

## USB Hubs

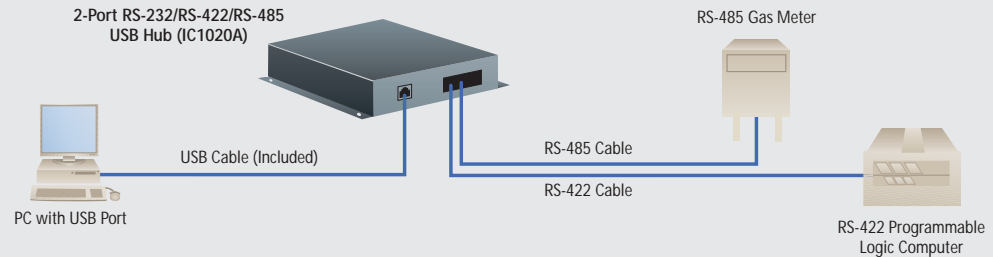


**Use your PC's USB bus to connect serial peripherals.  
We have hubs for RS-232, RS-422/RS-485,  
and RS-232/RS-422/RS-485 applications!**

## FEATURES

- High-speed alternatives to installing serial boards.
- Support USB Version 1.1.
- Data rates up to 921.6 kbps.
- Plug-and-play, hot-swappable, autoconfiguring.
- Ideal for industrial applications.
- Include a 6-foot (1.8-m) USB cable.
- Compatible with Windows® 98/Me/XP and Windows 2000.

## Use a USB Hub in an industrial monitoring application.



## OVERVIEW

USB connections have replaced serial connections as the preferred method of linking peripheral devices to computers. Why? Because USB offers increased bandwidth, lower costs than conventional I/O ports, and the ability to connect devices externally.

And wouldn't you prefer to use an external connection to connect your serial peripherals instead of installing a PCI or ISA card in your system? BLACK BOX® USB Hubs enable you to do just that.

These hubs are available with two, four, or eight ports for RS-232, RS-422/RS-485, or RS-232/RS-422/RS-485 communications.

No matter which model you choose, the USB Hubs enable non-USB serial peripherals to be connected to your PC's USB bus while preserving serial speeds (standard PC data rates of up to 921.6 kbps). These high-speed capabilities are the result of the hubs' two high-speed FIFO buffers—a 128-byte FIFO buffer for data transmission and a 384-byte FIFO buffer for data reception.

The hubs spare you from opening your computer case, and they don't require resources such as input/output (I/O) ports or IRQs. In addition, your system doesn't need to be USB, both in terms of hardware and operating system.

Just think of the possible applications. Instead of plugging factory automation devices into serial ports on a PC, you can attach them to a hub and, in turn, connect the hub to your PC's USB bus. Data rates continue to transfer at serial connection speeds through the externally attached serial devices.

The USB Hubs are ideal for connecting factory automation devices, such as data loggers and industrial machinery, or any device that depends on links that aren't affected by excessive noise or spikes in voltage.

And, with these hubs, you not only get industrial-quality serial connections, but automatic RS-485 data enable/disable along with a DB9 connector that's compatible with PCI and ISA RS-422 products.

You don't need much time to connect one of the hubs, either. These compact units connect to peripheral serial devices in external plug-and-play fashion. And they're hot-swappable—you don't have to turn off your PC to install one.

Setup is easy. The hubs are shipped with drivers on a CD-ROM. Screen captures, including a "new hardware found" wizard, are used to locate the appropriate drivers and, once they're found, a pop-up window indicates correct installation of the new ports and that the hub's hardware is ready for use.

Each port on a USB Hub can be individually configured to the RS- interface of your choice. To do this, simply adjust DIP switches and DIP shunts.

LEDs indicate whether USB is enabled and if there's activity on any hub ports. Upon hub installation, you can begin the setup utility and use the included loopback plug to check communications between TD and RD.

When testing in loopback mode, a port LED flashes and the interface screen displays echoed data (in the form of a hex pattern and ASCII data strings) to verify the hub's readiness for use in your application.

