BLACK BOX ®

NETWORK SERVICES

Serial Parallel↔Converter III

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 lineas 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 objectos 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: Objectos 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

The trademarks mentioned in this manual are the sole property of their owners.

Contents

1. Specifications

Interface — Asynchronous, RS-232C compatible

Connectors — Serial DB25 female; Parallel Centronics 36-pin male

Data Rates — 300, 600, 1200, 2400, 4800, 9600, 19200, 38400

Power Supply — From interface or from power-supply adapter: PI115A-C: 120 VAC; PI115AE-R2: 230 VAC

Data Format — 7 or 8 bits; 1 or 2 stop bits; even, odd, or no parity

Temperature — 32 to 140 °F (0 to 60 °C)

Altitude — 0-10,100 feet

Humidity — 5 to 95% noncondensing

Size — 4.4"H x 2.9"W x 0.8"D (11.1 x 7.4 x 2 cm)

Weight — 2.6 oz. (73.8 g)

2. Introduction

2.1 Description

The Serial↔Parallel Converter III automatically converts RS-232 serial data to parallel data format and vice versa. Incorporating advanced microprocessor technology, the Converter automatically senses and selects parallel and serial modes, as well as DCE/DTE modes. The Converter supports serial data rates to 38.4 Kbps.

For easy configuration, the Converter features a convenient set of configuration switches. These internally accessible configuration switches allow the user to control baud rate, parity, word length, and flow control.

Housed in a miniature ABS plastic case, the Converter comes equipped with a DB25 female connector on the serial side and a Centronics 36-pin male connector on the parallel side. A female-to-female Centronics gender changer is also included in the package for connecting to a male Centronics parallel interface on the Converter. Although the Converter is able to receive power from the RS-232 interface, it also comes with a wallmount power supply for low-power applications.

2.2 Features

- Converts parallel data to serial data and vice versa

- Automatically selects parallel-to-serial
  and serial-to-parallel operation

- Automatically selects DCE/DTE modes

- Serial data rates to 38,400 bps

- No AC power required

- Supports both software and hardware flow control

- AC adapter included for low-power interfaces

- Ultra-miniature size

- Made in the USA

3. Configuration and Installation

The Converter is simple to install and extremely reliable. The following instructions will help you set up and install your converter properly. If you have any questions, please call Black Box Technical Support at 724-746-5500.

3.1 Configuration Switches

The Converter uses a set of eight internal DIP switches (see **Figure 3-1**) that allow configuration to a wide range of applications. You must open the case to gain access to the internal switches. To open the case, insert a small screwdriver into one of the slots on the side of the plastic case. Then twist from side to side until the case opens.

The configuration switches allow you to enable the self-test and select data rates, parity, word length and flow control selection. The following sections describe all switch locations, positions, and functions.

3.1.1 SWITCHES 1 AND 2

The setting for Switch 1 determines whether the unit uses hardware or software (XON/XOFF) flow control. Switch 1 is alternatively used to determine the direction of the self-test output message whenever the self-test is activated via Switch 2. See the table on **page 14**.

3.1.2 SELF-TEST

Use Switch 2 to activate the self-test in the direction of the serial or parallel interface. You can use this test to determine whether the unit is working properly. When self-test is activated, the unit outputs the following "barber pole" pattern, which represents every ASCII character on a standard US keyboard:

0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
XYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}~

NOTE

When you activate the self-test, the unit "memorizes" the setting of Switches S1, S3, S4, S5, S7, and S8 to perform the test. If you modify any of these switches, you must de-activate Switch 2 for the changes to take effect.

For switch settings, see the table on **page 14**.

3.1.3 SWITCHES 3 THROUGH 5: DATA PARITY AND STOP BIT

Switches 3 through 5 are used to specify the data, parity, and stop bits. For settings, see the table on **page 14**.

3.1.4 SWITCHES 6 THROUGH 8: FREQUENCY AND DATA RATE

Switches 6 through 8 determine the frequency and data rate. For settings, see the table on **page 14**.

3.1.5 LOCATION OF THE CONFIGURATION SWITCHES ON THE CONVERTER
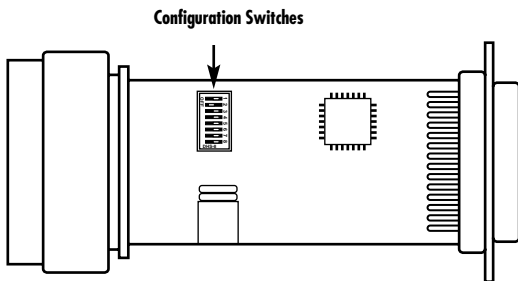
Configuration Switches

Figure 3-1. Location of the configuration switches on the Converter.

