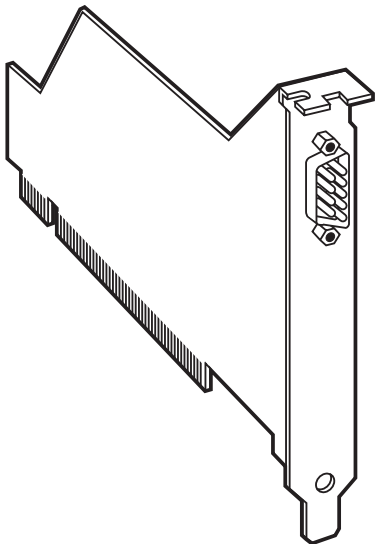




PCI Plus Adapter— RS-232 HS Serial PCI



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)

FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**

Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018

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**FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

**NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT**

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS

The trademarks mentioned in this manual are the sole property of their owners.

NOTE

The software you received may call the PCI Adapter the “Lava” Adapter. Both refer to the PCI Plus Adapter—RS-232 HS Serial PCI (part number IC145C).

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1. Specifications

Speed — Up to 460 kbps

UART — 16650

Connectors — (1) DB9 male

Power — From the PC bus

Size — 3/4 card

Weight — 1 oz. (28 g)

2. Introduction

2.1 Description

The PCI Plus Adapter—RS-232 HS Serial adds one ultra-high-speed COM port designed to operate at speeds up to 460 kbps to any PCI-equipped PC.

2.2 Features

- PCI bus single 9-pin ultra-high-speed 16650 UART serial port
- COM port is capable of data transmission rates up to 460.8 kbps (including 230.4 kbps)
- Integrated 32-byte FIFO buffer with software-configurable TX/RX triggers, 4X clock, and on-board flow control which guarantee error-free data transmission even at top speed
- Easy plug-and-play installation. Automatically selects next available IRQ and COM addresses—just plug it in and go!
- Includes utility software for easy configuration of 230.4-kbps-capable external modems

PCI PLUS ADAPTER—RS-232 HS SERIAL PCI

- 100% compatible with all 56-kbps external modems and ISDN external terminal adapters
- Ships with drivers for Windows 3x, Windows 95/98, and Windows NT 4.0.
- Complies with PCI specification 2.1

3. Quick Installation Using Windows 95/98

NOTE

These instructions are for Windows 95/98 only. If you have a different operating system, refer to **Section 5.1** or **5.3**.

1. With the power off, insert the PCI Adapter into any free PCI slot.
2. Launch Windows 95/98—new hardware will be found.
3. When prompted, insert the installation diskette and select the file “Lava.inf” in the Win95 subdirectory. If the diskette is not found, you may have to manually type “A:\WIN95\”.
4. After Windows boots, click the Start button, then Settings, Control Panel, System, Device Manager, Ports. The Adapter port will be listed as one of your Com ports. Click “Properties” to change the default settings as desired.
5. If desired, install the Com Port Redirect and Modem Speed Set utilities to change the COM numbers of your ports, and to automate modem-speed settings.

4. Installing the Hardware

1. Before opening the casing of your computer, make sure that all power is off.
2. Locate an unused PCI slot and insert the PCI Plus Adapter into it. Make sure that it's well-seated.
3. Screw the metal backplane of the Adapter to your PC's casing and replace the machine's cover.
4. Connect your modem cable to the Adapter port and power on the PC.

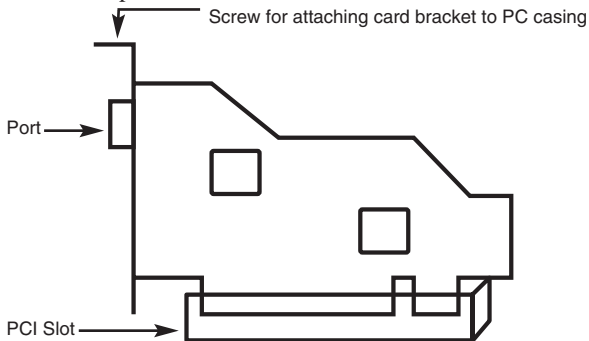


Figure 4-1. The PCI Plus Adapter.

