



Control Cable User Guide



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Getting Started

Overview

This document describes how to build cables for Comtrol products.

This chapter describes the standard Comtrol cables and the basic types of devices that can connect to Comtrol products. It also explains the difference between shielded and unshielded cables. This chapter covers the following topics:

- [RS-422 Pinouts](#)
- [Standard Comtrol Cables](#)
- [DTE versus DCE](#)
- [Shielded vs. Unshielded](#)

RS-422 Pinouts

RS-422 pinouts are not the same across Comtrol product lines. For example, a DB9 loopback plug designed for a RocketPort model will not work on a DeviceMaster model. When you build a cable make sure that you use the correct pinouts for the Comtrol product. The following sections describes the valid pinouts and cabling for each product:

- [Building Cables for RocketPort Products](#)
- [Building Cables for DeviceMaster Products](#)

Standard Comtrol Cables

The following table displays standard cables for RocketPort products.

Comtrol Product	Cable Type	Connector Type	Part Number		Cable Length	
			New Part Number	Old Part Number	Feet	Meters
RocketPort 4,8,16-port ISA/PCI, and 8 port uPCI cables	Interface Cable	DB25 to DB25	4000025	23601A	3'	0.91
RocketPort Rackmount Cables	Interface Cable	DB25 to DB25	4000027	23607A	10'	3.05
RocketPort ISA 32-port, PCI, uPCI 16/32-port, CPCI 16-port cables	Interface Cable	DB25 to DB26	4000030	23701A	3' ^a	0.91
	Octacable	DB25 male	4000032	23801-0	3.5'	1.06
	Octacable	DB9 male	4000033	23901-7	3.5'	1.06
	Quadcable	DB25 male	4000034	N/A	3.5'	1.06
	Quadcable	DB9 male	4000035	N/A	3.5'	1.06
	Octacable	RJ45	4000036	N/A	10"	0.25

a. This is a 3 foot cable. If necessary, you can connect a 10 foot DB25 to DB25 cable to extend the length of the cable.

DTE versus DCE

Most devices, except modems, are Data Terminal Equipment (DTE) devices. Modems are Data Communication Equipment (DCE) devices. Control ports are configured as DTE.

How you build a cable depends on which device you are connecting to (DTE or DCE). For example, you need a null-modem cable to connect the COM ports (com1 or com2) on the computer or the DeviceMaster ports to printers, terminals, bar code readers or DNC equipment. If you are connecting a DTE device to a DCE device you need a straight-through modem cable.

- **Straight-through cable (DTE to DCE)** - Connects TxD to TxD and RxD to RxD.
- **Null-modem cable (DTE to DTE)** - Connect TxD to RxD and RxD to TxD.

RS-232 DTE to DCE

This topic describes how to build a straight-through cable. Use a straight-through cable to connect to a DCE device.

Straight-Through Cables

The following figure shows the most common types of DTE to DCE cables. This cable configuration works with most modems and is generally called a modem cable.

Note: If you have a DTE to DCE interface but are uncertain as to which signals are required, you can use a full 25-wire cable. The 25-wire cable is constructed as shown in the following cable example, but the remaining pins are not used.

RocketPort Connector					Customer DCE Connector			
Signal Name	DB25 Pins	RJ45 Pins	RJ11 Pins	DB9 Pins	DB9 Pins	DB25 Pins	Signal Name	
TxD	2	4	3	3	→	3	2	TxD
RxD	3	5	4	2	←	2	3	RxD
RTS	4	1	N/A	7	→	7	4	RTS
CTS	5	8	N/A	8	←	8	5	CTS
DSR	6	7	N/A	6	←	6	6	DSR
GND	7	3	2	5	→	5	7	GND
DCD	8	6	5	1	←	1	8	DCD
DTR	20	2	1	4	→	4	20	DTR

RS-232 DTE to DTE

This topic describes how to build a null-modem cable for connecting to a DTE device.

Null-Modem Cables

If you need RTS-CTS/DTR-DSR hardware flow control, you can use the pinouts provided in the following example.

Note: If the wiring on the peripheral device differs from the one shown below, adjust the pinouts accordingly. Refer to the manufacturer's installation document if you need help with connector pinouts or cabling for the peripheral device.

RocketPort Connector					Customer DTE Connector			
Signal Name	DB25 Pins	RJ45 Pins	RJ11 Pins	DB9 Pins	DB9 Pins	DB25 Pins	Signal Name	
TxD	2	4	3	3	→	2	3	RxD
RxD	3	5	4	2	←	3	2	TxD
RTS	4	1	N/A	7	→	8	5	CTS
CTS	5	8	N/A	8	←	7	4	RTS
DSR	6	7	N/A	6	←	4	20	DTR
DCD	8	6	5	1	←	1	8	DCD
DTR	20	2	1	4	→	6	6	DSR
GND	7	3	2	5	→	5	7	GND

Data-Only Null-Modem Cables

If no hardware flow is required, use the pinouts in the following figure. If you are using a 3-wire cable and you need control, use software flow control.

RocketPort Connector					Customer DTE Connector		
Signal Name	DB25 Pins	RJ45 Pins	RJ11 Pins	DB9 Pins	DB9 Pins	DB25 Pins	Signal Name
TxD	2	4	3	3	→	2	RxD
RxD	3	5	4	2	←	3	TxD
GND	7	3	2	5	—	5	GND

Control Loopback Cables

Some equipment may not require hardware handshaking. However, they may require that certain control signals are active before sending data.

RocketPort Connector					Customer DTE Connector		
Signal Name	DB25 Pins	RJ45 Pins	RJ11 Pins	DB9 Pins	DB9 Pins	DB25 Pins	Signal Name
TxD	2	4	3	3	→	2	RxD
RxD	3	5	4	2	←	3	TxD
RTS	4	1	N/A	7	→	7	RTS
CTS	5	8	N/A	8	←	8	CTS
DSR	6	7	N/A	6	→	6	DSR
DCD	8	6	5	1	→	1	DCD
DTR	20	2	1	4	→	4	DTR
GND	7	3	2	5	—	5	GND

RS-422 to DTE Cables

Most RS-422 communication links do not use hardware handshaking or signal ground lines. The following figure shows twisted-pair transmission lines.

