

***Single and Dual Port PCI Bus CE  
RS-232/422/485 Serial Card  
with Send Data Control***  
**3PCISD1A 3PCISD1B 3PCISD2A 3PCISD2B**

Documentation Number 3PCISDxx3903m (pn4541-r004)

This manual applies to models 3PCISD1/2A and 3PCISD1/2B. The "1" and "2" suffix designates the number of ports on the card. The "A" models are equipped with 16550A UARTs which have 16 byte transmit and receive buffers. The "B" models are equipped with 16850 UARTs with 128 byte transmit and receive buffers. The model number of each card is printed on a sticker on the board.

*This product designed and manufactured in Ottawa, Illinois USA  
of domestic and imported parts by*



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# TABLE OF CONTENTS

<b>CHAPTER 1: GENERAL INFORMATION.....</b>	<b>1</b>
INTRODUCTION .....	1
DESCRIPTION .....	1
FEATURES .....	1
SPECIFICATIONS .....	2
<b>CHAPTER 2: SETUP .....</b>	<b>5</b>
INSPECTION .....	5
RS-232 MODE.....	7
RS-422 MODE.....	8
RS-485 MODE.....	10
INSTALLING THE CARD.....	13
<b>CHAPTER 3. WINDOWS INSTALLATION.....</b>	<b>15</b>
WINDOWS 95 AND WINDOWS 98.....	15
WINDOWS 2000 PROFESSIONAL.....	24
WINDOWS NT 4.0 .....	29
<b>CHAPTER 4: TROUBLESHOOTING.....</b>	<b>37</b>
<b>APPENDIX A: 3PCISDXX I/O SCHEMATIC .....</b>	<b>A-1</b>
<b>APPENDIX B: RS-232 &amp; RS-422/485 PINOUTS .....</b>	<b>B-1</b>
<b>APPENDIX C: JUMPER MODE TABLES.....</b>	<b>C-1</b>
<b>APPENDIX D: TROUBLESHOOTING WITH COMTEST .....</b>	<b>D-1</b>
<b>APPENDIX E: RENAMING COM PORTS - WIN 95/98/ME .....</b>	<b>E-1</b>
<b>APPENDIX F: DECLARATION OF CONFORMITY .....</b>	<b>F-1</b>

## Chapter 1: GENERAL INFORMATION

### Introduction

B&B Electronics 3PCISD1x and 3PCISD2x serial interface cards are designed for IBM compatibles with a PCI Bus. The PCI design is Plug and Play compatible which allows the driver and Operating System to select the IRQ and addresses used by the card.

The 3PCISD1x and 3PCISD2x cards offer exceptional setup flexibility with a mix of selectable operating modes. If you are writing your own applications, be sure that the communications routine used supports Windows communication drivers and a wide range of COM ports.

### Description

The 3PCISD1x is a single port card, the 3PCISD2x is a two port card, each with exceptional setup flexibility. Each port can be independently configured for RS-232, RS-422, or RS-485 data protocols. The RS-485 mode Automatic Send Data Control feature transparently handles the enable and disable functions of the RS-485 transceiver. Buffered, high speed UARTs (16550 or 16850) make the cards ideal for high-speed (modem) and multitasking applications.

### Features

- IBM compatible, PCI Version 2.1 bus
- Supports baud rates to 460.8K baud with 4X clock option enabled
- RS-232/422/485 Mode Independently Configurable - Dual Port Models
- High speed 16 byte FIFO 16550A UARTs (A suffix models), 128 byte FIFO 16850 UARTs (B suffix models)
- RS-485 Automatic Send Data Control or RTS control
- 2-wire or 4-wire RS-485 Operation (Half or Full Duplex)
- 120Ω Termination Select Jumpers for RS-422/RS-485 Networks
- RS-232 Mode Signal lines: TD, RD, RTS, CTS, DTR, DSR, & DCD, RI and Signal Ground

- 2 Channel RS-422 Signal Lines: TD(A), TD(B), RD(A), RD(B) and Signal Ground
- RS-485 Signal Lines: TD(A), TD(B), RD(A), RD(B) and Signal Ground. (Data A & Data B lines when wired for 2-wire operation.)

### Specifications

Bus:	PCI bus version 2.1
Slot:	Requires one PCI slot
Dimensions:	9.3 x 4.2 in (23.6 x 10.7 cm)
I/O Connections:	9-pin male D-sub (DB9M) connectors
OS Supported:	Windows 95, 98, 2000 and NT 4.0
Baud rates:	460.8K baud maximum - RS-232/422/485
UARTs:	16550A 16-byte TX and RX buffers ( <b>3PCISD1/2A</b> ), or 16850 128-byte TX and RX buffers ( <b>3PCISD1/2B</b> )
Character length:	5, 6, 7, or 8 bits
Parity:	Even, odd or none
Stop bits:	1, 1.5, or 2

#### RS-232 Control Lines Drivers/Receivers:

Device:	75185 transceiver
High level output voltage:	6.0 V minimum
Low level output voltage:	-6.0 V minimum
Output current limited to:	±10 mA
Input high threshold voltage:	1.5 V maximum
Input low threshold voltage:	0.75 V minimum
Device will withstand:	±30 V

#### RS-232 Data Lines Drivers/Receivers:

Device:	SP211H transceiver
High level output voltage:	5.0 V minimum
Low level output voltage:	-5.0 V minimum
Output current limited to:	±25 mA
Input high threshold voltage:	1.7 V maximum
Input low threshold voltage:	0.8 V minimum
Device will withstand:	±15 V

RS-422/485 Driver/Receiver:

Device: 75ALS180 or MAX491  
Differential driver output voltage: 1.5 - 6 V  
Differential input high-threshold voltage: 0.2 V maximum  
Differential input low-threshold voltage: -0.2 V minimum

Automatic RS-485 Driver Control Timing:

Driver is enabled when data is a logic "0" (start bit). Driver remains enabled for one character transmission time (10 bits of data at current baud rate). Each additional logic "0" resets the timeout.

Termination: A 120Ω termination resistor is jumper selectable on each 422/485 receiver.

Max Power Consumption: All ports loaded

3PCISD1X			3PCISD2X	
Voltage (V)	Current (mA)	Power (W)	Current (mA)	Power (W)
+5	241.0	1.205	298.0	1.490
+12	31.0	0.372	62.0	0.744
-12	31.0	0.372	62.0	0.744
<b>Total</b>	<b>303.0</b>	<b>1.949</b>	<b>422.0</b>	<b>2.978</b>

**Accessories:**

Software: Driver Disk (3.5) for Windows 95/98/2000/NT 4.0  
PCI/USB COM Port Utility Disk (3.5)

Manual: Instruction Manual (this booklet)

## Chapter 2: SETUP

### Inspection

Your 3PCISD1x or 3PCISD2x serial card was tested for proper operation before shipment. It should be in perfect mechanical and electrical condition upon receipt.

The single port card has components only for Port 1, but is otherwise the same as the two port version.

The card is normally pre-configured for RS-232 operation.

