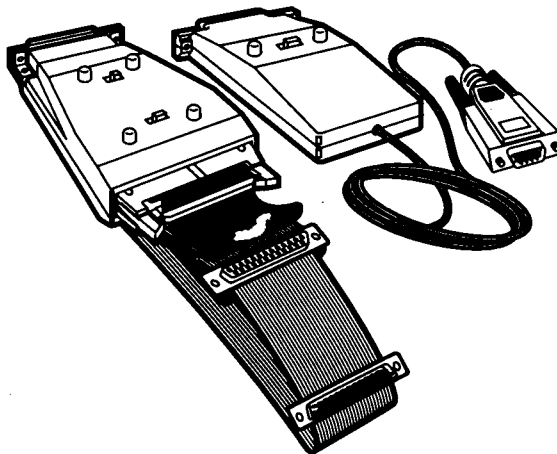


Clever Cable



CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: 877-877-BBOX
FREE technical support, 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
Mail order: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

TRADEMARKS USED IN THIS MANUAL

AT is a registered trademark of International Business Machines Corporation.

MS-DOS is a registered trademark of Microsoft Corporation.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

Chapter	Page
1. Package Contents	4
2. Introduction	5
3. Operation	6
3.1 Clever Cable, Universal Cable (TS101A)	6
3.2 Clever Cable, Laptop/AT Style (TS100A)	9
4. System Setup	11
4.1 Setting Parameters in Windows 95	11
4.2 Setting Parameters in Windows 3.1	12
4.3 Setting Parameters in DOS	12
5. Troubleshooting	14
6. RS-232 Checklist	17

1. Package Contents

The Universal Cable (TS101A)

- (1) 25-pin male gender changer (including one 5-ft. ribbon cable with one DB25 male and one DB25 female connector)

The Laptop/AT Style Cable (TS100A)

- (1) 25-pin male gender changer (including one 9.5-ft. cable)

The Universal Cable Kit (TS105A) or the Laptop AT/Style Kit (TS106A)

- (1) TS100A or TS101A
- Leather carrying case
- 9-pin F to 25-pin M gender changer (TS105A includes 2; TS106A includes 1)
- (2) 9-pin M to 9-pin M gender changers
- (1) 25-pin M to 25-pin M gender changer

2. Introduction

The Clever Cable is ideal when you want to connect a variety of peripherals to your computer without the frustration and expense of using custom cables. It's an intelligent interface cable that connects an RS-232 asynchronous serial device (such as a printer, modem, plotter, or bar-code reader) to your computer. The Cable's logic system figures out the RS-232 interface pattern and makes the correct connections instantly.

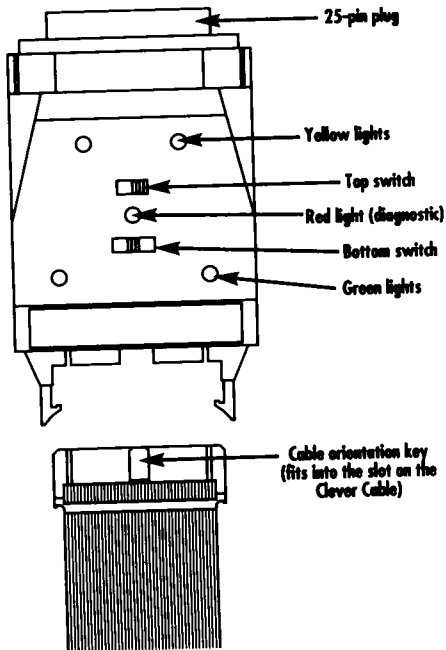
The RS-232 interface is the most common computer interface used today. However, a large number of different interconnecting patterns are possible with an RS-232 interface. Typically a special cable must be built to accommodate each RS-232 application.

The Clever Cable eliminates the need for such special cables, saving you time, money, and effort required to build and debug them. All you do is plug in the Cable and set the switch. This guide will tell you how to set the switch and how to get your system up and running quickly.