5. Installing the Software

NOTE

Make sure that you are installing the correct drivers for the appropriate operating system.

5.1 Installing the PCI Plus Adapter under DOS for use with Windows 3.x or DOS

SETUP FOR PCI UNDER WINDOWS 3.1/3.11

1. Insert the Adapter PCI into a PCI slot in your system (make sure power is off).
2. Power on your PC. If the system automatically enters Windows, exit to DOS.
3. Copy the file “**Lavaconf.exe**” from the floppy diskette to your hard drive.
4. Run **Lavaconf.exe**.
5. **Lavaconf.exe** will display the two I/O addresses and one IRQ that are used by the Adapter PCI—make a note of them.
6. If **Lavaconf.exe** reports “IRQ=0,” you will need to manually make an IRQ available to the PCI bus through CMOS (BIOS) settings. To do this, reboot

the system, and press DELETE to enter CMOS. Each CMOS setting is different, but most have a PCI configuration screen that will list IRQ assignments. Assign an unused IRQ to the PCI bus.

7. Enter Windows (WIN).
8. Install the Windows 3.1/3.11 driver from the software diskette.
9. Using the Adapter Configuration Utility, configure your Com Ports for the proper UART type, I/O address, IRQ, etc. If you have 2 Com Ports previously installed on your motherboard, the PCI ports should be configured as Com 3/4, but you will have to manually type the I/O address and IRQ (as reported by **Lavaconf.exe**) into the appropriate screens.
10. In the Windows subdirectory, find the file called “**System.ini**” and open it using Write or Notepad. In this file there will be 2 lines that read:
ComXSHAREIRQ=0, where X is the port numbers that you have assigned in Step 9 using the Adapter Configuration Utility. Both of these lines must be changed to **ComXSHAREIRQ=1**.
11. Save settings, exit Windows, and reboot.

12. Enter Windows and check that all settings have been saved in the Adapter Configuration Utility. If you have problems entering the Adapter Configuration Utility, you may have to open Control Panel and then Ports to verify your settings. If so, do not make changes in Control Panel. Simply enter and exit, then open Adapter Configuration Utility again.

NOTE

We recommend using the Driver Utility for all Com Port configuration (not just the Adapter), rather than using the standard Ports icon. Your standard COM 1 and COM 2 should be configured as UART type 450 or 550, while the Adapter should be set for UART type 650.

5.2 Windows 95/98

1. Once the Adapter is installed in your PC, power on your computer. Windows 95 will automatically detect the Adapter as a new PCI serial controller and ask you to insert the installation diskette. The installation files are located in the Win95 subdirectory of this disk. On some PCs, you may have to manually type A:\WIN95 when prompted for the installation diskette.
2. After the necessary files have been copied, Windows will complete the full installation of the Adapter, creating a new COM port in Device

Manager under the Ports tree. The following describes how you may custom configure this port.

3. Click on the Start button, then choose Settings, Control Panel, System, Device Manager. You should see a window that is similar to the one shown in **Figure 5-1**.

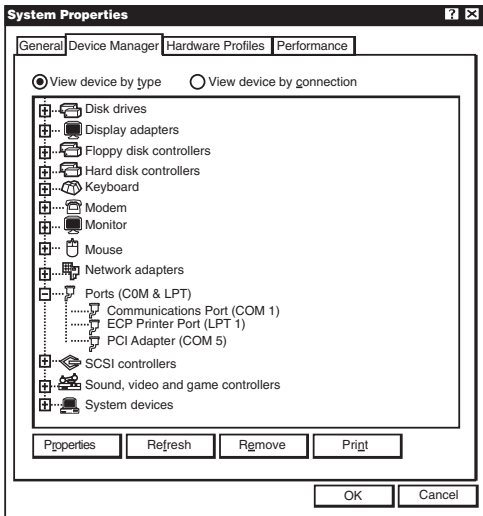


Figure 5-1. System Properties screen.

