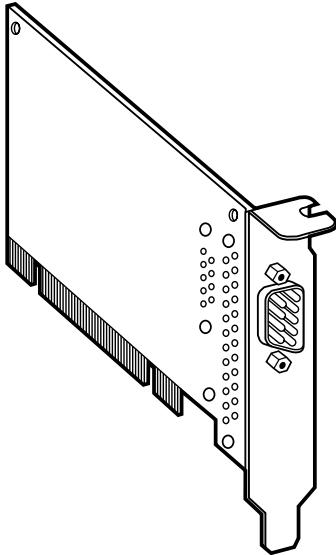




RS-232 Single-Port PCI Card



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

Web site: www.blackbox.com • E-mail: info@blackbox.com

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

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

CAUTION

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

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B 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 B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment complies with the requirements of the European EMC Directive 89/336/EEC.



**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 connectado 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 fisica 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 energia.
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 liquidos 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.

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1. Specifications

UART: 16850

Connector: (1) DB9 male

Interface: RS-232

Temperature Tolerance: *Operating:* 32 to 122°F (0 to 50°C); *Storage:* -4 to +158°F (-20 to +70°C)

Relative Humidity: 10 to 90%, noncondensing

MTBF: Greater than 150,000 hours (calculated)

Power: Universal bus +3.3 or +5 VDC, 480 mA

Size: 2.3"H x 4.9"W (5.8 x 12.5 cm), excluding goldfingers; 2.6"H x 4.9"W (6.6 x 12.5 cm), including goldfingers

Weight: 2.6 oz. (73.7 g)

2. Introduction

2.1 Overview

The RS-232 Single-Port PCI Card is a PCI bus serial I/O adapter. It provides one RS-232 serial port that supports data rates up to 460.8 kbps.

2.2 What the Package Includes

The PCI card is shipped with the following items.

- (1) RS-232 Single-Port PCI Card.
- (1) Serial utilities software CD-ROM containing drivers for Windows® 3.1x/95/98/2000 and Windows NT®, Advanced COM drivers, utilities, INF files, help files, and this users' manual in PDF format.

If either item is missing or damaged, contact Black Box at 724-746-5500.

2.3 Technical Description

The RS-232 Single-Port PCI Card provides a versatile interface for any RS-232 device including modems, printers, and plotters.

The card uses the 16850 UART. This chip features programmable baud rates, data format, interrupt control, and industry-leading 128-byte FIFOs.

2.4 RS-232 DB9 Male DTE Connector Pin Assignments

Signal	Name	Pin #	Mode
TD	Transmit Data	3	Output
RTS	Request To Send	7	Output
DTR	Data Term Ready	4	Output
GND	Ground	5	—
RD	Receive Data	2	Input
DCD	Data Carrier Detect	1	Input
DSR	Data Set Ready	6	Input
CTS	Clear To Send	8	Input
RI	Ring Indicator	9	Input

3. Card Setup

3.1 Address and IRQ Selection

The RS-232 Single-Port PCI Card is automatically assigned resources by your motherboard BIOS. Only the I/O address may be modified by you.

Adding or removing other hardware may change the assignment of I/O addresses and IRQs.

3.2 Clock Modes

The RS-232 Single-Port PCI Card uses a unique clocking option that allows you to select from divide by 4 and divide by 1 clocking modes. These modes are selected at Header J1. (See **Appendix D** for proper location.)

To select the baud rates commonly associated with COM: ports (that is, 2400, 4800, 9600,... 115.2 kbps), place the jumper in the divide by 4 mode (silk-screen “D4”) position.

To select the maximum data rates up to 460.8 kbps, place the jumper in the divide by 1 (silk-screen “D1”) position. Please refer to Table 3-1 on the following page for the data rates.

3.3 Baud Rates and Divisors for D1 Mode

Table 3-1 shows some common data rates and the rates you should choose if using the adapter in D1 mode.

Table 3-1. Data rates.

For this Data Rate	Choose this Data Rate
1200 bps	300 bps
2400 bps	600 bps
4800 bps	1200 bps
9600 bps	2400 bps
19.2 kbps	4800 bps
57.6 kbps	14.4 kbps
115.2 kbps	28.8 kbps
230.4 kbps	57.6 kbps
460.8 kbps	115.2 kbps

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If your communications package allows the use of baud rate divisors, choose the appropriate divisor from the following table:

Table 3-2. Baud rate divisors.

For this Data Rate	Choose this Divisor
1200 bps	384
2400 bps	192
4800 bps	96
9600 bps	48
19.2 kbps	24
38.4 kbps	12
57.6 kbps	8
115.2 kbps	4
230.4 kbps	2
460.8 kbps	1

4. Installation

4.1 Operating System Installation

4.1.1 FOR WINDOWS USERS

Start by choosing **Install Software** at the beginning of the CD. Choose **Asynchronous COM: Port Software, SeaCOM**.

4.1.2 OTHER OPERATING SYSTEMS

Refer to the appropriate section of the serial utilities software.

4.2 System Installation

The RS-232 Single-Port PCI Card can be installed in any of the PCI expansion slots and contains several jumper straps per port. These must be set for proper operation.

1. Turn off PC power. Disconnect the power cord.
2. Remove the PC's case cover.
3. Locate an available PCI slot and remove the blank metal slot cover.

RS-232 SINGLE-PORT PCI CARD

4. Gently insert the PCI card into the slot. Make sure that the adapter is seated properly.
5. Replace the screw.
6. Replace the cover.
7. Connect the power cord.

Installation is complete.