The data clock speed for both ports is set by one jumper to x1 (normal) operation or to x4 operation.

The operating mode of each port on the card is set using 9 jumpers: 5 jumpers select RS-232 operation or RS-422/485 operation, 2 jumpers select RS-422 or RS-485 operating modes for Receive and Transmit, one jumper sets RS-485 Send Data or RTS mode, and the last selects 120 ohm termination for the RS-422 or RS-485 Receive.

Refer to **Jumper Mode Table** in **Appendix C**.

### CAUTION: ELECTROSTATIC SENSITIVE DEVICE

Use ESD precautions for safe handling.

Before removing the card from the anti-static protective packaging:

- Discharge any static electricity buildup on your body by touching a large grounded metal surface or the metal chassis on equipment connected to earth ground by a 3-wire power cord.
- Avoid touching the gold connectors or other parts on the card except as necessary to set the configuration jumpers for each port. After setting the jumpers, ground yourself to the computer chassis before and while inserting the card.
- Remove AC power from the computer and unplug the power cord before inserting the card.
- Retain the ESD bag for handling the card.  
Save the packaging for storage or shipping.

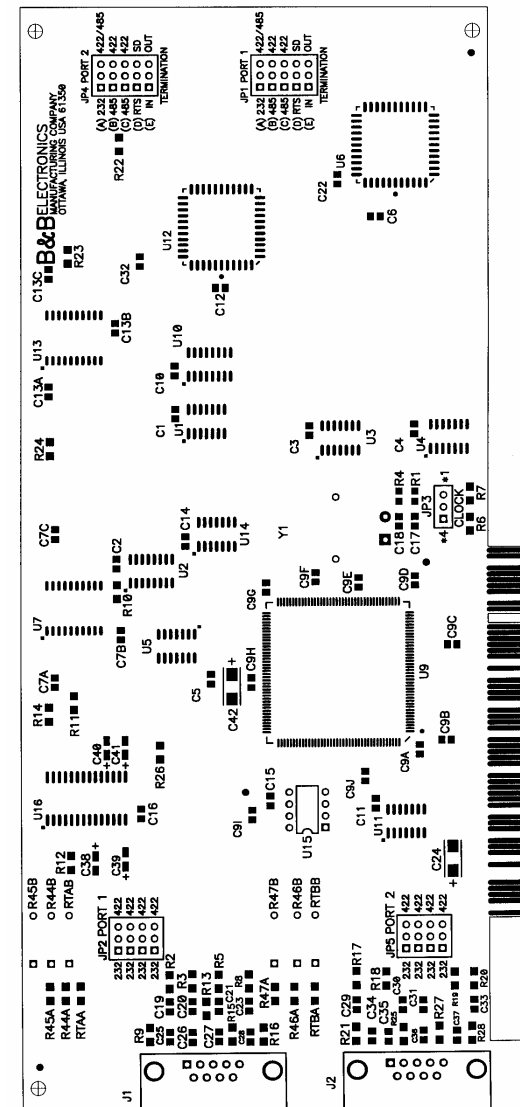


Figure 1. Silk Screen Plot of 3PCISD1/2x PCB

## RS-232 Mode

To configure a port for RS-232 mode, 5 jumpers must be set/checked. The following settings will configure Port 1 as RS-232. *Jumpers for Port 2 shown in italics.*

1. Set the four jumpers of JP2 to the "232" (left) position. Use JP5 for Port 2.
2. Set the top jumper (A) of JP1 to the "232" (left) position. Use JP4 for Port 2.
3. The remaining jumpers (B-E) of JP1 (*JP4 for Port 2*) are unused in the RS-232 mode and may be in either position. Figure 2 shows the jumper configuration to set both ports for RS-232 mode with \*1 clock enabled.

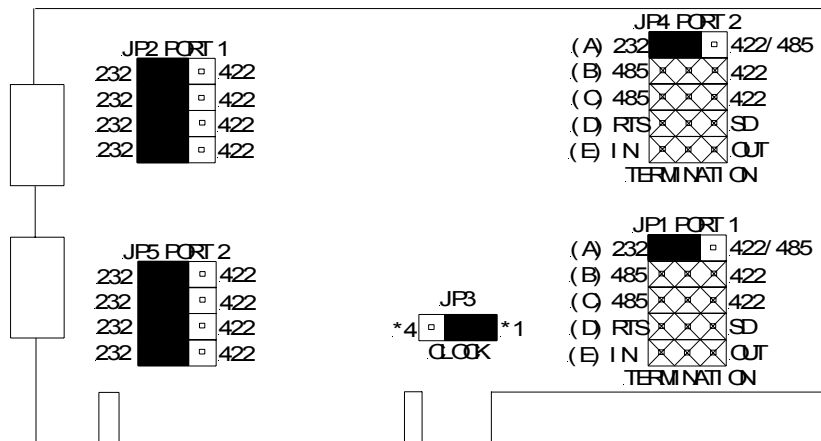


Figure 2. RS-232 Mode Jumper Settings

### RS-232 Pinouts

The DB-9 male connectors on the cards are configured as standard DTE RS-232 serial ports. **Table 1** shows the signal names and pin numbers.

Name	Description	Direction	DB9M Pin
DCD	Data Carrier Detect	Input	1
RD	Receive Data	Input	2
TD	Transmit Data	Output	3
DTR	Data Terminal Ready	Output	4
GND	Signal Ground	-----	5
DSR	Data Set Ready	Input	6
RTS	Request to Send	Output	7
CTS	Clear to Send	Input	8
RI	Ring Indicator	Input	9

Table 1: RS-232 Pinouts

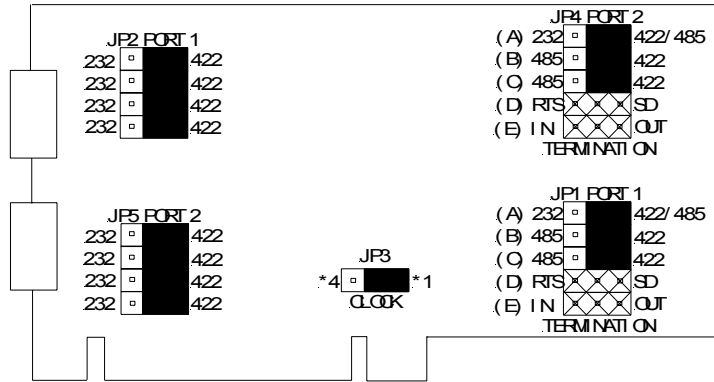
## RS-422 Mode

To configure a port for RS-422 mode, 8 jumpers must be set/checked. The following settings configure Port 1 as RS-422. *Jumpers for Port 2 shown in italics.*

1. Set the four jumpers of JP2 to the "422" (right) position. Use JP5 for Port 2.
2. Set JP1 (A) to the "422/485" (right) position. Use JP4 (A) for Port 2.
3. Set JP1 (B), (C) to the "422/485" (right) position. These set the Receiver and Transmitter (enabled) to 422 mode. Use JP4 (B), (C) for Port 2.
4. The bottom jumper of JP1 (E) switches the 120Ω Termination resistor IN or OUT. Use JP4 (E) for Port 2. Typically this resistor is not used. In some cases using high baud rates and very long cables, termination is needed. See our **RS-422/485 Application Note**, Termination section for more information (available on our website).