RocketPort Connector		Customer DTE Connector	
Signal Name	DB25 Pins	Signal Name	DB25 Pins
TxD+	19	RxD+	15
TxD-	25	RxD-	17
RxD+	15	TxD+	19
RxD-	17	TxD-	25
GND	7	GND	7

Shielded vs. Unshielded

If the Control device falls within the limits for a Class A computing device established by the FCC, the serial cables used to connect the Control device to the external devices must be shielded. The cable shield must be connected to the chassis ground at both ends to reduce EMI. If the cable shield is not connected to the chassis ground at both ends, the EMI radiation from your system may exceed the limits allowed for FCC class A equipment. You can use an isolation device if you experience problems with ground loops.

Refer to the statement on electromagnetic compliance in the Control hardware document to determine the FCC class for your Control product.

Building Cables for RocketPort Products

Overview

This chapter describes the cables and pinouts for RocketPort products and covers the following topics:

- [DB9 Serial Cables and Loopback Plugs](#)
- [DB25 Serial Cables and Loopback Plugs](#)
- [RJ11 Serial Cables and Loopback Plugs](#)
- [RJ45 Serial Cables and Loopback Plugs](#)

DB9 Serial Cables and Loopback Plugs

This section describe how to build your own null-modem or straight-through DB9 serial cables.

Requirements

Refer to the manufacturer's installation guide if you need help with connector pinouts or cables for the peripheral device.

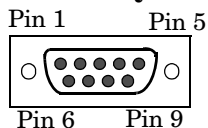
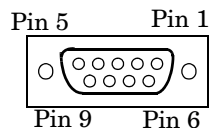
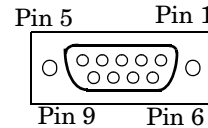
DB9 Pinouts

This topic describes DB9 pinouts for the following RocketPort Products:

- The RocketPort PCI 422 supports RS-422 mode, Quadcable, Octacable, and 8-port box interface equipped with male DB9 connectors.
- The RocketPort Plus Universal PCI 422 supports RS-422 mode, Quadcable, Octacable, an 8-port box interface equipped with male DB9 connectors, and the 8-port SMPTE 207M interface module, which is equipped with female DB9 connectors.
- RocketPort PCI supports RS-232 and RS-422 mode, and Quadcable and Octacable available with DB9 connectors on the fanout cable.
- RocketPort Universal PCI and Rocketport Plus Universal PCI support RS-232 and RS-422 mode.

Note: Ring Indicator (RI) is only supported on Quad/Octacable cards.

The following figures and tables illustrate the signals present on DB9 connectors.

DB9 Male for Quad/Octa**DB9 Female****DB9 Female for SMPTE**

Pinouts for Standard DB9 Connector			
Pin	RS-232 Mode	RS-422 DTE Mode	RS-422 DCE Mode
1	DCD	Not used	Not used
2	RxD	TxD-	RxD-
3	TxD	RxD+	TxD+
4	DTR	Not used	Not used
5	GND	Not used	Not used
6	DSR	Not used	Not used
7	RTS	TxD+	RxD+
8	CTS	RxD-	TxD-
9	RI/Not Used ^a	Frame Ground	Frame Ground/Not Used ^b

- a. RI is only supported on the RocketPort Universal PCI and RocketPort Plus Universal PCI. This pin is not used by the other RocketPort models.
- b. Frame Ground is only supported on the RocketPort PCI 422 and RocketPort Plus Universal PCI 422. This pin is not used by the other RocketPort models.

Pinouts for SMPTE 207M DB9 Female Connector		
Pin	RS-422 DTE Mode	RS-422 DCE Mode
1	Frame Ground	Frame Ground
2	TxD-	RxD-
3	RxD+	TxD+
4	Not used	Not used
5	Not used	Not used
6	Not used	Not used
7	TxD+	RxD+
8	RxD-	RxD-
9	Frame Ground	Frame Ground

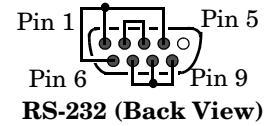
DB9 Loopback Plugs

A *loopback plug* is a DB9 female serial port plug with pins wired together. You can use it with application software (for example, Test Terminal) to test serial ports. This topic describes the following DB9 loopback plugs:

- An RS-232 loopback plug is shipped with the following models: RocketPort PCI, RocketPort Universal PCI and RocketPort ISA.
- An RS-422 loopback plug is shipped with the following models: RocketPort PCI 422, RocketPort Plus PCI 422 and RocketPort Plus Universal PCI 422.

RS-232 Female Loopback Plug

The Quadcable and Octacable use the RS-232 female loopback plug. To build a loopback plug for the Quadcable and Octacable, wire the following pins together:



- Pins 1 to 4 to 6
- Pins 2 to 3
- Pins 7 to 8 to 9

Note: Ring Indicator (RI) is only supported on Quad/Octacable cards.

RS-422 Loopback Plug

To build a DB9 loopback plug, wire the following pins together:

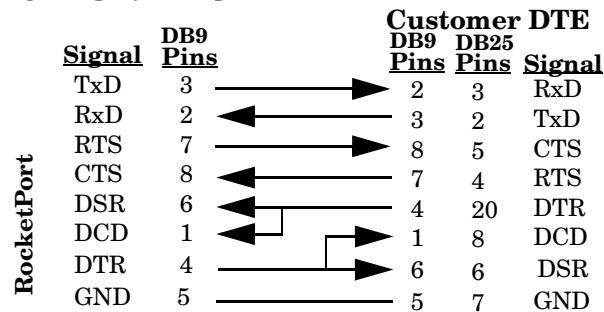
- Pin 2 to 8
- Pin 3 to 7

DB9 Null-Modem Cables

You need a null-modem cable to connect to DTE devices. For example, you can connect one end of a a null-modem cable to COM2 on one computer and the other end of the null-modem cable to COM2 on another computer. All RocketPort models support DB9 null-modem cables.

RS-232 Null-Modem Cable

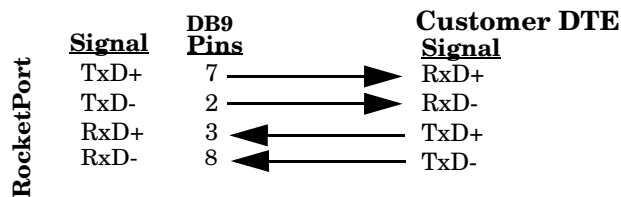
The following image displays the pinouts for an RS-232 null-modem cable.



Note: You can also attach a null-modem adapter to one end of a straight-through cable to create a null-modem cable.

RS-422 Null-Modem Cable

The following image displays the pinouts for an RS-422 null-modem cable.



