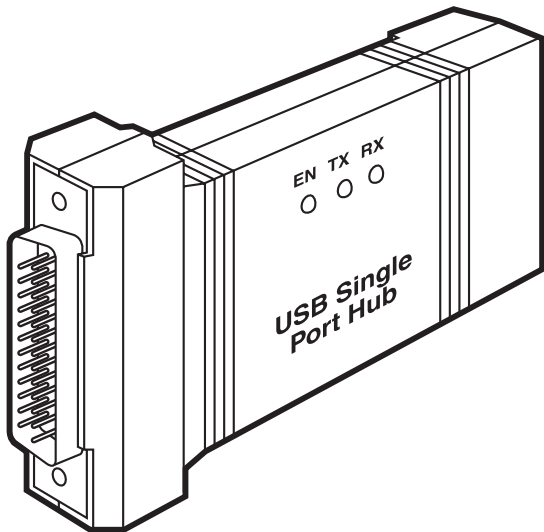


USB Single-Port Hub (RS-232)



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

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.

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

1.1 General

Manufacturing: UL® 94V0 rating; 100% electrically tested; solder mask over bare copper or solder mask over tin nickel.

Connectors: (1) DB25 male; (1) USB Type B

Indicators: LEDs: (1) USB Enabled, (1) TX, (1) RX

Mean Time Between Failures (MTBF): Greater than 150,000 hours

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

Relative Humidity: Operating and Storage: 10 to 90% noncondensing

Power: Supply line: + 5 VDC; Rating: 50 mA

Size: 1"H x 2.3"W x 3.8"D (2.5 x 5.8 x 9.7 cm)

1.2 Connector Pin Assignments (DB25 Male)

Name	Pin #	Mode
TD Transmit Data	2	Output
RTS Request to Send	4	Output
DTR Data Terminal Ready	20	Output
GND Ground	7	—
RD Receive Data	3	Input
DCD Data Carrier Detect	8	Input
DSR Data Set Ready	6	Input
CTS Clear to Send	5	Input
RI Ring Indicator	22	Input

NOTE

These assignments meet EIA/TIA.ANSI-574 DTE specifications for DB25 type connectors.

2. Introduction

2.1 Overview

The USB Single-Port Hub (RS-232) equips the PC with one USB to RS-232 asynchronous serial port, providing a versatile interface for common RS-232 needs (modem, mouse, and plotter). The advantage of this product over more traditional approaches is that it doesn't require opening the computer case, nor does it require resources such as I/O ports or IRQs. It does require a system that supports USB both in terms of hardware and operating system.

2.2 What the Package Includes

The USB Single-Port Hub (RS-232) is shipped with the following items.

- USB Single-Port Hub (RS-232)
- USB cable for connecting to upstream host/hub
- Software
- This users' manual

2.3 Technical Description

The USB Single-Port Hub (RS-232) uses a USB UART. This chip features programmable baud rate, data format, a 128-byte dual-port TX buffer, and a 384-byte dual-port RX buffer. The RS-232 transceiver supports data rates up to 460.8 kbps.

2.4 Features

- Hot-pluggable device that doesn't require opening the case.
- No system resources are required (no I/O ports or IRQs).
- LED status indicators for “USB Enabled,” “TX,” and “RX.”

3. Installation

3.1 Operating System Installation

Choose **Install Software** at the beginning of the CD. Select the Serial I/O software drivers and install **SeaCOM**.

3.2 System Installation

The screen shots pictured in this section are taken from a Windows® Me installation. Your particular operating system may differ slightly from what is shown based on your version of Windows.

The USB Single-Port Hub (RS-232) can be connected to any upstream Type “A” port either at the PC host or an upstream hub. The Hub is hot-pluggable, meaning there is no need to power down your computer before installation.

The USB Single-Port Hub (RS-232) requires no user hardware configuration since there are no jumpers present on the card.

Connect the USB Single-Port Hub (RS-232) to an upstream Host or Hub.

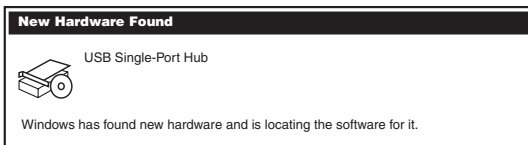


Figure 3-1. New Hardware Found screen.

This indicates that the system has recognized the new device and will now locate a driver.

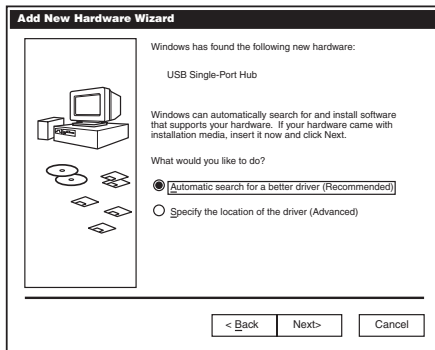


Figure 3-2. Add New Hardware Wizard screen.

