



# User Guide



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# Overview

## Product Overview

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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

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If you are planning on installing the RocketPort EXPRESS in a Windows system make sure that you have placed 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 links in the following table to locate the latest device drivers and documentation.

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

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This table contains links the software and installation documentation.

<b>Software or Document</b>	<b>Location</b>
Device drivers	<a href="http://downloads.comtrol.com/html/rp_express_drivers.htm">http://downloads.comtrol.com/html/rp_express_drivers.htm</a>
Diagnostic and Utilities	<a href="http://downloads.comtrol.com/html/rp_express_diag.htm">http://downloads.comtrol.com/html/rp_express_diag.htm</a>
User Guides	<a href="http://downloads.comtrol.com/html/rp_express_docs.htm">http://downloads.comtrol.com/html/rp_express_docs.htm</a>



# 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 9
- [Installing a Rackmount Interface Box](#) on Page 10

## Installing the Card

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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. Insert the card into the slot and seat it securely.
6. Reinstall the expansion slot retaining screw or clamp.

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



7. *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](#) on Page 8
  - [Attaching an Interface Box](#) on Page 9
  - [Installing a Rackmount Interface Box](#) on Page 10
8. *If this is a 4J or 8J installation,* see [Connecting Serial Devices](#) on Page 11 for cabling information after driver installation.
  - a. Tighten the retaining screws.
  - b. Replace the system cover on your computer.
  - c. Power on your host system.
  - d. Click **Cancel** if a *Found New Hardware* message appears on a Windows operating system.

Execute the device driver assembly to start the driver installation. For other operating system device drivers, see [Locating the Latest Drivers and Documentation](#) on Page 5.

- e. After installing the device driver, you should verify that the ports are functioning properly and then connect your serial devices. You can use the [Troubleshooting](#) section on Page 25 for port testing procedures for your operating system. Refer to [Connecting Serial Devices](#) on Page 11 for information about connecting serial devices.

## Attaching a Quad/Octacable Interface Cable

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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.

***Make sure that the connectors are properly aligned and forcefully push the connector of the Quad/Octacable with a rocking motion into the card connector. Make sure that the connector is seated tightly before tightening the retaining screws on the connector.***



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.

Execute the device driver assembly to start the driver installation.

For other operating system device drivers, see [Locating the Latest Drivers and Documentation](#) on Page 5.

6. After installing the driver, you should verify that the ports are functioning properly and then connect your serial devices.

You can use the [Troubleshooting](#) section on Page 25 for port testing procedures.

Refer to [Connecting Serial Devices](#) on Page 11 for information about connecting serial devices.



## 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. The interface is not hot-swappable.***

***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.



***Make sure that the connectors are properly aligned. Do NOT use force when connecting the cables to the host adapter card.***

***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.

Execute the device driver assembly to start the driver installation.

For other operating system device drivers, see [Locating the Latest Drivers and Documentation](#) on Page 5.

6. After installing the driver, you should verify that the ports are functioning properly and then connect your serial devices.

You can use the [Troubleshooting](#) section on Page 25 for port testing procedures.

Refer to [Connecting Serial Devices](#) on Page 11 for information about connecting serial devices.

## 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.



**Do not connect the cable to the RocketPort EXPRESS card or interface box when the computer is powered on. The interface is not hot-swappable.**

**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. Place the Rackmount interface box on a stable surface or attach the brackets to the interface box using the screws supplied with the unit and attach the bracket into your rack.
3. Attach the cable shipped with the card between the interface box and the card.

**Make sure that the connectors are properly aligned. Do NOT use force when connecting the cables to the host adapter 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.**

4. Power on the host system.
5. Click **Cancel** if a *Found New Hardware* message appears on a Windows operating system.

Execute the device driver assembly to start the driver installation.

For other operating system device drivers, see [Locating the Latest Drivers and Documentation](#) on Page 5.

6. After installing the driver, you should verify that the ports are functioning properly and then connect your serial devices.

You can use the [Troubleshooting](#) section on Page 25 for port testing procedures.

Refer to [Connecting Serial Devices](#) on Page 11 for information about connecting serial devices.



Rx Tx Each port has transmit and receive LEDs.

The receive LED is lit if connected to an RS-232/422/485 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 an application (for example, the diagnostic, Test Terminal, or minicom) to test serial ports. See [Before Calling Technical Support](#) on Page 25 for information about using the test application shipped with the RocketPort EXPRESS.

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## 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 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 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.

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## 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. Quad cable, 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.

<b>DB9 Male Connector Signals</b>				
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	SIG GND	SIG GND	SIG GND	SIG GND
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

*Ground must be tied to signal ground.*

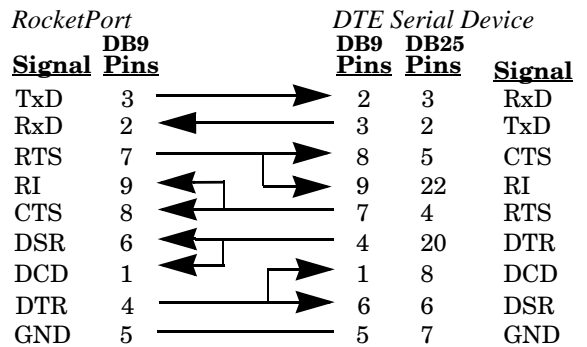
**DB9 Null-Modem Cables (RS-232)**

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.