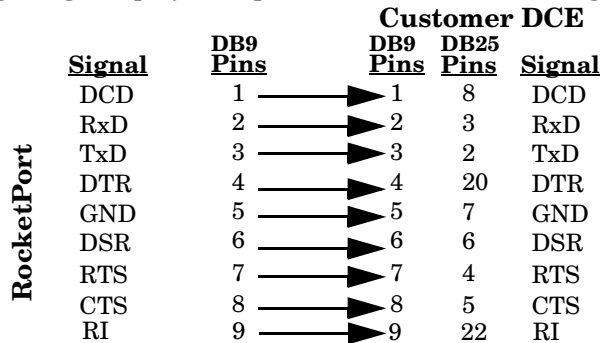
Important: RS-422 pinouts are not standardized. Each peripheral manufacturer uses different pinouts. Please refer to the document for the peripheral device to determine the pinouts for the signals above.

DB9 Straight-Through Cables

Straight-through cables connect modems to other DCE devices. For example, you can connect one end of a straight-through cable to COM2 on one computer and the other end of a straight-through cable to a modem. All RocketPort models support DB9 straight-through cables.

RS-232 Straight-Through Cable

The following image displays the pinouts for an RS-232 straight-through cable.



Note: Ring Indicator (RI) is only supported on Quad/Octacable cards for RocketPort Universal PCI and RocketPort Plus Universal PCI.

DB25 Serial Cables and Loopback Plugs

This section describes DB25 cables and loopback plugs.

Requirements

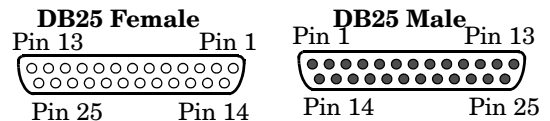
- Refer to the manufacturer’s installation guide if you need help with connector pinouts or cables for the peripheral device.

DB25 Pinouts

This topic describes pinouts for the DB25 interface connectors. The following RocketPort models support DB25 connectors:

- RocketPort PCI
- RocketPort ISA
- RocketPort Universal PCI
- RocketPort Plus Universal PCI

Standard interface modules use female DB25 connectors, while the Surge interface module, Quadcable, and Octacable fanouts use male connectors.



This table shows connector information for DB25 connectors.

Interface Modules ^a			Quad/Octacable ^b
Pin	RS-232 Signal	RS-422 Signal	RS-232 Signal
1	Not used	Not used	Not used
2	TxD	Not used ^c	TxD
3	RxD	Not used ^c	RxD
4	RTS	Not used ^c	RTS
5	CTS	Not used ^c	CTS
6	DSR	Not used ^c	DSR
7	Signal ground	Signal ground ^c	Signal ground
8	DCD	Not used ^c	DCD
9 to 14	Not used	Not used	Not used
15	Not used	RxD+	Not used
16	Not used	Not used	Not used
17	Not used	RxD-	Not used
18	Not used	Not used	Not used
19	Not used	TxD+	Not used
20	DTR	Not used ^c	DTR
21	Not used	Not used	Not used
22	Not used	Not used	RI ^d /Not Used ^e
23-24	Not used	Not used	Not used
25	Not used	TxD-	Not used

- a. The following RocketPort models support interface modules: RocketPort PCI, Rocket, Port Universal PCI and RocketPort Plus Universal PCI.
- b. The following RocketPort models support quad/octacable: RocketPort PCI, RocketPort ISA, RocketPort Universal PCI and RocketPort Plus Universal PCI.
- c. All RS-232 signals are present in RS-422 mode. The quad/octacables do not support RS-422 mode.
- d. RI is only supported on quad/octacable adapters for RocketPort Universal PCI and RocketPort Plus Universal PCI.
- e. This pin is not used by RocketPort PCI and RocketPort ISA.

DB25 Loopback Plugs

A *loopback plug* is a DB25 serial port plug with pins wired together. You can use it with application software (for example, Test Terminal) to test serial ports.

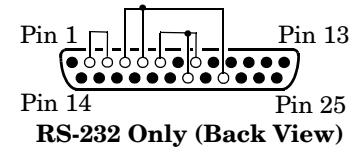
RS-232 Female Loopback Plug

The following RocketPort models support the female loopback plug for RS-232 port:

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort Plus Universal PCI
- RocketPort ISA

Quadcable and Octacable use the RS-232 female loopback plug. To build a DB25 loopback plug for an Quadcable or Octacable, wire the following pins together:

- Pins 2 to 3
- Pins 4 to 5 to 22
- Pins 6 to 8 to 20

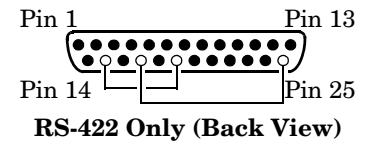
*RS-422 Female Loopback Plug*

The following RocketPort models support the female loopback plug for RS-422 port:

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort ISA

To build a DB25 loopback plug (surge interface model) for an RS-422 serial connection, wire the following pins together:

- Pins 15 to 19
- Pins 17 to 25

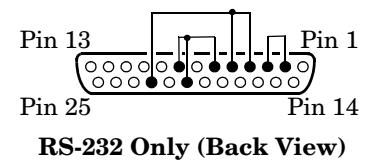
*RS-232 Male Loopback Plug*

The following RocketPort models support the female loopback plug for RS-232 port:

- RocketPort PCI
- RocketPort Universal PCI

This the standard 8 and 16-port DB25 interface modules use the RS-232 male loopback plug. To build a DB25 loopback plug for an RS-232 serial connection, wire the following pins together:

- Pins 2 to 3
- Pins 4 to 5 to 22
- Pins 6 to 8 to 20

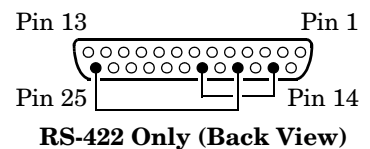
*RS-422 Male Loopback Plug*

The following RocketPort models support the female loopback plug for RS-422 port:

- RocketPort PCI
- RocketPort Universal PCI

To build a DB25 loopback plug for an RS-422 serial connection, wire the following pins together.

- Pins 15 to 19
- Pins 17 to 25



RJ11 Serial Cables and Loopback Plugs

The RocketPort PCI/8J and Universal PCI/8J have eight standard RJ11 modular connectors, located on the controller board mounting bracket. The ports are numbered 0 through 7, with Port 7 being the connector closest to the bus.