Figure 3 shows the jumper configuration to set both ports for RS-422 mode with \*1 clock enabled.

Figure 3. RS-422 Mode Jumper Settings



**RS-422 Pinouts**

The RS-422 mode supports 2 channels (transmit and receive). The pinouts of the DB-9 male connector are given in **Table 2**.

**Table 2: RS-422/485 Pinouts**

Name	Description	Direction	DB9M Pin
RD(A) –	Receive Data A	Input	1
TD(B) +	Transmit Data B	Output	2
TD(A) –	Transmit Data A	Output	3
GND	Signal Ground	-----	5
RD(B) +	Receive Data B	Input	9

With 2-wire RS-485 mode operation, your connection cable must jumper TD(A) to RD(A) and TD(B) to RD(B). Connect from TD(A) and TD(B) to the Data A(–) and Data B(+) wires of your RS-485 network.

Note that the EIA RS-422 Specification labels data lines with an "A" and "B" designator. Some RS-422 equipment uses a "–" and "+" designator. In almost all cases, the "A" line is the equivalent of the "–" line and the "B" line is the equivalent of the "+" line. *More information on RS-422 communications can be found in our **RS-422/485 Application Note** (available on our website).*

**RS-485 Mode**

To configure one port for RS-485 mode, 8 jumpers must be set/checked. The following settings configure Port 1 as RS-485. *Jumpers for Port 2 shown in italics.*

1. Set the four jumpers of JP2 to the "422" (right) position. *Use JP5 for Port 2.*
2. Set JP1 (A) to the "422/485" (right) position. *Use JP4 (A) for Port 2.*
3. For 2-Wire 485 operation, set the second jumper JP1 (B) to the "485" (left) position (half duplex). For 4-wire 485 operation, set it to the "422" (right) position (full duplex, Receive enabled). *Use JP4 (B) for Port 2.*
4. Set JP1 (C) to the "485" (left) position. This sets transmit to the 485 mode. *Use JP4 (C) for Port 2.*
5. Set JP1 (D) to select the type of RS-485 transmit driver control, automatic Send Data control or RTS. Select SD control (right) unless you are sure that your software requires RTS control (left). *Use JP4 (D) for Port 2.*
6. The bottom jumper of JP1 (E) switches the 120 ohm termination resistor IN or OUT. *Use JP4 (E) for Port 2.* Typically this resistor is not used. In some cases using high baud rates and very long cables, termination is needed. *See our **RS-422/485 Application Note**, Termination section, for more information (available on our website).*

Figure 4 shows the jumper configuration to set both ports for RS-485 mode with \*1 clock enabled.

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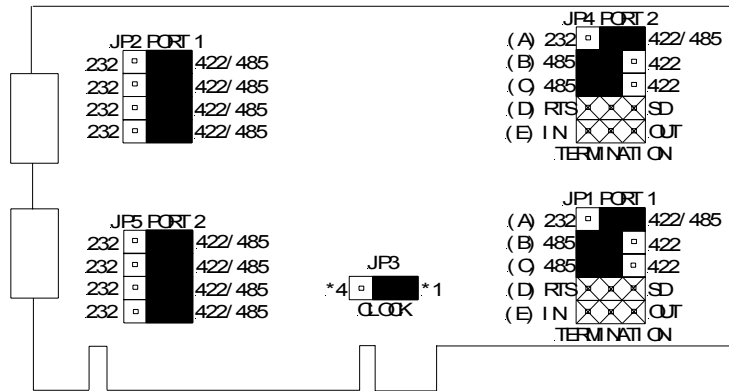


Figure 4. RS-485 Mode Jumper Settings

### RS-485 Pinouts

The pinouts in RS-485 mode are the same as those listed in Table 2 for RS-422 mode.

### Explanation of RS-485 Operation

In RS-485 mode the transmit driver must be enabled to transmit, and set to a high impedance (tri-state) at the end of transmission. In a 2-wire (half duplex) mode, the receiver is disabled during transmit and enabled when not transmitting.

The 3PCISDxx card provides two methods of enabling/disabling the driver, automatic Send Data (SD) control and Request To Send (RTS) control. With automatic SD control, the driver is enabled when data is sent. The driver remains enabled for the transmission time and ten data bits after data transfer is complete. The SD circuit automatically adjusts its timing to the baud rate of the data. With RTS control, software must assert the RTS line to enable the driver and disassert to disable the driver. To select SD control for Port 1, place the fourth jumper (D) of JP1 (use JP4 for Port 2) in the “SD” (right) position. Place the jumper in the “RTS” (left) position for RTS control.

The receiver can also be enabled and disabled, a useful feature in two-wire communications to prevent the transmitted data from “echoing back” on its own receiver. The second jumper (B) of JP1 (Use JP4 for Port 2) determines the receiver mode. If the jumper is placed in the “485” position, the “echo” is turned off (normal in 2-wire mode). This is achieved by disabling the receiver when the driver is enabled. Placing this jumper in the “422” position will hold the receiver enabled at all times (normal for 4-wire RS-485 mode). *More information on RS-485 communications can be found in our **RS-422/485 Application Note** (available on our Website).*

### RS-422 and RS-485 Termination

A 120Ω termination resistor has been provided for each RS-422/485 receiver. Note that termination should only be used in systems with both high baud rates (>19200) and over several thousand feet of cable. If a value other than 120Ω is desired, space for a through-hole resistor has been provided on the board adjacent to the surface mount termination resistor. These through-hole termination resistors are labeled RTAB and RTBB for ports 1 and 2, respectively. *See our **RS-422/485 Application Note** for more discussion on termination.*

### RS-485 Network Biasing

Biasing is required on an RS-485 network to hold the network in the marking state between transmissions. The 3PCISDxx RS-485 receivers are biased with a 4.7 KΩ pull-up resistor (R44A and R46A) on the Receive Data B line and a 4.7 KΩ pull-down resistor (R45A and R47A) on the Receive Data A line. These values are usually adequate for networks without termination and small numbers of nodes. For more complex networks, the user must calculate the required value and replace these resistors. Space for through-hole resistors has been provided over the top of the surface-mount components placed at the factory. The through-hole resistors for the pull-ups are marked as R44B and R46B and the pull-downs are marked as R45B and R47B.



## 4 X Baud Rate Option

Baud rates higher than 115,200 are possible with the 3PCISDxx card in RS-232, 422, or 485 mode. Jumper JP3 controls the clock frequency supplied to the UARTs, by moving this jumper to the “\*4” (left) position, the clock frequency is increased from 1.8432 to 7.3728 MHz. This multiplies all UART baud rates by 4 times. For example, if the software is set for 57.6K baud, the actual baud rate will be increased by a factor of four to 230.4K baud. In many systems, these higher baud rates can improve throughput significantly. However, remember that baud rates and actual throughput are only proportional if the system can keep up with the communications, otherwise increasing the baud rate effectively only increases the idle time between characters.