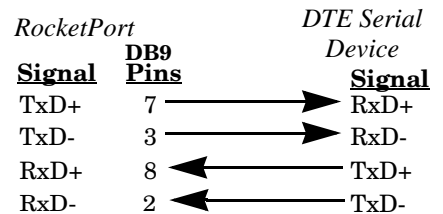
**Note:** *RJ45 connectors are not standardized. Refer to your serial device documentation for signal information.*



**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).

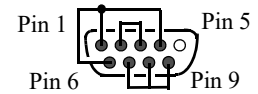
Wire the following pins together to build additional plugs or replace a missing RS-232/422 loopback plug.

- 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.

<b>DB25 Male Connector Signals (Quad/Octacables)</b>				
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	SIG GND	SIG GND	SIG GND	SIG GND
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

*Ground must be tied to signal ground.*

## Interface Box Signals

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

<b>DB25 Female (Standard Interface Box) and DB 25 Male (Surge Interface Box) Connector Signals</b>				
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	SIG GND	SIG GND	SIG GND	SIG GND
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-

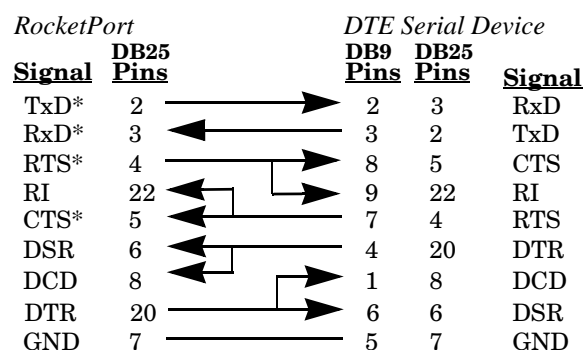
*Ground must be tied to signal ground.*

### 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.*



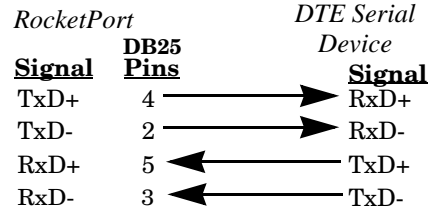
\* Interface boxes have alternate pins available for this signal. Refer to Interface Box Signals for additional information.

**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.

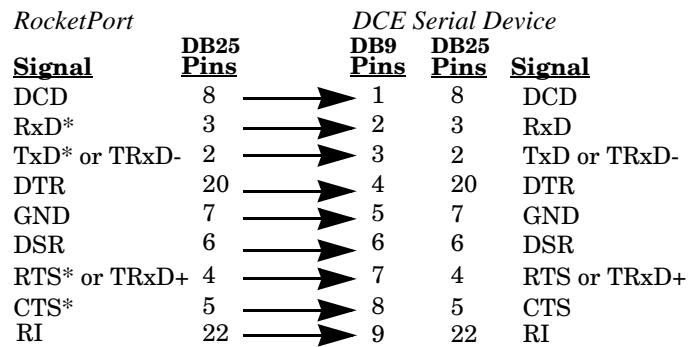
Interface boxes have optional pins available for these signals. Refer to [Interface Box Signals](#) on Page 15 for more information.

**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**

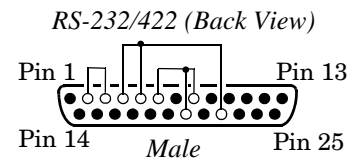
RocketPort EXPRESS models with DB25 male connectors on the interface are shipped with a a single loopback plug (RS-232/422).

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**

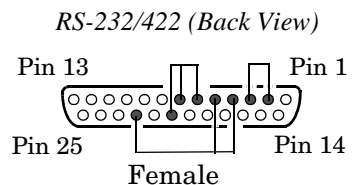
RocketPort EXPRESS models with DB25 female connectors on the interface box are shipped with a a single loopback plug (RS-232/422).

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



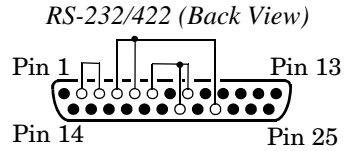


**DB25M: Surge Interface Box Loopback Plugs**

RocketPort EXPRESS models with DB25 male connectors on the Surge interface box are shipped with a 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



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.

