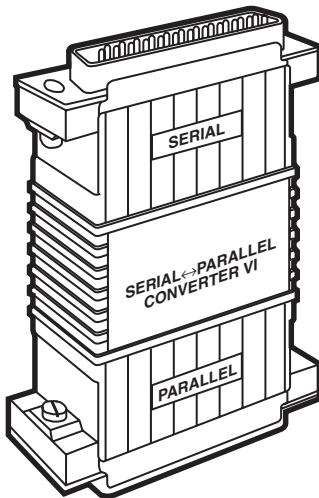




Serial ↔ Parallel Converter VI



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**
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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 la 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 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.

TRADEMARKS USED IN THIS MANUAL

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1. Specifications

Compliance — FCC Part 15 Class A, IC Class/ classe A

Interfaces — EIA RS-232 serial (auto-sensing DTE/DCE) and IBM PC parallel

Protocol — Serial: Asynchronous

Data Format — Serial: 7 data bits with odd or even parity or 8 data bits with no parity

Flow Control — Serial Software: X-ON/X-OFF, Hardware: DTR/CTS; Parallel: Busy and Acknowledge

Data Rate — Serial: 115,200, 57,600, 38,400, 19,200, 9600, 2400, or 1200 bps

Throughput — Parallel: Greater than 10,000 cps

Internal Memory — 32 bytes of buffer RAM

User Controls — (1) 8-position DIP switch

Connectors — (1) DB25 female (serial);
(1) DB25 male (parallel)

Power — 3 mA typical idle power required at 3 VDC or higher voltage; derived from DTR and RTS leads of serial interface, or from ACK (Pin 10) of DB25 parallel interface

Size — 0.6"H x 2.1"W x 3.5"D (1.5 x 5.3 x 8.9 cm)

Weight — 2 oz. (56.7 g)

2. Introduction

The Serial↔Parallel Converter VI converts RS-232 serial to IBM® PC parallel or vice versa. The unit will automatically set itself for the direction of conversion. The Converter supports both X-ON/X-OFF and DTR/CTS serial hardware handshaking, and Busy/Acknowledge parallel handshaking.

Since the Converter is powered by the connected devices, it needs no external power source.

The Converter is programmed with an 8-position DIP switch for baud rate, parity, word length, and flow control.

Because the Converter is so small and light, it's easy to connect it directly to a DB25 serial port or a computer's DB25 parallel port. For other connections, all you need is common, low-cost serial or PC parallel-printer cables.

NOTE

In the applications for which the Converter was designed and tested, it is installed between PCs and printers. The Converter should function normally in such environments. However, the Converter will not work with certain serial devices that do not comply with the RS-232 specifications for voltage. To be sure, consult with devices' manufacturers.

3. Installation

3.1 General

CAUTION

Make sure the computer and any other connected devices are turned off before you make any connections to the Converter.

The Converter has been designed to plug directly into a computer's DB25 male (DTE) serial port, or into a computer's DB25 female parallel-printer port. If your serial port is a DB9 male port, use an ordinary DB9-female-to-DB25-male adapter. If you're outputting to a parallel printer, use a standard PC-to-parallel-printer cable and a DB25 female-to-female gender changer (ordered separately, part number FA412).

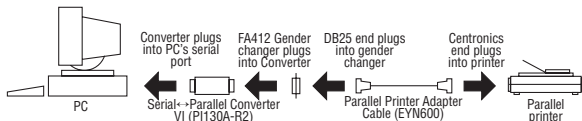


Figure 3-1. Serial-to-Parallel Application.

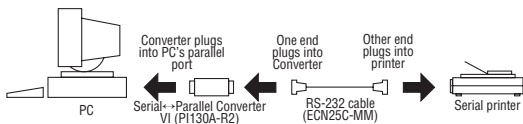


Figure 3-2. Parallel-to-Serial Application.

3.2 DIP Switches

The Converter uses a set of eight external DIP switches (see **Figure 3-3**). 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.

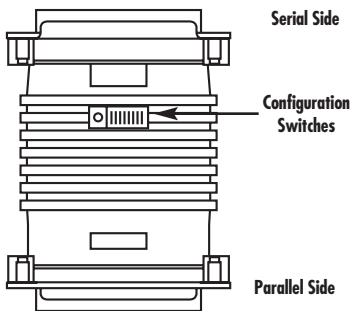


Figure 3-3. The location of the configuration switches.