## Installing the Card

1. Ground yourself by touching the metal chassis of the computer to discharge any static electricity.
2. Turn the power to your computer off and unplug the power cord.
3. Remove the cover of the computer.
4. Locate a free PCI expansion slot.
5. Remove the expansion slot cover. Save the screw for installation of the 3PCISDxx card.
6. Install the card into the unused slot. Be certain that the card is inserted completely (fully seated) in the slot.
7. Secure the card with the mounting screw from step 5.
6. Replace the cover, plug in the power cord, and power up the system.

## Chapter 3. WINDOWS INSTALLATION

### Windows 95 and Windows 98

Any prior installation using previous B&B Serial drivers must be removed before installing the new drivers. Refer to page 23.

Windows 98 screens are shown for this section. Windows 95 is a bit different with fewer steps and the screen names and text shown differs. Windows 95 differences are noted (*W95:...*).

1. Configure each port on the PCI card to the desired RS-232/422/485 mode using the jumpers.
2. Install the card in the slot, start the computer.
3. Windows will detect the PCI card, start the Add New Hardware Wizard, and begin driver installation. When installation is complete, Windows will set the hardware addressing & interrupt using the drivers and the Plug and Play function of the Operating System.
4. The driver installation proceeds in two parts: the first part installs the driver for the PCI Serial card, the second part installs the serial driver for the Com Port A & B (Port A=Port 1, Port B=2).

5. After new hardware is detected, this screen will appear. (*W95: This screen is named Update Device Driver Wizard*).



6. Click **Next** to continue. (*W95: Insert the Driver Disk in Drive, then click Next - skip to step 9*)

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7. Click **Next**.



7. Select **Floppy disk drives**, Specify **A:**

8. Insert the driver disk, then Click **Next**.

Windows will find "PCI Serial Adapter (3PCISD1)" or "2-Port PCI Serial Adapter (3PCISD2)" and the driver .inf file.



10. Click **Next**.



11. Click **Finish** to begin the second part of the driver installation which installs the Com port driver for Port A & B.



12. Click **Next**. (W95: Skip to step 15)



14. Click **Next**. (W95: Driver name not shown)



13. Click **Next** to continue. Re-insert the driver disk if needed.  
Windows will find the Communications Port and .inf file.



15. Click **Finish** to complete Com driver installation.

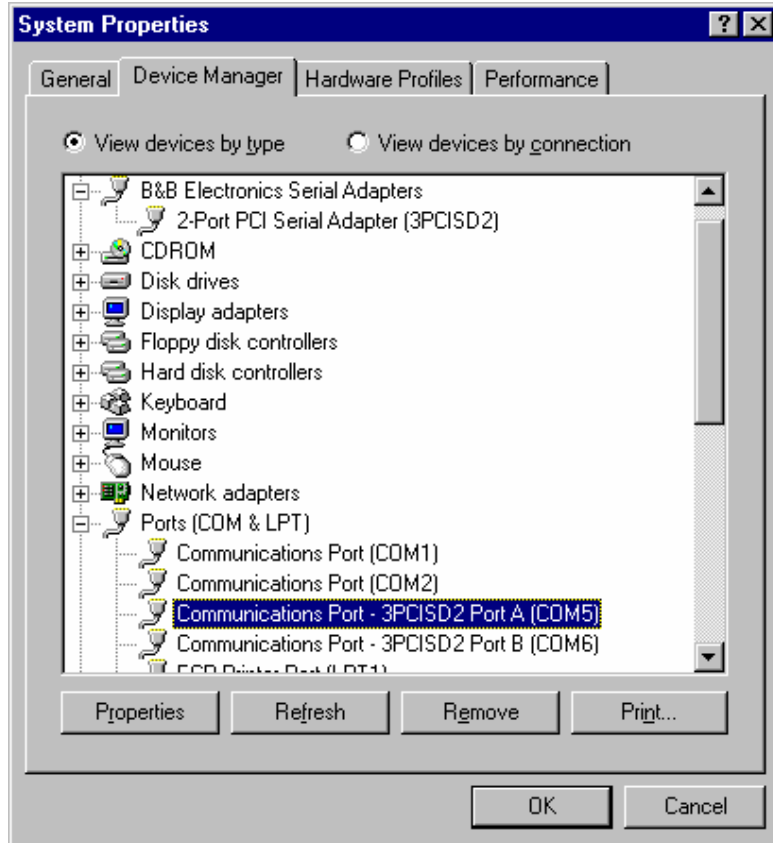
To verify the installation, open **My Computer, Control Panel, System** (or Start, Setting, Control Panel, System).

The computer will finish Com driver installation for Port A, then search, find and install the driver for Port B without requiring any more user input.

16. Wait for the process to complete.

To verify the installation, open **My Computer, Control Panel, System** (or Start, Setting, Control Panel, System).

Then select the **Device Manager** Tab.



Click the **B&B Electronics Serial Adapters** device to view the adapter. If you want other details, Select **Properties**.

Click **Ports (COM & LPT)** to view the COM numbers assigned by Windows to the card.

The 3PCISD2x card will have 3PCISD2 Port A (COMx) and Port B (COMx). The COM port numbers will normally be COM5, COM6, if available. The 3PCISD1x will have 3PCISD1 Port A (COMx).

17. You can now remove the driver disk, close the Windows, and check the new ports with your software.

If your software requires accessing a COM port below COM5, and you have unused COM numbers not occupied by a FAX/Modem or other device, you can re-assign the PCI card COM numbers using our B&B PnP COM Rename utility. Refer to Appendix E.

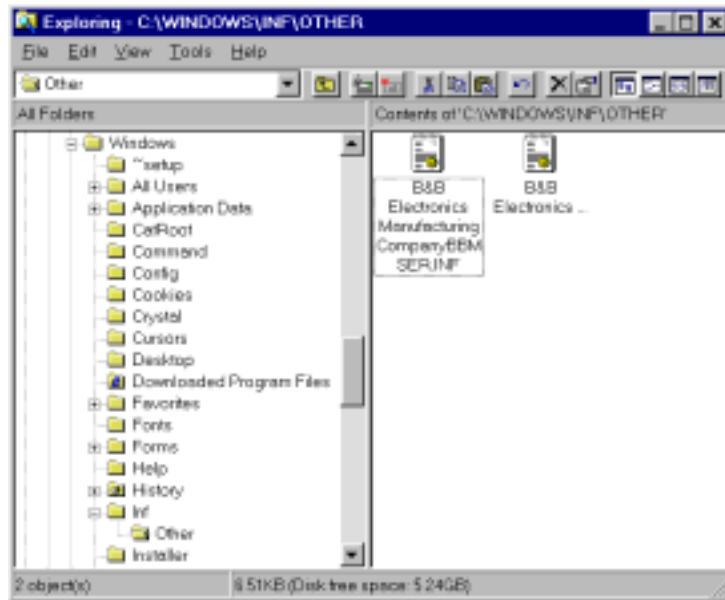
### Removal of Card And Drivers

If you need to remove the card from your system or remove the current driver before installing a possible future driver upgrade:

1. Open **My Computer, Control Panel, System** (or Start, Setting, Control Panel, System).
2. Select the **Device Manager** Tab (see figure on previous page).
3. Click **B&B Electronics Serial Adapters**, then select the **2-Port PCI Serial Adapter (3PCISD2)** or the **PCI Serial Adapter (3PCISD1)** which matches the card installed.
4. Click the **Remove** button.