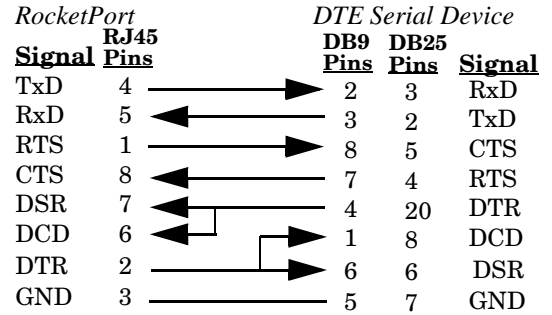


RJ45 Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	RTS	TxD+	TxD+	TRxD+
2	DTR	Not Used	Not Used	Not Used
3	SIG GND	SIG GND	SIG GND	SIG GND
4	TxD	TxD-	TxD-	TRxD-
5	RxD	RxD-	RxD-	Not Used
6	DCD	Not Used	Not Used	Not Used
7	DSR	Not Used	Not Used	Not Used
8	CTS	RxD+	RxD+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

*Ground must be tied to signal ground.*

**RJ45 Null-Modem Cable (RS-232)**

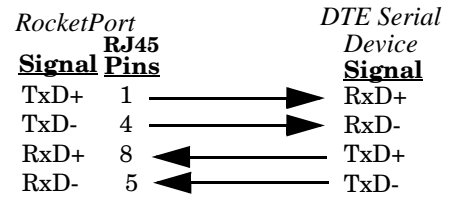
Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.



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

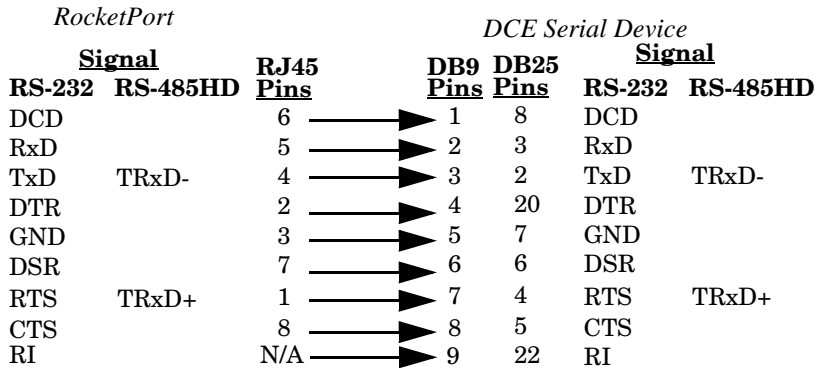
Use the following figure if you need to build an RS-422 null-modem cable. A null-modem cable is required for connecting DTE devices.

**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).

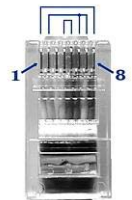
Wire the following pins together to build additional loopback plugs or replace a missing RS-232/422 loopback plug:

- 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.

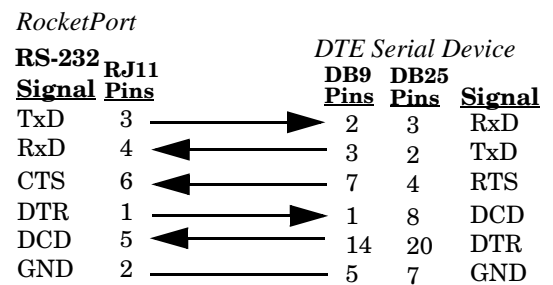


RJ11 Connector Signals				
Pin	RS-232	RS-422	RS-485 (Full-Duplex)	RS-485 (Half-Duplex)
1	DTR	TxD+	TxD+	TRxD+
2	SIG GND	SIG GND	SIG GND	SIG GND
3	TxD	TxD-	TxD-	TRxD-
4	RxD	RxD-	RxD-	Not Used
5	DCD	Not Used	Not Used	Not Used
6	CTS	RxD+	RxD+	Not Used

*Ground must be tied to signal ground.*

### RJ11 Null-Modem Cable (RS-232)

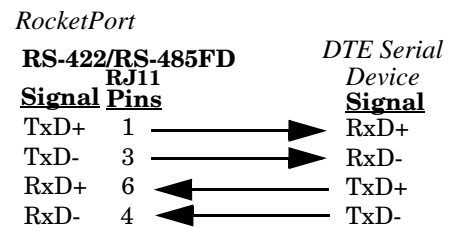
Use the following figure if you need to build an RS-232 null-modem cable. A null-modem cable is required for connecting DTE devices.



### 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 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.

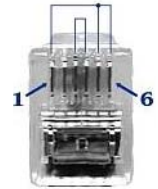
<i>RocketPort</i>		<i>DCE Serial Device</i>					
<u>Signal</u>		<u>RJ11</u>		<u>DB9</u>	<u>DB25</u>	<u>Signal</u>	
RS-232	RS-485HD	Pins		Pins	Pins	RS-232	RS-485HD
DCD		5	→	1	8	DCD	
RxD		4	→	2	3	RxD	
TxD	TRxD-	3	→	3	2	TxD	TRxD-
DTR	TRxD+	1	→	4	20	DTR	TRxD+
GND		2	→	5	7	GND	
CTS		6	→	8	5	CTS	

