabling).

The 1000BASEZX GBIC is intended to be used as a Physical Medium Dependent (PMD) component for Gigabit Ethernet interfaces found on various switch and router products. It operates at a signaling rate of 1250 Mbaud, transmitting and receiving 8B/10B encoded data.

When shorter lengths of single-mode fiber are used, it may be necessary to insert an in-line optical attenuator in the link to avoid overloading the receiver.

- Insert a 10-dB in-line optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASEZX GBIC at each end of the link whenever the fiber-optic cable span is less than 15.5 miles (25 km).
- Insert a 5-dB in-line optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASEZX GBIC at each end of the link whenever the fiber-optic cable span is equal to or greater than 15.5 miles (25 km) but less than 31 miles (50 km).

**Note**

Fiber-optic cables are commercially available; they are not available from Cisco Systems.

## Fast Ethernet/Ethernet RJ-45 Port Pinouts

The Cisco 7401ASR router has RJ-45 ports for the two Fast Ethernet/Ethernet connections. The RJ-45 ports support IEEE 802.3 (Ethernet) and IEEE 802.3u (Fast Ethernet) interfaces compliant with 10BASET and 100BASETX specifications.

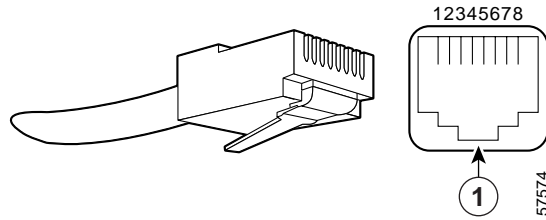
The RJ-45 ports support standard straight-through and crossover Category 5 UTP cables with RJ-45 connectors. Cisco Systems does not supply Category 5 UTP cables; these cables are available commercially.

**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.

Figure A-1 shows an RJ-45 port and connector. Table A-8 lists the pinouts and signals for the RJ-45 port.

Figure A-1 RJ-45 Port and Connector



1	RJ-45 connector		
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Table A-8 RJ-45 Receptacle Pinouts

Pin <sup>1</sup>	Description
1	TxD+ <sup>2</sup>
2	TxD-
3	RxD+ <sup>3</sup>
6	RxD-

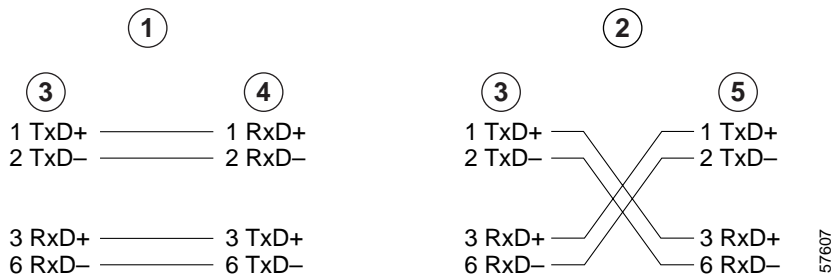
1. Any pin not referenced is not connected.
2. TxD = Transmit Data
3. RxD = Receive Data

**Note**

With reference to the RJ-45 pinouts in [Table A-8](#), proper common-mode line terminations should be used for the unused Category 5 UTP cable pairs 4/5 and 7/8. Common-mode termination reduces electromagnetic interference (EMI).

Use the pinouts shown in [Figure A-2](#) for straight-through and crossover twisted-pair cable connections for your RJ-45 interface cabling requirements.

Figure A-2 Fast Ethernet/Ethernet Pinouts—Straight-Through or Crossover Cable



1	Straight-through cable pinout, Ethernet port to a hub or repeater	4	Hub
2	Crossover cable pinout, Ethernet port to a DTE	5	DTE
3	Ethernet port		

To determine whether a UTP cable is a crossover cable or a straight-through cable, hold the two RJ-45 connectors next to each other so you can see the colored wires inside the ends.

Examine the sequence of colored wires to determine the type of cable, as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Crossover—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.

## Console and Auxiliary Port Signals and Pinouts

The Cisco 7401ASR router does not support Data Carrier Detect (DCD). [Table A-9](#) lists the RJ-45 console port signals.

**Table A-9** Console Port Signals

Pin	Signal	Direction	Description
1	CTS	Out	Clear To Send (tracks RTS)
2	DSR	Out	Data Set Ready (always on)
3	RXD	Out	Receive Data
4	GND	—	Signal Ground
	—	—	Not connected
6	TXD	In	Transmit Data
7	DTR	In	Data Terminal Ready
8	RTS	In	Ready To Send

[Table A-10](#) lists the RJ-45 auxiliary port signals.

**Table A-10** Auxiliary Port Signals

Pin	Signal	Direction	Description
1	RTS	Out	Ready To Send
2	DTR	Out	Data Terminal Ready
3	TXD	Out	Transmit Data
4	RING <sup>1</sup>	In	Ring Indication
5	GND	—	Signal Ground
6	RXD	In	Receive Data
7 <sup>2</sup>	DSR/DCD (RLSD)	In	Data Set Ready / Data Carrier Detect (Receive Line Signal Detect)
8	CTS	In	Clear To Send (tracks RTS)

1. RING is not supported on Cisco-supplied adapters. To use this pin, you must create a customized cable.
2. Pin 7 can be used as a DCD input for connection to a modem. The RJ-45-to-DB-25F adapter maps DCD to this pin when used with a straight-through cable.

## Alarm Port

The dry relay alarm port operates up to 50V AC/DC maximum and up to 80 mA maximum. Total power dissipation should not exceed 300 milliwatts. The normally closed position will have from 15 to 30 ohms resistance. The open position will be greater than 1 megohm. The Alarm condition is the closed position. This port is a switch so that the cable connector can be inserted in either orientation.

## Lithium Battery Caution

This caution is required although the Cisco 7401ASR router has no internal field replaceable units.



**Caution** Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturers instructions.

<b>ADVARSEL!</b>	Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage tilleverandøren.
<b>VAROITUS</b>	Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan valmistajan suositteluun tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.
<b>ADVARSEL</b>	Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.
<b>WARNING</b>	Eksplosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

