

Cabling Guide for Console and AUX Ports

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Introduction

This document summarizes the cabling requirements for console and auxiliary (AUX) ports. Cisco routers either have RJ-45-based or DB-25 DCE/DTE console and AUX ports. You can connect either a terminal (DTE) or a modem (DCE) to these ports. In either instance, you need both an RJ-45 cable and an RJ-45-to-DB-25 or RJ-45-to-DB-9 connector.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Table of Routers with Console and AUX Ports

The table in this section lists the Cisco router series and the corresponding console and AUX ports.

Router	Console Port	Console Port Cable	AUX Port	AUX Port Cable
600	RJ-45 (management port)	RJ-45 Rolled / RJ-45 to DB-9 Female	N/A	N/A
700	RJ-45	RJ-45 Rolled	N/A	N/A
800	RJ-45	RJ-45 Rolled / RJ-45 to DB-9 Female	N/A	N/A
1000	RJ-45	RJ-45 Rolled	N/A	N/A
1600	RJ-45	RJ-45 Rolled / RJ-45 to DB-9 Female	N/A	N/A
1700	RJ-45	RJ-45 Rolled / RJ-45 to DB-9 Female	RJ-45	RJ-45 Rolled
2500	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
2600	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
3600	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
MC3810	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
4000	DB-25 DCE	RS 232 / RJ-45 Rolled	DB-25 DTE	RS 232 / RJ-45 Rolled

AS5200/5300	RJ45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
AS5400	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
AS5800	DB-25 DCE	RS 232 / RJ-45 Rolled	DB-25 DTE	RS 232 / RJ-45 Rolled
7100/7200/7300	RJ-45	RJ-45 Rolled	RJ-45	RJ-45 Rolled
7200	DB-25 DCE	RS 232 / RJ-45 Rolled	DB-25 DTE	RS 232 / RJ-45 Rolled
7500	DB-25 DCE	RS 232 / RJ-45 Rolled	DB-25 DTE	RS 232 / RJ-45 Rolled
12000	DB-25 DCE	RS 232 / RJ-45 Rolled	DB-25 DTE	RS 232 / RJ-45 Rolled

Console Port Settings for Terminal Connection

Before you connect a terminal to the console port, configure the terminal to match the router console port as shown here:

- 9600 baud
- 8 data bits
- no parity
- 2 stop bits (9600 8N2) OR 1 stop bit¹

¹Dependant on the router.

Types of Console and AUX Connectors

Cisco routers have three types of console and AUX connectors. The table in this section lists these types:

- RJ-45
- DB-25 DCE
- DB-25 DTE

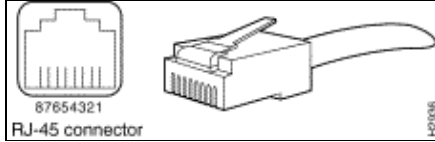
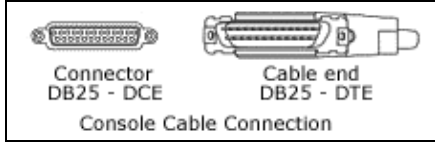
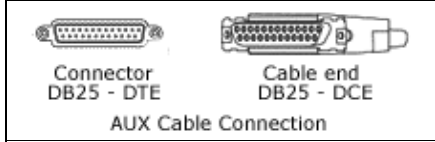
There are three styles of RJ-45-to-DB-25 connectors:

1. DCE style (modem)
2. DTE style
3. DCE style (non modem)

Each of these styles has a different role. Generally, DTE is for terminals, DCE (modem) is for modems, and DCE (non-modem) is obsolete.

Note: Move pin 6 to pin 8 if you want to change a DCE style (non modem) to a DCE style (modem).

Console and AUX Connectors for Cisco Routers

Connector	Graphic
RJ-45	 87654321 RJ-45 connector L42036
DB-25 DCE	 Connector DB25 - DCE Cable end DB25 - DTE Console Cable Connection
DB-25 DTE	 Connector DB25 - DTE Cable end DB25 - DCE AUX Cable Connection

Cabling for console and AUX port:

- RJ-45 Cables
- RS 232 Straight-through Cable

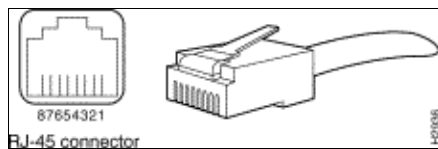
Types of RJ-45 Cabling

Cisco products use these types of RJ-45 cables:

- Straight-through
- Crossover
- Rolled
- RJ-45 to DB9 female

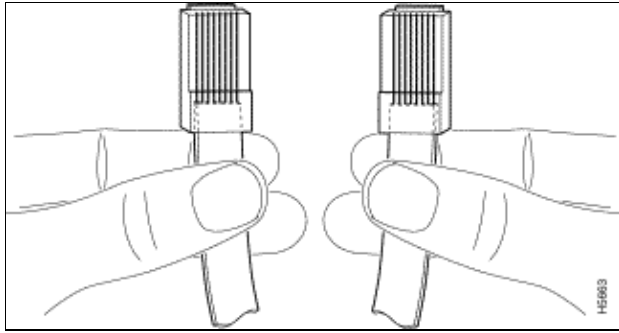
Cisco does not provide these cables. These cables are widely available from other sources. Console cable is usually provided with the Console Cable Kit.

Note: The console port does not support modem control or hardware flow control.



How to Identify an RJ-45 Cable

In order to identify the RJ-45 cable type, hold the two ends of the cable next to one another so you can see the colored wires inside the ends, as shown here:



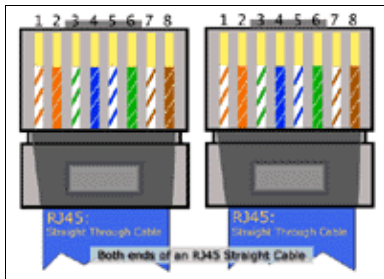
There are three types of commonly used RJ-45 cabling: straight, cross and rolled. Hold the two ends of an RJ-45 cable side by side. There are eight colored strips, or pins, at each end. If the order of the colored pins is the same at each end, the cable is straight. If the order of the colors is reversed at each end, the cable is rolled.

Examine the sequence of colored wires to determine the type of RJ-45 cable. This section explains how you can do this.

Straight-through Cable

In a straight-through cable, the colored wires are in the same sequence at both ends of the cable.

Straight-through Cable



RJ-45 Straight-through (Ethernet) Cable Pin-outs

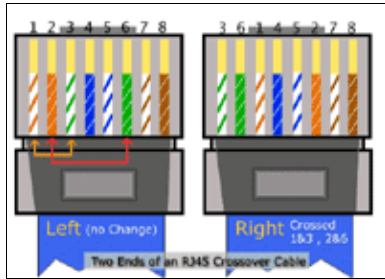
Signal	RJ-45 Pin	RJ-45 Pin	Signal
Tx+	1	1	Tx+
Tx	2	2	Tx
Rx+	3	3	Rx+
	4	4	
	5	5	
Rx	6	6	Rx
	7	7	
	8	8	

Crossover Cable

In a crossover cable, the first (far left) colored wire at one end of the cable is the third colored wire at the other

end of the cable.

Crossover Cable



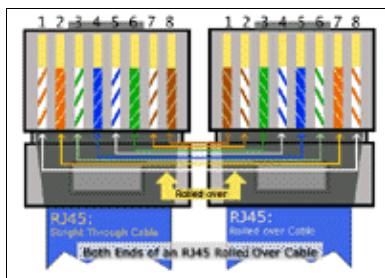
RJ-45 Crossover (Ethernet) Cable Pin-outs

Signal	RJ-45 Pin	RJ-45 Pin	Signal
Tx+	1	3	Rx+
Tx	2	6	Rx
Rx+	3	1	Tx+
	4	4	
	5	5	
Rx	6	2	Tx
	7	7	
	8	8	

Rolled Cable

In a rolled cable, the colored wires at one end of the cable are in the reverse sequence of the colored wires at the other end of the cable.

Rolled Cable



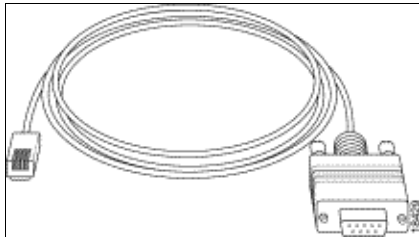
Rolled Cable Pinouts

Signal	RJ-45 Pin	RJ-45 Pin	Signal
	1	8	
	2	7	

	3	6	
	4	5	
	5	4	
	6	3	
	7	2	
	8	1	

Note: CAB-OCTAL-ASYNC, the 8-port RJ-45 adapter that is used with the Cisco 2509, 2510, 2511, and 2512, is the same as a rolled cable.