**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



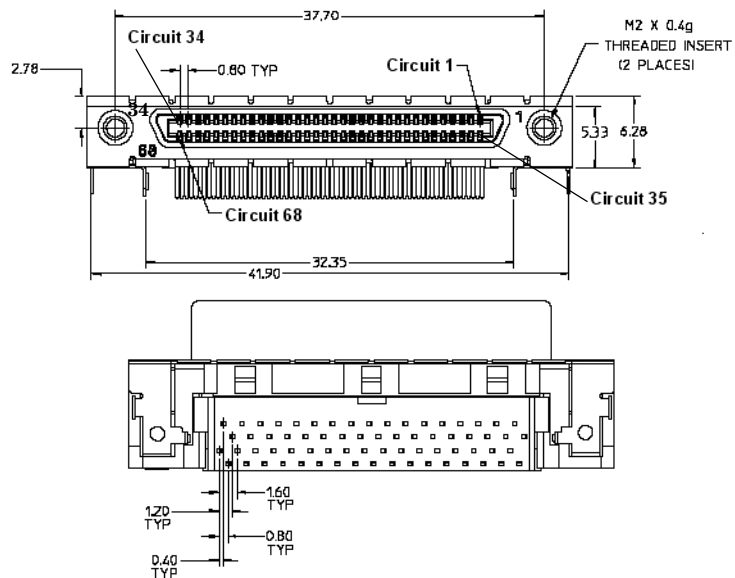
# Building Interfaces

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

## 68-Pin VHDCI Connector (Quad/Octacable)

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



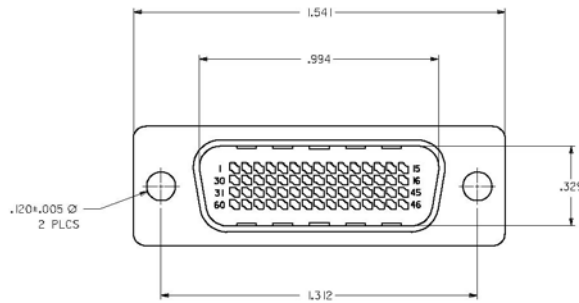
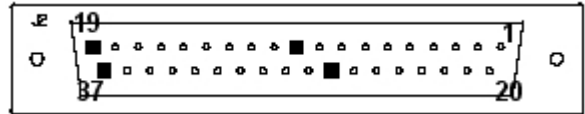
Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
1	TXD1	TXD-1	TXD-1	TRXD-1
2	RI1			
3	DCD1			
4	DTR1			
5	RTS1	TXD+1	TXD+1	TRXD+1
6	DSR1			
7	RXD1	RXD-1	RXD-1	
8	CTS1	RXD+1	RXD+1	
9	TXD2	TXD-2	TXD-2	TRXD-2
10	RI2			
11	DCD2			
12	DTR2			
13	RTS2	TXD+2	TXD+2	TRXD+2
14	DSR2			
15	RXD2	RXD-2	RXD-2	

Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
16	CTS2	RXD+2	RXD+2	
17	RJ45			
18	SIG GND	SIG GND	SIG GND	SIG 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	SIG GND	SIG GND	SIG GND	SIG GND
52	SIG GND	SIG GND	SIG GND	SIG GND
53	TXD7	TXD-7	TXD-7	TRXD-7
54	RI7			
55	DCD7			
56	DTR7			
57	RTS7	TXD+7	TXD+7	TRXD+7
58	DSR7			
59	RXD7	RXD-7	RXD-7	

Pin	RS-232	RS-422	RS-485 FD	RS-485 HD
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		SIG GND
J1-3	J2-43		SIG GND
J1-4	J2-42		SIG GND
J1-5	J2-41		SIG 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	RXCNVT+
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+
J1-17	J2-48		V+

Ports 17-32			
DB37-2 Source	LFH60 Dest	Pair	Signal
J3-1	N/C		
J3-2	N/C		SIG GND
J3-3	J2-37		SIG GND
J3-4	J2-36		SIG GND
J3-5	J2-35		SIG 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	RXCNVT+
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+
J3-17	J2-55		V+

Ports 1-16 (Continued)			
DB37-1 Source	LFH60 Dest	Pair	Signal
J1-18	J2-49		V+
J1-19	J2-50		V+
J1-20	N/C		
J1-21	N/C		
J1-22	J2-40		SIG GND
J1-23	J2-39		SIG GND
J1-24	J2-38		SIG 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
J3-18	J2-56		V+
J3-19	N/C		
J3-20	N/C		
J3-21	N/C		
J3-22	J2-34		SIG GND
J3-23	J2-33		SIG GND
J3-24	J2-32		SIG 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		



# 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

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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 25).
- 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 Linux or QNX driver.

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

- [Troubleshooting Windows Systems](#) on Page 27
- [Troubleshooting Linux Systems](#) on Page 34

## RocketPort EXPRESS Diagnostics

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This subsection describes how to run the bootable diagnostic CD to verify that the RocketPort EXPRESS hardware is functioning properly. You can [download](#) (Page 5) the RocketPort EXPRESS .iso file and burn a bootable CD that executes hardware diagnostics.

