Cisco – Cabling Guide for Console and AUX Ports

Table of Contents

Cabling Guide for Console and AUX Ports

Introduction

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 will need both an RJ−45 cable and an RJ−45−to−DB−25 or RJ−45−to−DB−9 connector. The following table describes the Cisco router series and corresponding console and AUX ports.

Table of Routers with 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

Cisco − Cabling Guide for Console and AUX Ports

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 follows:

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

*Dependant on the router.
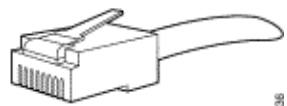
Types of Console and AUX Connectors

As described in the following table, Cisco routers have three types of console and AUX connectors:

- RJ−45
- DB−25 DCE
- DB−25 DTE

There are three styles of RJ−45−to−DB−25 connectors: DCE style (modem), DTE style, and DCE style (non modem). Each one has a different role. Generally, DTE is for terminals, DCE (modem) is for modems, and DCE (non−modem) is obsolete.

Note: You can change a DCE style (non modem) to a DCE style (modem) by moving pin 6 to pin 8.

Console and AUX Connectors for Cisco Routers

RJ−45	87654321 RJ-45 connector
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 the following types of RJ−45 cables:

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

Cisco does not provide these cables; they are widely available from other sources. Console cable is usually provided with the Console Cable Kit.
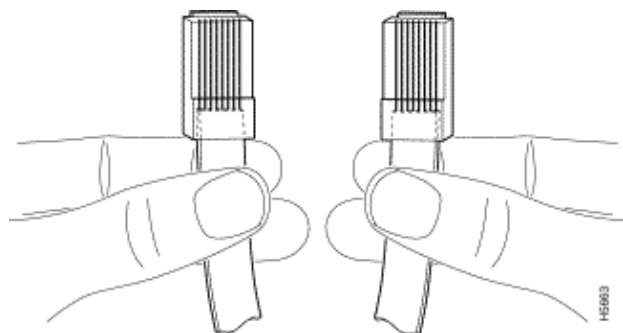
Note: The console port does not support modem control or hardware flow control.

RJ−45 Cable

RJ-45 connector
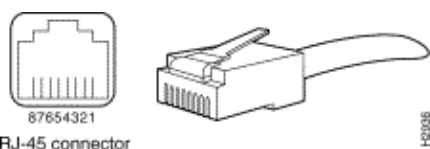
How to Identify an RJ−45 Cable

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 in the following figure.

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

Examine the sequence of colored wires to determine the type of RJ−45 cable, as follows:

Straight−through Cabling

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

Straight−through Cable
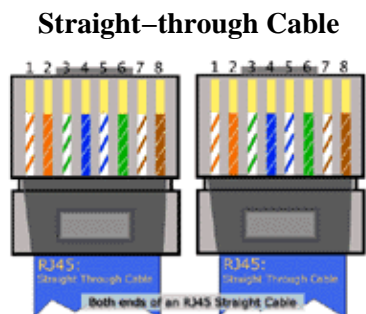
Zoom In

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

Signal	Pin	Pin	Signal
Tx+	1	1	Tx+
Tx−	2	2	Tx−
Rx+	3	3	Rx+

Cisco − Cabling Guide for Console and AUX Ports

–	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.
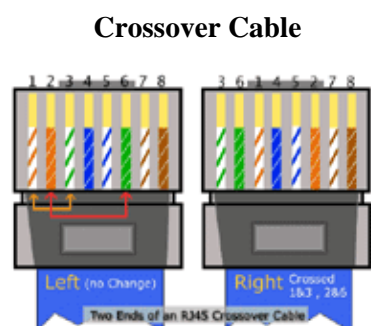
Crossover Cable

Zoom In

RJ–45 Crossover (Ethernet) Cable Pin–outs

Signal	Pin	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

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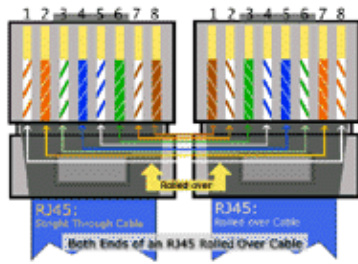
Zoom In

RJ−45 Rolled (Console) Cable Pin−outs

Signal	Pin	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 is providing this cable with its 600, 800, 1600 and 1700 series routers.

Type of Cable for DB−25 Connectors
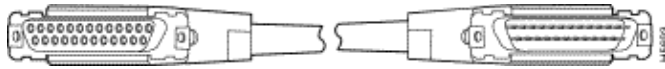
RS 232 Straight−through Cable

The following illustration shows serial cable CAB−R23= (part number 74−0173), which is a general serial cable for all router platforms. 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,

Cisco − Cabling Guide for Console and AUX Ports

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.

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

DTE: Male DB−25   DCE: Female DB−25

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

There are two types of adapters needed 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

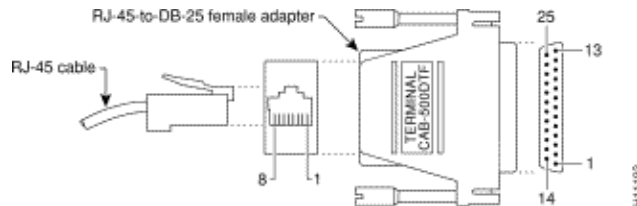This adapter connects a router to a PC though a COM port.

