

Cisco – 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 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 | N/A | N/A |

| | | | | |
|-------------|---------------------------|---|-------------------------------|---|
| | | DB-9 Female | | |
| 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 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

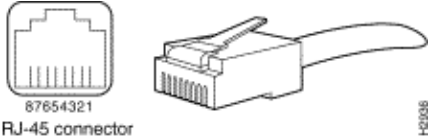


As described in the following [table](#), Cisco routers have three types of console and AUX connectors:

- 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 |  <p>87654321 RJ-45 connector</p> |
| DB-25 DCE |  <p>Connector DB25 - DCE Cable end DB25 - DTE Console Cable Connection</p> |
| DB-25 DTE |  <p>Connector DB25 - DTE Cable end DB25 - DCE AUX Cable Connection</p> |

Cabling for console and AUX port:

- [RJ-45 Cables](#)
- [RS 232 Straight-through Cable](#)

Types of RJ-45 Cabling

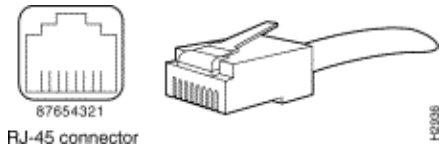
Cisco products use the following types of RJ-45 cables:

- [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](#).

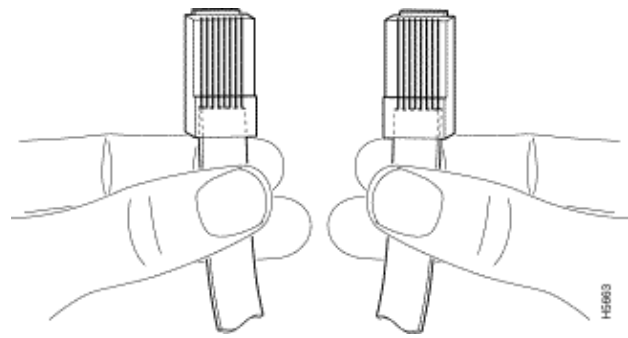
Note: The console port does not support modem control or hardware flow control.

RJ-45 Cable



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.

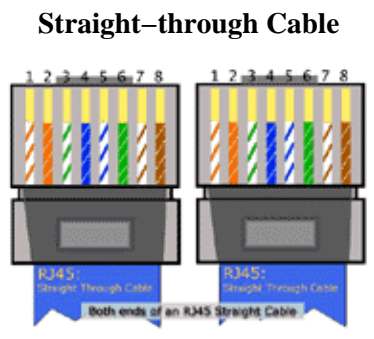


There are three types of commonly used RJ-45 cabling: straight, cross and rolled. If you hold the two ends of an RJ-45 cable side by side, you'll see eight colored strips, or pins, at each end. If the order of the colored pins is the same at each end, then the cable is straight. If the order of the colors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



[Zoom In](#)

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

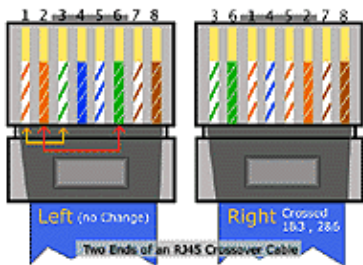
| | | | |
|--------|-----|-----|--------|
| Signal | Pin | Pin | Signal |
|--------|-----|-----|--------|

| | | | |
|-----|---|---|-----|
| Tx+ | 1 | 1 | Tx+ |
| Tx- | 2 | 2 | Tx- |
| Rx+ | 3 | 3 | Rx+ |
| - | 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](#)

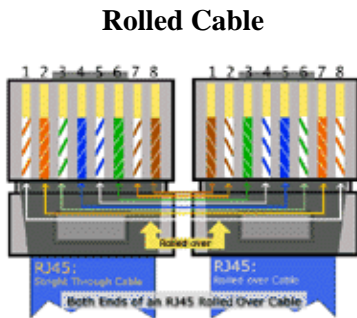
RJ-45 Crossover (Ethernet) Cable Pin-outs

| 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.



[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**.

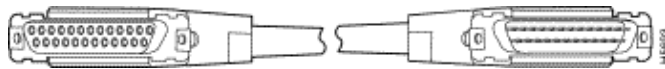
*Cisco is providing this cable with its 600, 800, 1600 and 1700 series routers.

