

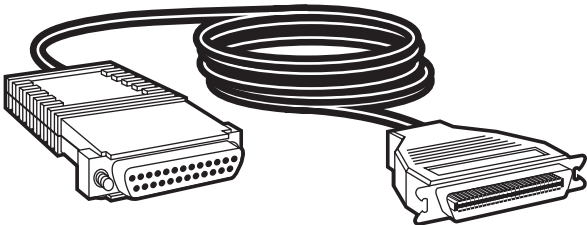


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1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

# Serial↔Parallel Converter (38.4 kbps)



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## 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

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**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.*

**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.

## **Trademarks Used in This Manual**

Centronics is a registered trademark of Centronics Corporation.

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

## **CE Notice**

The **CE** symbol on your Serial↔Parallel Converter (38.4 kbps) indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU).

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# 1. Specifications

<b>Serial Interface:</b>	Asynchronous, RS-232C compatible, DB25 female; DCE/DTE auto-sensing
<b>Serial Data Rates:</b>	300, 600, 1200, 2400, 4800, 9600, 19,200, or 38,400 bps
<b>Data Format:</b>	7 or 8 data bits, 1 or 2 stop bits (switch-selectable)
<b>Parity:</b>	Enable/disable, even/odd (switch-selectable)
<b>Parallel Interface:</b>	Centronics compatible, 36-pin male connector attached to the end of a 6-foot (1.8-m) cable
<b>Temperature Tolerance:</b>	32 to 140°F (0 to 60°C)
<b>Altitude Tolerance:</b>	Up to 10,100 feet (3078 m)
<b>Maximum Humidity:</b>	5 to 95%, noncondensing

<b>Power:</b>	Uses power from RS-232C interface; no external power required
<b>Size:</b>	2.6"H x 1.3"W x 0.8"D (6.6 x 3.3 x 2 cm)
<b>Weight:</b>	2 oz. (57 g)

## 2. Introduction

### 2.1 Description

The Serial↔Parallel Converter (38.4 kbps) converts RS-232C serial data to parallel data and vice versa. Incorporating advanced microprocessor technology, the Converter automatically senses and selects parallel and serial modes, as well as DTE/DCE modes. The Converter requires no AC power and supports serial data rates from 300 to 38,400 bps.

Convenient configuration switches control data rate, parity, word length, and flow control. An easy-to-read LED indicator displays status and operating conditions.

The Serial↔Parallel Converter (38.4 kbps) includes a DB25 female connector on the serial side and a 6-foot (1.8-m) cable ending in a Centronics® 36-pin male connector on the parallel side.

### 2.2 Features

- Converts serial data to parallel data and vice versa.
- Automatic parallel and serial sensing and selection.

- Automatic DCE/DTE sensing and selection.
- Built-in 1-kbit buffer prevents data loss.
- Serial data rates up to 38,400 bps.
- No AC power required.
- Supports both software and hardware flow control.
- Ultra-miniature size.
- A five-state LED monitors status and diagnostics.
- Complete with 6 ft. (1.8 m) of cable and a Centronics 36-pin connector.

## 3. Configuration

### 3.1 Configuration Switches

The Serial↔Parallel Converter (38.4 kbps) uses a set of eight external DIP switches (see Figure 3-1) that allow configuration to a wide range of applications. Because all eight switches are in one externally accessible DIP-switch package, you don't have to open the case for configuration. The configuration switches allow you to select data rates, parity, word length, and flow control. This chapter describes all switch locations, positions, and functions.

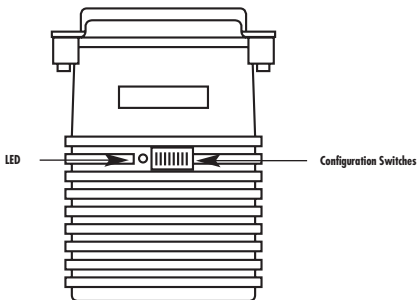


Figure 3-1. Locating the configuration switches.

The Converter uses a miniature 8-position DIP switch package (see Figure 3-2). To configure the unit, use a small screwdriver and gently push each switch to its proper setting. The ON and OFF positions are shown in Figure 3-2. Default settings for the DIP switches are shown in Table 3-1. Detailed settings follow the table in **Section 3.2**.

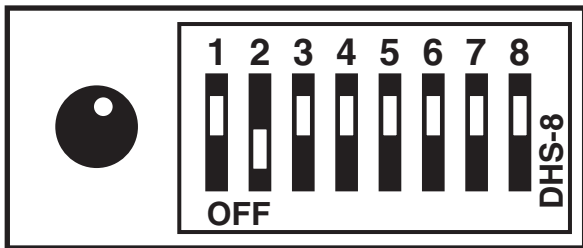


Figure 3-2. The miniature 8-position DIP switch.

**Table 3-1. DIP switch summary table.**

<b>Position</b>	<b>Function</b>	<b>Factory Default</b>
SW1	Flow Control	OFF Hardware
SW2	LED Indicator	ON Enabled
SW3	Data, Parity, Stop Bits	OFF
SW4	Data, Parity, Stop Bits	OFF 8B*, NP**, 1S***
SW5	Data, Parity, Stop Bits	OFF
SW6	Data Rate	OFF
SW7	Data Rate	OFF 9600 bps
SW8	Data Rate	OFF

## 3.2 Detailed Switch Settings

### SWITCH 1: HARDWARE/SOFTWARE FLOW CONTROL

The setting for Switch 1 determines whether the Converter will have hardware or software flow control.

