

Cabling Specifications

This appendix provides the following cable assembly illustrations and pinout descriptions for constructing your own cables:

- RS-232 console cable
- RS-232 auxiliary cable
- Serial DTE and DCE RS-232 cables
- Serial DTE and DCE RS-449 cables
- Serial DTE and DCE V.35 cables
- Serial DTE and DCE X.21 cables
- Serial DTE EIA-530 cable
- Ethernet (AUI) cable
- RJ-45 (10BaseT) cable
- Token Ring port

The cables available from Cisco meet FCC part 15J Class A requirements and Verband Deutscher Elektrotechniker (VDE) 0871 Limit B levels. When constructing your own cables, refer to the appropriate documentation regarding interference considerations and cable length limitations.

Making Your Own Cables

When assembling a cable, follow these steps:

- Step 1** Fold back the braided shield to make electrical and mechanical connection with the metal shell on both ends.
- Step 2** Cut unterminated wires back. Insulate or ensure insulation from other conductors.
- Step 3** Use the following illustrations and connection tables as a guide to making your own cables.
- When assembling an RS-232 console cable, refer to Table A-1.
 - When assembling an RS-232 auxiliary cable, refer to Table A-2.
 - When assembling an RS-232 cable, refer to Figure A-1, Table A-3, and Table A-4.
 - When assembling an RS-449 cable, refer to Figure A-2, Table A-5, and Table A-6.
 - When Assembling a V.35 cable, refer to Figure A-3, Table A-7, and Table A-8.
 - When assembling an X.21 cable, refer to Figure A-4, Table A-9, and Table A-10.

- When assembling an EIA-530 cable, refer to Figure A-5 and Table A-11.
- When assembling an Ethernet (AUI) cable, refer to Figure A-6 and Table A-12.
- For RJ-45 connector pinout, refer to Figure A-7 and Table A-13.
- For the Token Ring cable pinout, refer to Table A-14.

RS-232 Console and Auxiliary Port Signals and Pinouts

Refer to Table A-1 when assembling an RS-232 console cable and to Table A-2 when assembling an RS-232 auxiliary cable.

Table A-1 Console Port RS-232 Pinouts and Signals (DCE 25-Pin D-Sub Connector)

Pin 1	Signal Name	Direction
1	Frame Ground	–
2	Transmitted Data	Input
3	Received Data	Output
4	Request To Send	Looped to Clear To Send
5	Clear To Send	–
6	Connected to Pin 8	Output
7	Signal Ground	–
8	Carrier Detect	Output
15	Transmit Clock	Output
17	Connected to Pin 15	Output
20	Data Terminal Ready	Input

1. Any pin not referenced on a connector is not connected.

Table A-2 Auxiliary Port RS-232 Signals (DTE 25-Pin D-Sub Connector)

Pin ¹	Signal Name	Direction
1	Frame Ground	–
2	Transmitted Data	Output
3	Received Data	Input
4	Request To Send	Output
5	Clear To Send	Input
7	Signal Ground	–
8	Carrier Detect	Input
15	Transmit Clock	Input
17	Connected to Pin 15	Input
20	Data Terminal Ready	Output

1. Any pin not referenced on a connector is not connected.

Serial Cable Pinouts

The following figures and tables provide the pinouts for the RS-232, RS-449, V.35, and X.21 DTE and DCE cables and for the EIA-530 DTE cable.

RS-232 Cable Assembly

Table A-2 shows the RS-232 cable assembly. Table A-3 lists the DTE pinout, and Table A-4 lists the DCE pinout.

Figure A-1 RS-232 Cable Assembly

Table A-3 RS-232 DTE Serial Cable Pinout

72-0670-01 Connections ¹		
50 Pin	25 Pin	Type
J1-3	J1-36	
J1-39	J2-5	Twisted Pair
J1-40	J2-4	
J1-9	J2-8	Twisted Pair
J1-42	J2-6	
J1-11	J2-2	Twisted Pair
J1-44	J2-7	
J1-46	J2-3	Twisted Pair
J1-30	J2-20	

72-0670-01 Connections¹

50 Pin	25 Pin	Type
J1- 14	J2- 18	Twisted Pair
J1- 47	J2- 17	
J1- 31	J2- 15	Twisted Pair
J1- 15	J2-1	
J1- 16	J2- 24	Twisted Pair