4. Click on Ports and select the Com port listed under the heading “LavaPort 650 PCI.”
5. Click Properties. The screen shown in **Figure 5-2** will appear.

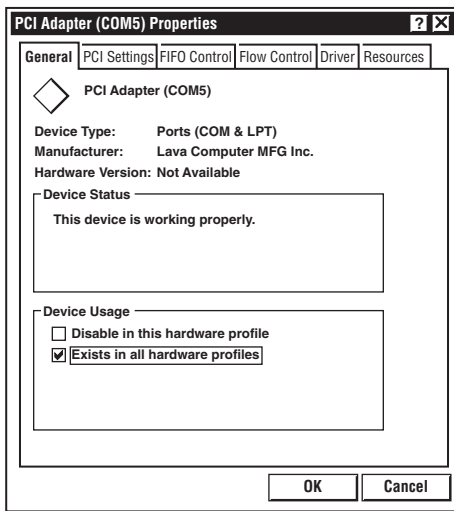


Figure 5-2. Adapter Properties screen, General Tab.

5.2.1 MODIFYING THE COM NUMBERING AND IRQ OF YOUR PORT

Click on the Resources Tab in the LavaPort 650 listing in Device Manager. A screen similar to the one shown in **Figure 5-3** will appear.

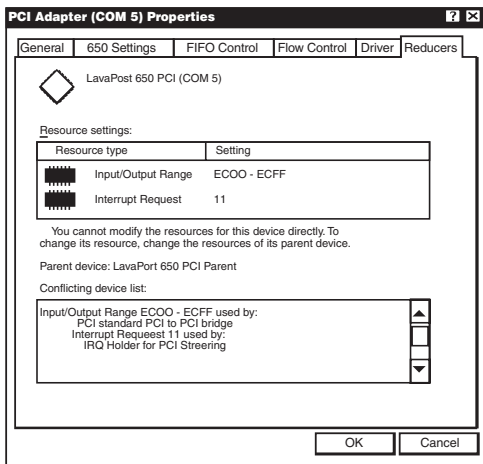


Figure 5-3. Resource Settings.

Because the Adapter is a PCI device, Windows will always allocate non-standard I/O resources to this port—for example, it will assign the port as COM 5, even though any one of COM 1 through 4 may be free. If your software requires the use of standard I/O resources, you may modify those used by the Adapter in one of two ways.

1. You may physically modify the I/O range and IRQ used by the Adapter by de-selecting the “Use Automatic Settings” check box, and double-clicking the appropriate heading.
2. You may use the Redirect Utility provided in the Utils subdirectory of your Adapter diskette. You can run this utility from the diskette or install it onto your hard drive. To install the Redirect utility on your hard drive, insert the diskette into your floppy drive, click Start, Run and type A:\Utils\Setup.

The Redirect utility will allow you to change the COM number assigned to the Adapter (for example, change COM 5 to COM 4) without modifying I/O resources.

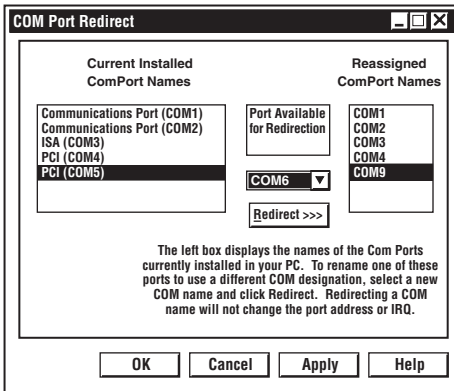


Figure 5-4. Port Redirect screen.

5.2.2 SETTING ADAPETR DATA RATES IN WINDOWS 95/98

You can set the data rate of the Adapter using the “Bits per second” pull-down menu.