The following RocketPort models support the female loopback plug for RS-232 port:

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort ISA

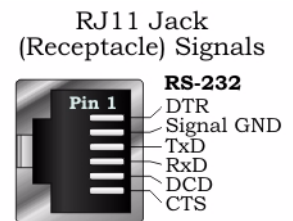
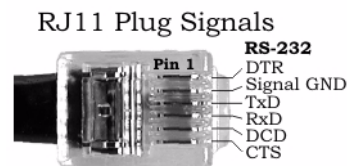
Requirements

There are no standards for the RJ11. Before you build the custom RJ11 serial cable for your terminal equipment or device you should:

- Refer to the manufacturer's installation guide if you need help with connector pinouts or cables for the peripheral device.
- Supported RS-modes are described in the electronic document shipped with your Control device.

RJ11 Pinouts

This topic describes pinouts for the RJ11 interface connector for an RS-232 port. The following figures provide pinout information for the RJ11 jack plug and receptacle



RJ11 Loopback Plugs

A *loopback plug* is an RJ11 serial port plug with pins wired together. You can use it with application software (for example, Test Terminal) to test serial ports.

To build an RJ11 loopback plug, wire these pins together:

- Pins 3 to 4
- Pins 1 to 5 to 6



RJ45 Serial Cables and Loopback Plugs

This section describe how to build your own null-modem or straight-through RJ45 serial cables. The following models have RJ45 connectors:

- **RocketPort PCI:** 4J (4-port RJ45), the Octacable model, and the Rack Mount interface module
- **RocketPort Universal PCI:** Octacable model, the 4J (4-port RJ45) model and the Rack Mount interface module. The ports on the 4J model are numbered 0 to 3 and port 3 is the connector closest to the bus.
- **RocketPort Plus Universal PCI:** Octacable model.

Requirements

There are no standards for the RJ45. Before you build the custom RJ45 serial cable for your terminal equipment or device you should:

- Refer to the manufacturer’s installation guide if you need help with connector pinouts or cables for the peripheral device.
- Supported RS-modes are described in the electronic document shipped with your Control device.

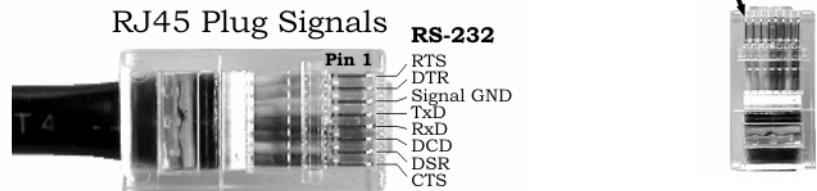
RJ45 Pinouts

RJ45 Pinouts for Octacable Interface Module (RS-232 Port)

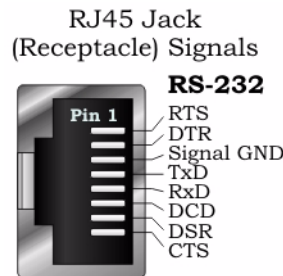
The following RocketPort models support the octacable interface module (RS-232):

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort Plus Universal PCI

The following figures provide pinout information for the RJ45 connectors used on the octacable interface module.



Note: Ring indicator is not supported on the RJ45 connector.



RJ45 Null-Modem Cables

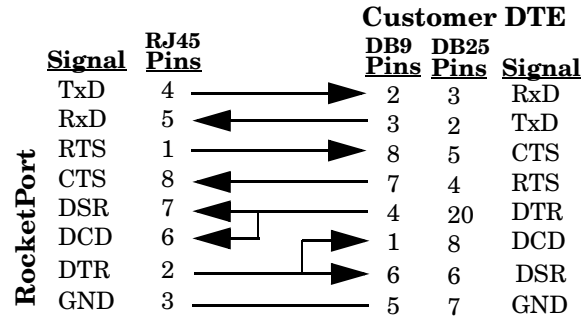
You need a null-modem cable to connect to DTE devices. For example, you can connect one end of a null-modem cable to COM2 on one computer and the other end of the null-modem cable to COM2 on another computer.

RS-232 Null-Modem Cable

The following RocketPort models support RJ45 null-modem cables on RS-232 ports:

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort Plus Universal PCI

The following image displays the pinouts for an RS-232 null-modem cable.



Important: RJ45 pinouts are not standardized. Each peripheral manufacturer uses different pinouts. Please refer to the document for the peripheral device to determine the pinouts for the signals above.

Note: You can also attach a null-modem adapter to one end of a straight-through cable to create a null-modem cable.

RJ45 Straight-Through Cables

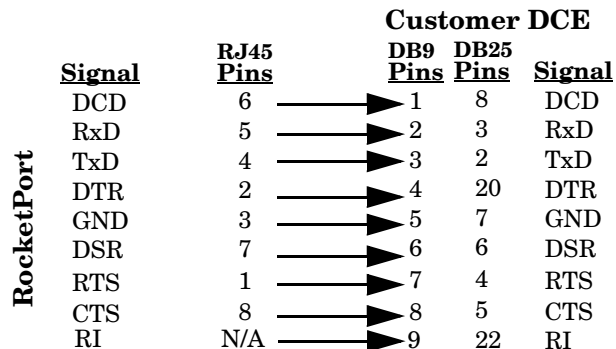
Straight-through cables connect modems to other DCE devices. For example, you can connect one end of a straight-through cable to COM2 on one computer and the other end of the straight-through cable to a modem.

RS-232 Straight-Through Cable

The following RocketPort models support RJ45 straight-through cables on RS-232 ports:

- RocketPort PCI
- RocketPort Universal PCI
- RocketPort Plus Universal PCI

The following image displays the pinouts for an RS-232 straight-through cable.



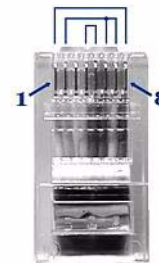
Note: If your RJ45 wiring differs from the one shown above, adjust the RJ45 pinouts accordingly.

RJ45 Loopback Plugs

A *loopback plug* is an RJ45 serial port plug with pins wired together. You can use it with application software (for example, Test Terminal) to test serial ports.

The following RocketPort models support RJ45 loopback plugs:

- **RocketPort PCI:** 4J (4-port RJ45), the Octacable model, and the Rack Mount interface module
- **RocketPort Universal PCI:** Octacable model, the 4J (4-port RJ45) model and the Rack Mount interface module.
- **RocketPort Plus Universal PCI:** Octacable model.
- **RocketPort ISA**



RS-232 Loopback Plug

To build an RJ45 loopback plug, wire the following pins together:

- Pins 4 to 5
- Pins 1 to 8
- Pins 2 to 6 to 7

Note: See the Help distributed in Test Terminal (WCom2.exe) for more information on testing serial ports. Test Terminal is installed when you install PortVision.