**Note:** *An .iso file cannot be copied onto a CD but must be burned using an application that burns the image to the CD. If you do not have an application available, you can download a freeware application at: <ftp://ftp.comtrol.com/iso/IsoBurner/>.*

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.

## Running the Bootable Diagnostic

Use the following procedure to run the diagnostics.

**Note:** If the diagnostic goes into sleep mode while unattended, press the **Num Lock** key to activate the screen. Use **Ctrl/Alt/Delete** to stop the diagnostic process at any time.

1. Insert the bootable CD that contains the diagnostic and restart your machine.

**Note:** If the Diagnostic CD does not boot the PC, you may need to change your BIOS settings so that the PC can boot from a CD drive.

The diagnostic starts automatically and takes a few minutes before the first screen appears.

**Note:** If the diagnostics did not detect the RocketPort EXPRESS, the adapter has a hardware failure, contact Technical support (Page 35).

2. Press **Enter** at the Copyright screen to begin the diagnostic.
3. Select from the following options and use the appropriate steps.

- [Testing a Port or Ports](#)
- [Stress Testing the RocketPort EXPRESS](#)

### Testing a Port or Ports

4. Enter **1** to **4** and then press **Enter** to test a port or ports on a specific RocketPort EXPRESS or multiple adapters.
5. Press **Enter** to test all ports on the RocketPort EXPRESS or enter the port number of a port that you want to test and then **Enter**.
6. Place the loopback plug on the appropriate port and press **Enter**. 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.

**Note:** Use **Shift Page Up/Down** to review the diagnostic report.

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

### Stress Testing the RocketPort EXPRESS

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

Select **S** and press **Enter** to run the stress test on all RocketPort EXPRESS cards installed in the system. Make sure that you have a loopback port installed and each port on each adapter.

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**.

### Exiting the Diagnostic

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 Diagnostic Fails

If the diagnostics fails, try one of the following before contacting Technical Support:

1. Turn off the power and reseal the RocketPort EXPRESS card into the slot.
2. Try running the diagnostics again. If they fail again, you may have a bad port, contact [Technical Support](#) on Page 35.

## 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.
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. Use the following subsection, *Control Utility*, below for installation and adapter testing procedures.

### Control Utility

The **Control Utility** is available on the *Software and Documentation* CD or you can [download](#) (Page 5) 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:

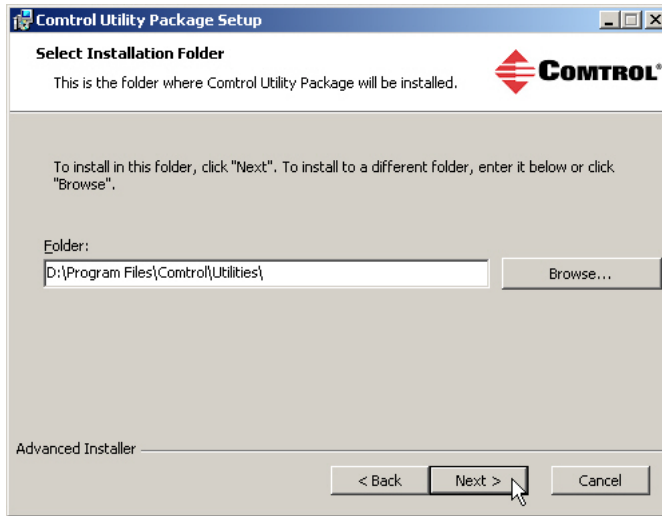
- **Port Monitor** (PortMon2) checks for errors, modem control, and status signals. In addition, it provides you with raw byte input, output counts, and confirm that the device driver is functioning. It can determine if the ports are in use by another application.
- **Test Terminal** (WCOM2) can be used to troubleshoot communications on a port-by-port basis ([Using Test Terminal to Test a Port](#) on Page 32). Test Terminal requires a loopback plug. You can build a loopback plug if you are missing the loopback plug shipped with the adapter ([DB9 Loopback Plugs](#) on Page 13).

Use the following procedure to install the Control Utility package.

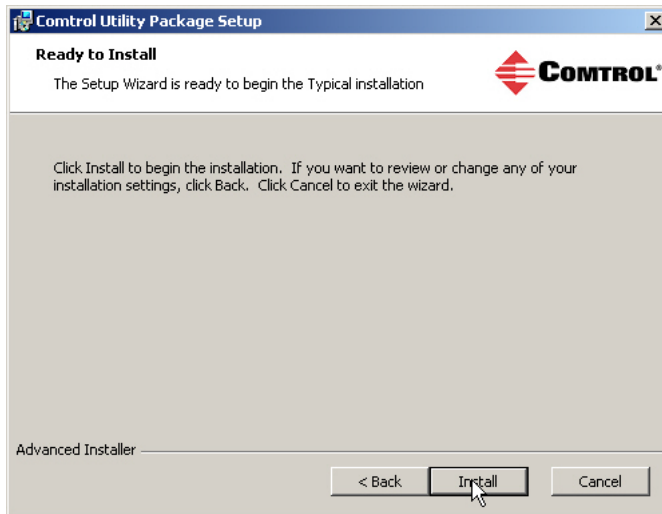
1. Execute the **Control\_Utility\_Package\_x.xx.msi** file, where **x\_xx** is the Control Utility version number.
2. Click **Next**.