RJ−45−to−DB−9 Adapter
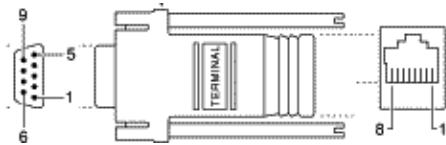
RJ−45−to−DB−25 Adapter

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

RJ−45−to−DB−25 Adapter

Cabling and Adapter Setups that Work

Below 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
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 is providing this cable with its Cisco 600, 800, 1600 and 1700 series routers.
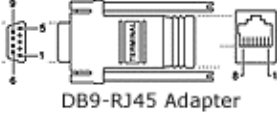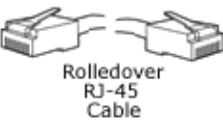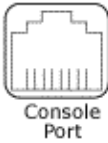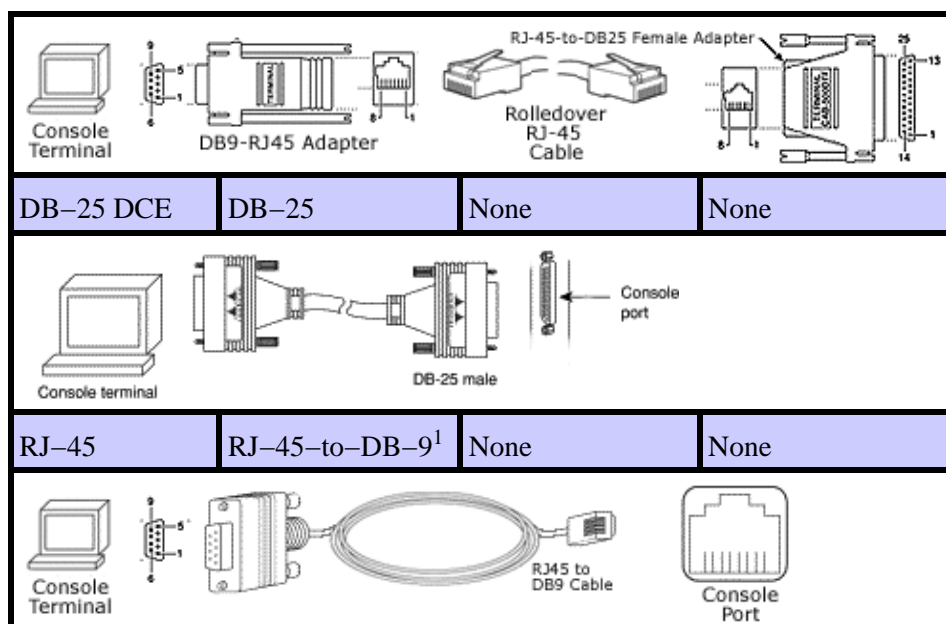
You can't mix and match these components randomly. Only the following combinations work:

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 don't have the components you need, use the RJ–45 Component Guide chart to order them.

RJ–45 Port and Adapter Pin–outs

The following 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

Cisco – Cabling Guide for Console and AUX Ports

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	6	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

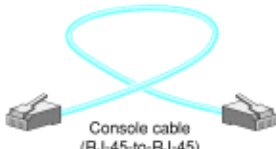| Pin	Signal	Direction	Description
2	TxD	––>	Transmit Data
3	RxD	<––	Receive Data
4	RTS	––>	Request To Send (used for hardware control)
5	CTS	<––	Clear To Send (used for hardware flow control)
6	DSR	<––	Data Set Ready
7	Signal Ground	–	Carrier Detect (used for modem control)
8	CD	<––	Data Terminal Ready (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 connecting 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)

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's RJ–45 Component Guide

The following chart summarizes Cisco's RJ–45 components. 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.

RJ–45 Component Guide

Style	Catalog Part Number	Catalog Description	Label	Shielded?
DTE	CAB–500DTF=	DB–25 CONNECTOR, DTE FEMALE	29–0810–01/29–DTF–01	no
DTE	CAB–500DTM=	DB–25 CONNECTOR, DTE MALE	29–0811–01/29–DTM–01	no
modem	CAB–25AS–MMOD=	CABLE CONN–MODEM TO RJ45 SHLD	74–0458–01/MODEM	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–01	no
NA	Rolled Cable	CABASY,RJ45 ROLLED, MODULAR	72–0876–01/CAB–500RJ	NA

Cisco – Cabling Guide for Console and AUX Ports

NA	Straight Cable	–not in catalog–	31–0756–01	NA
Cable for DB–25/DB–9 Connection				
NA	Depend 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	Depend on the router*	DB–9 Male to DB–25 male for Modem connection	29–4043–01	NA

Related Information

- **General Cabling Technical Tips**
- **TAC Top Issues**