## Technically Speaking

### RS-232

RS-232 defines three types of connections: electrical, functional, and mechanical. This interface is ideal for the data-transmission range of 0–20 kbps/50 feet (15.2 m). It employs unbalanced signalling and is usually used with DB25 connectors to interconnect DTEs (computers, controllers, etc.) and DCEs (modems, converters, etc.).

### RS-422

A differential interface that defines voltage levels and driver/receiver electrical specifications, RS-422 is typically more immune to noise or voltage spikes that may occur on the communication lines.

With differential interfaces, RS-422 also supports greater drive capabilities over longer distances. It can communicate over cabling lengths of up to 4000 feet (1219.2 m). Its signal levels range from 0 to 5 volts.

In addition, the RS-422 serial transmission standard defines driver and receiver electrical characteristics that enable you to put one driver and up to nine receivers on the line at the same time.

### RS-485

Backward compatible with RS-422, the RS-485 interface is used for multidrop applications.

As with RS-422, the RS-485 interface supports cable lengths up to 4000 feet (1219.2 m). Plus, the signal levels for RS-485 are the same as those defined by RS-422. Its electrical characteristics differ in that it allows for 32 devices to be connected simultaneously to one line.

### Universal Serial Bus (USB)

Universal Serial Bus is a royalty-free bus specification developed by leading manufacturers in the PC and telephony industries to support plug-and-play peripheral connections. USB offers increased bandwidth and lower costs than conventional I/O ports.

The USB is a daisychain consisting of USB hubs and peripherals less than 16.4 feet (5 m) apart. The USB daisychain can support up to 127 devices. Instead of opening up the CPU to insert new boards, you make all connections outside the case to the USB ports.

Because USB connections are hot-swappable, you can attach or remove peripherals without shutting down your computer. Also, USB hubs have additional ports that enable you to daisychain multiple devices together. Hundreds of manufacturers of PCs, various peripherals, and software support USB.

USB Version 1.1 supports 1.5- and 12-Mbps data rates. USB Version 2.0 is backward compatible to Version 1.1 speeds.



IC1020A

## TECH SPECS

**Communications Chips** — (2) High-speed USB-to-serial interface (128-byte FIFO transmit, 384-byte FIFO receive)  
**Distance (Maximum)** — RS-232: 50 ft. (15.2 m); RS-422/RS-485: 4000 ft. (1219.2 m)  
**Compliance** — UL® 94V0; FCC Class B, Part 15; CA class B, CE  
**Standards Supported** — USB Version 1.1  
**Operating Systems Supported** — Windows 98/Me/XP, Windows 2000  
**Distance (Maximum)** — RS-232: 50 ft. (15.2 m); RS-422/RS-485: 4000 ft. (1219.2 m)  
**Speed (Maximum)** — RS-232: 460.8 kbps; RS-422/RS-485: 921.6 kbps  
**MTBF** — >150,000 hours  
**Connectors** — Serial: (2), (4), or (8) DB9 M (DTE); USB: (1) Type B F  
**Temperature Tolerance** — Operating: 32 to 158°F (0 to 70°C); Storage: -4 to +158°F (-20 to +70°C)  
**Relative Humidity** — 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 7"W x 5.3"D (3.8 x 17.8 x 13.5 cm)

## WHAT'S INCLUDED

- ◆ (1) USB Hub
- ◆ (1) CD that includes user's manual plus software for setup in Windows 98/Me/XP and Windows 2000
- ◆ (1) 6-foot (1.8-m) USB cable

Item	Code
USB Hubs	
RS-232/RS-422/RS-485	
2-Port	IC1020A
4-Port	IC1022A
8-Port	IC1025A
RS-422/RS-485	
2-Port	IC1028A
4-Port	IC1021A
8-Port	IC1024A
RS-232	
2-Port	IC1026A
4-Port	IC1027A
8-Port	IC1023A
DIN Rail Mount Kit	
2- and 4-Port	DR110
8-Port	DR111

### For optimum performance and a 20% savings, order...

USB Version 1.1 Cable,  
Type A-Type B, 10-ft. (3-m) **USB01-0010**  
DB9 Extension Cable (with EMI/RFI Hoods),  
Foiled Shielded, 10-ft. (3-m) **EDN12H-0010**