3. Click Next.



4. Click Install.



5. Click Finish.

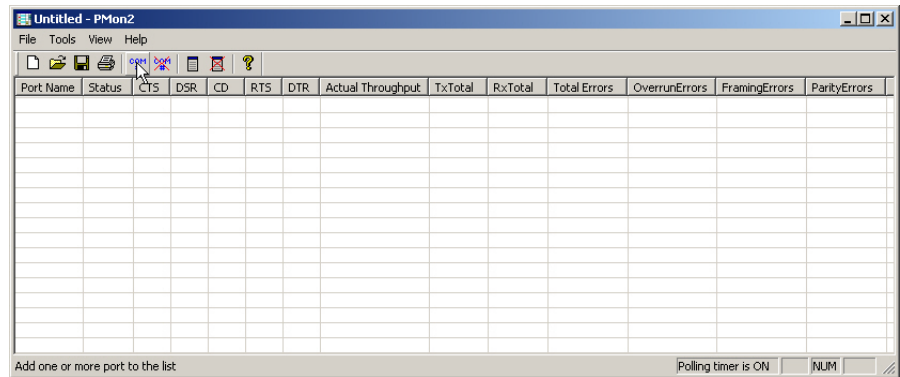


6. Go to [Using PortMon to Test the Driver Installation](#) on Page 29.

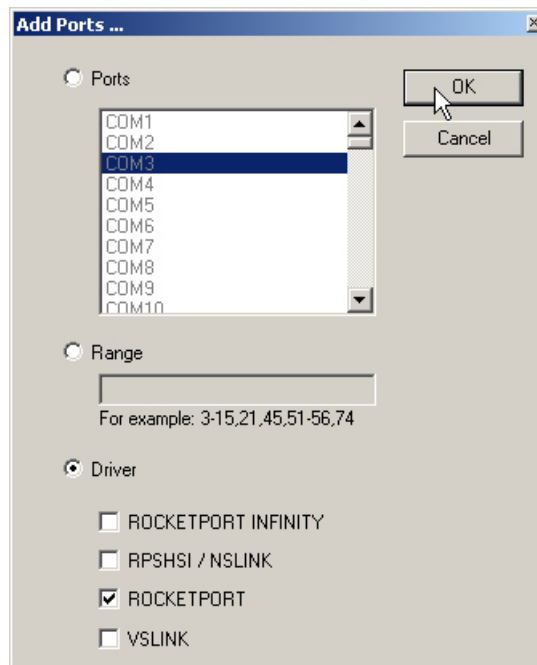
*Using PortMon to Test the Driver Installation*

You can use **PortMon** to check whether the RocketPort EXPRESS can communicate through the device driver for Windows. If necessary, use [Control Utility](#) on Page 27 to install **PortMon**.

1. From the **Start** menu, select **Programs > Control > Utilities > Port Monitor (PortMon2)**.



2. Click **Add Ports** using the icon or **Tools > Add Ports**, click **Driver, ROCKETPORT**, and click **Ok**.



3. If the RocketPort EXPRESS is communicating with the device driver for Windows, Port Monitor should display **CLOSED** status. If a port is open for an application, it displays as **OPEN**, and displays **Actual Throughput**, **TxTotal** and **RxTotal** statistics.

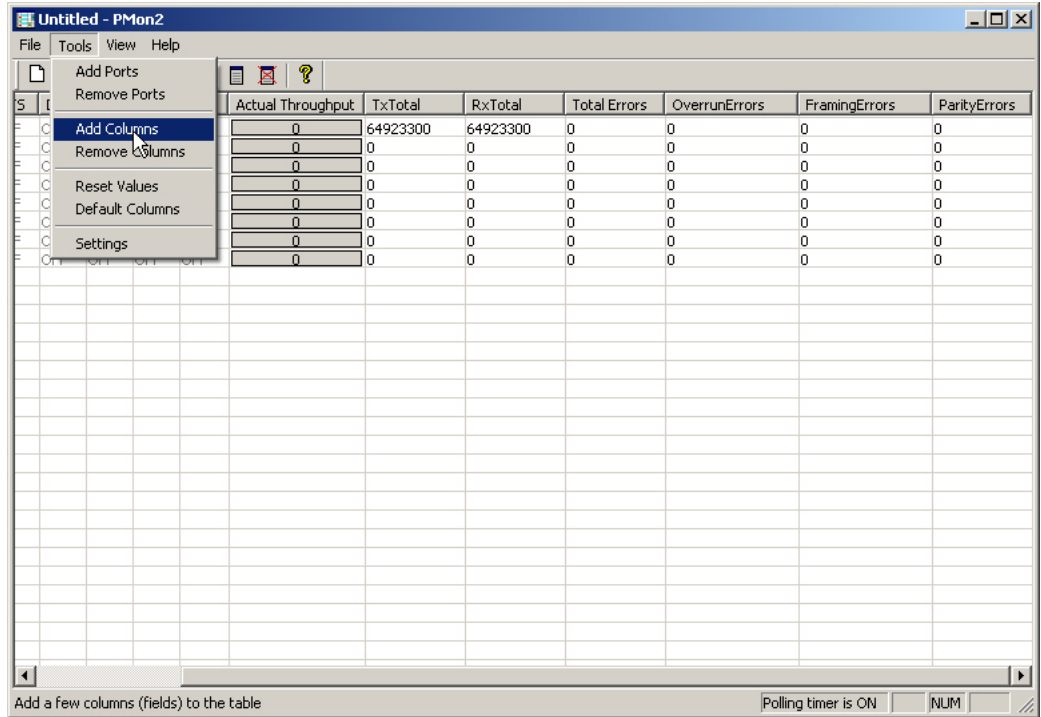
Port Name	Status	CTS	DSR	CD	RTS	DTR	Actual Throughput	TxTotal	RxTotal	Total Errors	OverrunError
COM11	OPEN	ON	ON	ON	ON	ON	114600	205891	205638	0	0
COM12	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM13	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM14	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM15	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM16	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM17	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0
COM18	CLOSED	OFF	OFF	OFF	OFF	OFF	0	0	0	0	0