3. Operation

3.1 Clever Cable, Universal Cable (TS101A)

Plug this end into
the computer



- 1) Connect the module and ribbon cable. Be sure the cable orientation key (see the illustration on the previous page) fits into the slot on the logic module.
- 2) Power up both pieces of equipment; make sure no data is being sent.
- 3) Make sure the baud rate, word length, and parity settings are matched between the two pieces of equipment. The Cable is transparent to these settings, which must be set correctly for equipment to work properly. For more information, see **Chapter 4**.
- 4) Plug the logic module into the RS-232 serial port of the computer and plug either the male or the female 25-pin plug on the cable end into the peripheral.
- 5) Set the bottom switch (the switch between the green lights) in the center position. Look at the top yellow lights. If both are on, the top switch is in the correct position. If only one yellow light is on, slide the switch to the other position. If both yellow lights come on, that setting is correct.

NOTE

If neither of the yellow lights comes on, check the port on the computer. It's probably plugged into a parallel port. It should be plugged into a serial port.

NOTE

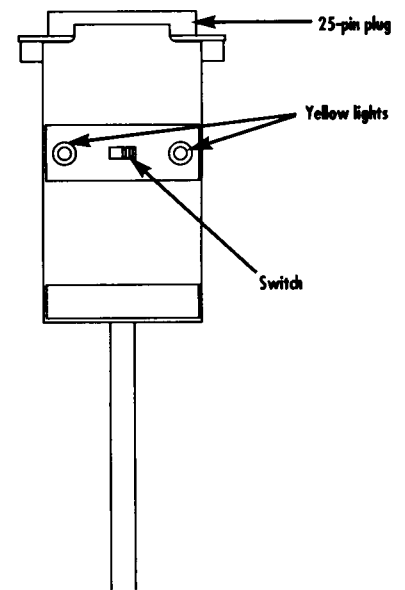
If only one yellow light is on in either switch position (this will be the case with a receive-only printer), try sending data in each position. The position that permits data flow is the correct position.

- 6) Look at the bottom green lights. If one is on, slide the bottom switch toward it. If neither light is on, leave the switch in the center position. If both green lights are on, refer to Situation 1 in **Chapter 5**. If the red light in the center comes on, it means that something is disabling data transfer (during data transfer the red light may flicker; this is normal). If the light remains on, check for sources of disabled data transfer.

When both switches are set and the red light is off, the Clever Cable installation is complete. Leave the Cable in place for as long as you want. You can always re-use the Cable to connect a different peripheral, simply following these instructions for the correct switch settings each time.

3.2 Clever Cable, Laptop/AT® Style (TS100A)

Plug this end into
your peripheral



- 1) Make sure the baud rate, word length, and parity settings are matched between the two pieces of equipment. These settings must be set *exactly the same*

for each piece in order for your system to work properly. For more information, see **Chapter 4**.

- 2) Make sure the data is being sent to the computer's serial port. For more information, see **Chapter 4**.
- 3) Plug the cable connector into the computer's serial port. Plug the Logic Module (casing with switch and 2 lights) into your peripheral port.
- 4) Power up your computer and peripheral.
- 5) If the cable is connected to a modem, set the switch to the right.
- 6) For printers, plotters, etc., both lights should be on. In most cases, lights will be on in both center and left switch positions, although the most common setting is to the left. Send data. If the transfer is disabled, move the switch to the center position.

Leave the Clever Cable in place as long as you want the peripheral connected. You can re-use the Cable to connect a different peripheral; simply follow these instructions for the correct switch setting.

4. System Setup

Before you can send data from your computer to your peripheral using any type of serial cable, you need to match the baud rate, parity, word size, and stop bits between the two pieces of equipment.

To do this, look in your peripheral user manual for the section referring to RS-232 port set-up. If you are unsure which setting to use, try 9600-baud rate, 8-bit word size, no parity, and 1 stop bit. Check your user manual and set the DIP switches accordingly. (Note that with some printers or plotters these DIP switches are only accessible after removing the printer cover).

Once you have set the correct parameters on your peripheral, set the parameters on your computer.

4.1 Setting Parameters in Windows 95

1. Double-click on the "My Computer" icon.
2. Double-click on "Control Panel."
3. Double-click on "System."
4. Select the "Device Manager" tab.

5. Double-click on the "Communications Port" you want to configure.
6. Select the "Port Settings" tab.
7. Adjust the port settings to match the device connected to that port.

4.2 Setting Parameters in Windows 3.1

1. In the "Main" program group, double-click on the "Control Panel" icon.
2. Double-click on "Ports."
3. Double click on the COM port you want to configure.
4. Adjust the port settings to match the device connected to that port.