*continued next page*

5. Close the Windows, and Open **My Computer**, Drive **C:**
6. Open the Windows directory on your hard drive, then Open the .inf folder, then Other. (If the .inf folder is not shown, it is hidden. Select **View**, **Folder Options**, **Files and Folders**, **Show** all files. Win95: Select **View**, **Options**, **View**, **Show** all files).
- 7.



8. Remove the B&B INF files. (\*BBMSER.INF & \*BBMSER95.INF) Close the Window.
9. Shut down the computer, then remove the card.

## Windows 2000 Professional

This section covers device driver installation for Windows 2000 Professional.

1. Configure each port on the PCI card to the desired RS-232/422/485 mode using the jumpers for Port 1 and Port 2.
2. Install the card in the slot. Start the computer as an Administrator or ask your system administrator to install the software.
3. Windows will detect the PCI card and start Found New Hardware Wizard, to begin driver installation. When installation is complete, Windows will set the hardware addressing & interrupt using the drivers and the Plug and Play function of the Operating System.
4. After the driver for the PCI Serial Card installs, the serial driver for the Com port will be installed once for each port on the card.



5. Click **Next** to continue.





6. Select **Search** and Click **Next** to continue.



7. Insert the driver disk in the **Floppy disk drive**. Click **Next**.



8. Click **Next**.



10. Click **Finish** to complete the install.

The computer will complete the installation of the driver for the card, then search for the Com driver for Port A, then for Port B without requiring any more user input.

11. Wait for the process to complete. Check to verify that 1 or 2 new Com ports have been assigned to the card.
11. Open **My Computer, Control Panel, System**. Then select the **Hardware** tab on System Properties.
12. Select **Device Manager**, then view the hardware list.

Under B&B Electronics Serial Adapters, the PCI Serial Adapter (3PCISD1) or 2-Port PCI Adapter (3PCISD2) is installed.

Under Ports, COM3 was assigned to Port A, and with the dual port card, COM4 was assigned to Port B. (Port A=1, B=2)



13. Remove the driver disk and check the ports with your software.

## Removal of Card & Drivers

If you need to remove the card from your system or remove the current driver before installing a possible future driver upgrade:

1. Click on *3PCISD1* or *3PCISD2 Port A* under **Ports (COM & LPT)** and select Uninstall (right click). Repeat for Port B, if present.
2. Next Click on *PCI Serial Adapter (3PCISD1)* or *2-Port PCI Serial Adapter (3PCISD2)* under **B&B Electronics**. Select **Uninstall**.
3. Remove the two sets of driver files from the Windows INF directory. (These are named by the OS in the sequence of installation. On a clean system they are: Oem0.inf & Oem0.PNF and Oem1.inf & Oem1.PNF. The .inf versions should be verified by opening it with Notepad, then checking that it is a B&B Electronics file. The PNF version is a compiled copy of the same information.)

You can use the **Find, File or Folder** function to search for the text *B&B* within the files.

You may need to set your Views (under My Computer) to show all files and folders if the INF directory and .inf files are not visible.

4. Shut down the system and remove the card.

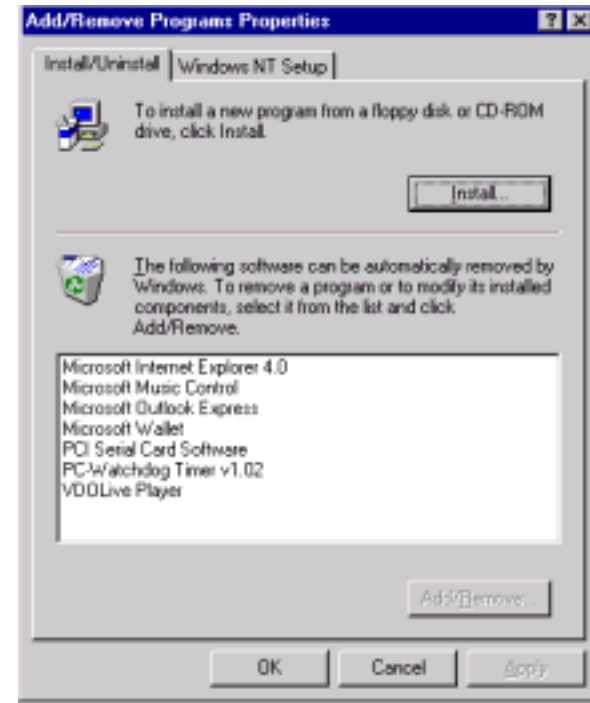


## Windows NT 4.0

1. Configure the port on the PCI card to the desired RS-232/422/485 mode using the jumpers.
2. Install the card in the slot, start the computer, and log on to Windows NT 4.0 as an Administrator or ask your system administrator to install the software.
3. Open the **Control Panel**. (Select **Start, Settings**)

