Understand Cable Requirements for Console and AUX Ports

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Introduction

This document describes the cable and connector requirements for console and auxiliary (AUX) ports.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Conventions

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

Background Information

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.

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 bit
  - Dependent 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

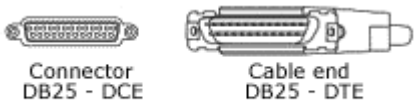
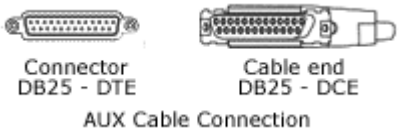
There are three styles of RJ-45-to-DB-25 connectors:

- DCE style (modem)
- DTE style
- 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 Generally, DTE is for terminals, DCE (modem) is for modems, and DCE (non-modem) is obsolete.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	 *RJ-45*
DB-25 DCE	 *DB-25 DCE*
DB-25 DTE	 *DB-25 DTE*

Cable for console and AUX port:

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

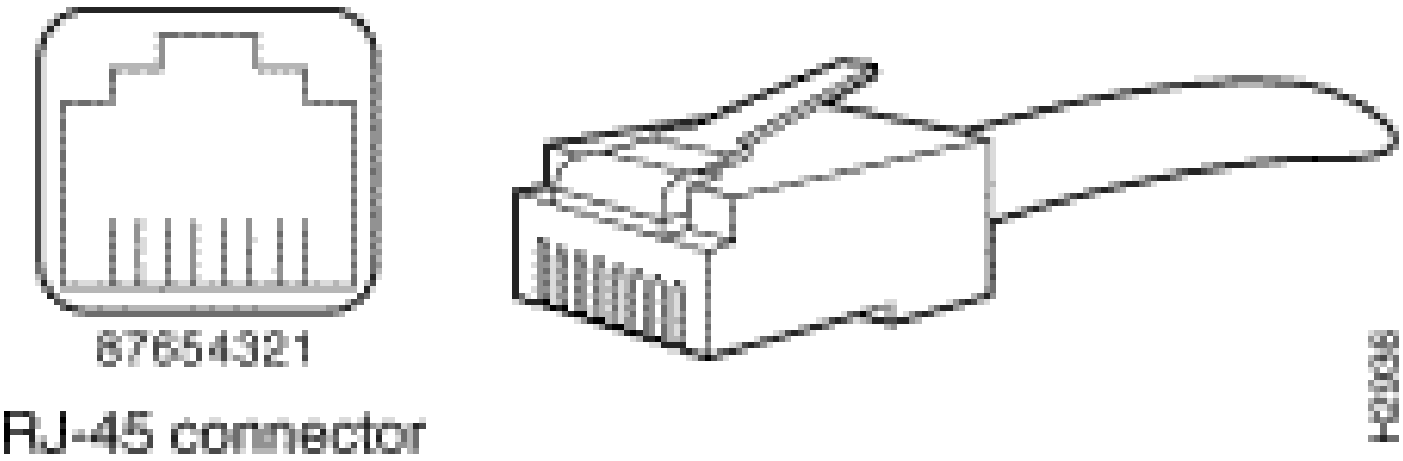
RJ-45 Cables

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.