Building Cables for DeviceMaster Products

Overview

This chapter describes the cables and pinouts for DeviceMaster products and covers the following topics:

- [DB9 Serial Cables and Loopback Plugs](#)
- [RJ45 Serial Cables and Loopback Plugs](#)

DB9 Serial Cables and Loopback Plugs

This section describe how to build your own null-modem or straight-through DB9 serial cables and loopback plugs.

The following DeviceMaster models support DB9 connectors:

- DeviceMaster AIR
- DeviceMaster PRO
- DeviceMaster RTS
- DeviceMaster Serial Hub (RS-232 only)
- DeviceMaster UP

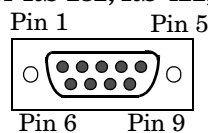
Requirements

Refer to the manufacturer's installation document if you need help with connector pinouts or cables for the peripheral device.

DB9 Pinouts

The following figure and table illustrates the DB9 connector signals.

DB9 Male for RS-232, RS-422, and RS-485



Pinouts for Standard DB9 Connector			
Pin	RS-232 Mode	RS-422 DCE Mode	RS-485 Mode
1	DCD	Not used	Not used
2	RxD	RxD-	Not used
3	TxD	TxD-	TxD/RxD-
4	DTR	Not used	Not used
5	GND	Not used ^a	Not used ^a
6	DSR	Not used	Not used
7	RTS	TxD+	TxD/RxD+
8	CTS	RxD+	Not used
9	RI	Not used	Not Used

a. Pin 5 is tied to ground on the board, but is not used in the cable.

Note: If you are using a DB9 to RJ45 adapter, see [“RJ45 Serial Cables and Loopback Plugs”, page 22](#) for additional information.

DB9 Loopback Plug

A *loopback plug* is a DB9 female serial port plug with pins wired together. You can use it with application software (for example, Test Terminal) to test serial ports. This topic describes the following DB9 loopback plugs:

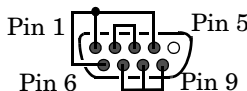
- An RS-232 loopback plug is shipped with the DeviceMaster Serial Hub.
- An RS-232/422 loopback plug is shipped with the following models: DeviceMaster AIR, DeviceMaster PRO, DeviceMaster RTS, and DeviceMaster UP.

Note: For more information on testing serial ports, see the Help in Test Terminal (WCom2.exe). Test Terminal is installed when you install PortVision.

RS-232 Loopback Plug

To build an RS-232 loopback plug, wire the following pins together:

- Pins 1 to 4 to 6
- Pins 2 to 3
- Pins 7 to 8 to 9

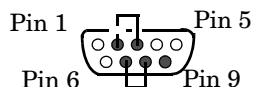


RS-232 Only (Back View) The RS-232 loopback plug also works for RS-422.

RS-422 Loopback Plug

To build an RS-422 loopback plug, wire the following pins together:

- Pins 2 to 3
- Pins 7 to 8



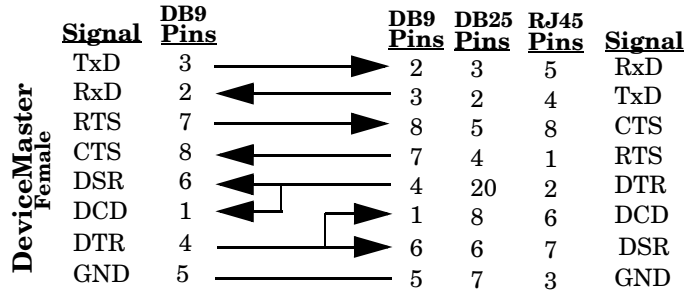
RS-422 Only (Back View)

DB9 Null-Modem Cable

You need a null-modem cable to connect to DTE devices. For example, you can connect one end of a null-modem cable to COM2 of one computer and the other end of the null-modem cable to COM2 of another computer.

RS-232 Null-Modem Cable

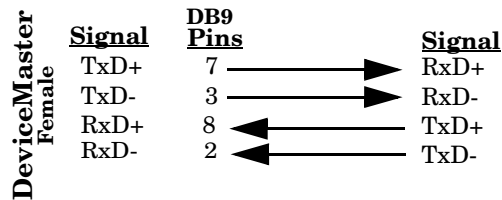
The following image displays the pinouts for an RS-232 null-modem cable. You need a null-modem cable to connect to DTE devices.



Note: You can also attach a null-modem adapter to one end of a straight-through cable to create a null-modem cable.

RS-422 Null-Modem Cable

The following image displays the pinouts for an RS-422 null-modem cable.



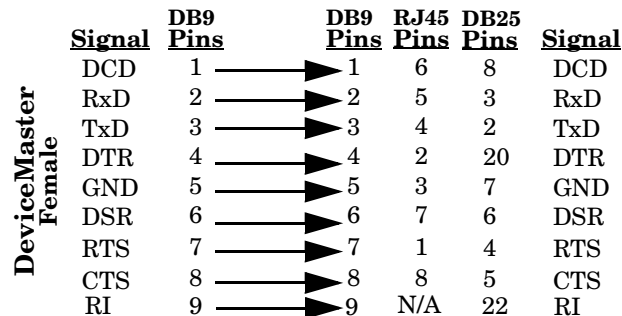
Important: RS-422 pinouts are not standardized. Each peripheral manufacturer uses different pinouts. Please refer to the document for the peripheral device to determine the pinouts for the signals in the previous picture.

DB9 Straight-Through Cable

Straight-through cables connect modems to other DCE devices. For example, you can connect on end of the straight-through cable to COM2 on a computer and the other end of the straight-through cable to a modem.

RS-232 Straight-Through Cable for DeviceMaster Serial Hub

The following image displays the pinouts for an RS-232 straight-through cable.



RS-232 and RS-485
Straight-Through
Cable for
DeviceMaster AIR,
PRO, RTS or UP

The following image displays the pinouts for an RS-232 or RS-485 straight-through cable.

