

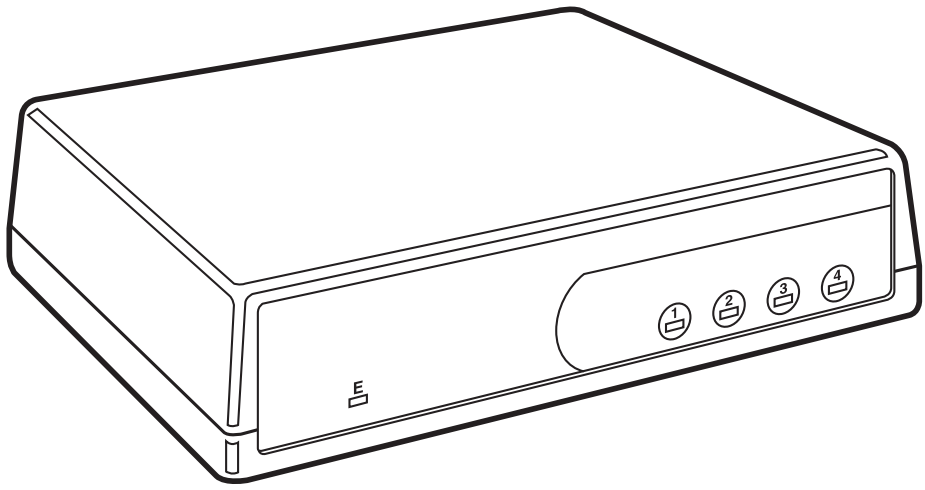


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1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746



4-Port RS-232 USB Hub



**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 B 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 la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY



Products bearing the CE label fulfill the requirements of the EMC directive (89/336/EEC) and of the low-voltage directive (73/23/EEC) issued by the European Commission.

To obey these directives, the following European standards must be met:

- EN55022 Class B: Limits and methods of measurement of radio interference characteristics of information technology equipment.
- EN55024: Information technology equipment immunity characteristics limits and methods of measurement.
- EN60950 (IEC950): Safety of information technology equipment, including electrical business equipment.

Always use cabling provided with this product if possible. If no cable is provided or if an alternate cable is required, use high-quality shielded cabling to maintain compliance with EMC directives.

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.

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1. Specifications

Communication Chips: (4) High-speed, USB-to-serial interface (128-byte FIFO transmit, 384-byte FIFO receive) UARTs

Distance (Maximum): RS-232: 50 ft. (15.2 m)

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

Speed (Maximum): RS-232: 460.8 kbps

Connectors: Serial: (4) DB9 male (see pinout below);
USB: (1) Type B female

Table 1-1. RS-232 (DB9) male connector pinouts.

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

Indicators: (5) LEDs: USB Enabled, Serial Port 1, Serial Port 2, Serial Port 3, Serial Port 4

Temperature Tolerance: 32 to 158°F (0 to 70°C)

Humidity Tolerance: 10 to 90%, noncondensing

Power: From the USB bus (as long as the device is connected directly to a powered PC or hub)

Size: 1.5"H x 5.3"W x 7.1"D (3.8 x 13.5 x 18 cm)

2. Overview

2.1 Introduction

The 4-Port RS-232 USB Hub has four USB to RS-232 asynchronous serial ports that enable you to connect non-USB peripherals to a USB bus. It doesn't require installing cards, I/O ports, or IRQs. However, you must have a recent enough operating system to support USB.

2.2 Hardware Description

2.2.1 FRONT PANEL

The 4-Port RS-232 USB Hub's front panel appears in Figure 2-1. Its components are described in Table 2-1.

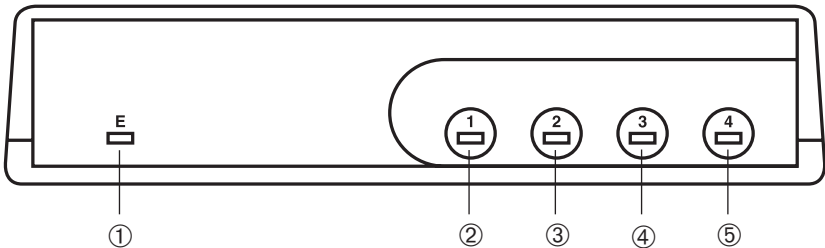


Figure 2-1. Front panel.

Table 2-1. Front-panel components.

Number	Component	Description
①	USB Enabled LED	Lights when a USB device is connected to the hub.
②	Serial Port 1 LED	Lights when the corresponding serial device is active.
③	Serial Port 2 LED	Lights when the corresponding serial device is active.

Table 2-1 (continued). Front-panel components.

Number	Component	Description
④	Serial Port 3 LED	Lights when the corresponding serial device is active.
⑤	Serial Port 4 LED	Lights when the corresponding serial device is active.

2.2.2 BACK PANEL

The 4-Port RS-232 USB Hub's back panel appears in Figure 2-2. Its components are described in Table 2-2.