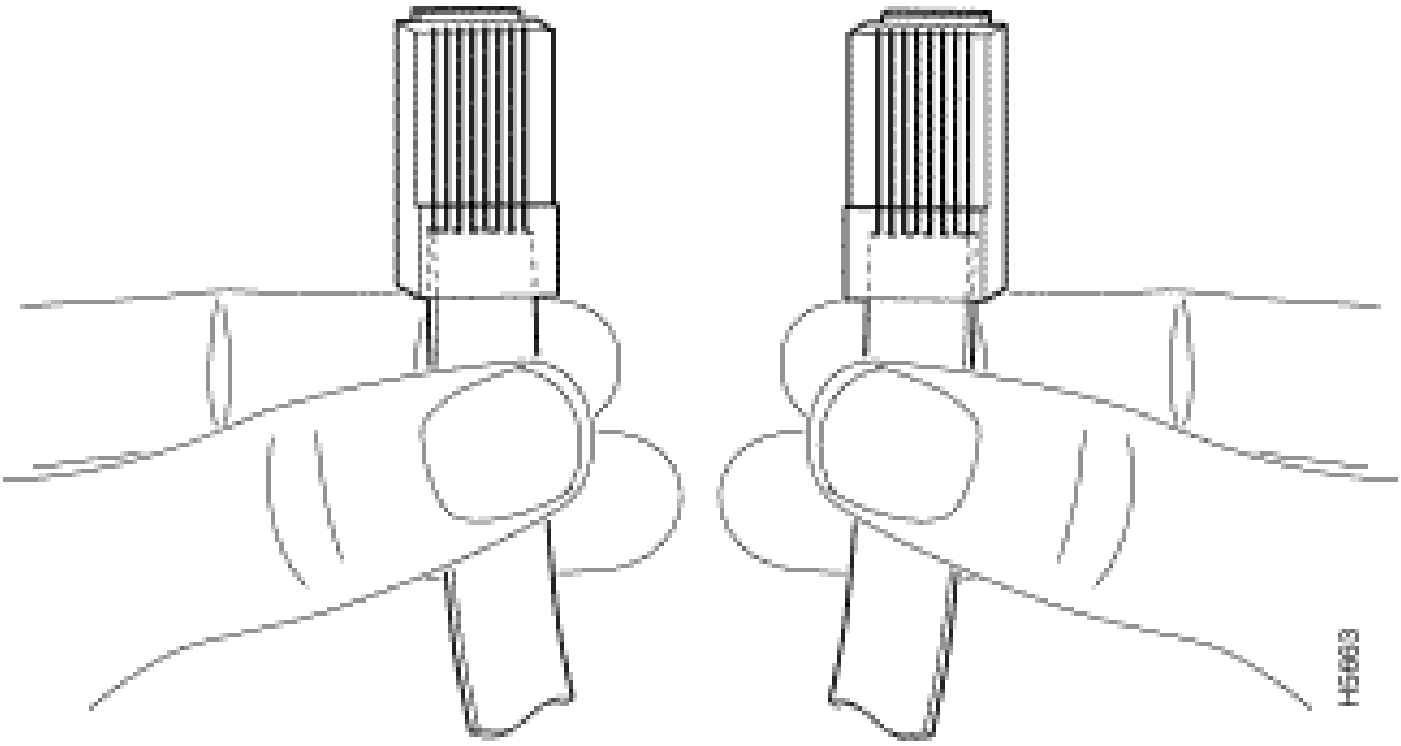
Note: The console port does not support modem control or hardware flow control.



RJ-45 Connector

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:



RJ-45 Cable Ends

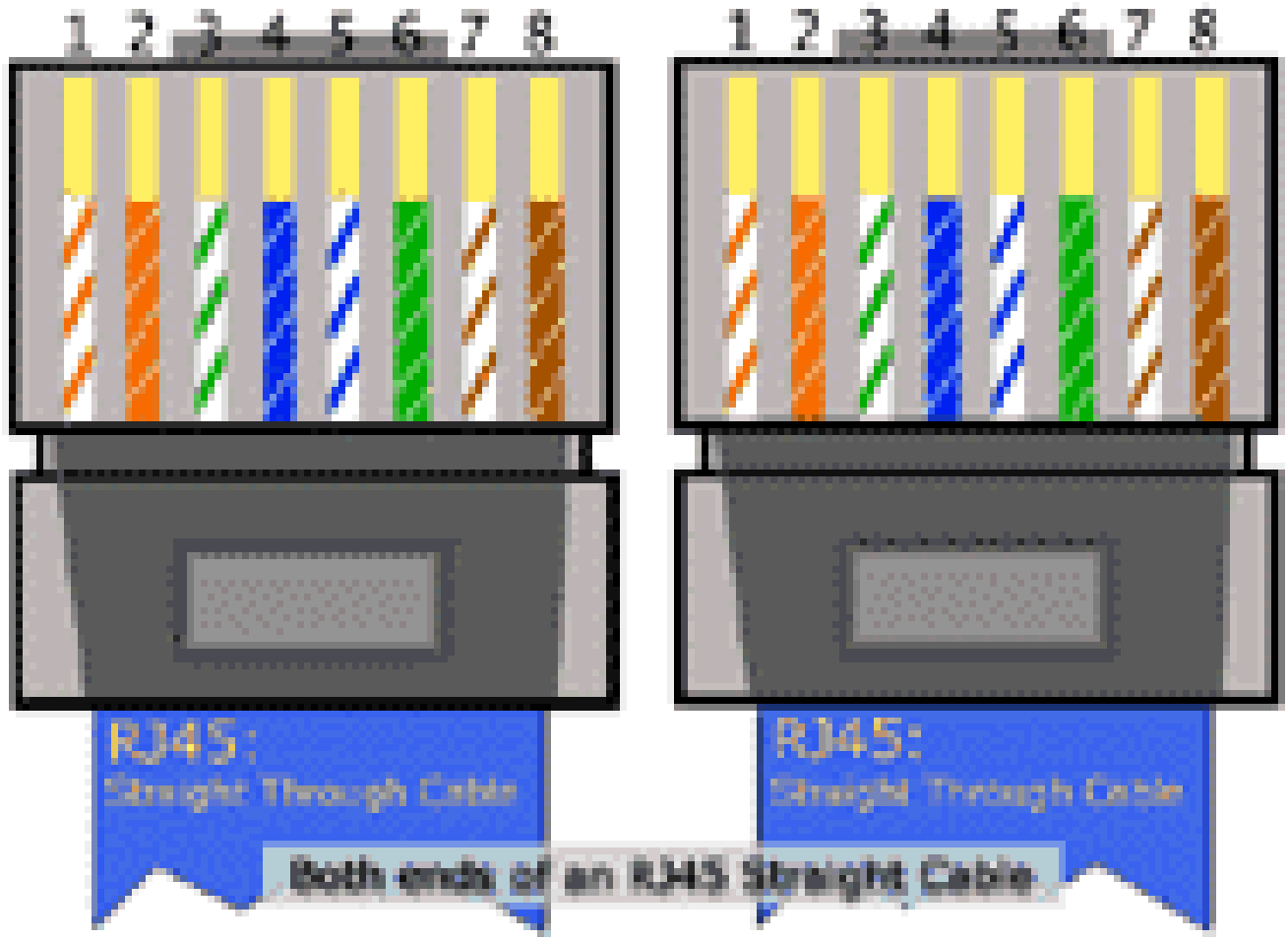
There are three types of commonly used RJ-45 cables: straight, cross and rolled. Hold the two ends of an RJ-45 cable side by side. There are eight colored strips, or pins, at each end. If the order of the colored pins is the same at each end, the cable is straight. If the order of the colors is reversed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