DeviceMaster Female	Signal	DB9 Pins	DB9 Pins	RJ45 Pins	DB25 Pins	Signal
	DCD	1	1	6	8	DCD
	RxD	2	2	5	3	RxD
	TxD or TRx-	3	3	4	2	TxD or TRx-
	DTR	4	4	2	20	DTR
	GND	5	5	3	7	GND
	DSR	6	6	7	6	DSR
	RTS or TRx+	7	7	1	4	RTS or TRx+
	CTS	8	8	8	5	CTS
	RI	9	9	N/A	22	RI

RJ45 Serial Cables and Loopback Plugs

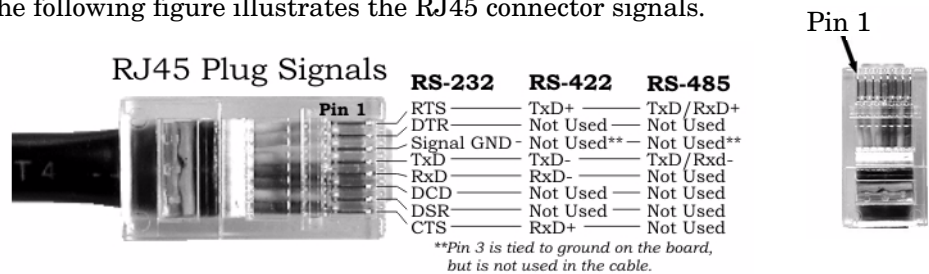
This section describe how to build your own null-modem or straight-through RJ45 serial cables and loopback plugs.

The following DeviceMaster models support RJ45 connectors:

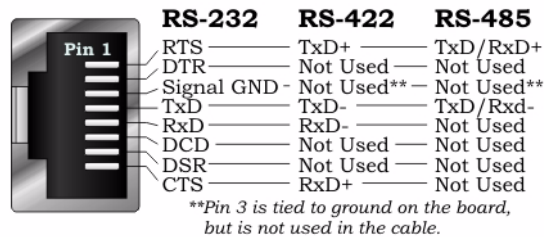
- DeviceMaster PRO
- DeviceMaster RTS
- DeviceMaster UP

RJ45 Pinouts

The following figure illustrates the RJ45 connector signals.



RJ45 Jack (Receptacle) Signals

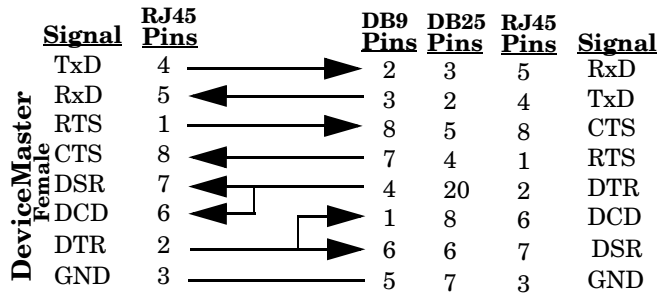


RJ45 Null-Modem Cable

You need a null-modem cable to connect to DTE devices. For example, you can connect one end of a null-modem cable to COM2 on a computer and the other end of the null-modem cable to COM2 on another computer.

RS-232 Null-Modem Cable

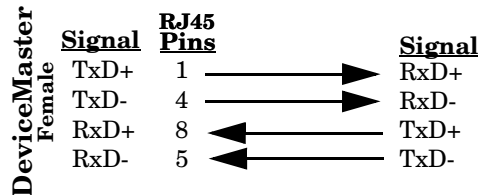
The following image displays the pinouts for an RS-232 null-modem cable.



Note: You can also attach a null-modem adapter to one end of a straight-through cable to create a null-modem cable.

RS-422 Null-Modem Cable

The following image displays the pinouts for an RS-422 null-modem RJ45 cable.



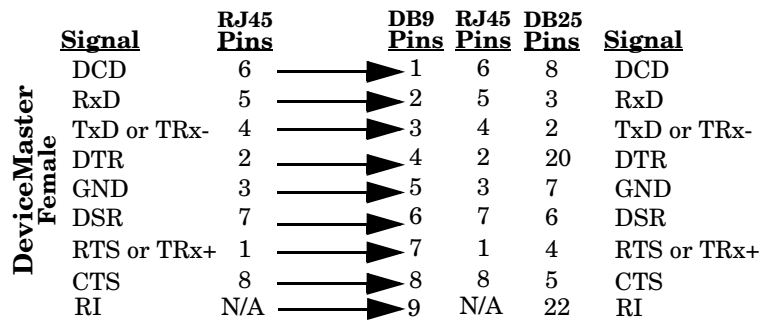
Important: RS-422 pinouts are not standardized. Each peripheral manufacturer uses different pinouts. Please refer to the document for the peripheral device to determine the pinouts for the signals in the previous picture.

RJ45 Straight-Through Cable

Straight-through cables connect modems to other DCE devices. For example, you can connect one end of a straight-through cable to COM2 on one computer and the other end of the straight-through cable to a modem.

RS-232 and RS-485 Straight-Through Cable

The following image displays the pinouts for an RS-232 or RS-485 straight-through cable.



Note: If your RJ45 wiring differs from the one shown above, adjust the RJ45 pinouts accordingly.

RJ45 Loopback Plug

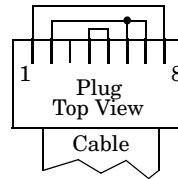
A *loopback plug* is an RJ45 serial port plug with pins wired together. You can use it with application software (for example, Test Terminal or MiniCom) to test serial ports.

The RS-232/422 single loopback plug is shipped with the following DeviceMaster models: DeviceMaster RTS, DeviceMaster PRO and DeviceMaster UP.

RS-232/RS-422 Loopback Plug

To build an RS-232/RS-422 loopback plug, wire the following pins together:

- Pins 4 to 5
- Pins 1 to 8
- Pins 2 to 6 to 7

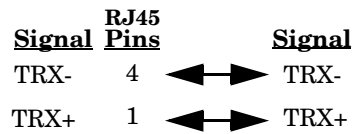


The RS-232 loopback plug also works for RS-422.

Note: For more information on testing serial ports, see the Help in Test Terminal (WCom2.exe). Test Terminal is installed when you install PortVision.

RS-485 Test Cable

You can use a straight-through cable as illustrated previously, or build your own cable.



