



User Guide



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Overview

Product Overview

The RocketPort EXPRESS is a high-speed in-server serial expansion card that is RS-232/422/485 software-selectable for use in a PCI-Express (PCIe) compatible slot in a host system. The RocketPort EXPRESS was designed to support speeds up to 921Kbps (if connected, using fan-out cables or the 4J/8J models) or 460.8Kbps (if using an interface box).

The RocketPort EXPRESS series uses Control Application Specific Integrated Circuit (ASIC) technology to replace most hardware functionality to minimize components, including:

- The processor
- A serial controller
- Bus interface logic and other miscellaneous logic

You can install up to four RocketPort EXPRESS cards in one computer, providing a maximum of 128 additional serial ports.

Before Installing the RocketPort EXPRESS

If you are planning on installing the RocketPort EXPRESS in a Windows system make sure that you have located the device driver assembly to a location that is available to the host system before installing the card in the host.

You can use the *Software and Documentation* CD to locate the latest device drivers and documentation or use the files on the CD for your installation. Optionally, you can use the links in the following table.

You may want to record the model and serial number of the RocketPort EXPRESS before installing the card in the event you need to call technical support.

Locating the Latest Drivers and Documentation

This table contains links the software and installation documentation. Optionally, you can locate the latest device drivers, software, and installation documentation.

Software or Document	Location
Device drivers	ftp://ftp.comtrol.com/html/rp_express_drivers.htm
Diagnostic and Utilities	ftp://ftp.comtrol.com/html/rp_express_diag.htm
User Guides	ftp://ftp.comtrol.com/html/rp_express_docs.htm

Card and Interface Installation

This section discusses the following:

- [Installing the Card](#)
- [Attaching a Quad/Octacable Interface Cable](#) on Page 8
- [Attaching an Interface Box](#) on Page 8
- [Installing a Rackmount Interface Box](#) on Page 9

Installing the Card

Use the following procedure to install a RocketPort EXPRESS card.

1. Turn off the host computer.
2. Remove the system cover from your computer.
3. Select a PCI-Express (PCIe) compatible slot.
4. Remove the slot cover or release the clamp.
5. If necessary, replace the low-profile mounting bracket with the standard mounting bracket shipped with the RocketPort EXPRESS.
6. Insert the card into the slot and seat it securely.
7. Reinstall the expansion slot retaining screw or clamp.
8. *If this is not a 4J or 8J (RJ45/11 connector integrated in the card bracket), attach the interface that came with your card using the appropriate procedure:*
 - [Attaching a Quad/Octacable Interface Cable](#) (below)
 - [Attaching an Interface Box](#) on Page 8
 - [Installing a Rackmount Interface Box](#) on Page 9
 - If this is a 4J or 8J installation, see [Connecting Serial Devices](#) on Page 11 for cabling information after driver installation.



Caution

Do not connect an interface box to the card when the host system is powered on, this can cause card failure.

9. After connecting the interface (cable or box), replace the system cover on your computer.
10. Power on your host system.
11. Click **Cancel** if a *Found New Hardware* message appears on a Windows operating system.
12. Install the latest device driver for your operating system. See [Locating the Latest Drivers and Documentation](#) on Page 5 to locate the latest driver and installation documentation.

Attaching a Quad/Octacable Interface Cable

Use this procedure to complete the quadcable or octacable installation.

1. Make sure that the host system is powered off before connecting the cable.
2. Attach the 68-pin end of the quadcable or octacable to the card.



Do not use force when connecting the cables. Make sure that the connectors are properly aligned.



3. Tighten the retaining screws.
4. Power on the host system.
5. Click **Cancel** if a *Found New Hardware* message appears on a Windows operating system.
6. You are ready to install and configure the appropriate device driver. For the latest software and documentation, go to [Locating the Latest Drivers and Documentation](#) on Page 5.
7. After installing the driver, you should verify that the ports are functioning properly (see the driver documentation) and then connect your serial devices ([Connecting Serial Devices](#) on Page 11.)

Attaching an Interface Box

Use this procedure to complete the installation with an interface box.



Do not connect the cable to the RocketPort EXPRESS card or interface box when the computer is powered on.

Connecting the cable to the RocketPort EXPRESS card or interface box while the computer is powered on may damage the electronics on the card or interface box.

1. Make sure that the host system is powered off before connecting the cable.
2. Attach the LFH60 end of the interface cable to the RocketPort EXPRESS card and the DB37 end to the connector the interface box.

Do not use force when connecting the cables. Make sure that the connectors are properly aligned.

Note: The 32-port card uses a Y-cable that is labeled 1-16 and 17-32 on the connectors.

3. Tighten the retaining screws.
4. Power on the host system.
5. Click **Cancel** if a *Found New Hardware* message appears on a Windows operating system.
6. You are ready to install and configure the appropriate device driver. For the latest software and documentation, go to [Locating the Latest Drivers and Documentation](#) on Page 5.



- After installing the driver, you should verify that the ports are functioning properly (see the driver documentation) and then connect your serial devices. If necessary, return to this guide for information about connecting serial devices ([Connecting Serial Devices](#) on Page 11.)

Installing a Rackmount Interface Box

Rackmount interface boxes are sturdy enough to allow you to stack several units on a shelf, or you can mount it directly into a rack.

- Make sure that the host system is powered off before connecting the cable.
- Place the Rackmount interface box on a stable surface or attach the L brackets to the interface box using the screws supplied with the unit and attach the L bracket into your rack.



Note: You can mount the unit facing in either direction.

- Attach the cable shipped with the card between the interface box and the card.



Do not connect 16-port cards located in various machines to the 32-port Rackmount. It is possible to damage the interface box and card if the interface box is connected to two PCs using separate line power sources.



Caution

- Power on the host system.
If this is Windows operating system A *Found New Hardware* message starts the driver installation for the RocketPort EXPRESS when you power on the system.
- Use the appropriate software installation document for your operating system, with the driver to complete the RocketPort EXPRESS installation.
For the latest software and documentation, go to [Locating the Latest Drivers and Documentation](#) on Page 5.
- Verify that the ports are functioning properly and connect your serial devices. For more information about connecting serial devices, see [Connecting Serial Devices](#) on Page 11.