RJ-45 to DB-9 Female*



This cable is also known as **Management Cable**.

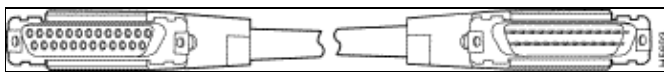
*Cisco provides this cable with the 600, 800, 1600 and 1700 Series Routers.

Type of Cable for DB-25 Connectors

RS 232 Straight-through Cable

This illustration shows serial cable CAB-R23= (part number 74-0173), which is a general serial cable for all router platforms:

Both Ends of RS 232 Straight-through Cable for DB-25 Connectors



This cable has a female DB-25 connector on one end and a male DB-25 connector on the other end. Either end of the CAB-R23 cable can be the Cisco end or the network end, depending on whether the Cisco router is designated as a DCE device or a DTE device. If the router is designated as a DCE device, the female DB-25 connector is the Cisco end. If the router is designated as a DTE device, the male DB-25 connector is the Cisco end.

Pin-outs for RS 232 Straight Through Cable (DB-25)

Male DTE Pin-outs		Female DTE Pin-outs	
25 Pin	Signal	25 Pin	Signal

J2-1	Shield GND	J2-1	Shield GND
J2-2 Shield	TxD	J2-2 Shield	TxD
J2-3 Shield	RxD	J2-3 Shield	RxD
J2-4 Shield	RTS	J2-4 Shield	RTS
J2-5 Shield	CTS	J2-5 Shield	CTS
J2-6 Shield	DSR	J2-6 Shield	DSR
J2-7 Shield	Circuit GND	J2-7 Shield	Circuit GND
J2-8 Shield	DCD	J2-8 Shield	DCD
J2-15 Shield	TxC	J2-15 Shield	TxC
J2-17 Shield	RxC	J2-17 Shield	RxC
J2-18 Shield	LTST	J2-18 Shield	LTST
J2-20 Shield	DTR	J2-20 Shield	DTR
J2-24 Shield	TxCE	J2-24 Shield	TxCE

Adapters

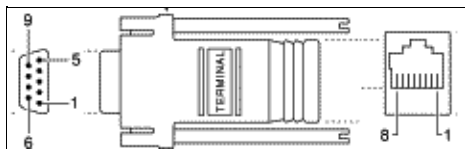
You need two types of adapters to connect a PC to a router.

- RJ-45-to-DB-9 Adapter
- RJ-45-to-DB-25 Adapter

RJ-45-to-DB-9 Adapter

This adapter connects a router to a PC through a COM port.

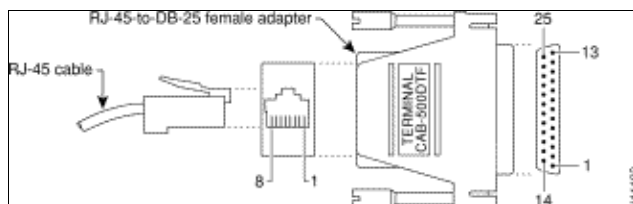
RJ-45-to-DB-9 Adapter



RJ-45-to-DB-25 Adapter

This adapter connects a router to PC through a serial port.

RJ-45-to-DB-25 Adapter



Cabling and Adapter Setups that Work

Here are the most common ways to console into a router.

Console Connection Combination

Console Port	Cable	Adapter	Adapter for Console Port
RJ-45	RJ-45 Rolled	DB-9 / DB-25 <small>for PC</small>	None
DB-25 DCE	RJ-45 Rolled	DB-9 / DB-25	RJ-45 to DB-25
DB-25 DCE	DB-25	None	None
RJ-45	RJ-45 to DB-9 ¹	None	None

¹ Cisco provides this cable with the Cisco 600, 800, 1600 and 1700 Series Routers.

You cannot mix and match these components randomly. Here are the combinations that work:

Console Connection Combination

Port	RJ-45 Cable	DB-25 Adapter	To Attach
AUX / Console	Straight	DCE	TERMINAL
AUX / Console	Rolled	non-modem	TERMINAL
AUX / Console	Rolled	DCE modem	MODEM

AUX / Console	RJ-45 to DB9	None	TERMINAL
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These are the only setups that work. If you do not have the components you need, use the RJ-45 Component Guide chart to order them.