4.3 Setting Parameters in DOS

At the DOS prompt, use the MODE command. This command sets the baud rate, parity, word size, and stop bits for the computer. For example, for a serial printer set to 9600 bps, no parity, 8-bit word size, and one stop bit, the MODE command would be:

C:\MODE COM1: 9600,N,8,1,P and press [Enter].

Where	MODE	=	DOS command
	9600	=	baud rate
	N	=	no parity
	8	=	word size
	1	=	number of stop bits
	P	=	printer or plotter

Your computer now has the same baud rate, parity, word size, and stop bits as the device attached to it.

After we set the same parameters between the computer and peripheral, we need to direct the printer information to the computer serial port. Use the same DOS MODE command.

C:\MODE LPT1: = COM1

Where	LPT1:	=	printer output
	COM1:	=	serial port

5. Troubleshooting

Situation 1: Buffer Full Polarity

Symptom: Data transmission is disabled from computer to printer.

Problem: The “buffer full” signal line from the printer is the wrong polarity.

Solution: Put the switch in the center position. Your application should now work. If you are still unable to make the connection, however, you will need to change the buffer full polarity switch on your printer.

Refer to your printer’s user manual. The switch may be called “buffer memory full,” “reverse channel active,” “supervisory send,” or sometimes Pin 11 or Pin 19. The switch is usually located near the switches that control baud rate, word size, etc. Once you find this switch, flip it to the opposite position from the way it’s currently set. Note: Most printers require you to restart the printer before switch-setting changes take effect.

Situation 2: Printer Off-Line

Symptom: Your printer doesn’t respond to your computer command.

Problem: The printer is “off-line” or “local.”

Solution: Set the printer to “on-line” or “remote” (whichever is applicable).

Situation 3: Data Sent to Wrong Port

Symptom: The Clever Cable LEDs indicate the system is ready to transmit data, yet no text will print on the printer. Also, the screen will display one character and then stop.

Problem: Data from the computer is being sent to the wrong port.

Solution: Redirect the data to the correct port.

Extension Cables

The Laptop/AT Style Clever Cable (TS100A) comes with a standard 10-foot (3-m) cable. If you'd like to use an extension cable, make sure it's a straight-through cable with all 25 lines.

6. RS-232 Checklist

1) Are both devices using the same baud rate?

Both interfaces that use RS-232 must be handling data at the same rate. If not, the receiving device will misread the data, so you'll see apparently random data on the printer or terminal.

Baud rate is set by software, or in some older equipment, hardware switches. Consult your equipment manual and set both the computer and the peripheral to a common baud rate.

2) Are both interfaces using error checking?

Modern equipment is very reliable, so sending an error-check bit with each character is less common. The most common error-checking scheme is called parity. Both interfaces must be set to the same error-checking scheme. The choices are:

No Parity (does not use error checking)

Odd Parity

Even Parity

The easiest way to get started is to select No Parity, or no error checking, on both interfaces. If you require error checking, it can be added later, after the system is running.

3) Do both interfaces use the same word size (number of bits per character)?

Characters are commonly made up of 6, 7, or 8 bits. Again, both interfaces must use the same number of bits per character. This is relatively straightforward, except that a few manufacturers include the parity bit when they count the number of bits per character, which may cause some confusion. A standard number is 8 bits per word with no parity.

4) Are both interfaces in the same transmission mode?

Both interfaces should be in the same mode (either full or half-duplex, but not both). Symptoms of a transmission-mode mismatch are when a printer or terminal prints or displays double characters; for instance, instead of printing READY, it would print RREEAADDYY. Another symptom is when a terminal can send data to the computer via keyboard, but it doesn't display the data on the screen.

5) Do you have a two-speed modem?

Some modems have two data-transmission rates. The transmission rate may be selected by a switch on the modem or by a command from a computer or other peripheral. If the speed switch is not on the modem and your computer doesn't have the signal to select the speed, the Clever Cable will automatically set the modem to the high-speed data-transmission rate.

6) Are you transferring data asynchronously or synchronously?

Most applications today require asynchronous data transfer, and the Clever Cable is designed for this type of data transfer. The Clever Cable is not recommended for synchronous applications.