Rx Tx Each port has transmit and receive LEDs.

The receive LED is lit if connected to an RS-232 device.

The transmit LED is illuminated when RS-232/422/485 data is being transmitted. Noticeable flashing occurs only if transmit data starts and stops a few times per second or less. Otherwise, if data is being transmitted continuously, the LED illumination appears to be constant. If no data is transmitted the LED is off.

Connecting Serial Devices

This section provides information about the RocketPort EXPRESS connectors, in the event that you need to build cables or loopback plugs.

- [DB9 Serial Cables and Loopback Plugs](#) on Page 11
- [DB25 Serial Cables and Loopback Plugs](#) on Page 14
- [RJ45 Serial Cables and Loopback Plugs](#) on Page 17
- [RJ11 Serial Cables and Loopback Plugs](#) on Page 19

A *loopback plug* is a serial port plug with pins wired together that you can use with application (for example, the diagnostic, Test Terminal, or minicom) to test serial ports. See [Before Calling Technical Support](#) on Page 27 for information about using the test application shipped with the RocketPort EXPRESS.

DTE Versus DCE

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

How you build a cable depends on which device your 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 RocketPort EXPRESS 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) - connects TxD to RxD and RxD to TxD.

DB9 Serial Cables and Loopback Plugs

The following figures and table illustrate the signals present on DB9 connectors if you need to build your own null-modem or straight-through DB9 serial cables.

Quadcable, octacable, and the interface boxes use DB9 male connectors.

- [DB9 Signals](#) on Page 12
- [DB9 Null-Modem Cables \(RS-232\)](#) on Page 12
- [DB9 Null-Modem Cables \(RS-422 or RS-485 Full-Duplex\)](#) on Page 12
- [DB9 Straight-Through Cables \(RS-232 or RS-485 Half-Duplex\)](#) on Page 13
- [DB9 Loopback Plugs](#) on Page 13

DB9 Signals

Refer to the manufacturer’s installation documentation if you need help with the connector pinouts or cabling for the serial device.

DB9 Male Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	DCD	Not used	Not used	Not used
2	RxD	RxD-	RxD-	Not used
3	TxD	TxD-	TxD-	TRxD-
4	DTR	Not used	Not used	Not used
5	Gnd	Not used†	Not used†	Not used†
6	DSR	Not used	Not used	Not used
7	RTS	TxD+	TxD+	TRxD+
8	CTS	RxD+	RxD+	Not used
9	RI	Not used	Not Used	Not Used

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

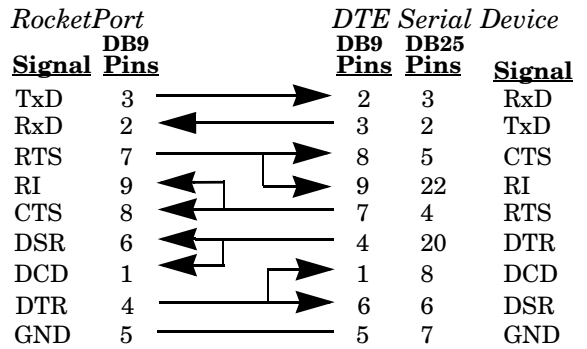
DB9 Null-Modem Cables (RS-232)

Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.

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

You may want to purchase or build a straight-through cable and purchase a null-modem adapter. For example, a null-modem cable can be used to connect COM2 of one PC to COM2 of another PC.

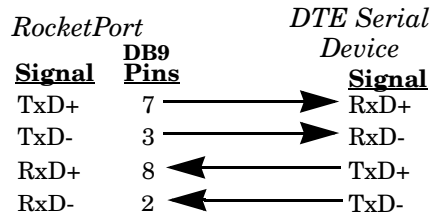
Note: *RJ45 connectors are not standardized. Refer to your serial device documentation for signal information.*



DB9 Null-Modem Cables (RS-422 or RS-485 Full-Duplex)

Use the following figure if you need to build an RS-422 or RS-485 full-duplex null-modem cable. A null-modem cable is required for connecting DTE devices.

Note: *RS-422 and RS-45 signals are not standardized and each serial manufacturer uses different pinouts. Refer to the serial device documentation to determine the pinouts for the signals above.*



DB9 Straight-Through Cables (RS-232 or RS-485 Half-Duplex)

Use the following figure if you need to build an RS-232 or RS-485 half-duplex straight-through cable. Straight-through cables are used to connect modems and other DTE devices. For example, a straight-through cable can be used to connect COM2 of one PC to a modem.

Note: *RJ45 connectors are not standardized. Refer to your serial device documentation for signal information.*

	<i>RocketPort</i>		<i>DCE Serial Device</i>		
<u>Signal</u>	<u>DB9 Pins</u>		<u>DB9 Pins</u>	<u>DB25 Pins</u>	<u>Signal</u>
DCD	1	→	1	8	DCD
RxD	2	→	2	3	RxD
TxD or TRxD-	3	→	3	2	TxD or TRxD-
DTR	4	→	4	20	DTR
GND	5	→	5	7	GND
DSR	6	→	6	6	DSR
RTS or TRxD+	7	→	7	4	RTS or TRxD+
CTS	8	→	8	5	CTS
RI	9	→	9	22	RI

DB9 Loopback Plugs

RocketPort EXPRESS models with DB9 connectors on the interface are shipped with a a single loopback plug (RS-232/422).

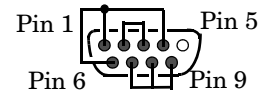
Wire the following pins together to build additional plugs or replace a missing RS-232/422 loopback plug.

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

Wire these pins together if you want to build an RS-422 (only) loopback plug.