Straight-through Cable

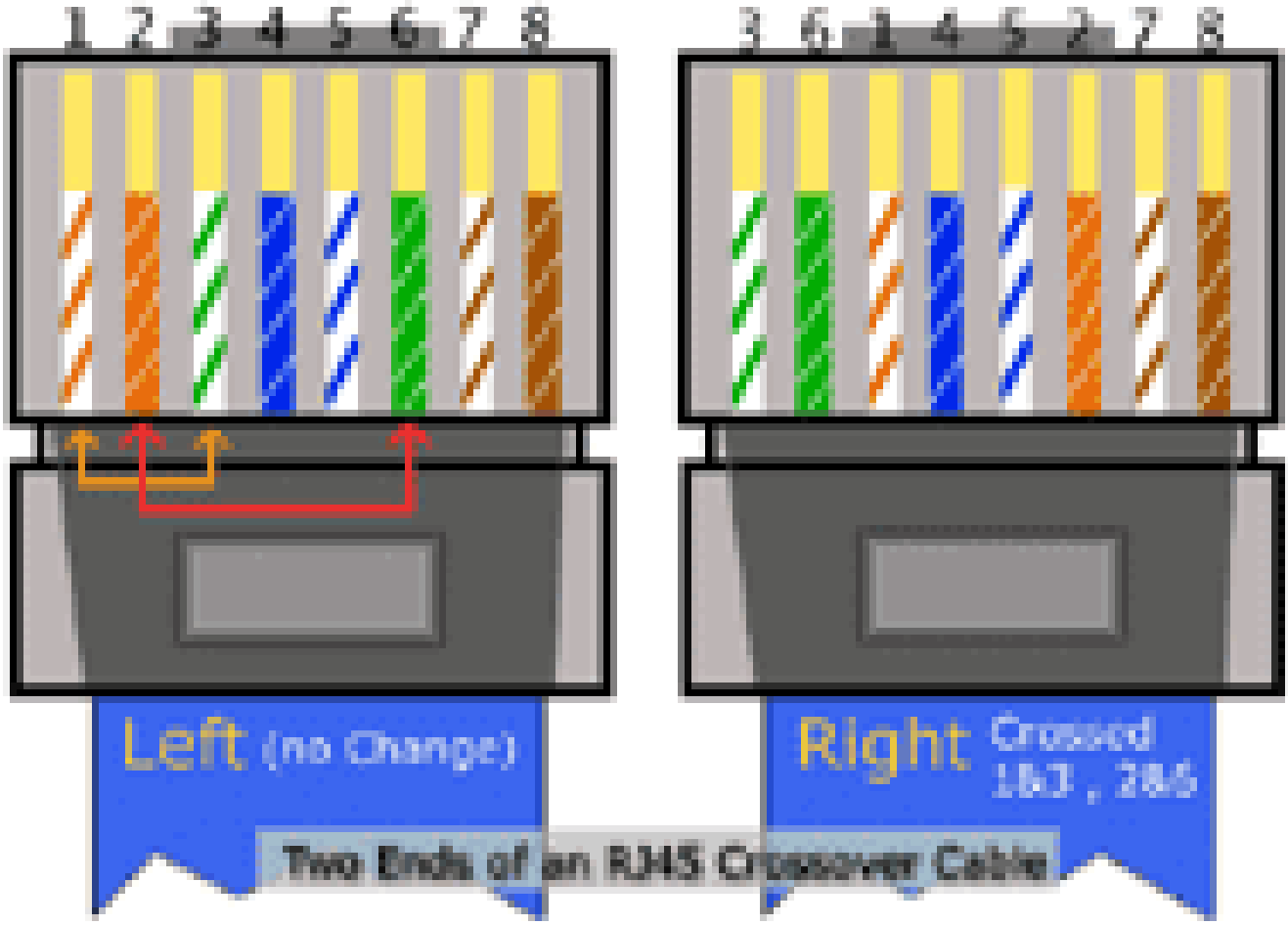
RJ-45 Straight-through (Ethernet) Cable Pin-outs