To configure your 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**.
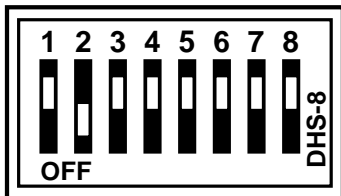
Figure 3-2. The miniature configuration switch package.

DIP Switch Settings	Position							
	1	2	3	4	5	6	7	8
Flow Control								
Hardware	OFF							
Software	ON							
Self-Test								
Parallel	OFF							
Serial	ON							
Bit Error Rate								
Self-Test ON		ON						
Self-Test OFF		OFF						
Parity/D. Bits/ S. Bit								
None/8/1			OFF	OFF	OFF			
Odd/8/1			ON	OFF	OFF			
Even/8/1			OFF	ON	OFF			
None/7/2			ON	OFF	ON			
Odd/7/2			ON	ON	OFF			
Even/7/2			OFF	OFF	ON			
Odd/7/1			OFF	ON	ON			
Even/7/1			ON	ON	ON			
D. Rate (bps)								
300							OFF	OFF ON
600							ON	OFF ON
1200							ON	ON OFF
2400							OFF	ON ON
4800							ON	ON ON
9600							OFF	OFF OFF
19200							ON	OFF OFF
38400							OFF	ON OFF

3.2 Installation

The Converter is very simple to install. Once you have configured the DIP switches, just plug your converter into a standard cable and you're ready to go. **Figure 3-3** illustrates the proper connections for the Converter. If you have a non-standard connector, your connections may be different.
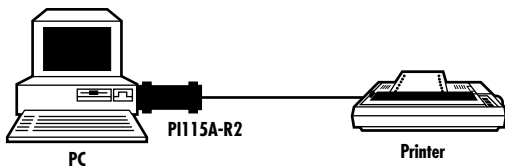

PI115A-R2

PC   Printer

Figure 3-3. Typical installation.

3.3 Power Connection

In many cases, the Converter will run without being connected to external power. However, additional power may be necessary in certain applications that use low-power RS-232 devices.

The 120VAC U.S. wall transformer version supplies +9V regulated DC up to 500mA. Connect this wall transformer to the Converter via a cannon jack on the side panel. The Converter is powered up as soon as it is plugged into an AC outlet—there is no power switch.

4. Operation

Once your interface 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.

5. Troubleshooting

If your Serial↔Parallel Converter VI seems to be malfunctioning, *do not attempt to alter or repair the unit.* Contact Black Box Technical Support 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're returning the Converter to Black Box, call Technical Support to get a Return Materials Authorization (RMA) number.

Appendix A: Interface Connections

A.1 36-Pin Centronics 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	
18	+5 volts	
32	Error (16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 36)	Ground

NOTE
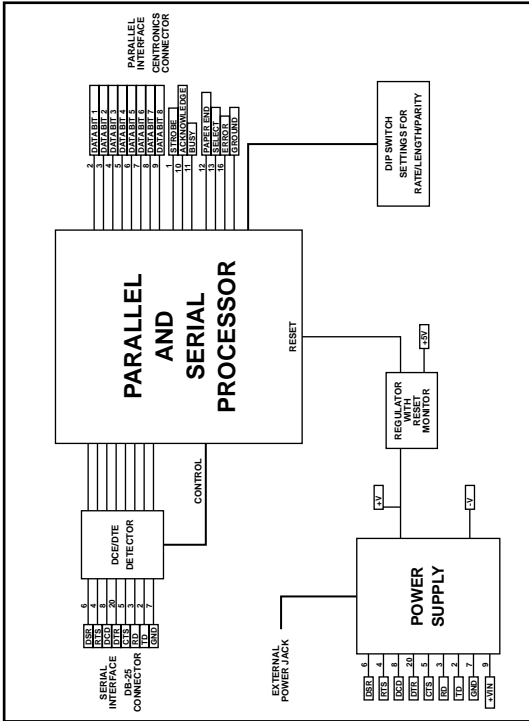
All other pins are unconnected.

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