- Pins 2 to 3
- Pins 7 to 8

RS-232/422 (Back View)



DB25 Serial Cables and Loopback Plugs

This section describes DB25 cables and loopback plugs for the following models:

- [Fan-out Cable Signals](#) (quadcable and octacable)
- [Interface Box Signals](#) on Page 15 (standard and surge models)
- [DB25 Null-Modem Cables \(RS-232\)](#) on Page 15
- [DB25 Null-Modem Cables \(RS-422 or RS-485 Full-Duplex\)](#) on Page 16
- [DB25 Straight-Through Cables \(RS-232 or RS-485 Half-Duplex\)](#) on Page 16
- [DB25M: Fan-out Cable Loopback Plugs](#) on Page 16
- [DB25F: Standard Interface Box](#) on Page 16
- [DB25M: Surge Interface Box Loopback Plugs](#) on Page 17

Note: Refer to the manufacturer’s installation documentation if you need help with connector pinouts or cabling for the serial device.

Fan-out Cable Signals

Refer to the manufacturer’s installation documentation if you need help with the connector pinouts or cabling for the serial device.

DB25 Male Connector Signals (Quad/Octacables)				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	Not used	Not used	Not used	Not used
2	TxD	TxD-	TxD-	TRxD-
3	RxD	RxD-	RxD-	Not used
4	RTS	TxD+	TxD+	TRxD+
5	CTS	RxD+	RxD+	Not used
6	DSR	Not used	Not used	Not used
7	Gnd	Not used [†]	Not used [†]	Not used [†]
8	DCD	Not used	Not used	Not used
9 to 19	Not used	Not used	Not used	Not used
20	DTR	Not used	Not used	Not used
21	Not used	Not used	Not used	Not used
22	RI	Not used	Not used	Not used
23-25	Not used	Not used	Not used	Not used

[†] Pin 7 is tied to ground on the board, but is not used in the cable.

Interface Box Signals

Refer to the manufacturer's installation documentation if you need help with the connector pinouts or cabling for the serial device.

DB25 Female (Standard Interface Box) DB 25 Male (Surge Interface Box) Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	Not used	Not used	Not used	Not used
2	TxD	TxD-	TxD-	TRxD-
3	RxD	RxD-	RxD-	Not used
4	RTS	TxD+	TxD+	TRxD+
5	CTS	RxD+	RxD+	Not used
6	DSR	Not used	Not used	Not used
7	Gnd	Not used†	Not used†	Not used†
8	DCD	Not used	Not used	Not used
15	CTS	RxD+	RxD+	Not used
17	RxD	RxD-	RxD-	Not used
19	RTS	TxD+	TxD+	TRxD+
20	DTR	Not used	Not used	Not used
21	Not used	Not used	Not used	Not used
22	RI	Not used	Not used	Not used
23-24	Not used	Not used	Not used	Not used
25	TxD	TxD-	TxD-	TRxD-

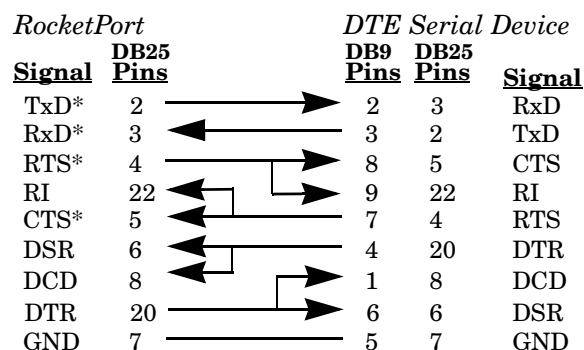
† Pin 7 is tied to ground on the board, but is not used in the cable.

DB25 Null-Modem Cables (RS-232)

Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.

You may want to purchase or build a straight-through cable and purchase a null-modem adapter. For example, a null-modem cable can be used to connect COM2 of one PC to COM2 of another PC.

Note: *RJ45 connectors are not standardized. Refer to your serial device documentation for signal information.*



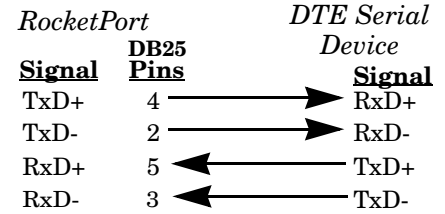
* Interface boxes have alternate pins available for this signal. Refer to Interface Box Signals for additional information.

DB25 Null-Modem Cables (RS-422 or RS-485 Full-Duplex)

Use the following figure if you need to build an RS-422 or RS-485 full-duplex null-modem cable. A null-modem cable is required for connecting DTE devices.

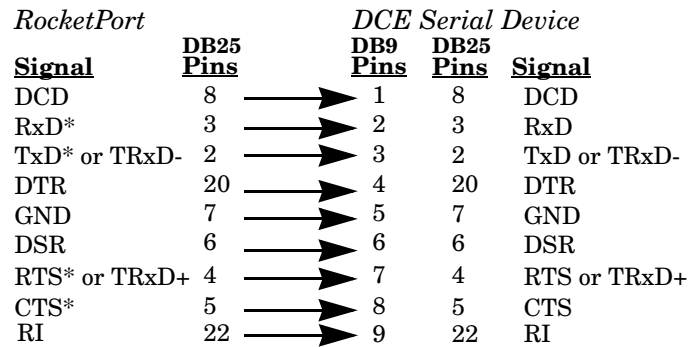
Interface boxes have optional pins available for these signals. Refer to [Interface Box Signals](#) on Page 15 for more information.

Note: RS-422 and RS-485 signals are not standardized and each serial manufacturer uses different pinouts. Refer to the serial device documentation to determine the pinouts for the signals above.



DB25 Straight-Through Cables (RS-232 or RS-485 Half-Duplex)

Use the following figure if you need to build an RS-232 or RS-485 half-duplex straight-through cable. Straight-through cables are used to connect modems and other DTE devices. For example, a straight-through cable can be used to connect COM2 of one PC to a modem.



* Interface boxes have alternate pins available for this signal. Refer to Interface Box Signals for more information.