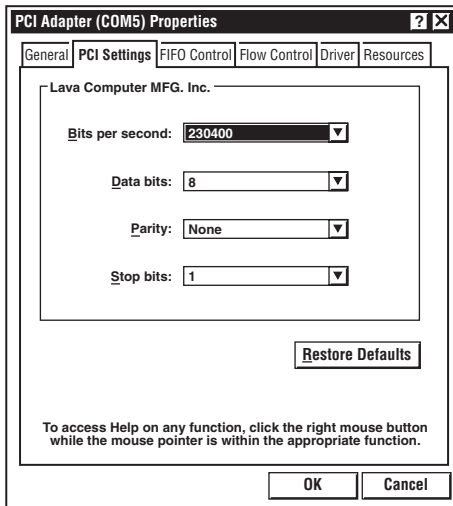


Figure 5-5. Properties screen, PCI Settings Tab.

NOTE

This menu will also appear when setting the “Port Properties” in any communications applications, and may have to be set independently of your Control Panel settings. Control Panel settings may not necessarily be linked to those of your communications application. For example, port speeds in Dial-Up Networking are controlled independently of speed settings in Device Manager.

For optimum performance, always verify that your Adapter is set to the maximum speed supported by your modem, and that both speed settings are the same in every application.

NOTE

The setting of communications port data rates is often the most confusing of tasks encountered by modem users. For this reason, we have included the Modem Speed Set utility in the Utils directory of your Adapter diskette. We strongly recommend using this utility for all PCI Plus Adapter-to-modem connections.

5.2.3 MODEM SPEED SET FOR WINDOWS 95/98

The Adapter supports data rates up to 460.8 kbps, including 115.2 kbps and 230.4 kbps. However, not all modems support COM-port rates above 115.2 kbps.

If your modem does not support higher data rates and you select a higher data rate in the Properties, Windows will automatically default to the slowest supported rate in the chain.

Some modems do support higher data rates but require special settings (AT Commands) and INF files for configuration. A software utility called “Modem Speed Set” that automates these functions and allows for easy speed reconfiguration is included. You will find this

utility in the Utils subdirectory of your Adapter diskette.

To install the Modem Speed Set utility on your hard drive, insert the Adapter diskette into your floppy drive, click Start, Run, and type A:\Utils\Setup.

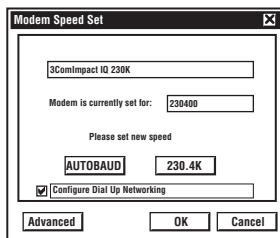
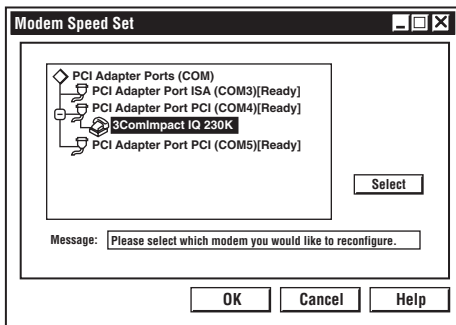


Figure 5-6. Speed Set screens.

5.2.4 SETTING ADAPTER FIFO CONTROL IN WINDOWS 95/98

The Adapter uses a 16650 UART incorporating a 32-byte FIFO (first-in first-out) buffer.

The FIFO control tabs set the buffer “trigger” levels. When the buffer is filled to its trigger level with the selected number of bytes, the CPU will be interrupted and asked to either reload the buffer (for transmission) or retrieve data from the buffer (for reception).

Most efficient data transmission occurs when the CPU is interrupted infrequently. For each interrupt, the CPU can then service the buffer with larger data blocks: during transmission, it can place a large burst of data into the buffer, and during reception it can retrieve a large block from the buffer and then continue multi-tasking.