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

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

Adapters

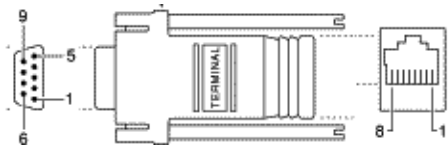
There are two types of adapters needed to connect a PC to a router.

- 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 through a COM port.

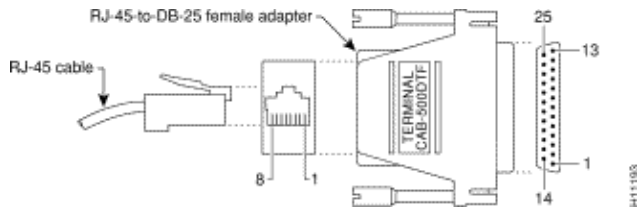
RJ-45-to-DB-9 Adapter



RJ-45-to-DB-25 Adapter

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

RJ-45-to-DB-25 Adapter

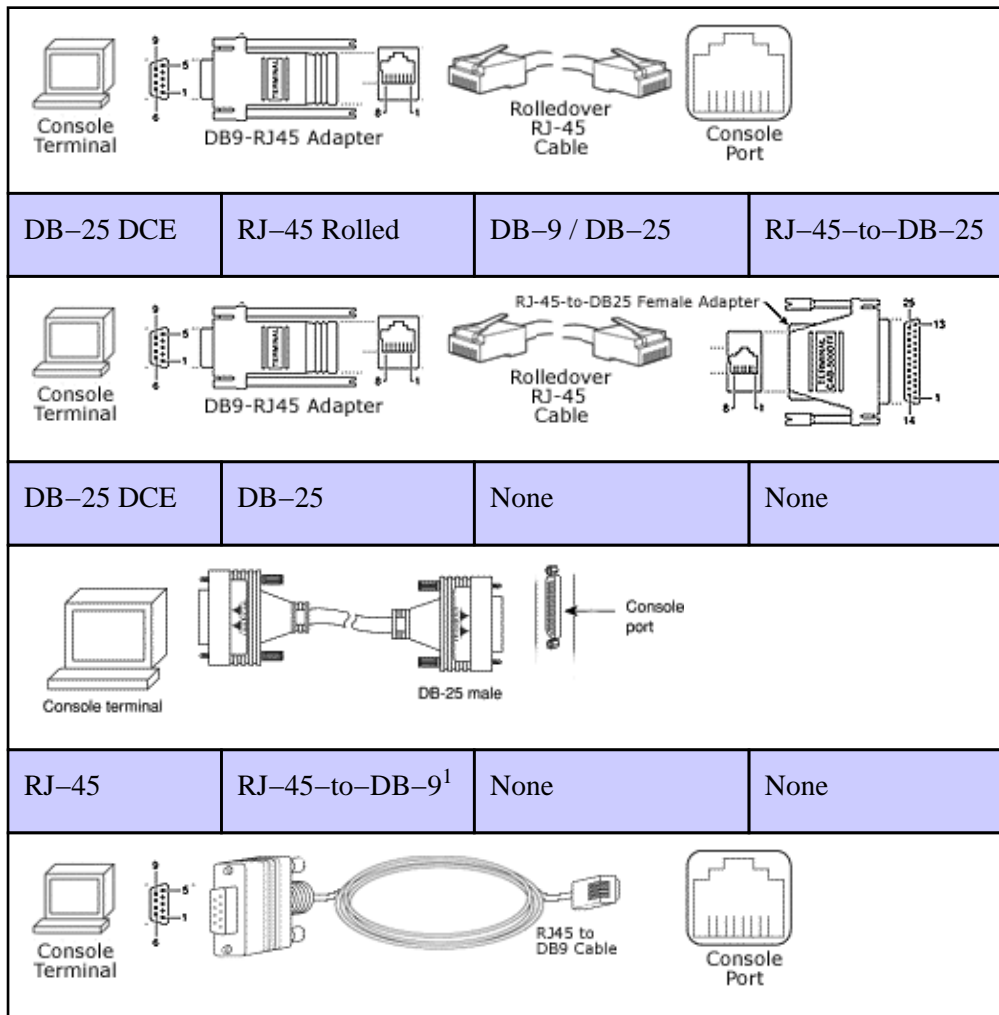


Cabling and Adapter Setups that Work

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 |



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 |
| | RJ-45-to-DB9 | None | TERMINAL |

| | | | |
|---------------|--|--|--|
| AUX / Console | | | |
|---------------|--|--|--|

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 |
| 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 |
| 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](#)

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