DB25M: Fan-out Cable Loopback Plugs

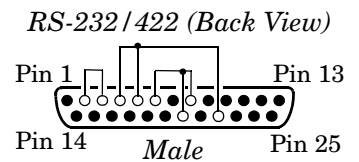
RocketPort EXPRESS models with DB25 male connectors on the interface are shipped with a a single loopback plug (RS-232/422).

Wire the following pins together to build additional RS-232/422 plugs or replace a missing RS-232/422 loopback plug.

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

You can wire the following pins together for an RS-422 only loopback plug.

- Pins 2 to 3
- Pins 4 to 5



DB25F: Standard Interface Box

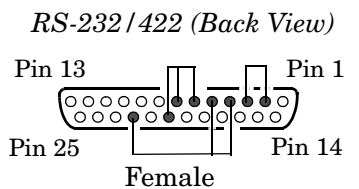
RocketPort EXPRESS models with DB25 female connectors on the interface box are shipped with a a single loopback plug (RS-232/422).

Wire the following pins together to build additional RS-232/422 plugs or replace a missing RS-232/422 loopback plug.

- Pins 2 to 3 or *alternately*, Pins 25 to 17
- Pins 4 to 5 to 22 or *alternately*, Pins 19 to 15 to 22
- Pins 6 to 8 to 20

You can wire the following pins together for an RS-422 only loopback plug.

- Pins 2 to 3 or *alternately*, Pins 17 to 25
- Pins 4 to 5 or *alternately*, Pins 15 to 19



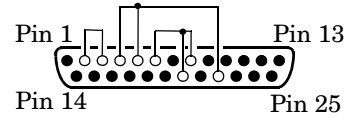
DB25M: Surge Interface Box Loopback Plugs

RocketPort EXPRESS models with DB25 male connectors on the Surge interface box are shipped with a single loopback plug (RS-232/422).

Wire the following pins together to build additional RS-232/422 plugs or replace a missing RS-232/422 loopback plug.

- Pins 2 to 3 or *alternately*, Pins 17 to 25
- Pins 4 to 5 to 22 or *alternately*, Pins 15 to 19 to 22
- Pins 6 to 8 to 20

RS-232 / 422 (Back View)



You can wire the following pins together for an RS-422 only loopback plug.

- Pins 2 to 3 or *alternately*, Pins 17 to 25
- Pins 4 to 5 or *alternately*, Pins 15 to 19

RJ45 Serial Cables and Loopback Plugs

This section describes RJ45 cables and loopback plugs for the RocketPort EXPRESS 4J, Octacable and Rackmount interface boxes.

- [RJ45 Signals](#)
- [RJ45 Null-Modem Cable \(RS-232\)](#) on Page 18
- [RJ45 Null-Modem Cable \(RS-422 or RS-485 Full-Duplex\)](#) on Page 18
- [RJ45 Straight-Through Cable \(RS-232 or RS-485 Half-Duplex\)](#) on Page 18
- [RJ45 Loopback Plugs](#) on Page 18

RJ45 Signals

There are no standards for RJ45 connector pinouts. Refer to the manufacturer’s installation documentation if you need help with connector pinouts or cabling for the serial device.

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

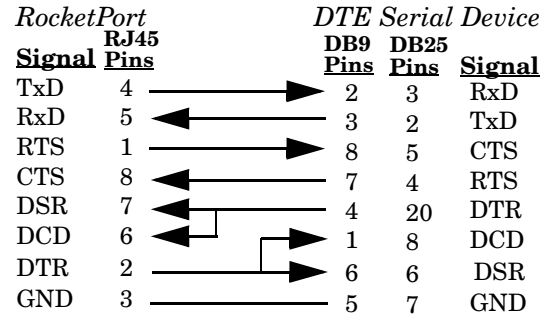


RJ45 Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	RTS	TxD+	TxD+	TRxD+
2	DTR	Not Used	Not Used	Not Used
3	Gnd	Not Used†	Not Used†	Not Used†
4	TxD	TxD-	TxD-	TRxD-
5	RxD	RxD-	RxD-	Not Used
6	DCD	Not Used	Not Used	Not Used
7	DSR	Not Used	Not Used	Not Used
8	CTS	RxD+	RxD+	Not Used

† Pin 3 is tied to ground on the board, but is not used in the cable.

RJ45 Null-Modem Cable (RS-232)

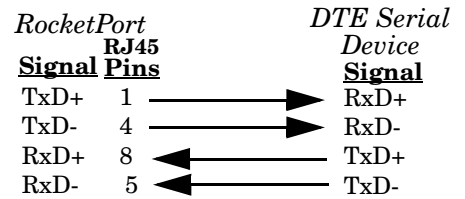
Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.



RJ45 Null-Modem Cable (RS-422 or RS-485 Full-Duplex)

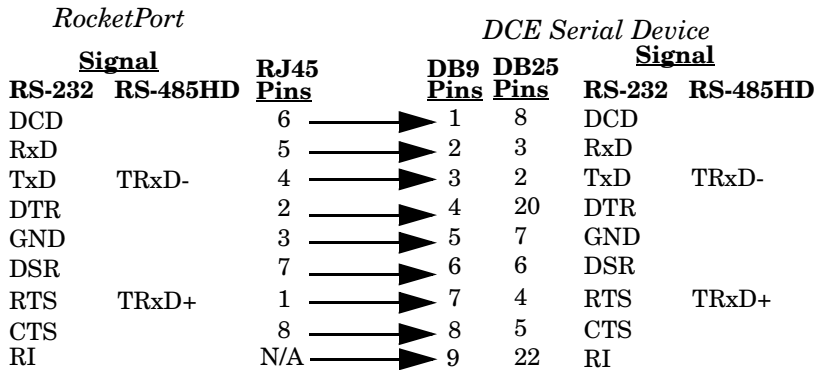
Use the following figure if you need to build an RS-422 null-modem cable. A null-modem cable is required for connecting DTE devices.

Note: RS-422 pinouts are not standardized. Each serial manufacturer uses various pinouts. Please refer to the documentation for the serial to determine the pinouts for the signals in the previous picture.