Ideally, you should set Receive triggers as high as possible, and Transmit triggers as low as possible. However, if the Transmit trigger levels are set too low, or Receive triggers too high, and the CPU is busy when an interrupt is called by the Adapter, a short period of inactivity may occur between the port and the modem. This will reduce effective transmission/reception speeds.

Optimum buffer settings depend on your modem speed, CPU speed, and the amount of multi-tasking that occurs while online. For a fast modem and CPU performing few multi-tasking functions, set transmit triggers low and receive triggers high. If multi-tasking while online, set transmit triggers higher and receive triggers lower.

5.2.5 SETTING ADAPTER FLOW CONTROL IN WINDOWS 95

Flow Control refers to the type of signaling that is used between the modem and the Adapter.

If you are connecting the Adapter to a modem or ISDN terminal adapter, use the default setting of hardware (RTS/CTS) flow control. Software Flow Control (X-ON/X-OFF) is used only for configuring the Adapter to a non-modem serial device (for example, if you're using a null-modem cable to connect to another COM port).

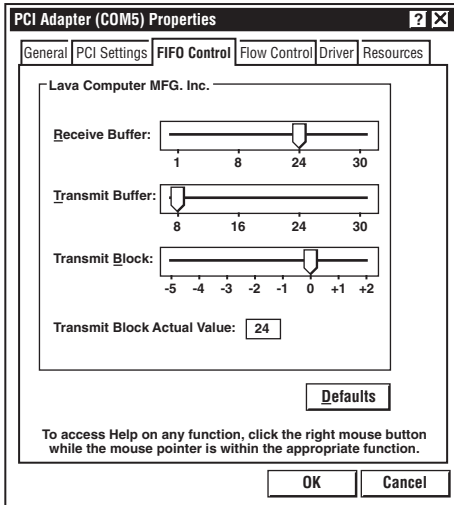


Figure 5-7. Properties screen, FIFO control tab.

5.3 Windows NT 4.0

NOTE

Make sure that you are installing the correct Adapter drivers for the appropriate operating system. Do NOT install Windows 95 or 3.x drivers under Windows NT.

5.3.1 INSTALLING THE WINDOWS NT DRIVER

Follow these steps:

1. Once the Adapter is installed in your PC, power on your computer and start NT.
2. Place the Adapter installation diskette into your floppy drive and select Run from the Start Menu. When prompted, type: A:\NT4.0\Setup.
3. After the necessary files have been copied, select “My Computer” and start Control Panel. A new icon will appear called “LavaPort.” This applet should now be used to configure all COM ports in your PC, not just PCI Plus Adapter ports.

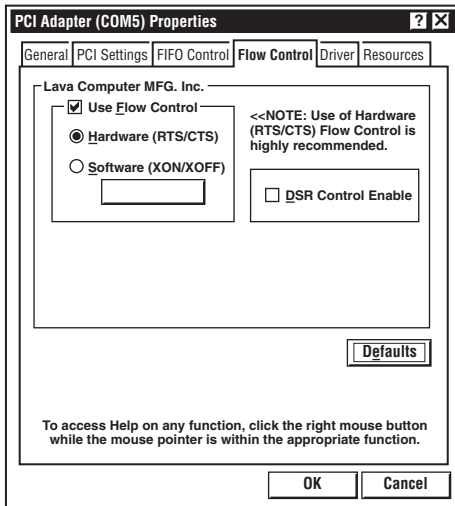


Figure 5-8. Properties screen, Flow Control Tab.

NOTE

COM 1 might not appear in this applet if you have your mouse attached to COM 1.

5.3.2 SETTING A 230.4 KBPS DATA RATE

The Adapter supports data rates up to 460.8 kbps, including 115.2 kbps and 230.4 kbps. However, not all modems support COM-port rates above 115.2 kbps. If your modem does not support higher data rates and you select a higher data rate in the Adapter Properties, Windows will automatically default to the slowest supported rate in the chain. Some modems do support higher data rates but require special settings (AT commands) and setup files for configuration. Contact your modem manufacturer for details.



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