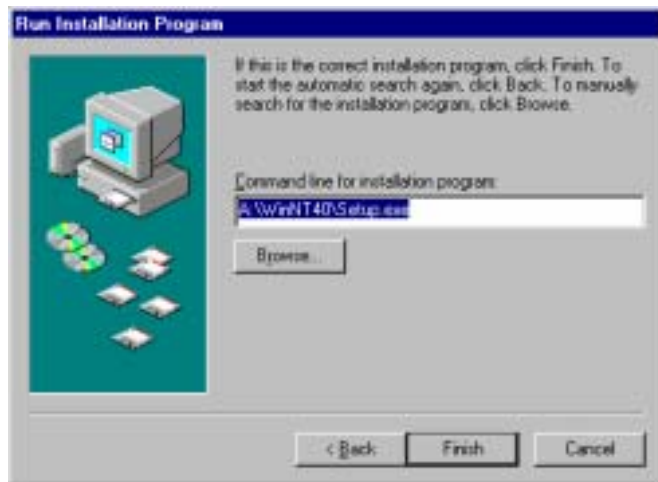


4. Select **Add/Remove Programs**.

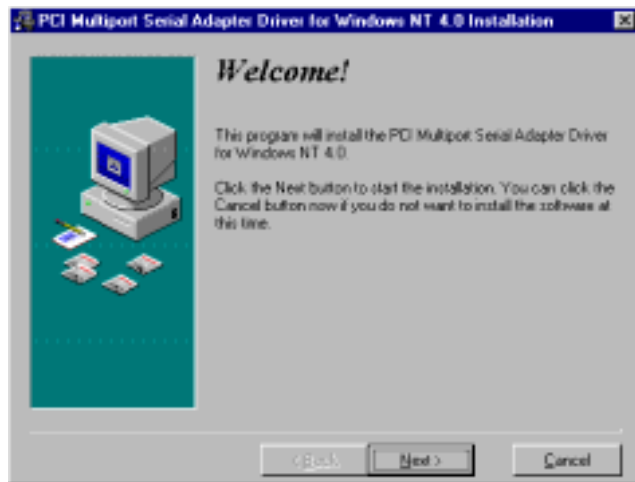


5. Click the **Install** button, then click Next.

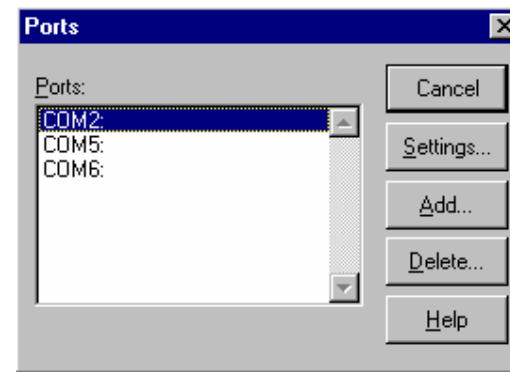
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6. Insert the driver disk into drive A:
7. Enter **A:\WinNT40\Setup.exe** in the **Command line for installation program** window. (as above)
8. Click **Finish** to start the Setup program.



9. Click **Next**. Follow the instructions until completed.
10. This driver does not require re-booting to complete installation.
11. Open the **Control Panel**, select **Ports**.



12. Verify 1 or 2 new COM Ports. (shown here as COM5: & COM6: using the 2-Port card)

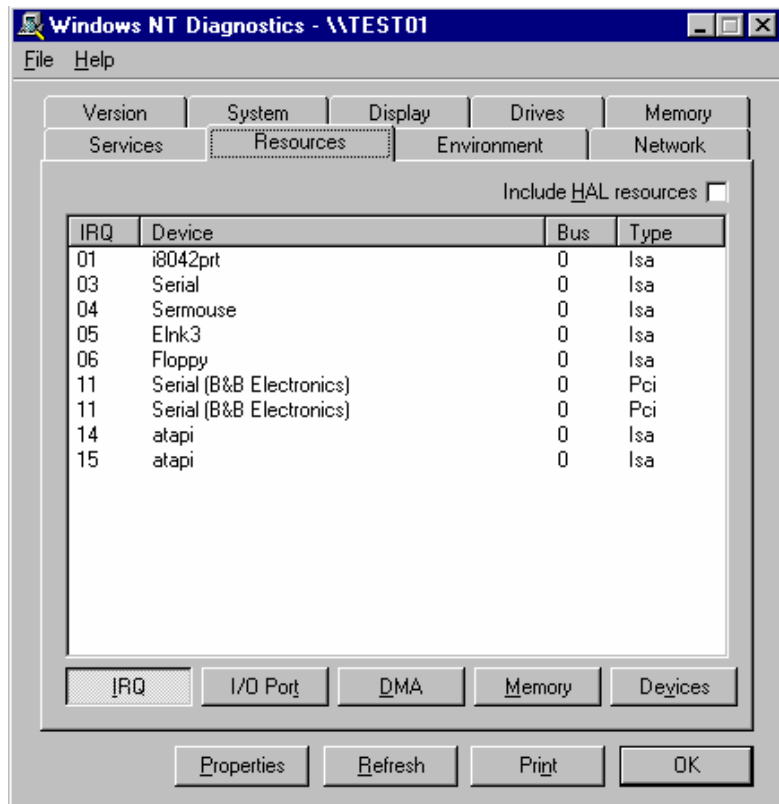
If you have the required number of new COM ports, the installation is complete. Select the port, select **Settings, Advanced**. You should obtain the message, "*There are no user configurable Advanced I/O parameters for this COM port.*"

Check the ports with your software or with a Loopback test.

NOTE: In the above example, a serial mouse is connected to the port which would usually be COM1. NT does not show it. COM2 is the second built-in serial port.

You can check details of the serial card setup using **Windows NT Diagnostics**, found under **Administrative Tools**. This can show the **Resources** used such as addresses and IRQ.

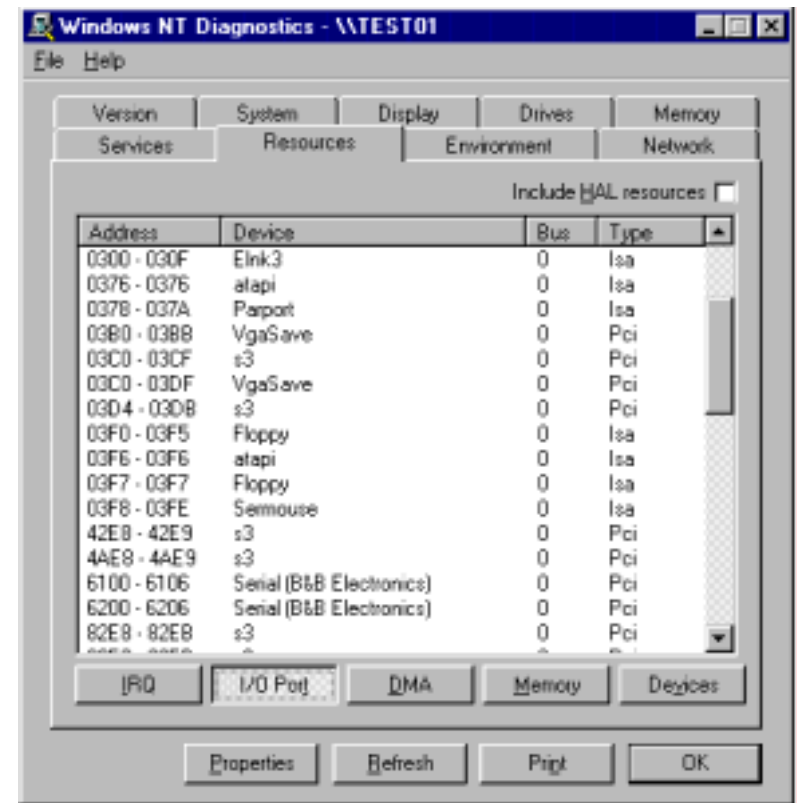
Windows Diagnostics will not allow any changes.



The above shows 2 ports using one PCI card interrupt.

continued next page

The screen below shows the address range for the each serial port on the B&B Electronics 2 port Serial Card.



continued next page

## Removal of Card and Driver

If you need to remove the card from your system or remove the current driver before installing a possible future driver upgrade:

1. Open the Windows NT subdirectory.
2. Open **System32**.
3. Open **Drivers**.
4. Find the "Bbserial.Sys" file and delete it.
5. Shut down the system.
6. Remove the PCI Serial Adapter card.