RJ45 Straight-Through Cable (RS-232 or RS-485 Half-Duplex)

Use straight-through cables to connect modems and other DTE 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.



RJ45 Loopback Plugs

RocketPort EXPRESS models with RJ45 connectors are shipped with a single loopback plug (RS-232/422).

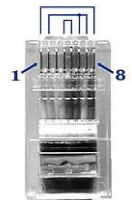
Wire the following pins together to build additional loopback plugs or replace a missing RS-232/422 loopback plug:

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

Wire the following pins together for an RS-422 loopback plug:

- Pins 4 to 5
- Pins 1 to 8

RS-232/422



RJ11 Serial Cables and Loopback Plugs

This section describes RJ11 cables and loopback plugs for the RocketPort EXPRESS 8J.

- [RJ11 Signals](#)
- [RJ11 Null-Modem Cable \(RS-232\)](#) on Page 19
- [RJ11 Null-Modem Cable \(RS-422 or RS-485 Full-Duplex\)](#) on Page 19
- [RJ11 Straight-Through Cable \(RS-232 or RS-485 Half-Duplex\)](#) on Page 20
- [RJ11 Loopback Plugs](#) on Page 20

RJ11 Signals

There are no standards for RJ11 connector pinouts. Refer to the manufacturer's installation documentation if you need help with connector pinouts or cabling for the serial device.

Note: Ring indicator, Request to Send, and Data Set Ready are not supported on the RJ11 connector.

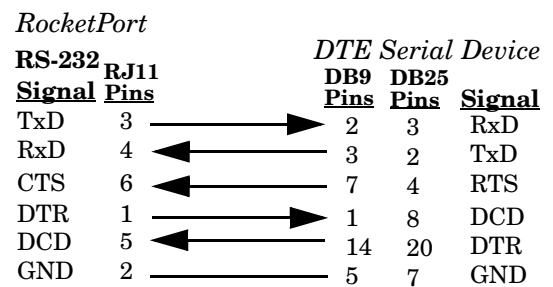


RJ11 Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	DTR	TxD+	TxD+	TRxD+
2	Gnd	Not Used†	Not Used†	Not Used†
3	TxD	TxD-	TxD-	TRxD-
4	RxD	RxD-	RxD-	Not Used
5	DCD	Not Used	Not Used	Not Used
6	CTS	RxD+	RxD+	Not Used

† Pin 2 is tied to ground on the board, but is not used in the cable.

RJ11 Null-Modem Cable (RS-232)

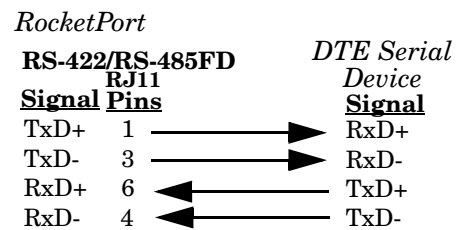
Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.



RJ11 Null-Modem Cable (RS-422 or RS-485 Full-Duplex)

Use the following figure if you need to build an RS-422 null-modem cable. A null-modem cable is required for connecting DTE devices.

Note: RS-422 pinouts are not standardized. Each serial manufacturer uses various pinouts. Please refer to the documentation for the serial to determine the pinouts for the signals in the previous picture.



RJ11 Straight-Through Cable (RS-232 or RS-485 Half-Duplex)

Use straight-through cables to connect modems and other DTE 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.

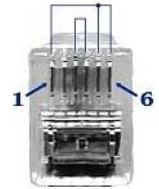
<i>RocketPort</i>			<i>DCE Serial Device</i>				
Signal		RJ11 Pins		DB9 Pins	DB25 Pins	Signal	
RS-232	RS-485HD					RS-232	RS-485HD
DCD		5	→	1	8	DCD	
RxD		4	→	2	3	RxD	
TxD	TRxD-	3	→	3	2	TxD	TRxD-
DTR	TRxD+	1	→	4	20	DTR	TRxD+
GND		2	→	5	7	GND	
CTS		6	→	8	5	CTS	

RJ11 Loopback Plugs

RocketPort EXPRESS models with RJ11 connectors are shipped with a single loopback plug (RS-232/422).

Wire the following pins together to build additional loopback plugs or replace a missing RS-232/422 loopback plug:

- Pins 3 to 4
- Pins 1 to 6



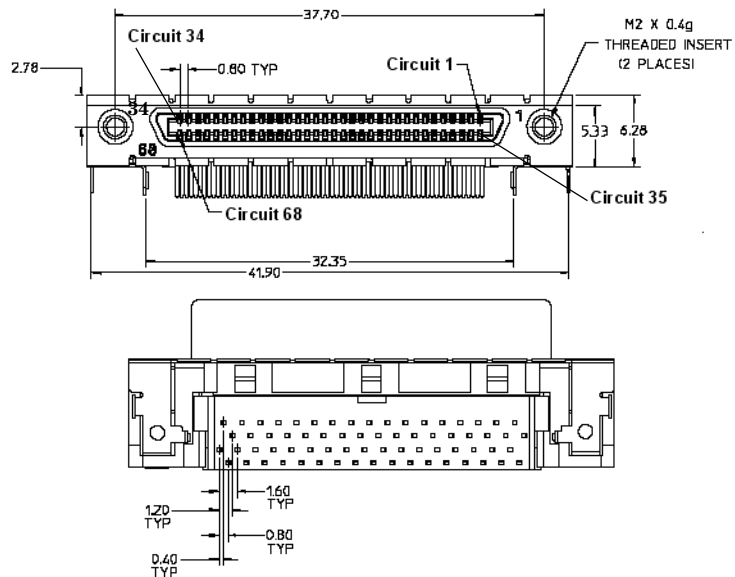
Specifications and Notices

This section discusses the following:

- [68-Pin VHDCI Connector \(Quad/Octacable\)](#) on Page 21
- [LFH60 and DB37M Multiplex Connectors DB9 and DB25 Interface Box Cable](#) on Page 23
- [FCC Notices](#) on Page 24

68-Pin VHDCI Connector (Quad/Octacable)

Use the following table if you need to build a cable for a proprietary serial device.