Since you have already installed the software by running “Setup,” simply click “Next” to proceed. The drivers that were installed during setup will automatically be used to configure the adapter.

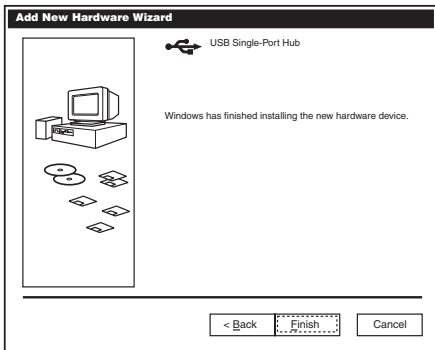


Figure 3-3. Hardware installation finished screen.

Windows has now located a driver and installed the software. Click “Finish” to proceed. You should see one more “New Hardware Found,” indicating the actual port being created. If you view your system’s Device Manager at this point, you should have a new “COM” port in the Ports (COM & LPT) Device Class. It should look similar to the illustration on the next page.

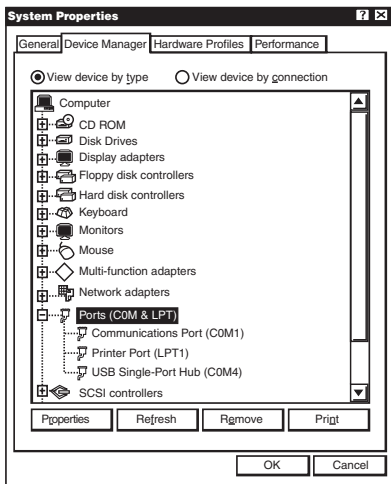


Figure 3-4. System Properties, Device Manager tab.

You can access your new COM port by using the assigned COM identifier. In this case, it is COM4: but this assignment will vary from system to system. At this point, the hardware is recognized. To verify operation, use the supplied WinSSD diagnostic utility. WinSSD can be found in the **Start, Programs** group.

Appendix A. Troubleshooting

A.1 Before Calling Technical Support

Serial Utility test software is supplied with the USB Single-Port Hub (RS-232) and will be used in the troubleshooting procedures. Using this software and following these simple steps, most common problems can be eliminated without calling Technical Support.

1. If your adapter isn't working, first check to make sure that USB support is enabled in the system BIOS and it is functioning properly in the operating system. This can be done by using either the Windows 98, Me, or Windows 2000 Device Manager.
2. Make sure that the systems software has been installed on the machine so that the necessary files are in place to complete the installation.
3. When the USB Single-Port Hub (RS-232) is configured properly, the USB Enabled LED (EN) will be lit. This should allow you to use the WinSSD utility and the supplied loopback plug to check communications. The supplied loopback plug connects TX to RX. If you decide to test the

Modem Control Signals, a full pin loopback plug will be required. Details on loopback plugs are included within WinSSD.

4. When testing the USB Single-Port Hub (RS-232) in loopback mode, you should see both the TX and RX LEDs flashing as well as seeing echoed data on the screen. The loopback test first transmits a HEX pattern, 55AA, and then an ASCII string of data. If this test passes, then the Hub is ready for use in your application.

A.2 Calling Black Box

If you determine that your USB Single-Port Hub (RS-232) 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 USB Single-Port Hub (RS-232):

- Package it carefully. We recommend that you use the original container.
- If you are shipping the USB Single-Port Hub (RS-232) 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 RS-232

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 9-pin D-sub 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 wide-spread 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. 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.

USB SINGLE-PORT HUB (RS-232)

The RS-232 and the EIA/TIA-574 specification define two types of interface circuits, Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE). The USB Single-Port Hub (RS-232) is a DTE device.

Appendix C. Asynchronous Communications

Serial data communications 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 communications is the standard means of serial data communication for PC compatibles and PS/2 computers. The original PC was equipped with a communication or 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. Character boundaries for asynchronous communications are defined by a starting bit followed by a pre-defined number of data bits (5, 6, 7, or 8). 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.

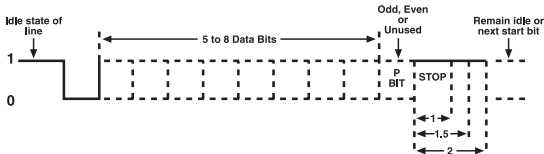


Figure C-1. Asynchronous communications bit diagram.

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 communications is sent consecutively, it is easy to generalize asynchronous communications 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 communications 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).



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