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



Crossover Cable

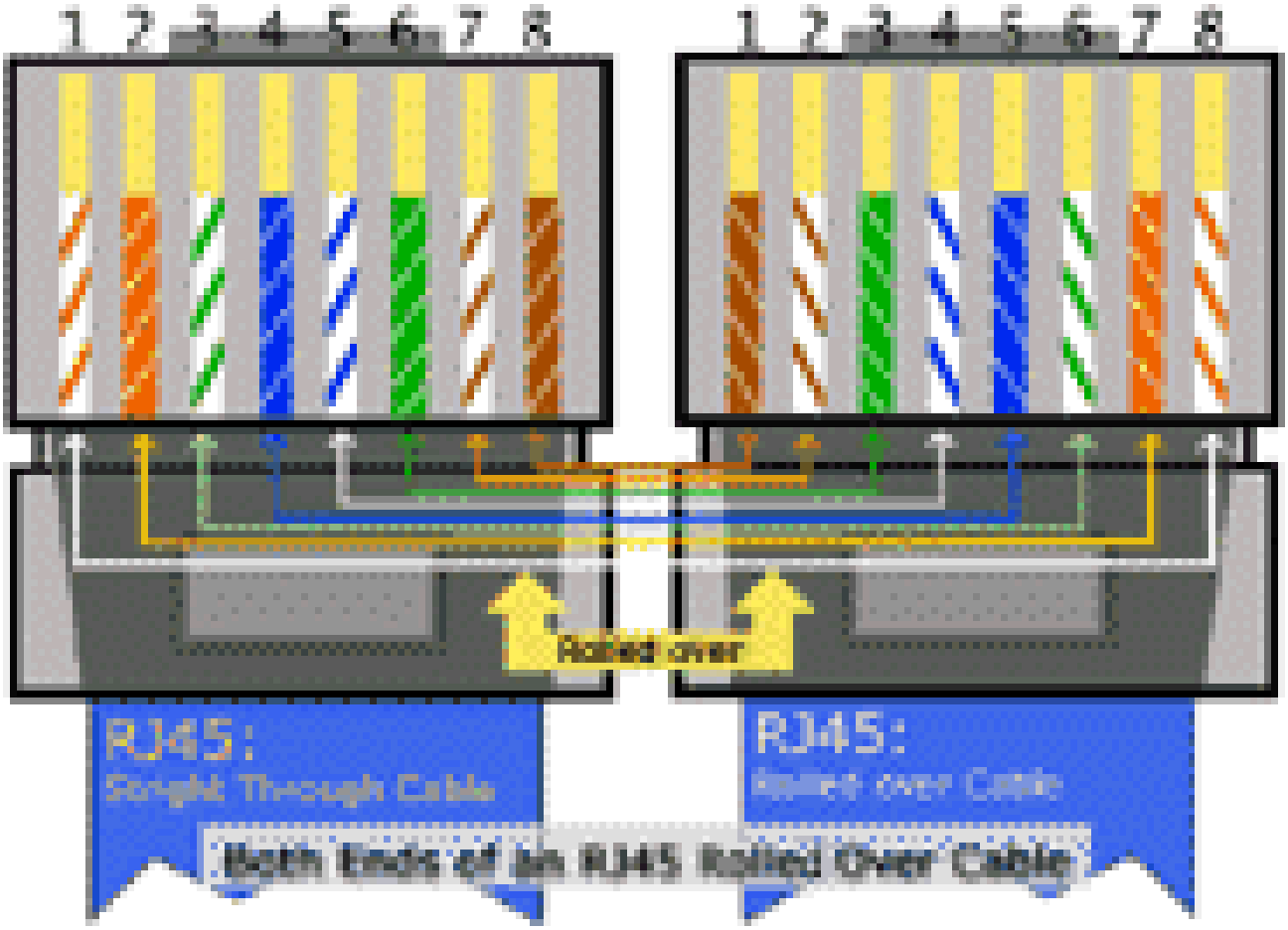
RJ-45 Crossover (Ethernet) Cable Pin-outs