1. Any pin not referenced on a connector is not connected.

Table A-4 RS-232 DCE Serial Cable Pinout**72-0736-01 Connections¹**

50 Pin	25 Pin	Signal	Type
J1-3	J1- 36	MUX	
J1- 47	J2- 24	SCTE DCE	Twisted Pair
J1- 17	J1- 38		
J1- 40	J2-5 J2-4	CTS RTS	Twisted Pair
J1- 39			
J1- 14	J2-8 J2-6	DCD DSR	Twisted Pair
J1- 30			
J1- 46	J2-2 J2-7	TXD GND	Twisted Pair
J1- 44			
J1-11 J1- 42	J2-3 J2- 20	RXD DTR	Twisted Pair
J1-9 J1- 23	J2- 18 J2- 17	LTST RXC	Twisted Pair
J1- 16 J1- 15	J2- 15 J2-1	TXC Chassis Ground	Twisted Pair

1. Any pin not referenced on a connector is not connected.

RS-449 Cable Assembly

Figure A-2 shows the RS-449 cable assembly. Table A-5 lists the DTE pinouts, and Table A-6 lists the DTE pinouts and signal descriptions.

Figure A-2 RS-449 Cable Assembly

Table A-5 RS-449 DTE Serial Cable Pinout

72-0672-01 Connection Table		
50 Pin ¹	37 Pin	Type
J1-5	J1-38	
J1-7	J2-10	
J1-1	J2-4	Twisted Pair
J1-34	J2-22	
J1-2	J2-5	Twisted Pair
J1-18	J2-23	
J1-35	J2-6	Twisted Pair
J1-19	J2-24	
J1-4	J2-7	Twisted Pair
J1-20	J2-25	

72-0672-01 Connection Table

50 Pin ¹	37 Pin	Type
J1-37 J1-21	J2-8 J2-26	Twisted Pair
J1-22 J1-6	J2-27 J2-9	Twisted Pair
J1-8 J1-24	J2-11 J2-29	Twisted Pair
J1-41 J1-25	J2-12 J2-30	Twisted Pair
J1-10 J1-26	J2-13 J2-31	Twisted Pair
J1-43 J1-27	J2-17 J2-35	Twisted Pair
J1-36 J1-15	J2-19 J2-1	Twisted Pair
J1-44 J1-48	J2-37 J2-20	Twisted Pair

1. Any pin not referenced on a connector is not connected.

Table A-6 RS-449 DCE Serial Cable Pinout Descriptions**72-0738-01 Connection Table**

50 Pin ¹	37 Pin	Type	Signal Name
J1-5	J1-38		MUX
J1-13	J2-10		LL
J1-35 J1-19	J2-4 J2-22	Twisted Pair	TXD+ TXD-
J1-43 J1-27	J2-5 J2-23	Twisted Pair	SCT+ SCT-
J1-1 J1-34	J2-6 J2-24	Twisted Pair	RXD+ RXD-
J1-6 J1-22	J2-7 J2-25	Twisted Pair	RTS+ RTS-

72-0738-01 Connection Table			
50 Pin¹	37 Pin	Type	Signal Name
J1-49	J2-8	Twisted Pair	SCR+
J1-50	J2-26		SCR-
J1-17	J1-44		DCE
J1-20	J2-27	Twisted Pair	CTS-
J1-4	J2-9		CTS+
J1-41	J2-11	Twisted Pair	DSR+
J1-25	J2-29		DSR-
J1-8	J2-12	Twisted Pair	DTR+
J1-24	J2-30		DTR-
J1-10	J2-13	Twisted Pair	RLSD+
J1-26	J2-31		RLSD-
J1-37	J2-17	Twisted Pair	SCTE+
J1-21	J2-35		SCTE-
J1-36	J2-19	Twisted Pair	Ground
J1-15	J2-1		Chassis Ground
J1-44	J2-37	Twisted Pair	Ground
J1-48	J2-20		Ground

1. Any pin not referenced on a connector is not connected.

V.35 Cable Assembly

Figure A-3 shows the V.35 cable assembly with the resistor (301 ohms, 1/4 watt, 1%), and Table A-7 and Table A-8 list the DTE and DCE pinouts.