Building Basic Cables

Overview

This chapter covers the following topics:

- [RocketPort 4/8/16 Interface Cable Assembly Wire Detail](#)
- [RocketPort 32 ISA, PCI 32, uPCI 16/32, and CPCI 16 Interface Cable Assembly Wire Detail](#)
- [DB25 Interface to Controller Pinouts for RocketPort ISA/PCI 4, 8 and 16-ports](#)
- [78-pin Connectors](#)

RocketPort 4/8/16 Interface Cable Assembly Wire Detail

Source DB25 Male	Destination DB25 Female	Base Color/Band Color	Twisted Pair #
J1-1	J2-1	Green/Black	No Pair
J1-2	J2-2	Blue/White	1A
J1-3	J2-3	White/Blue	1B
J1-4	J2-4	Orange/White	2A
J1-5	J2-5	White/Orange	2B
J1-6	J2-6	Green/White	3A
J1-8	J2-8	White/Green	3B
J1-7	J2-7	Brown/White	4A
J1-9	J2-9	White/Brown	4B
J1-10	J2-10	Gray/White	5A
J1-14	J2-14	White/Gray	5B
J1-11	J2-11	Blue/Red	6A
J1-12	J2-12	Red/Blue	6B
J1-13	J2-13	Orange/Red	7A
J1-15	J2-15	Red/Orange	7B
J1-16	J2-16	Green/Red	8A
J1-17	J2-17	Red/Green	8B
J1-18	J2-18	Brown/Red	9A
J1-19	J2-19	Red/Brown	9B
J1-20	J2-20	Gray/Red	10A
J1-22	J2-22	Red/Gray	10B
J1-21	J2-21	Gray/Red	11A
J1-23	J2-23	Black/Blue	11B
J1-24	J2-24	Orange/Black	12A
J1-25	J2-25	Black/Orange	12B

RocketPort 32 ISA, PCI 32, uPCI 16/32, and CPCI 16 Interface Cable Assembly Wire Detail

Source DB26 Male	Destination DB25 Female	Base Color/Band Color	Twisted Pair #
J1-1	J2-1	Violet/White Ring	No Pair
J1-2	J2-2	Yellow	1A
J1-3	J2-3	Yellow/Gray Ring	1B
J1-4	J2-4	Green	2A
J1-5	J2-5	Green/Gray Ring	2B
J1-6	J2-6	Blue	3A
J1-8	J2-8	Blue/Gray Ring	3B
J1-7	J2-7	Violet	4A
J1-9	J2-9	Violet/Gray Ring	4B
J1-10	J2-10	White	5A
J1-14	J2-14	White/Gray Ring	5B
J1-11	J2-11	Pink	6A
J1-12	J2-12	Pink/Gray Ring	6B
J1-13	J2-13	Red	7A
J1-15	J2-15	Red/Gray Ring	7B
J1-16	J2-16	Orange	8A
J1-17	J2-17	Orange/Gray Ring	8B
J1-18	J2-18	Brown/White Ring	9A
J1-19	J2-19	Red/Brown	9B
J1-20	J2-20	Gray/Red	10A
J1-22	J2-22	Red/Gray	10B
J1-21	J2-21	Gray/Red	11A
J1-23	J2-23	Black/Blue	11B
J1-24	J2-24	Orange/Black	12A
J1-25	J2-25	Black/Orange	12B
J1-26	No Pin	N/A	N/A

DB25 Interface to Controller Pinouts for RocketPort ISA/PCI 4, 8 and 16-ports

Pin	Function
1	GND
2	RXCLK+
3	RXCLK-
4	RXDAT+
5	RXDAT-
6	RXDAT1+
7	GND
8	RXDAT1-
9	VCC
10	VCC
11	V+
12	V+
13	RXCNV+
14	GND
15	RXCNV-
16	TXCLK+
17	TXCLK-
18	TXDAT+
19	TXDAT-
20	TXDAT1+
21	V-
22	TXDAT1
23	V-
24	TXCNV+
25	TXCNV-

Wire

- 28 AWG or larger
- Twisted pair

Shield

- AL-Foil/Mylar-overlap 25% minimum (AL side outside)
- Braid 24/8/0.12 TA coverage 85% minimum

Voltage Rating

- 30v

Capacitance

- **Wire to wire:** 44pf/M
- **Wire to other wires connected to a shield:** 87pf at 1000Hz

Shell

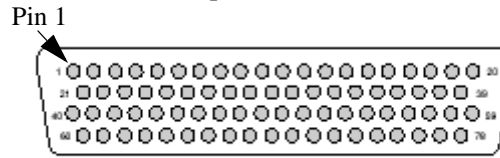
Fully-shielded with copper foil soldered to the connector shell and cable braid. Foil entire connector and solder all seams.

78-pin Connectors

78-pin Connector for RS-232 Quadcable/Octacable Controllers

The following table lists the pinouts for a 78-pin connector. The 78-pin connector is available on the following RocketPort models:

- RocketPort PCI quadcable and octacable.
- RocketPort Universal PCI quadcable and octacable.
- RocketPort Plus Universal PCI quadcable and octacable.



D-78

Pin	RS-232 Function	Pin	RS-232 Function
1	DTR Port 7	40	TxD Port 4
2	TxD Port 5	41	RTS Port 5
3	DTR Port 5	42	DSR Port 5
4	CTS Port 5	43	DCD Port 4
5	DSR Port 4	44	RI Port 4 ^a
6	DCD Port 7	45	CTS Port 7
7	RI Port 7 ^a	46	RxD Port 6
8	RxD Port 5	47	RI Port 6 ^a
9	CTS Port 6	48	DCD Port 6
10	TxD Port 3	49	DTR Port 0
11	TxD Port 2	50	TxD Port 1
12	RTS Port 2	51	RTS Port 0
13	DTR Port 2	52	DTR Port 3
14	RTS Port 3	53	CTS Port 1
15	RI Port 1 ^a	54	DSR Port 0
16	CTS Port 0	55	RxD Port 0
17	RxD Port 1	56	RxD Port 3
18	DCD Port 3	57	CTS Port 3
19	RI Port 3 ^a	58	DSR Port 2
20	RI Port 2 ^a	59	CTS Port 2
21	RTS Port 4	60	RTS Port 7
22	DTR Port 4	61	DTR Port 6
23	DCD Port 5	62	RTS Port 6
24	RI Port 5 ^a	63	TxD Port 6
25	CTS Port 4	64	TxD Port 7
26	DSR Port 7	65	SigGnd
27	RxD Port 7	66	SigGnd
28	RxD Port 4	67 ^b	Special
29	DSR Port 6	68	SigGnd Port 0
30	TxD Port 0	69	SigGnd Port 1
31	RTS Port 1	70	SigGnd Port 2
32	DTR Port 1	71	SigGnd Port 3
33	DCD Port 1	72	SigGnd Port 4
34	DSR Port 1	73	SigGnd Port 5
35	DCD Port 0	74	SigGnd Port 6
36	RI Port 0 ^a	75	SigGnd Port 7
37	RxD Port 2	76	SigGnd
38	DSR Port 3	77	SigGnd
39	DCD Port 2	78	SigGnd

a. RI only applies to the RocketPort uPCI, RocketPort Plus, and Hostess 554 products.

b. When grounded, Pin 67 indicates to the host adapter and software that it is a 4 port adapter instead of an 8 port adapter.