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



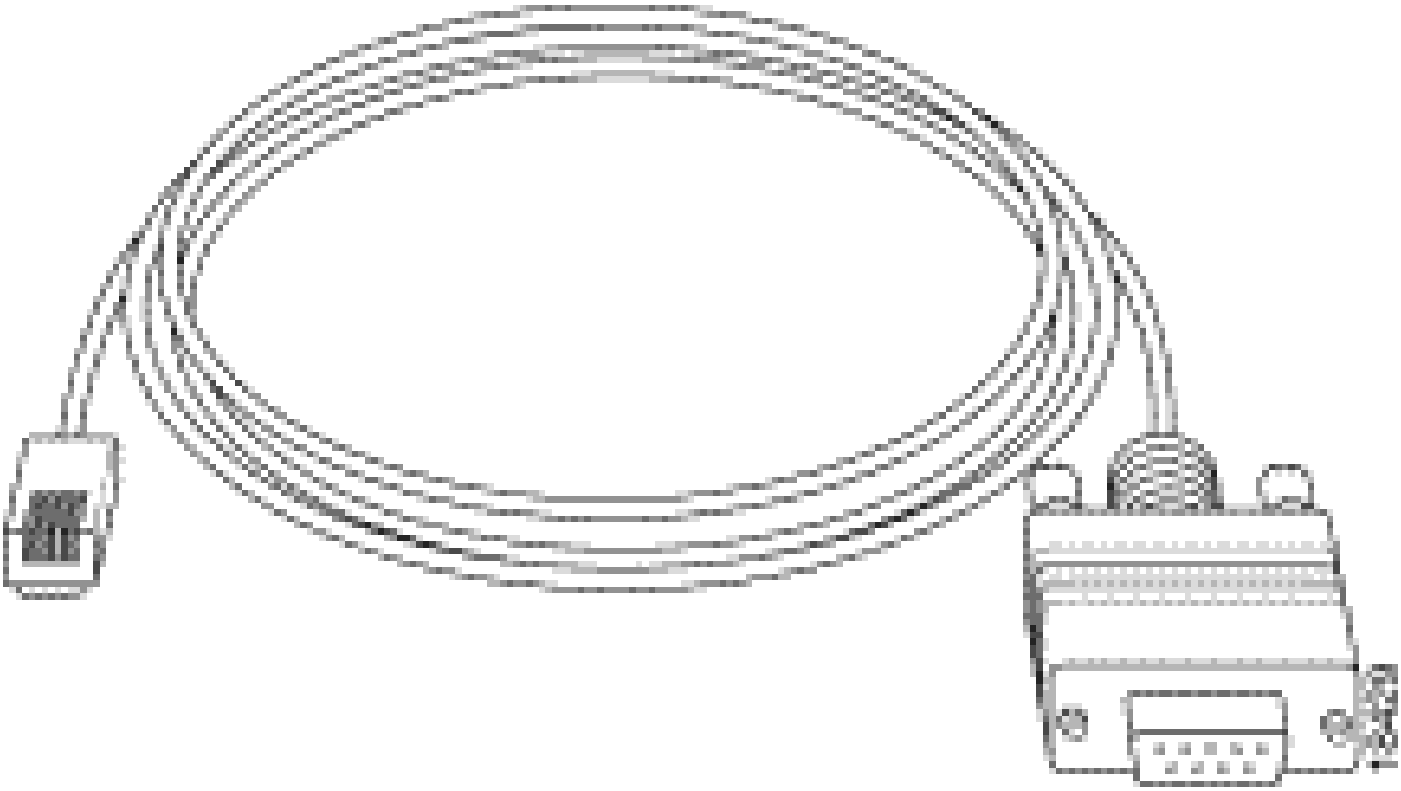
Rolled Cable

Rolled Cable Pin-outs

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*



*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



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, based 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

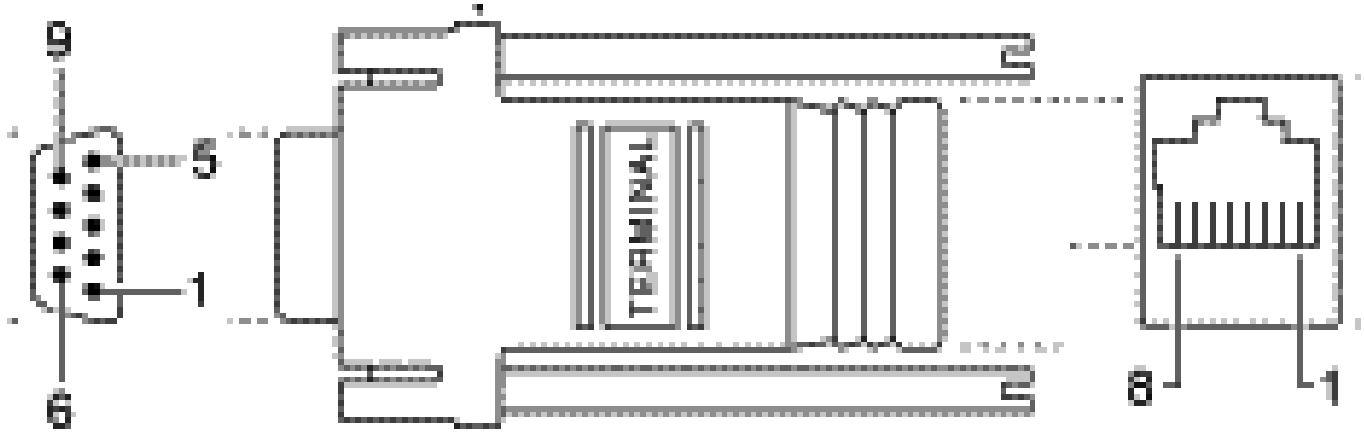
You need two types of adapters to connect a PC to a router.