Figure A-3 V.35 Cable Assembly

Table A-7 V.35 DTE Serial Cable Pinout**72-0671-02 Connections**

50 Pin ¹	34 Pin	Type	Signal	Direction
J1-3	J1-36	Jumper	MUX	To Ground
J1-5	J1-38	Jumper	MUX	To Ground
J1-14 J1- Shield	J2-K J2- Shield	Twisted Pair	LTST Not Used	→
J1-2 J1-18	J2-Y J2-AA	Twisted Pair	SCT+ SCT-	←
J1-12 J1-28	J2-P J2-S	Twisted Pair	TXD+ TXD-	→
J1-35 J1-19	J2-R J2-T	Twisted Pair	RXD+ RXD-	←
J1-37 J1-21	J2-V J2-X	Twisted Pair	SCR+ SCR-	←
J1-45 J1-29	J2-U J2-W	Twisted Pair	SCTE+ SCTE-	→
J1-42 J1- Shield	J2-E J2- Shield	Twisted Pair	DSR Not Used	←
J1-9 J1-48	J2-F J2-A	Twisted Pair	RLSD Ground	←
J1-40 J1- Shield	J2-C J2- Shield	Twisted Pair	RTS Not Used	→
J1-2 J1-18	J1-3 J1-5	Resistor Resistor	SCT+ SCT-	R To Ground
J1-35 J1-19	J1-36 J1-38	Resistor Resistor	RXD+ RXD-	R To Ground
J1-37 J1-21	J1-44 J1-48	Resistor Resistor	SCR+ SCR-	R To Ground
J1-30 J1-44	J2-H J2-B	Twisted Pair	DTR Ground	→
J1-39 J1- Shield	J2-D J2- Shield	Twisted Pair	CTS Not Used	→
J1- Shield J1- Shield	J2- Shield J2- Shield	Twisted Pair	Not Used Not Used	
J1- Shield	J2- Shield	Single	Not Used	

1. Any pin not referenced on a connector is not connected.

Table A-8 V.35 DCE Serial Cable Pinout**72-0740-02 Connections**

50 Pin ¹	34 Pin	Type	Signal Name	Direction
J1-3	J1-36	Jumper	MUX	To Ground
J1-5	J1-38	Jumper	MUX	To Ground
J1-9 J1- Shield	J2-K J2- Shield	Twisted Pair	LTST	←
J1-45 J1-29	J2-Y J2-AA	Twisted Pair	SCT+ SCT-	→ →
J1-35 J1-19	J2-P J2-S	Twisted Pair	TXD+ TXD-	← ←
J1-12 J1-28	J2-R J2-T	Twisted Pair	RXD + RXD-	→ →
J1-32 J1-33	J2-V J2-X	Twisted Pair	SCR+ SCR-	→ →
J1-37 J1-21	J2-U J2-W	Twisted Pair	SCTE+ SCTE-	← ←
J1-30 J1- Shield	J2-E J2- Shield	Twisted Pair	DSR	→
J1-14 J1-48	J2-F J2-A	Twisted Pair	RLSD Ground	→ →
J1-39 J1- Shield	J2-C J2- Shield	Twisted Pair	RTS Not Used	←
J1-17	J1-5	Jumper	DCE Mode	To Ground
J1- Shield	J2- Shield	Single	Not Used	
J1-35 ² J1-19	J1-36 J1-38	Resistor Resistor	TXD+ TXD-	R To Ground
J1-37 J1-21	J1-44 J1-48	Resistor Resistor	SCTE+ SCTE-	R To Ground
J1-42 J1-44	J2-H J2-B	Twisted Pair	DTR Ground	← ←
J1-40 J1- Shield	J2-D J2- Shield	Twisted Pair	CTS Not Used	→
J1- Shield J1- Shield	J2- Shield J2- Shield	Twisted Pair		

1. Any pin not referenced on a connector is not connected.

2. See Figure A-3. Resistor = 301 ohms, 1/4W, 1%.

X.21 Cable Assembly

Figure A-4 shows the X.21 cable assembly. Table A-9 and Table A-10 list DTE and DCE pinouts.

Figure A-4 X.21 Cable Assembly

Table A-9 X.21 DTE Serial Cable Pinout

72-0683-02 Connections ¹				
From	Signal	Type	To	Signal
J1-5	MUX SEL		J1-38	GND
J1-36	449 GND		J2-8	X.21 GND
J1-41 J1-25	449 DTR	Jumper	J1-6 J1-22	449 CTS
J1-41 J1-25	449 DTR	Jumper	J1-8 J1-24	449 DSR
J1-43 J1-27	449 SCTE	Jumper	J1-37 J1-21	449 SCR
J1-1 J1-34	449 TXD	Twisted Pair	J2-2 J2-9	X.21 TXD
J1-4 J1-20	449 RTS	Twisted Pair	J2-3 J2-10	X.21 CTL

72-0683-02 Connections ¹				
From	Signal	Type	To	Signal
J1-35 J1-19	449 RXD	Twisted Pair	J2-4 J2-11	X.21 RXD
J1-10 J1-26	449 RLSD	Twisted Pair	J2-5 J2-12	X.21 IND
J1-2 J1-18	449 SCT	Twisted Pair	J2-6 J2-13	X.21 CLK