**Table 3-2. SW1 settings.**

<b>Flow Control</b>	<b>SW1</b>
Hardware	OFF
Software	ON

\*B = data bits

\*\*NP = no parity

\*\*\*S = stop bit

**SWITCH 2: LED INDICATOR**

The setting for Switch 2 determines whether the LED indicator is enabled or disabled.

**Table 3-3. SW2 settings.**

LED	SW2
Enabled	ON
Disabled	OFF

**SWITCHES 3 THROUGH 5: DATA, PARITY, AND STOP BIT**

Switches 3 through 5 are used to specify the data, parity, and stop bits. Table 3-4 shows the settings that may be used.

**Table 3-4. SW3 through SW5 settings.**

Data	Parity	Stop Bit	SW3	SW4	SW5
7B*	EP**	1S***	ON	ON	ON
7B	OP	1S	OFF	ON	ON
7B	NP	2S	ON	OFF	ON
7B	EP	2S	OFF	OFF	ON
7B	OP	2S	ON	ON	OFF
8B	EP	1S	OFF	ON	OFF
8B	OP	1S	ON	OFF	OFF
8B	NP	1S	OFF	OFF	OFF

\*B = data bits

\*\*NP = no parity

\*\*EP = even parity

OP = odd parity

\*\*\*S = stop bit



## SERIAL↔PARALLEL CONVERTER (38.4 kbps)

### SWITCHES 6 THROUGH 8: FREQUENCY AND DATA RATE

Switches 6 through 7 determine the frequency and data rate. Table 3-5 shows the settings that may be used.

Table 3-5. SW6 through SW8 settings.

Data Rate	SW6	SW7	SW8
300	OFF	OFF	ON
600	ON	OFF	ON
1200	ON	ON	OFF
2400	OFF	ON	ON
4800	ON	ON	ON
9600	OFF	OFF	OFF
19,200	ON	OFF	OFF
38,400	OFF	ON	OFF

## 4. Installation

The Converter is simple to install. Once you have configured the DIP switches, just plug it in and you're ready to go. Figure 4-1 illustrates the proper connections for the standard cables. If you have a non-standard connector on your printer or PC, call Black Box Technical Support at 724-746-5500.

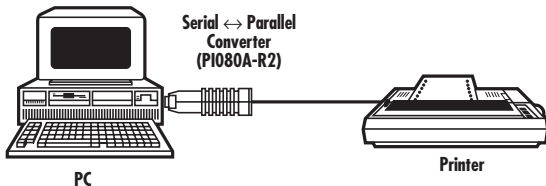


Figure 4-1. Installing the converter.

## 5. Operation

Once your Converter is properly configured and installed, it should operate transparently—as if it were a standard cable connection. Operating power is derived from the RS-232 data and control signals; there is no ON/OFF switch.

The Converter features an easy-to-read status LED that glows red to indicate the condition of the transmission line. Figure 3-1 at the beginning of **Chapter 3** shows the location of the LED. Table 5-2 (on the next page) describes the LED's various functions.

Table 5-1. Key for LED codes.

Key:	
•	Blink
_	Short pause
—	Long pause

Table 5-2. LED Codes.

• • - • — • • - • —	Computer is sending data.
• — • — • —	Serial device is connected; computer is not sending data.
• • — • • —	Both serial and parallel devices are connected; computer is not sending data.
• - • — • - • —	Printer is not ready; data is held in the buffer.
• • • • — • • • •	Computer is ignoring flow control, data is lost.

The red LED indicator blinks to show activity. Since there is only one indicator, it uses different LED codes to demonstrate various messages. Table 5-1 describes these codes.

## Appendix A. Port Connections

### A.1 36-Pin Centronics Parallel Port Connections

Pin	Description	Direction
1	Strobe	Output
2	Data bit 0	I/O
3	Data bit 1	
4	Data bit 2	
5	Data bit 3	
6	Data bit 4	
7	Data bit 5	
8	Data bit 6	
9	Data bit 7	
10	Acknowledge	Input (active low)
11	Busy	Input (active high)
12	Paper end	
13	Select	
18	+5 volts	
32	Error	
	(16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 36)	Ground

#### NOTE

All other pins are not connected.

## A.2 DB25 Serial Port Connections

Pin	Name	Description
1	FG	Connected to pin 7 with optional jumper.
2	TXD	Serial Transmit Data; also used as a power source.
3	RXD	Serial Receive Data; also used as a power source.
4	RTS	Request to Send; also used as a power source.
5	CTS	Clear to Send; also used as a power source.
6	DSR	Data Set Ready; also used as a power source.
7	SG	Signal Ground.
8	DCD	Carrier Detect; also used as a power source.
9	+V in	Used as a power source.
20	DTR	Data Terminal Ready; also used as a power source.

### NOTE

All other pins are not connected.

## Appendix B. Block Diagram