Normally, there should be no data errors recorded or they should be very small. To find out what the actual errors are, scroll to the right. You will see three columns: **Overrun Errors**, **Framing Errors**, and **Parity Errors**.

If the errors are:

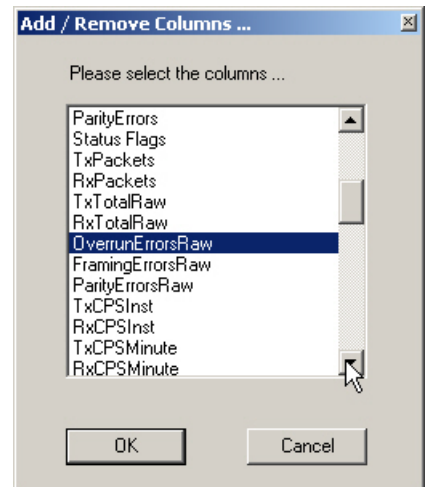
- **Overrun Errors** represent receive buffer overflow errors. If this is the case, you will have to configure either software or hardware handshaking to control the flow of data. The most common errors are Overrun errors.
- **Framing Errors** indicate that there is a synchronization error between the beginning of a data frame and the end of the data frame. A frame usually consists of a start bit, 8 data bits, and a stop bit or two. The framing error occurs if the stop bit is not detected or it occurs in the wrong time frame. Most causes for framing errors are electrical noise on the data lines, or differences in the data clocks of the RocketPort EXPRESS and the connected device.
- **Parity Errors** occur when parity is used and the parity bit is not what is expected. This can also be caused by noise on the data lines.

- You can view additional statistics to Port Monitor by adding columns. Click **Tools** and **Add Columns**.

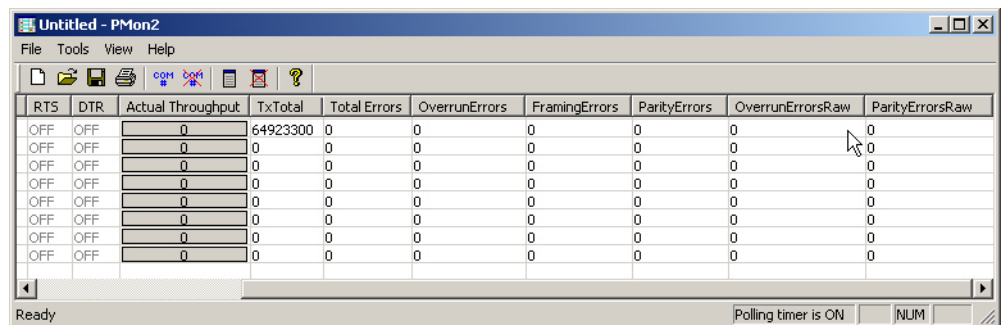


- Highlight or shift-click to add multiple statistics and click **Ok**.



**Note:** See the Port Monitor help system if you need an explanation of a column.



- Scroll to the right to view the new columns.





7. If you want to capture this session, you can save a current session as a report. To do this, select one of the following save options:
  - **File > Save As**
  - **File > Save** - if the report already exists in an older format
  - **Save Active Session**  buttonReports can be opened, viewed and re-used when needed. To open and view a report:
  - a. **Select File > Open** or the **Open Existing Session**  button. The *Open Session* dialog appears.
  - b. Locate the session (table), you want to open and click the **Open** button.Optionally, if you want to continue monitoring for an existing session, you need to activate the *Polling Interval*.
  - **Select Tools > Settings** to access the *PMon2 Settings* dialog
  - Change the **Polling Interval** field to a value other than zero (0)
8. Leave Port Monitor open so that you can review events when using *Test Terminal* to test a port or ports.