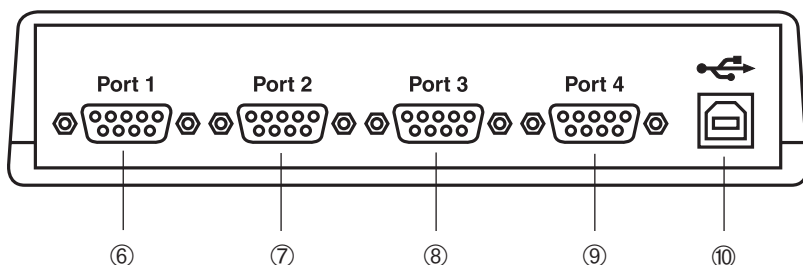


Figure 2-2. Back panel.

Table 2-2. Back-panel components.

Number	Component	Description
⑥	Serial Port 1	Connect a serial device to this DB9 port.
⑦	Serial Port 2	Connect a serial device to this DB9 port.
⑧	Serial Port 3	Connect a serial device to this DB9 port.

Table 2-2 (continued). Back-panel components.

Number	Component	Description
⑨	Serial Port 4	Connect a serial device to this DB9 port.
⑩	USB Type B connector	Links the USB source device to the hub.

2.3 What's Included

The 4-Port RS-232 USB Hub is shipped with the following items. If any of these items is missing or damaged, contact Black Box at 724-746-5500.

- 4-Port RS-232 USB Hub
- USB cable
- CD-ROM containing software and this user's manual in PDF

3. Installation

3.1 Windows 98/Me/2000/XP and Windows Vista™ Operating Systems

NOTE

Windows NT® cannot support this device.

Do not connect the device to a USB port until the software is installed.

1. Start Windows®.
2. Insert the software CD into your CD drive.
3. If Auto-Start is enabled, the installation window will automatically appear. Otherwise, go to the CD drive's root directory and double-click the **autorun.exe** application to launch the installation window.
4. Select **Install Software**.
5. Select the device's part number from the listing.
6. The setup file will automatically detect the operating environment and install the proper components. Follow the information presented on the installation screens.
7. A screen may appear with the message "The publisher cannot be determined due to the problems below: Authenticode signature not found." Press the **Yes** button to continue installing the software. This message simply means that the operating system is not aware of the driver being loaded. It will not cause any harm to your system.
8. During setup, you may specify installation directories and other preferred configurations. This program also adds entries to the system registry that are necessary for specifying each driver's operating parameters. An uninstall option is included to remove the driver and all registry/INI file entries from your system.
9. Install the 4-Port RS-232 USB Hub hardware as described in **Section 3.2**.

3.2 Hardware Installation

1. Connect the 4-Port RS-232 USB Hub to any upstream type “A” port either at the PC host or an upstream hub. The hub is hot-pluggable, so you don’t have to power down your computer before installing it.
2. The New Hardware Found wizard will now locate the appropriate drivers. These drivers were installed during the software setup procedure. Once the drivers are found, a new window will appear and tell you that the new ports are installed properly.
3. If you view the system’s Device Manager, new COM ports in the Ports (COM & LPT) device class should appear.
4. You can access your new COM ports by using the assigned COM identifiers as shown in the Device Manager. The assigned COM port may differ from system to system. The hardware is now recognized and ready to use.

Appendix A. Troubleshooting

A.1 Calling Black Box

If you determine that your 4-Port RS-232 USB Hub is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support 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.2 Shipping and Packaging

If you need to transport or ship your 4-Port RS-232 USB Hub:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, 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 EIA/TIA-232. The IBM® AT® 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 are 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 feet (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, Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE). The 4-Port RS-232 USB Hub is a DTE device.

Appendix C. Asynchronous Communication

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 communication is the standard means of serial data communication for PC and compatible computers. The original PC was equipped with a communication or COM port that was designed around an 8250 Universal Asynchronous Receiver Transmitter (UART), which allows asynchronous serial data to be transferred through a simple and straightforward programming device.

Asynchronous communication works this way: 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).

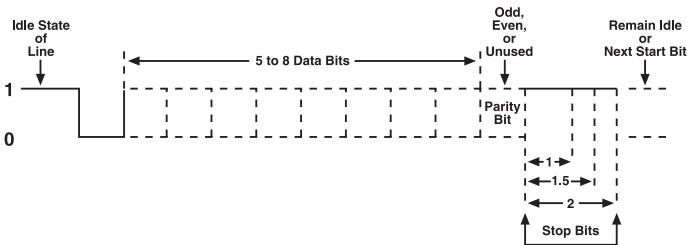


Figure C-1. Asynchronous communication bit diagram.

An extra bit used for error detection is often appended before the stop bits. This special bit is called the parity bit. Parity is a simple way to determine 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 called [N]o Parity). Because each bit in asynchronous communication is sent consecutively, it 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—for example, 9600, N, 8, 1.