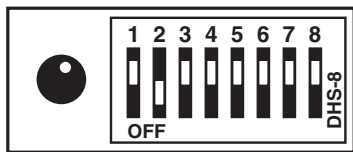


Figure 3-4. The miniature configuration switch package.

SERIAL ↔ PARALLEL CONVERTER VI

After connecting the hardware, set up the Converter by selecting the appropriate DIP-switch settings for your application:

	Position							
	1	2	3	4	5	6	7	8
Flow Control Hardware Software	OFF ON							
LED Enabled Disabled		ON OFF						
Parity/D. Bits / S. Bit None/8/1 Odd/8/1 Even/8/1 None/7/2 Odd/7/2 Even/7/2 Odd/7/1 Even/7/1			OFF ON OFF ON ON OFF OFF ON	OFF OFF ON OFF ON OFF ON ON	OFF OFF OFF ON ON ON ON ON			
D. Rate (bps) 1200 2400 4800 9600 19,200 38,400 57,600 115,200						OFF ON ON OFF ON OFF ON OFF	OFF OFF ON ON ON OFF OFF ON	ON ON OFF ON ON OFF OFF OFF

NOTE: The Converter reads DIP-switch settings during power-up. All other positions (1 through 5, 7, and 8) are not checked after power-up, and changing any of these positions will not affect the operation of the Converter until the connected equipment is powered off and back on again.

The installation is finished now. If your connection is working, you don't have to do anything else. If you have problems, read **Chapters 4 and 5**.

4. 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.

4.1 LED Status Monitors

The Converter indicates data activity by blinking. When the Converter has another message to report, the LED blinks according to the codes in **Table 4-1** on the next page.

Table 4-1. 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 not ready, data held in buffer
•••-••••	Computer ignoring flow control, data lost
Key:	
•	Blink
-	Short pause
—	Long pause

5. Troubleshooting

If your Serial↔Parallel Converter VI seems to be malfunctioning, *do not attempt to alter or repair the unit; contact Black Box at 724-746-5500.*

Before you do so, 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.

If you need to transport or ship your Converter:

- Carefully package it. We recommend that you use the original container.
- If you are returning the Converter to Black Box, call Technical Support to get a Return Materials Authorization (RMA) number.

Appendix A: Interface Connections

A.1 DB25 Male Parallel Port Connections

Pin	Description	Direction
1	Strobe	Output
2	Data bit 0	I/O
3	Data bit 1	I/O
4	Data bit 2	I/O
5	Data bit 3	I/O
6	Data bit 4	I/O
7	Data bit 5	I/O
8	Data bit 6	I/O
9	Data bit 7	I/O
10	Acknowledge	Input (active low)
11	Busy	Input (active high)
12	Paper end	
13	Select	
14	Auto Line Feed	(active low)
15	Error	(Fault—active low)
16	Initialize Printer	(Prime—active low)
17	Select Input	(active low)
18-25	Ground	

NOTE

All other pins are unconnected.

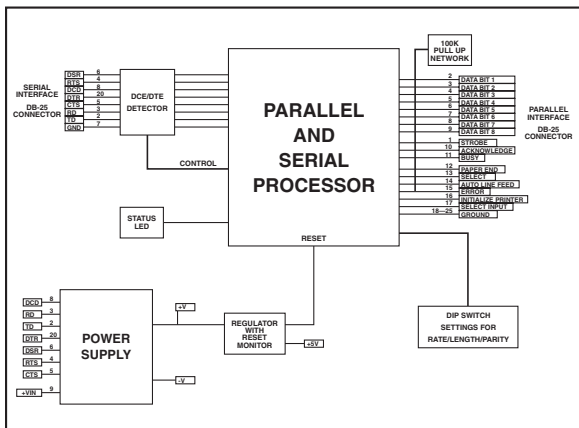
A.2 DB25 Female Serial Port Connections

Pin	Name	Description
1	FG	Connected to pin 7
2	TXD	Serial Transmit Data; also used as a power source
3	RXD	Serial Receive Data (sends XON/XOFF only)
4	RTS	Used as a power source
5	CTS	Clear to Send; connected to +V
7	SG	Signal Ground
8	DCD	Carrier Detect; connected to +V
9	+V in	Used as a power source
11		Secondary Flow Control; accepts flow control signal (connected to DTR line) (pin 20)
19	SRTS	Secondary Flow Control; accepts flow control signal (connected to DTR line) (pin 20)
20	DTR	Data Terminal Ready

NOTE

All other pins are unconnected.

Appendix B: Block Diagram





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