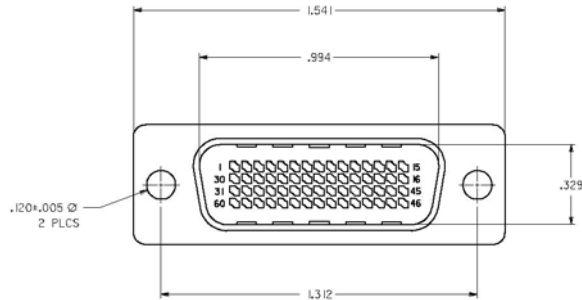
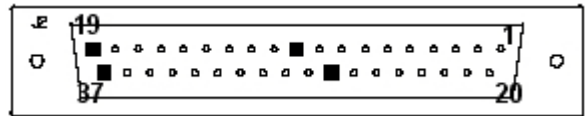
Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
1	TXD1	TXD-1	TXD-1	TRXD-1
2	RI1			
3	DCD1			
4	DTR1			
5	RTS1	TXD+1	TXD+1	TRXD+1
6	DSR1			
7	RXD1	RXD-1	RXD-1	
8	CTS1	RXD+1	RXD+1	
9	TXD2	TXD-2	TXD-2	TRXD-2
10	RI2			
11	DCD2			
12	DTR2			
13	RTS2	TXD+2	TXD+2	TRXD+2
14	DSR2			

Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
15	RXD2	RXD-2	RXD-2	
16	CTS2	RXD+2	RXD+2	
17	RJ45			
18	GND			
19	TXD3	TXD-3	TXD-3	TRXD-3
20	RI3			
21	DCD3			
22	DTR3			
23	RTS3	TXD+3	TXD+3	TRXD+3
24	DSR3			
25	RXD3	RXD-3	RXD-3	
26	CTS3	RXD+3	RXD+3	
27	TXD4	TXD-4	TXD-4	TRXD-4
28	RI4			
29	DCD4			
30	DTR4			
31	RTS4	TXD+4	TXD+4	TRXD+4
32	DSR4			
33	RXD4	RXD-4	RXD-4	
34	CTS4	RXD+4	RXD+4	
35	TXD5	TXD-5	TXD-5	TRXD-5
36	RI5			
37	DCD5			
38	DTR5			
39	RTS5	TXD+5	TXD+5	TRXD+5
40	DSR5			
41	RXD5	RXD-5	RXD-5	
42	CTS5	RXD+5	RXD+5	
43	TXD6	TXD-6	TXD-6	TRXD-6
44	RI6			
45	DCD6			
46	DTR6			
47	RTS6	TXD+6	TXD+6	TRXD+6
48	DSR6			
49	RXD6	RXD-6	RXD-6	
50	CTS6	RXD+6	RXD+6	
51	GND			
52	4-Port			
53	TXD7	TXD-7	TXD-7	TRXD-7
54	RI7			
55	DCD7			
56	DTR7			
57	RTS7	TXD+7	TXD+7	TRXD+7
58	DSR7			

Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
59	RXD7	RXD-7	RXD-7	
60	CTS7	RXD+7	RXD+7	
61	TXD8	TXD-8	TXD-8	TRXD-8
62	RI8			
63	DCD8			
64	DTR8			
65	RTS8	TXD+8	TXD+8	TRXD+8
66	DSR8			
67	RXD8	RXD-8	RXD-8	
68	CTS8	RXD+8	RXD+8	

LFH60 and DB37M Multiplex Connectors DB9 and DB25 Interface Box Cable

Use the following table if you need to build an interface cable.



Ports 1-16			
DB37-1 Source	LFH60 Dest	Pair	Signal
J1-1	N/C		
J1-2	J2-44		GND
J1-3	J2-43		GND
J1-4	J2-42		GND
J1-5	J2-41		GND
J1-6	J2-23		RESET
J1-7	J2-46	1A	RXCLK+
J1-8	J2-16	2A	RXDATA+
J1-9	J2-17	3A	RXDATB+
J1-10	J2-18	4A	RXCNV+T
J1-11	N/C		
J1-12	J2-19	5A	TXDATB-
J1-13	J2-20	6A	TXDATA-
J1-14	J2-21	7A	TXCLK-
J1-15	J2-22	8A	TXCNVT-
J1-16	J2-47		V+

Ports 17-32			
DB37-2 Source	LFH60 Dest	Pair	Signal
J3-1	N/C		
J3-2	N/C		GND
J3-3	J2-37		GND
J3-4	J2-36		GND
J3-5	J2-35		GND
J3-6	J2-8		RESET
J3-7	J2-24	1A	RXCLK+
J3-8	J2-25	2A	RXDATA+
J3-9	J2-26	3A	RXDATB+
J3-10	J2-27	4A	RXCNV+T
J3-11	N/C		
J3-12	J2-28	5A	TXDATB-
J3-13	J2-29	6A	TXDATA-
J3-14	J2-30	7A	TXCLK-
J3-15	J2-31	8A	TXCNVT-
J3-16	J2-54		V+

Ports 1-16 (Continued)			
DB37-1 Source	LFH60 Dest	Pair	Signal
J1-17	J2-48		V+
J1-18	J2-49		V+
J1-19	J2-50		V+
J1-20	N/C		
J1-21	N/C		
J1-22	J2-40		GND
J1-23	J2-39		GND
J1-24	J2-39		GND
J1-25	J2-45	1B	RXCLK-
J1-26	J2-15	2B	RXDATA-
J1-27	J2-14	3B	RXDATB-
J1-28	J2-13	4B	RXCNVT-
J1-29	N/C		
J1-30	J2-12	5B	TXDATB+
J1-31	J2-11	6B	TXDATA+
J1-32	J2-10	7B	TXCLK+
J1-33	J2-9	8B	TXCNVT+
J1-34	J2-51		V+
J1-35	J2-52		V+
J1-36	J2-53		V+
J1-37	N/C		