Appendix A. Troubleshooting

A.1 Tips

Using the supplied software and following these simple steps can eliminate most common problems.

1. Identify all I/O adapters currently installed in your system. This includes your on-board serial ports, controller cards, sound cards, etc. Identify the I/O addresses used by these adapters, as well as the IRQ (if any).
2. Configure your PCI card so that there is no conflict with currently installed adapters. No two adapters can occupy the same I/O address.
3. Make sure the PCI card is using a unique IRQ. While the PCI card does allow the sharing of IRQs, many other adapters (that is, SCSI adapters and on-board serial ports) do not. The IRQ is typically selected via an onboard header block. Refer to **Chapter 3** for help in choosing an I/O address and IRQ.
4. Make sure the PCI card is securely installed in a motherboard slot.

5. When running DOS or Windows 3.x, refer to the supplied software and this manual to verify that the PCI card is configured correctly. This software contains an easy-to-use diagnostic program (SSD) that will verify if a card is configured properly.
6. For Windows 95/98/Me/2000 and Windows NT, the diagnostic tool “WinSSD” is installed in the SeaCOM folder on the Start Menu during the setup process. First find the ports using the Device Manager, then use “WinSSD” to verify that the ports are functional.
7. Always use the diagnostic software when troubleshooting a problem. This will eliminate any software issues.

If none of the above steps solved the problem, please refer to **Section A.2**.

A.2 Calling Black Box

If you determine that your RS-232 Single-Port PCI Card is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

A.3 Shipping and Packaging

If you need to transport or ship your RS-232 Single-Port PCI Card:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the RS-232 Single-Port PCI Card for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Appendix B. Electrical Interface

Quite possibly the most widely used communication standard is RS-232. This implementation has been defined and revised several times and is often referred to as RS-232 or EIA/TIA-232. The IBM® PC computer defined the RS-232 port on a DB9 connector, and subsequently the EIA/TIA approved this implementation as the EIA/TIA-574 standard. This standard is defined as the 9-Position Non-Synchronous Interface between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange. Both implementations are in widespread use and will be referred to as RS-232 in this document.

RS-232 is capable of operating at data rates up to 20 kbps at distances less than 50 ft. (15.2 m). The absolute maximum data rate may vary due to line conditions and cable lengths. RS-232 is a single-ended or unbalanced interface, meaning that a single electrical signal is compared to a common signal (ground) to determine binary logic states. The RS-232 and the EIA/TIA-574 specification define two types of interface circuits, DTE and DCE. The RS-232 Single-Port PCI Card is a DTE device.

Appendix C. Asynchronous Communication

Serial data communication implies that individual bits of a character are transmitted consecutively to a receiver that assembles the bits back into a character. Data rate, error checking, handshaking, and character framing (start/stop bits) are pre-defined and must correspond at both the transmitting and receiving ends.

Asynchronous communication is the standard means of serial data communication for PC compatibles and PS/2® computers. The original PC was equipped with a communication (COM:) port that was designed around an 8250 Universal Asynchronous Receiver Transmitter (UART). This device allows asynchronous serial data to be transferred through a simple and straightforward programming interface. A start bit, followed by a pre-defined number of data bits (5, 6, 7, or 8) defines character boundaries for asynchronous communication. The end of the character is defined by the transmission of a pre-defined number of stop bits (usually 1, 1.5, or 2). An extra bit used for error detection is often appended before the stop bits.

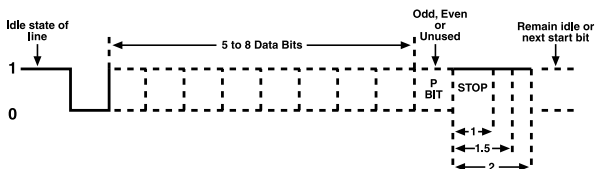
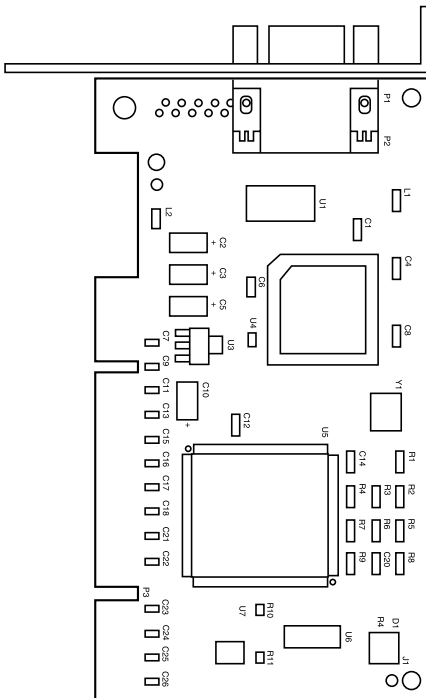


Figure C-1. Asynchronous communication bit diagram.

This special bit is called the parity bit. Parity is a simple method of determining if a data bit has been lost or corrupted during transmission. There are several methods for implementing a parity check to guard against data corruption. Common methods are called (E)ven Parity or (O)dd Parity. Sometimes parity is not used to detect errors on the data stream. This is referred to as (N)o parity. Because each bit in asynchronous communication is sent consecutively, it is easy to generalize asynchronous communication by stating that each character is wrapped (framed) by pre-defined bits to mark the beginning and end of the serial transmission of the character. The data rate and communication parameters for asynchronous communication have to be the same at both the

transmitting and receiving ends. The communication parameters are baud rate, parity, number of data bits per character, and stop bits (that is, 9600, N, 8, 1).

Appendix D. Board Layout





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