78-pin Connector for RS-422 Quadcable/Octacable Controllers

The following table lists the pinouts for a 78-pin connector. The 78-pin connector is available on the following RocketPort models:

- RocketPort PCI 422 quadcable, octacable and SMPTE.
- RocketPort Plus Universal PCI 422 quadcable, octacable and SMPTE.



D-78

Pin	RS-422 DTE Function	RS-422 DCE Function	Pin	RS-422 DTE Function	RS-422 DCE Function
1			40	RxD5+	TxD5+
2	RxD6+	TxD6+	41	TxD6+	RxD6+
3			42		
4	RxD6-	TxD6-	43		
5			44	FRM GND 5	
6			45	RxD8-	TxD8-
7	FRM GND 8		46	TxD7-	RxD7
8	TxD6-	RxD6-	47	FRM GND 7	
9	RxD7-	TxD7-	48		
10	RxD4+	TxD4+	49		
11	RxD3+	TxD3+	50	RxD2+	TxD2+
12	TxD3+	RxD3+	51	TxD1+	RxD1+
13			52		
14	TxD4+	RxD4+	53	RxD2-	TxD2-
15	FRM GND 2		54		
16	RxD1-	TxD1-	55	TxD1-	RxD1-
17	TxD2-	RxD2-	56	TxD4-	RxD4-
18			57	RxD4-	TxD4-
19	FRM GND 4		58		
20	FRM GND 3		59	RxD3-	TxD3-
21	TxD5+	RxD5+	60	TxD8+	RxD8+
22			61		
23			62	TxD7+	RxD7+
24	FRM GND 6		63	RxD7+	TxD7+
25	RxD5-	TxD5-	64	RxD8+	TxD8+
26			65		
27	TxD8-	RxD8-	66		
28	TxD5-	RxD5-	67 ^a	Special	
29			68		
30	RxD1+	TxD1+	69		
31	TxD2+	RxD2+	70		
32			71		
33			72		
34			73		
35			74		
36	FRM GND 1		75		
37	TxD3-	RxD3-	76		
38			77		
39			78		

a. When grounded, Pin 67 indicates to the host adapter and software that it is a 4 port adapter instead of an 8 port adapter.

The pins with no description are floating and have no connection.

Cable Adapters

Overview

This chapter covers the following topics:

- [RJ45 to DB9 Connector Pinouts for DeviceMaster and RocketPort](#)
- [8J RJ11 to Standard DB25 \(Null-modem Configuration\)](#)
- [8J RJ11 to Standard DB9 \(Null-modem Configuration\)](#)

RJ45 to DB9 Connector Pinouts for DeviceMaster and RocketPort

The following table displays the modem wiring connection from a Control RJ45 connector to a standard DB9 connector.

Note: If your DB9 wiring differs from the one shown below, adjust the DB9 pinouts accordingly.

RJ45 Connector Pinouts			DB9 Connector Pinouts	
Pin	RS-232 Signal		Pin	RS-232 Signal
6	DCD	→	1	DCD
5	RxD	→	2	RxD
4	TxD	→	3	TxD
2	DTR	→	4	DTX
3	Signal GND	→	5	Signal GND
7	DSR	→	6	DSR
1	RTS	→	7	RTS
8	CTS	→	8	CTS
	NC ^a		9	RI

a. Ring indicator is not supported on the RJ45 connector.

8J RJ11 to Standard DB25 (Null-modem Configuration)

The following table displays the modem wiring connection from a Control 8J RJ11 to a standard DB25 connector.

Note: If your DB25 wiring differs from the one shown below, adjust the DB25 pinouts accordingly.

8J RJ11 Connector Pinouts ^a			DB25 Connector Pinouts	
Pin	RS-232 Signal		Pin	RS-232 Signal
			1	NC
4	RxD	←	2	TxD
3	TxD	→	3	RxD
6	CTS		4	RTS ^b
			5	CTS ^b
1	DTR	→	6	DSR
2	SigGnd	—	7	SigGnd
5	DCD	—	8	DCD
			20	DTR

a. RJ11 does not have all of the signals for RTS CTS (hardware handshaking). Use the cable for XON/XOFF (software handshaking).

b. RTS and CTS may be jumpered together.

8J RJ11 to Standard DB9 (Null-modem Configuration)

The following table displays the modem wiring connection from a Control 8J RJ11 to a standard DB9 Connector.

Note: If your DB9 wiring differs from the one shown below, adjust the DB9 pinouts accordingly.

8J RJ11 Connector Pinouts ^a			DB9 Connector Pinouts	
Pin	RS-232 Signal		Pin	RS-232 Signal
5	DCD	—	1	DCD
3	TxD	→	2	RxD
4	RxD	←	3	TxD
			4	DTR
2	Signal GND	—	5	Signal GND
1	DTR	→	6	DSR
6	CTS	←	7	RTS ^b
			8	CTS ^b
			9	NC

a. RJ11 does not have all of the signals for RTS CTS (hardware handshaking). Use the cable for XON/XOFF (software handshaking).

b. RTS and CTS may be jumpered together.

Technical Support

Control has a staff of support technicians available to help you. In the US, telephone support is available during standard weekday business hours (Central Standard Time, excluding holidays). If you need technical support, contact Control by using one of the following methods:

Contact Method	Corporate Headquarters	Control Europe
FAQ/Online	support.comtrol.com/support.asp	
Downloads	support.comtrol.com/download.asp	
Online	support.comtrol.com/support	support@comtrol.co.uk
Web site	www.comtrol.com	www.comtrol.co.uk
Fax	(763) 494-4199	+44 (0) 1 869-323-211
Phone	(763) 494-4100	+44 (0) 1 869-323-220

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Cables

RS-232

DB25

Loopback plug for

RocketPort PCI or Universal PCI [14](#)

RocketPort PCI, Universal PCI, Plus Universal PCI
or ISA [14](#)

DB9

Loopback plug for

All DeviceMaster models [20](#)

RocketPort PCI, Universal PCI or ISA [11](#)

Null-modem cable for

All DeviceMaster models [21](#)

All RocketPort models [11](#)

Straight-through cable for

All RocketPort models [12](#)

RJ11

Loopback plug for

RocketPort PCI, Universal PCI or ISA [15](#)

RJ45

Loopback plug for

DeviceMaster PRO, RTS or UP [24](#)

RocketPort PCI, Universal PCI, Plus Universal PCI
or ISA [18](#)

Null-modem cable for

DeviceMaster PRO, RTS or UP [23](#)

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