- 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 though a COM port.

RJ-45-to-DB-9 Adapter

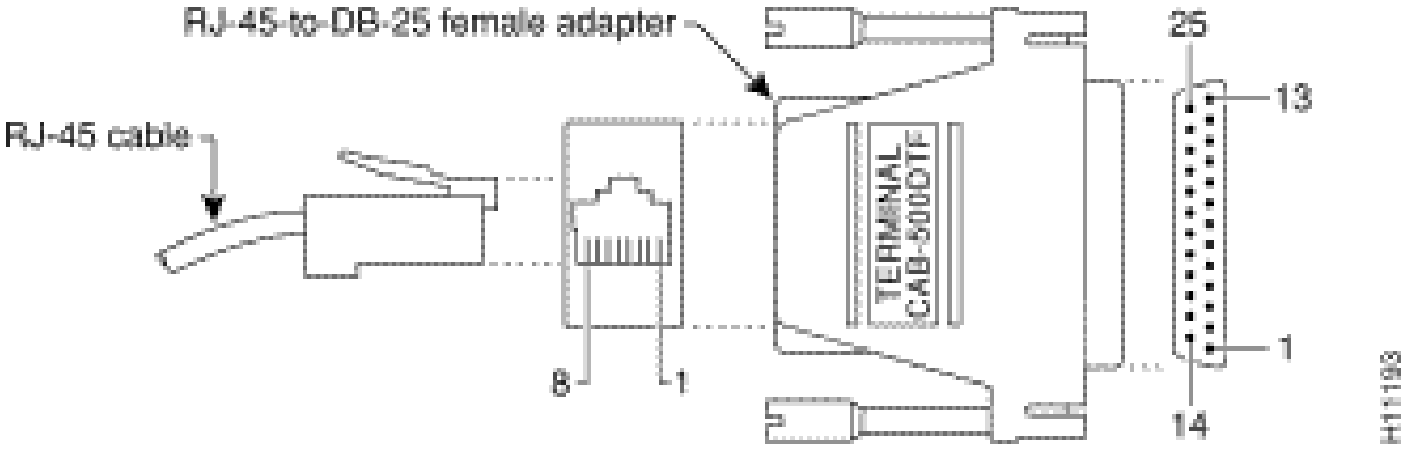


RJ-45-to-DB-9 Adapter

RJ-45-to-DB-25 Adapter

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

RJ-45-to-DB-25 Adapter

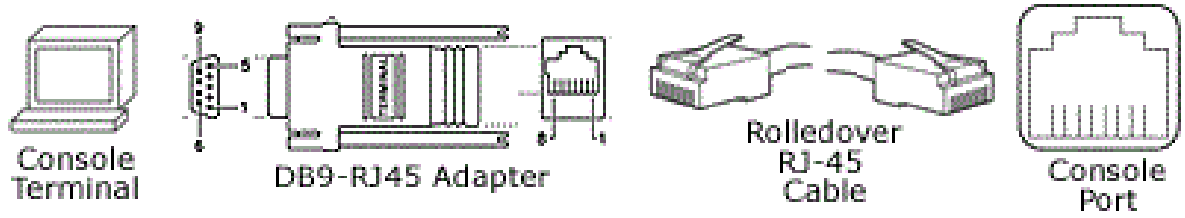


RJ-45-to-DB-25 Adapter-Female Adapter

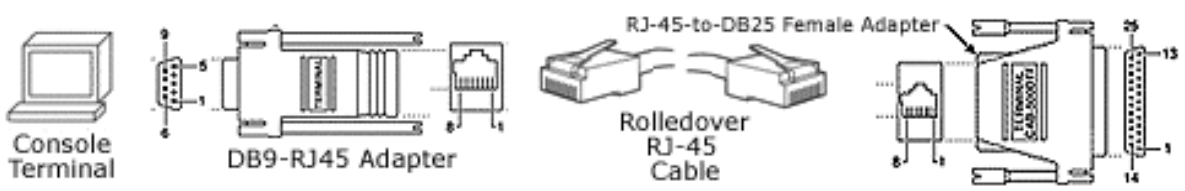
Cable and Adapter Setups that Work

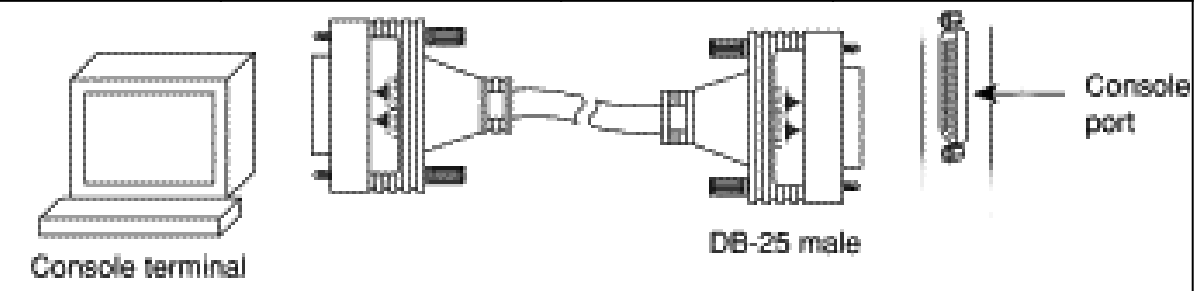
Here are the most common ways to console into a router.

Console Connection Combination

Console Port	Cable	Adapter for PC	Adapter for Console Port
RJ-45	RJ-45 Rolled	DB-9 / DB-25	None
			

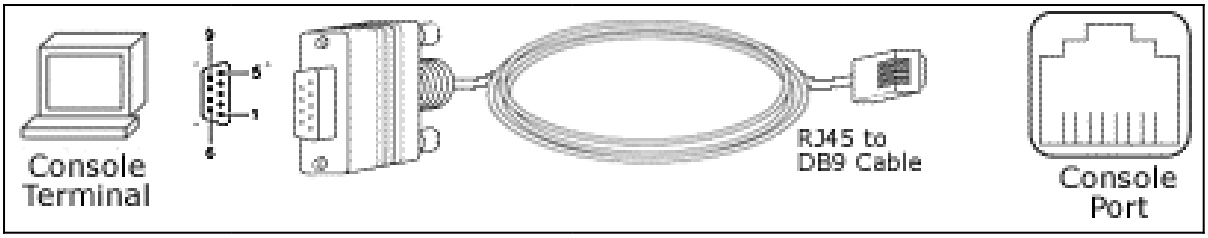
DB9-RJRT Adapter-Rolled Over RJ-45 Cable

DB-25 DCE	RJ-45 Rolled	DB-9 / DB-25	RJ-45-to-DB-25
			

DB-25 DCE	DB-25	None	None
			

DB-25 DCE, DB-25, None, None

RJ-45	RJ-45-to-DB-9	None	None



- 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 non-modem	TERMINAL
AUX / Console	Rolled	DTE	TERMINAL
AUX / Console	Rolled	DCE modem	MODEM
AUX / Console	RJ-45-to-DB9	None	TERMINAL

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
 *RJ-45-to-RJ-45 Console Cable*	 DB-25-to-RJ-45 modem cable adapter *RJ-45-to-DB-25 Adapter*	 DB-9-to-RJ-45 console 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	Catalog Description	Label	Shielded?

	Number			
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. Again, you need shielded cables in order to run at 115.2 kbps.

Related Information

- **Cisco Technical Support & Downloads**