1. Any pin not referenced on a connector is not connected.

Table A-10 X.21 DCE Serial Cable Pinout

72-0737-01 Connections ¹				
From	Signal	Type	To	Signal
J1-5	MUX SEL		J1-38	GND
J1-36	449 GND		J2-8	X.21 GND
J1-41 J1-25	449 DSR	Jumper	J1-8 J1-24	449 DTR
J1-35 J1-19	449 TXD	Twisted Pair	J2-2 J2-9	X.21 TXD
J1-6 J1-22	449-RTS	Twisted Pair	J2-3 J2-10	X.21 CTL
J1-1 J1-34	449 RXD	Twisted Pair	J2-4 J2-11	X.21 RXD
J1-10 J1-26	449 RLSD	Twisted Pair	J2-5 J2-12	X.21 IND
J1-43 J1-27	449 SCT	Twisted Pair	J2-6 J2-13	X.21 CLK
J1-17	DCE SEL		J1-44	
J1-15	Chassis GND		J2-1	

1. Any pin not referenced on a connector is not connected.

EIA-530 Cable Assembly

Figure A-5 shows the EIA-530 cable assembly, and Table A-11 lists the EIA-530 DTE serial cable pinout.

Figure A-5 EIA-530 Cable Assembly

Table A-11 EIA-530 DTE Serial Cable Pinout

72-0732-01 Connections				
50 Pin ¹	Signal Name	Direction	25 Pin	Type
J1-5 J1-38	Looped		NC	Jumper
J1-1 J1-34	TXD + TXD -	→	J2-2 J2-14	Twisted Pair
J1-35 J1-19	RXD + RXD -	←	J2-3 J2-16	Twisted Pair
J1-4 J1-20	RTS + RTS -	→	J2-4 J2-19	Twisted Pair
J1-6 J1-22	CTS + CTS -	←	J2-5 J2-13	Twisted Pair
J1-10 J1-26	RLSD + (RR+) RLSD - (RR-)	←	J2-8 J2-10	Twisted Pair
J1-2 J1-18	SCT + SCT -	←	J2-15 J2-12	Twisted Pair

72-0732-01 Connections				
50 Pin¹	Signal Name	Direction	25 Pin	Type
J1-37	SCR +	←	J2-17	Twisted Pair
J1-21	SCR -	←	J2-9	
J1-43	SCTE + (TT+)	←	J2-24	Twisted Pair
J1-27	SCTE - (TT-)	←	J2-11	
J1-7	LL	→	J2-18	Twisted Pair
J1-48	Ground		J2-23	Twisted Pair
J1-36			J2-7	
J1-15	Shield		J2-1	Single Wire
J1-8	DCE Ready	←	J2-6	Twisted Pair
J1-24	Ground		J2-23	
J1-41	DTE Ready	→	J2-20	Twisted Pair

1. Any pin not referenced on a connector is not connected.

Ethernet Cable Pinouts

The following figures and tables provide the pinouts and signal descriptions for the Ethernet (AUI) cable and RJ-45 connector.

Ethernet (AUI) Cable Pinouts

Figure A-6 shows the Ethernet (AUI) cable assembly, and Table A-12 lists the pinout.

Figure A-6 Ethernet (AUI) Cable Assembly

Table A-12 Ethernet (AUI) Pinouts and Signal Descriptions

Pin ¹	Ethernet Circuit	Signal Name
3	DO-A	Data Out Circuit A
10	DO-B	Data Out Circuit B
11	DO-S	Data Out Circuit Shield
5	DI-A	Data In Circuit A
12	DI-B	Data In Circuit B
4	DI-S	Data In Circuit Shield p
7	CO-A	Control Out Circuit A (not connected)
15	CO-B	Control Out Circuit B (not connected)
8	CO-S	Control Out Circuit Shield (not connected)
2	CI-A	Control In Circuit A
9	CI-B	Control In Circuit B
1	CI-S	Control In Circuit Shield
6	VC	Voltage Common
13	VP	Voltage Plus
14	VS	Voltage Shield (L25 and M25)
Shel l	PG	Protective Ground

1. Any pin not referenced on a connector is not connected.

RJ-45 Connector Pinouts

Figure A-7 shows the RJ-45 (10BaseT) connector, and Table A-13 lists the pinout.

Figure A-7 RJ-45 (10BaseT) Connector

Table A-13 RJ-45 Connector Pinout

Pin	Description
1	TX+
2	TX-
3	RX+
4	—
5	—
6	RX-
7	—
8	—

1. Any pin not referenced on a connector is not connected.

Token Ring Port Pinout

Table A-14 shows the Token Ring network processor module port pinout:

Table A-14 Token Ring Port Pinout (DB-9)

9-Pin	Signal
1	–RX
2	NC ¹
3	NC
4	NC
5	–TX
6	+RX
7	NC
8	NC
9	+TX

1. NC stands for *not connected*.