Ports 17-32 (Continued)			
DB37-2 Source	LFH60 Dest	Pair	Signal
J3-17	J2-55		V+
J3-18	J2-56		V+
J3-19	N/C		
J3-20	N/C		
J3-21	N/C		
J3-22	J2-34		GND
J3-23	J2-33		GND
J3-24	J2-32		GND
J3-25	J2-7	1B	RXCLK-
J3-26	J2-6	2B	RXDATA-
J3-27	J2-5	3B	RXDATB-
J3-28	J2-4	4B	RXCNVT-
J3-29	N/C		
J3-30	J2-3	5B	TXDATB+
J3-31	J2-2	6B	TXDATA+
J3-32	J2-1	7B	TXCLK+
J3-33	J2-60	8B	TXCNVT+
J3-34	J2-57		V+
J3-35	J2-58		V+
J3-36	J2-59		V+
J3-37	N/C		

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)

The RocketPort EXPRESS has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15 of the FCC Rules when connected to:

- Quad/octacable interface
- Standard or surge interface boxes (4/8/16/32-port models)

The RocketPort EXPRESS has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules when connected to 16 or 32-port Rackmount interface boxes.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

This equipment complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Comtrol Corporation may void the user's authority to operate this equipment.

Serial Cables (FCC 15.27)

Depending on the interface box, this equipment is certified for Class B operation when used with shielded cables.

Troubleshooting

If you are experiencing problems with the RocketPort EXPRESS, review the troubleshooting procedures for your system before calling Technical Support.

Before Calling Technical Support

Review the following information before calling Technical Support because they will request that you perform many of the procedures or verifications before they will be able to help you diagnose a problem.

- Verify the cabling using [Connecting Serial Devices](#) on Page 11.
Note: Most customer problems reported to Control Technical Support are eventually traced to cabling or network problems.
- If you have not done so, run the diagnostics ([RocketPort EXPRESS Diagnostics](#) on Page 27).
- Verify that you have installed the latest RocketPort EXPRESS device driver, see [Locating the Latest Drivers and Documentation](#) on Page 5.
If necessary, remove or update the existing driver using the procedures in the *RocketPort EXPRESS Device Driver Installation Guide for Windows* or **README** file packaged with the FreeBSD, Linux, QNX, or SCO OpenServer driver.

If none of the above work, you can refer to one of these subsections:

- [Troubleshooting Windows Systems](#) on Page 28
- [Troubleshooting Linux Systems](#) on Page 30

RocketPort EXPRESS Diagnostics

This subsection describes how to run the bootable diagnostic CD to verify that the RocketPort EXPRESS hardware is functioning properly. The RocketPort EXPRESS is shipped with a bootable CD that executes hardware diagnostics.

In the event that you cannot locate the CD, you can [download](#) the latest version and burn the **.iso** image to a CD-ROM.

You can use the diagnostic to:

- Confirm that the hardware is functioning
- Determine resolutions to conflicts during installation
- Perform a stress test on all RocketPort EXPRESS ports in the system

The diagnostic requires a loopback plug to test a port or ports. A single loopback plug is shipped with the RocketPort EXPRESS. You can build additional loopback plugs or move the loopback plug to the port you want to test. See [Connecting Serial Devices](#) on Page 11 if you want to build loopback plugs.

Use the following procedure to run the diagnostics.

1. Insert the bootable CD that contains the diagnostic and restart your machine.
The diagnostic starts automatically and takes a few minutes before the first screen appears.
2. Press **Enter** at the disclaimer screen to begin the diagnostic.

Note: *If the diagnostic goes into sleep mode while unattended, press the **Num Lock** key to activate the screen.*

3. Enter **1** to **4** to test a port or ports on a specific RocketPort EXPRESS, or select **S** to run the stress test on all RocketPort EXPRESS cards installed in the system.

Note: *The stress test requires a loopback plug for each port on each card.*

Use **Ctrl/Alt Delete** to kill the diagnostic process at any time.

Testing a Port or Ports

Enter **A** to test all ports on the RocketPort EXPRESS or enter the port number of a port that you want to test and follow the instructions on the screen. If you are testing all of the ports and have only one loopback plug, you must move it from port to port during the test.

Stress Testing the RocketPort EXPRESS

The stress test uses a default configuration to simultaneously stream data to all ports of the RocketPort EXPRESS cards in a system until you stop the test. To stop the test and review the results of the stress test, enter **S**.

To end the diagnostic, you may need to select **b** to return to a screen that contains a **q** to quit. Type **reboot**, select **Enter**, and remove the CD from the drive when prompted.

If the diagnostics *did not detect* a hardware problem, you may have a device driver problem. See [Before Calling Technical Support](#) on Page 27 for more information.

If the diagnostics could *not find* the card:

- Check for proper cable connections between the card and interface. Verify your cables using [Connecting Serial Devices](#) on Page 11.
- Verify that the loopback plug is firmly connected.
- Turn off the power and reseal the RocketPort EXPRESS card into the slot.
- Try running the diagnostics again. If they fail again, you may have a bad port, contact [Technical Support](#) on Page 31.

Troubleshooting Windows Systems

If you are using a RocketPort EXPRESS driver on a Windows system and the diagnostic verified that the card is functional, you can check the following:

1. Verify that the RocketPort EXPRESS has installed by checking the *Device Manager* to verify that the RocketPort EXPRESS card displays.
2. Verify that you are addressing the port correctly.

In many applications, device names above COM9 require the prefix `\\.\` in order to be recognized. For example, to reference COM20, use `\\.\COM20` as the file or port name. RocketPort EXPRESS.

3. After driver installation, *if a port does not open*; go to *Ports COM & LPT*, right-click on the yellow exclamation mark on the port, and click **Update Driver**. Use the same procedure used when installing the ports that are detected with plug and play systems.
4. Enable the *Verbose Event Log* feature on the *Options* tab of the RocketPort EXPRESS driver and then reboot the server.
5. Install and use one of the tools in the **Control Utility** package. The **Control Utility** is available on the *Software and Documentation CD* or you can [download](#) the latest version. The file is a self-extracting zip file that automatically starts the installation procedure. It is not necessary to reboot the PC after installation.