RJ-45 Port and Adapter Pin-outs

This chart shows the pin-outs for RJ-45 console and AUX ports. The console port does not use RTS/CTS.

RJ-45 Port Pin-outs

Signal	Console Port (DTE)	RJ-45 Rolled Cable	Adapter	Adapter	Signal
	RJ-45	RJ-45 Pin	DB-9 Pin	DB-25 Pin	
CTS	1	8	7	4	RTS
DTR	2	7	4	20	DSR
TxD	3	6	3	2	RxD
GND	4	5	5	7	GND
GND	5	4	5	7	GND
RxD	6	3	2	3	TxD
DSR	7	2	6	8	DTR
RTS	8	1	8	5	CTS

DB-25 Console and AUX Port Pin-outs

Console Port Signals

Pin	Signal	Direction	Description
1	GND		Ground
2	TxD	<---	Transmit Data
3	RxD	--->	Receive Data
6	DSR	--->	Data Set Ready (always on)
7	GND		Ground
8	DCD	--->	Data Carrier Detect (always on)

Note: The console port does not support modem control or hardware flow control.

Auxiliary Port Signals

Pin	Signal	Direction	Description
2	TxD	→	Transmit Data
3	RxD	←	Receive Data
4	RTS	→	Request To Send (used for hardware control)
5	CTS	←	Clear To Send (used for hardware flow control)
6	DSR	←	Data Set Ready
7	Signal Ground		Carrier Detect (used for modem control)
8	CD	←	Data Terminal Ready (used for modem control only)
20	DTR	→	

Note: The auxiliary port supports hardware flow control and modem control.

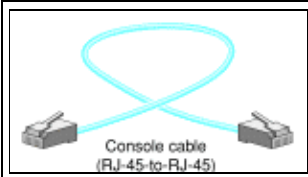


Console Cable Kit

A console cable kit is provided with your router. Use this kit when you connect your router to a PC or a terminal.

The console cable kit contains these items:

- RJ-45-to-RJ-45 console cable (blue)
- RJ-45-to-DB-25 adapter (gray)
- RJ-45-to-DB-9 adapter (gray)

Note: The Cisco 7200 Series and Cisco 7301 are not shipped by default with a console cable kit. If a console cable is required, order an accessory kit (part number: ACS-2500ASYN).

RJ-45-to-RJ-45 console cable	RJ-45-to-DB-25 adapter	RJ-45-to-DB-9 adapter
		
Console cable (RJ-45-to-RJ-45)	DB-25-to-RJ-45 modem cable adapter	DB-9-to-RJ-45 console adapter

Cisco RJ-45 Component Guide

This chart summarizes the RJ-45 components of Cisco:

RJ-45 Component Guide

Style	Catalog Part Number	Catalog Description	Label	Shielded?
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DTE	CAB-500DTF=	DB-25 CONNECTOR, DTE FEMALE	29-0810-01/29-DTF-01	no
DTE	CAB-500DTM=	DB-25 CONNECTOR, DTE MALE		no
modem	CAB-25AS-MMOD=	CABLE CONN-MODEM TO RJ45 SHLD		yes
modem	CAB-MMOD=	ADP,RJ45/DSUB	29-0881-01/29-MMOD-01	no
DCE	CAB-500DCF=	DB-25 CONNECTOR, (non modem) DCE FEMALE	29-0809-01/29-DCF-01	no
DCE	CAB-500DCM=	DB-25 CONNECTOR,(non modem) DCE MALE	29-0808-01/29-DCM-0129- 0808-01/29-DCM-01	no
NA	Rolled Cable	CABASY,RJ45 ROLLED, MODULAR	72-0876-01/CAB-500RJ	NA
NA	Straight Cable	not in catalog	31-0756-01	NA
Cable for DB-25/DB-9 Connection				
NA	Depends on the router*	RJ-45 to DB-9 female an all in one cable	72-3383-01	NA
NA	CAB-R23=	RS 232 Straight-through Cable		NA
NA	Depends on the router*	DB-9 Male to DB-25 male for Modem connection	29-4043-01	NA

The first seven entries are DB-25 connectors, and the last two are RJ-45 cables. Connectors are described in terms of their sex and their role. For example, an FDTE is a female DTE style connector, an MMOD is a male modem style connector, and so on. Remember, you need shielded cables in order to run at 115.2 kbps.

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