## Chapter 4: TROUBLESHOOTING

If you have any trouble starting your system after installing the card, the card may not be properly seated in the slot. Remove and re-insert it or try a different slot.

If you are unable to communicate with the card using your software and hardware devices:

1. Check your pinouts. In RS-422 or RS-485 mode the "A" lines should match your "A" or "-" lines. "B" lines should match your "B" or "+" lines. *Note: RS-422/485 pinouts are non-standard.*
2. Use the COMTest program provided on the PCI/USB COM Port Utility Disk with a loop back to check the card. Run Setup.exe to install COMTest on your program menu under B&B Electronics. A loopback connection for RS-232 connects the Transmit output to the Receive input (pins #2 & #3 on the DB9 connector). For RS-422 or 4-wire RS-485, connect the TD(A) to RD(A) and the TD(B) to RD(B). Then use the COMTest program to send characters, and observe the characters being received. To check 2-wire RS-485, you will need to enable the receiver by moving the receive jumper to 422 mode, or use one Port to transmit to another by cross connecting and loading COMTest twice, one copy for each port. Characters typed in one copy of COMTest will appear in the receive window of the other. Note that software must ignore the RS-232 handshaking lines in RS-422/RS485 mode, the input lines (CTS, DSR, DCD, RI) are not pulled high.
3. Try another software package for troubleshooting.
4. Check our website for available FAQ's or troubleshooting hints.
5. Call B&B Electronics Technical Support for troubleshooting assistance.

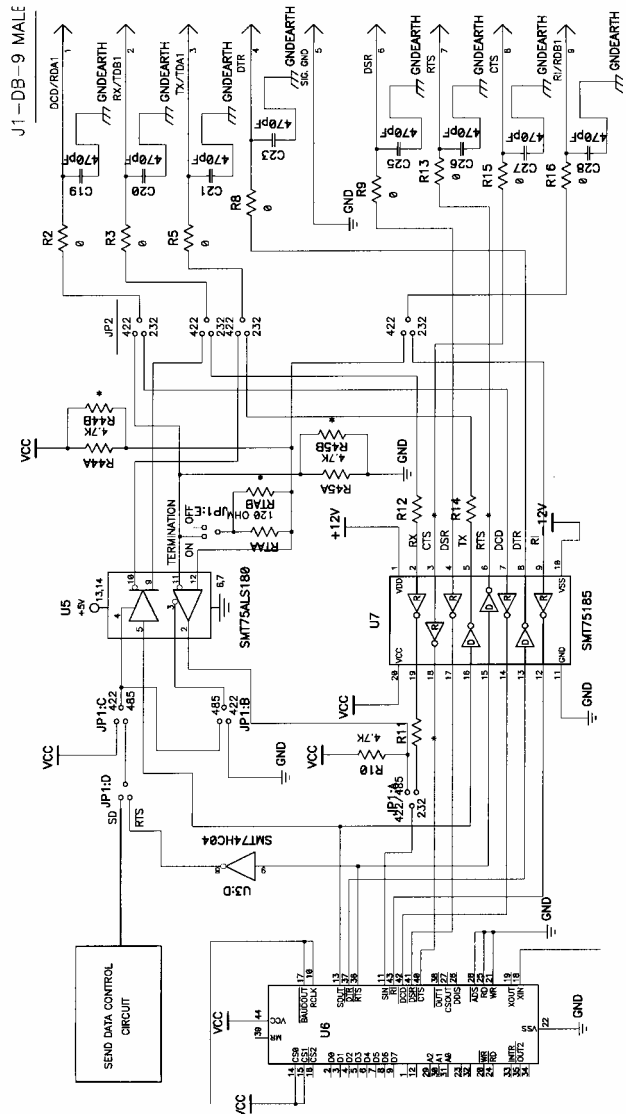
### USA Office

Technicians are available at (815) 433-5100 to answer your questions from 8 AM - 5 PM weekdays (Central Time).

### European Office

Technicians are available at +353 91 792444 to answer your questions from 8:30 AM – 5 PM weekdays (GMT Time).

# Appendix A: 3PCISDXX I/O SCHEMATIC



Port 1 I/O Schematic

## Appendix B: RS-232 & RS-422/485 Pinouts

Table 1: RS-232 Pinouts

Name	Description	Direction	DB9M Pin
DCD	Data Carrier Detect	Input	1
RD	Receive Data	Input	2
TD	Transmit Data	Output	3
DTR	Data Terminal Ready	Output	4
GND	Signal Ground	-----	5
DSR	Data Set Ready	Input	6
RTS	Request to Send	Output	7
CTS	Clear to Send	Input	8
RI	Ring Indicator	Input	9

Table 2: RS-422/485 Pinouts

Name	Description	Direction	DB9M Pin
RD(A) –	Receive Data A	Input	1
TD(B) +	Transmit Data B	Output	2
TD(A) –	Transmit Data A	Output	3
GND	Signal Ground	-----	5
RD(B) +	Receive Data B	Input	9

With 2-wire RS-485 mode operation, your connection cable must jumper TD(A) to RD(A) and TD(B) to RD(B). Connect from TD(A) and TD(B) to the Data A(–) and Data B(+) wires of your RS-485 network.

Note that the EIA RS-422 Specification labels data lines with an "A" and "B" designator. Some RS-422 equipment uses a "–" and "+" designator. In almost all cases, the "A" line is the equivalent of the "–" line and the "B" line is the equivalent of the "+" line. *More information on RS-422 communications can be found in the B&B Electronics **RS-422/485 Application Note** (available on our website).*

## Appendix C: Jumper Mode Tables

### Port A Jumper Settings Mode Table

Port A (1) Jumpers	RS-232	RS-422 4-Wire	RS-485 4-Wire	RS-485 2-Wire
JP2 4 Jumpers	232	422/485	422/485	422/485
JP1 A	232	422/485	422/485	422/485
JP1 B (RX)	232	422	422	485
JP1 C (TX)	232	422	485	485
JP1 D Typical	232	not used	RTS/SD SD*	RTS/SD SD*
JP1 E Termination Typical	not used	IN/OUT	IN/OUT	IN/OUT
JP3 Clock	*4/*1	*4/*1	*4/*1	*4/*1

**How to use the table:** The left vertical column shows the jumpers for port A. The right 4 vertical columns show the position setting of the jumper at the left for RS-232, RS-422 or 4-wire RS-485 or 2-wire RS-485 modes.

#### NOTES:

RS-485 Mode: The JP1 (D) & JP4 (D) Control jumpers should be set to Send Data mode unless your software requires RTS control

Refer to the Setup section for explanations of the SD/RTS, Termination and Clock settings.

Note that termination should only be used in systems with both high baud rates (>19200) and over several thousand feet of cable.