*Using Test Terminal to Test a Port*

Test Terminal (WCom2) allows you to open a port, send characters and commands to the port, and toggle the control signals. This application can be used to troubleshoot communications on a port-by-port basis.

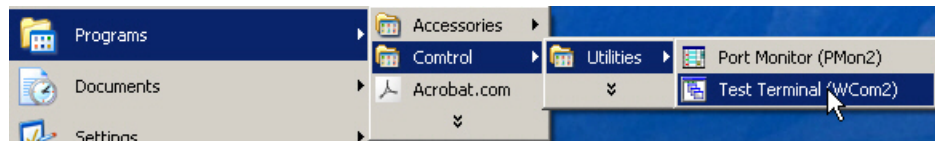
The **Send and Receive Test Data** option sends data out the transmit line to the loopback plug, which has the transmit and receive pins connected thus sending the data back through the Rx line to **Test Terminal**, which then displays the received data in the terminal window for that port. This test 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.

The **Loopback Test** option 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.

The following procedure shows how to use **Test Terminal** to send and receive test data to the serial ports and run a loopback test. If necessary, install the Control Utility package using [Control Utility](#) on Page 27.

1. Stop all applications that may be accessing the ports such as 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.
2. From the **Start** menu, select **Programs > Control > Utilities > Test Terminal (WCom2)**.

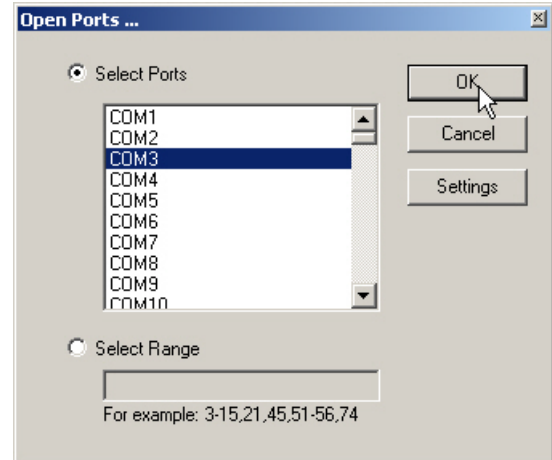




3. Select **File > Open Port**, the appropriate port (or ports) from the *Open Ports* drop list and **Ok**.

**Note:** If you left *Port Monitor* open from the previous subsection, you should show that the port is open.

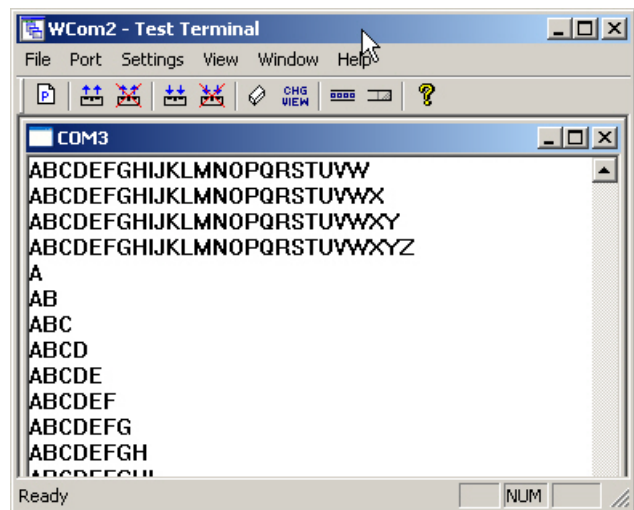
4. Install the loopback plug ([DB9 Loopback Plugs](#) on Page 13) onto the port (or ports) that you want to test.
5. Select **Port > Send and Receive Test Data**.



You should see the alphabet scrolling across the port. If so, then the port installed properly and is operational.

**Note:** If you left *Port Monitor* running, it should show data sent and received and show the average data throughput on the port.

6. Select **Port > Send and Receive Test Data** to stop the scrolling data.
7. 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

8. Close **Test Terminal**

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

**Note:** Do *NOT* forget to restart the communications application.

## Troubleshooting Linux Systems

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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

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Control has a staff of support technicians available to help you. You should review [Before Calling Technical Support](#) on Page 25 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

Control	Corporate Headquarters
Support	<a href="http://control.com/Support">http://control.com/Support</a>
Device drivers	<a href="ftp://ftp.control.com/html/rp_express_drivers.htm">ftp://ftp.control.com/html/rp_express_drivers.htm</a>
Diagnostic and Utilities	<a href="ftp://ftp.control.com/html/rp_express_diag.htm">ftp://ftp.control.com/html/rp_express_diag.htm</a>
User Guides	<a href="ftp://ftp.control.com/html/rp_express_docs.htm">ftp://ftp.control.com/html/rp_express_docs.htm</a>
Web site	<a href="http://www.control.com">http://www.control.com</a>
Phone	763.957.6000
Downloads	<a href="http://downloads.control.com/html/default.htm">http://downloads.control.com/html/default.htm</a>