The **Control Utility** package includes the following applications that you can access from the *Control Program* group:

- **Test Terminal** can be used to troubleshoot communications on a port-by-port basis. Test Terminal requires a loopback plug. You can build a loopback plug if you are missing the loopback plug shipped with the RocketPort EXPRESS ([Connecting Serial Devices](#) on Page 11).
- **Port Monitor** checks for errors, modem control, and status signals. In addition, it provides you with raw byte input and output counts.

Use the following procedures to run **Test Terminal** tests.

Test Terminal Explanation

This subsection provides background information about the two tests procedures in the following subsection.

- **Send and Receive Test Data:** This sends data out the transmit line to the loopback plug, which has the transmit and receive pins connected thus sending the data back through the Rx line to **Test Terminal**, which then displays the received data in the terminal window for that port. This test is only testing the Tx and Rx signal lines and nothing else. This test works in either RS-232 or RS-422 modes as both modes have transmit and receive capability. A failure in this test will essentially prevent the port from working in any manner.
- **Loopback Test:** This tests all of the modem control signals such as RTS, DTR, CTS, DSR, DCD, and RI along with the Tx and Rx signals. When a signal is made HI in one line the corresponding signal line indicates this. The **Loopback Test** changes the state of the lines and looks for the corresponding state change. If it successfully recognizes all of these changes, the port passes.

A failure on this test is not necessarily critical as it will depend on what is connected and how many signal lines are in use. For example, if you are using RS-232 in 3-wire mode (Transmit, Receive and Ground) a failure will cause no discernible issue since the other signals are not being used. If the port is configured for use as either RS-422 or RS-485 this test will fail and is expected to fail since RS-422 and RS-485 do not have the modem control signals that are present in RS-232 for which this test is designed.

Using Test Terminal to Test a Port

The following procedure shows how to use **Test Terminal** to send and receive test data to the serial ports and run a loopback test.

1. Stop all applications that may be accessing the ports such as RAS, RRAS, or any faxing or production software. See the appropriate help systems or manuals for instructions on stopping these services or applications. If another application is controlling the port, then **Test Terminal** will be unable to open the port and an error message will be shown.

Note: Remember to restart the application once testing of the ports has been completed.

2. From the **Start** menu, select **Programs > Control > Utilities > Test Terminal (WCOM2)**.
3. Select **File > Open Port** and the appropriate port (or ports) from the *Open Ports* drop list.
4. Install the loopback plug onto the port (or ports) that you want to test.
5. Select **Port > Send and Receive Test Data**.

You should see the alphabet scrolling across the port. If so, then the port installed properly and is operational. Select **Port > Send and Receive Test Data** to stop the scrolling data.

6. Select **Port > Loopback Test**.

This is a pass fail test and will take a second or two to complete. Repeat for each port that needs testing.

The loopback test test the modem control (hardware handshaking) signals. It only has meaning in RS-232 mode on serial connector interfaces with full RS-232 signals. If performed under the following conditions, the test will always fail because full modem control signals are not present:

- RS-422
- RS-485
- RJ11 connectors

7. Close Test Terminal

If both of these tests successfully complete, then the port is operational as expected.

Note: *Do forget to restart the application.*

Troubleshooting Linux Systems

You can use the following subsections to test the serial ports.

lcom(1)

Control has available **lcom(1)**, which is a multiport serial I/O test program. You can use **lcom** in test mode to send test data to any serial port.

lcom is available on the *Software and Documentation CD* or you can [download](#) the latest version.

Note: *For assistance using lcom, use the manual page, lcom(1) that accompanies the program.*

File Transfer

You can transfer a file using the following information. The default settings are 9600, 8, n, 1, and no parity. To send a file you can redirect output to a device; for example:

```
cat /etc/inittab > /dev/ttyRP0
```

Sends the contents of the **/etc/inittab** file to the **ttyRP0** device at 9600 baud, 8, n, 1, and no parity.

Changing Serial Port Settings (stty)

Use the following information if you need assistance changing or viewing the baud rate settings.

To change the baud rate, use the following example, which changes the baud rate to 19200:

```
stty 19200 </dev/ttyRP0
```

To view the current serial port settings for **ttyRP0**, enter:

```
stty -a </dev/ttyRP0
```

Note: *Settings changes via stty are only valid during current log in session. For permanent setting changes, use the /etc/inittab file.*

Setting Up Terminals and Modems (mgetty, getty)

Add the appropriate line or lines to the **/etc/inittab** file then restart.

Terminal Example:

```
T0:23:respawn:/sbin/agetty -L ttyRP0 57600 vt100
```

Modem Example:

```
T1:23:respawn:+/sbin/mgetty -m "" AT&F OK' -D -x9 -s 115200 ttyRP0
```

Note: *If necessary, see the manual pages for more information on mgetty.*

Testing with minicom

You can also use **minicom**, which shipped with most Linux distributions, to test the serial ports. A Control document is available for using [minicom](#).

Technical Support

Control has a staff of support technicians available to help you. You should review [Before Calling Technical Support](#) on Page 27 before calling Technical Support. If you call for Technical Support, please have the following information available:

- Model number
- Serial number
- Interface type
- Operating system type, release, and service package, and if Linux, the kernel version
- Device driver version
- Computer make, model, speed, and single or dual processor
- List other devices in the computer and their addresses

Contact Method	Corporate Headquarters
Support	http://www.comtrol.com/pub/en/Support
Device drivers	ftp://ftp.comtrol.com/html/rp_express_drivers.htm
Diagnostic and Utilities	ftp://ftp.comtrol.com/html/rp_express_diag.htm
User Guides	ftp://ftp.comtrol.com/html/rp_express_docs.htm
Web site	http://www.comtrol.com
Phone	763.494.4100
Downloads	ftp://ftp.comtrol.com/html/default.htm

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- RJ11
 - null-modem cables 19
 - signals 19
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- DB25M
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