Information on RS-422 and RS-485 communications can be found in the B&B Electronics **RS-422/485 Application Note** (available on our Website)

### Port B Jumper Settings Mode Table

Port B (2) Jumpers	RS-232	RS-422 4-Wire	RS-485 4-Wire	RS-485 2-Wire
JP5 4 Jumpers	232	422/485	422/485	422/485
JP4 A	232	422/485	422/485	422/485
JP4 B	232	422	422	485
JP4 C	232	422	485	485
JP4 D Typical	232	not used	RTS/SD SD*	RTS/SD SD*
JP4 E Termination Typical	not used	IN/OUT	IN/OUT	IN/OUT
Shared Clock	*4/*1	*4/*1	*4/*1	*4/*1

**How to use the table:** The left vertical column shows the jumpers for port B. The right 4 vertical columns show the position setting of the jumper at the left for RS-232, RS-422 or 4-wire RS-485 or 2-wire RS-485 modes.

#### NOTES:

RS-485 Mode: The JP1 (D) & JP4 (D) Control jumpers should be set to Send Data mode unless your software requires RTS control

Refer to the Setup section for explanations of the SD/RTS, Termination and Clock settings.

Note that termination should only be used in systems with both high baud rates (>19200) and over several thousand feet of cable.

Information on RS-422 and RS-485 communications can be found in the B&B Electronics **RS-422/485 Application Note** (available on our Website).



## Appendix D: TROUBLESHOOTING WITH COMTest

Included on the PCI/USB COM Port Utility Disk is a test program called ComTest. It can be installed on your "Programs" menu for use by inserting the disk and running Setup.

ComTest is a simple 32-bit Windows (Windows 95, 98, 2000 or NT 4.0) COM port test program. It is a simple tool that can be used to troubleshoot RS-232, RS-422, or RS-485 serial communications. It allows multiple ports, at any address and IRQ, to be opened at any given time. ComTest can also be found on the Internet at [www.bb-elec.com](http://www.bb-elec.com).

## Appendix E: Renaming COM Ports - Win 95/98/ME

### Renaming PCI COM Ports Using the PnP COM Rename Utility

**CAUTION:** You must be using Windows 95/98 or ME. This utility is not designed for NT or other Windows versions.

*This program edits the registry directly, it will only change entries related to B&B PCI or USB Serial Ports. Improper use of this program can cause conflicts with other COM Ports installed on your computer.*

*Renaming COM ports will only affect software that accesses COM ports through Windows, not software that accesses ports from DOS or at the hardware level.*

*This program should only be used after all serial ports have been installed.*

Windows 95/98 and ME automatically assigns COM port numbers starting at COM5 when the port is not at the standard base addresses for COM1 to COM4.

If your software refuses to access COM ports above COM4, and you have unused COM numbers that you want to be able use with your B&B PCI Serial Card, this utility can be used to rename some or all of the ports to the unused COM numbers.

First, check the ports list shown in the Device Manager, then check any Modem or FAX device to make sure that the port number isn't being used for a FAX/Modem or Network Redirector.

If you have built-in ports you want to disable from the BIOS in order to use your PCI card at that COM number, first remove the port with the Device Manager. Then re-boot to the BIOS, disable the port with hardware settings, Exit with a "Save Settings", then re-start Windows Next, verify the port number is not present. Then use the Rename utility to rename the PCI card ports as needed.

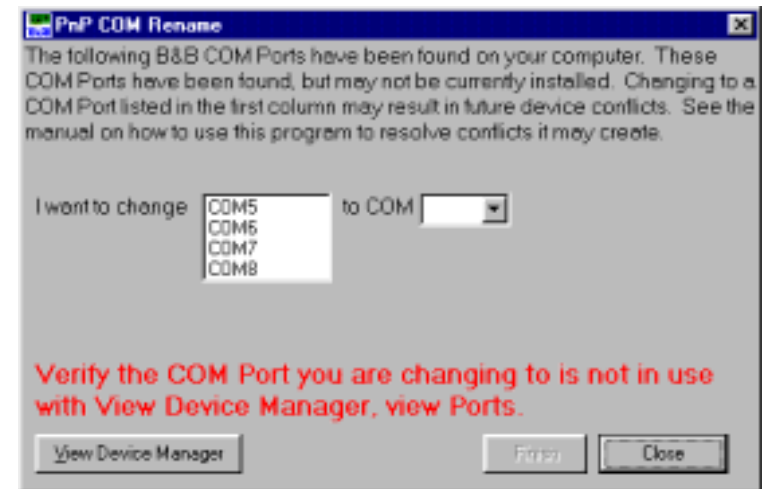
To Remove a Port: Choose Settings, Control Panel, System, Device Manager, then select the port to highlight it. Click Remove below the window. To remove all B&B PCI ports, select the B&B Serial Adapter. This clears registry entries for the card and ports.

### Install the PCI/USB COM Port Utilities

- (1) To use the PnP COM Rename utility, insert the PCI/USB COM Port Utility Disk and run Setup.exe. This will install COMTest and PnP COM Rename under Programs, B&B Electronics.
- (2) The Rename utility will not be installed if you are running Windows 2000 or NT.

### Using PnP COM Rename

- (1) Shut down all programs that are accessing any Com ports.
- (2) Start the PnP COM Rename Utility from the Programs menu under B&B Electronics.
- (3) Read the Cautionary Warnings, it is possible to rename a PCI or USB serial port to a number already in use which will cause problems. If any problems occur after renaming, you may need to re-start the system and rerun the Rename utility to correct the situation or remove the serial card in the Device Manager. Then Refresh the Device Manager to detect the card and re-install the drivers. Determine which renamed COM port caused the problem, and do not use that name for a renamed port.
- (4) Accept the conditions of use by clicking Yes or click No to exit.
- (5) Select the currently named COM port number you want to change in the left window, then the new number in the right window. Then click Finish. Repeat for other ports as needed.





- (6) If the PCI card was previously installed and not removed in the Device Manager, you may find several B&B COM ports with the same number. The last instance of the same number is usually the most recent installation. Only the active ports can be renamed with the program to show the new name under the Device Manager. Inactive port numbers will not show any change after renaming. Ideally, unused entries should be removed by using RegEdit, then having the system re-install the drivers to make the entries. This will result in a single entry for each port on the card, and only that entry will need to be changed.
- (7) After all B&B PCI or USB COM ports have been renumbered as needed, click Close to exit.

If you need to install another serial device after using renaming with this utility, you must:

- (1) Name all COM Ports back to original settings using this program.
- (2) Install the new device according to manufacturer directions.
- (3) Use this utility to rename the B&B COM Ports again as needed.

## Appendix F: Declaration of Conformity Statement

DECLARATION OF CONFORMITY	
Manufacturer's Name:	B&B Electronics Manufacturing Company
Manufacturer's Address:	P.O. Box 1040 707 Dayton Road Ottawa, IL 61350 USA
Model Numbers:	3PCISD1Aa/b, 3PCISD2a/b
Description:	Single/Dual Port PCI Serial Card
Type:	Light industrial ITE equipment
Application of Council Directive:	89/336/EEC
Standards:	EN 55022 EN 61000-6-1 EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11)
	
William H. Franklin III, Director of Engineering	