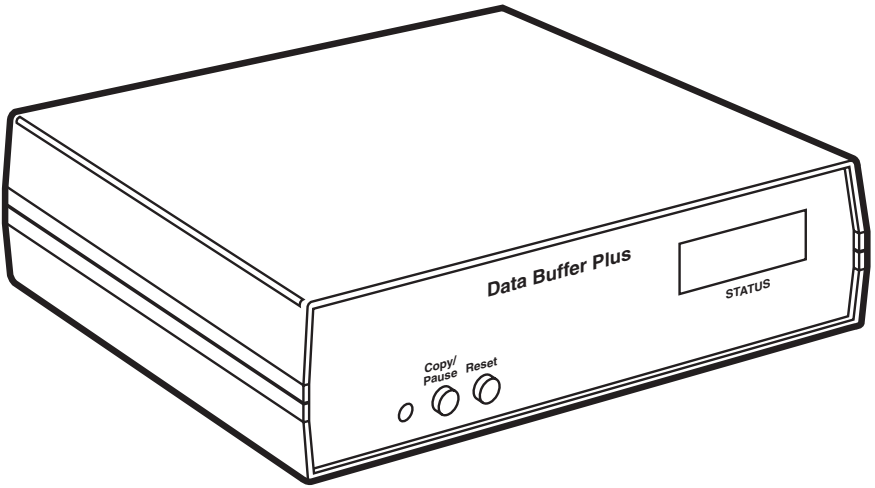
1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

BLACK BOX®
NETWORK SERVICES

SEPTEMBER 1999

PI405A(E)	PI415A(E)	PI420A(E)	PI425A(E)
PI406A(E)	PI416A(E)	PI421A(E)	PI426A(E)
PI407A(E)	PI417A(E)	PI422A(E)	PI427A(E)
PI408A(E)	PI418A(E)	PI423A(E)	PI428A(E)
PI409A(E)	PI419A(E)	PI424A(E)	PI429A(E)

DataBuffer Plus



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**

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 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

Speed — 300 to 115,200 bps

Memory — PI405, PI415, PI420, PI425 models: 128 KB; PI406, PI416, PI421, PI426 models: 256 KB; PI407, PI417, PI422, PI427 models: 512 KB; PI408, PI418, PI423, PI428 models: 1 MB; PI409, PI419, PI424, PI429 models: 2 MB

Flow Control — Serial: X-ON/X-OFF or hardware; Parallel: Hardware, Busy, ACK

Data Format — 7 or 8 data bits, Parity even or odd

Interface — RS-232 async ASCII (input port is DTE, output port is DCE)

Connectors — (1) DB25 female input; (1) DB25 female output

Display — Four-digit LED display

Power — 115/230 VAC, 50/60 Hz, 20 watts, 5 VDC, 1 amp

Size — 2.4"H x 8.1"W x 6.3"D (6.1 x 20.6 x 16 cm)

Weight — 2.5 lb. (1.1 kg)

2. Introduction

The DataBuffer Plus is a versatile buffering device that accepts data rapidly from your computer and sends it to a printer or plotter. The DataBuffer Plus also takes data from or sends data to other devices such as scanners and modems. The DataBuffer Plus comes in the following models:

- DataBuffer Plus-128K-S/S (PI405A(E))— serial-to-serial version with 128 KB of memory.
- DataBuffer Plus-128K-S/P (PI415A(E))— serial-to-parallel version with 128 KB of memory.
- DataBuffer Plus-128K-P/P (PI420A(E))— parallel-to-parallel version with 128 KB of memory.
- DataBuffer Plus-128K-P/S (PI425A(E))— parallel-to-serial version with 128 KB of memory.
- DataBuffer Plus-256K-S/S (PI406A(E))— serial-to-serial version with 256 KB of memory.
- DataBuffer Plus-256K-S/P (PI416A(E))— serial-to-parallel version with 256 KB of memory.
- DataBuffer Plus-256K-P/P (PI421A(E))— parallel-to-parallel version with 256 KB of memory.
- DataBuffer Plus-256K-P/S (PI426A(E))— parallel-to-serial version with 256 KB of memory.
- DataBuffer Plus-512K-S/S (PI407A(E))— serial-to-serial version with 512 KB of memory.
- DataBuffer Plus-512K-S/P (PI417A(E))— serial-to-parallel version with 512 KB of memory.
- DataBuffer Plus-512K-P/P (PI423A(E))— parallel-to-parallel version with 512 KB of memory.
- DataBuffer Plus-512K-P/S (PI427A(E))— parallel-to-serial version with 512 KB of memory.
- DataBuffer Plus-1M-S/S (PI408A(E))— serial-to-serial version with 1MB of memory.

- DataBuffer Plus-1M-S/P (PI418A(E))— serial-to-parallel version with 1 MB of memory.
- DataBuffer Plus-1M-P/P (PI423A(E))— parallel-to-parallel version with 1 MB of memory.
- DataBuffer Plus-1M-P/S (PI428A(E))— parallel-to-serial version with 1 MB of memory.
- DataBuffer Plus-2M-S/S (PI409A(E))— serial-to-serial version with 2 MB of memory.
- DataBuffer Plus-2M-S/P (PI419A(E))— serial-to-parallel version with 2 MB of memory.
- DataBuffer Plus-2M-P/P (PI424A(E))— parallel-to-parallel version with 2 MB of memory.
- DataBuffer Plus-2M-P/S (PI429A(E))— parallel-to-serial version with 2 MB of memory.

3. Installation and Configuration

To install the DataBuffer Plus, simply connect the unit's input side to your computer and the unit's output side to your printer using the appropriate cables. The cables you use will depend on your application. Typical input and output cable order codes are listed below. **Figures 3-1** and **3-2** show two typical applications of the DataBuffer Plus.

Typical Input Cables:

- PC/XT™ Serial Port— EVNBXL-0010
- AT® Serial Port— EHNPI02-0010
- PC Parallel Port— ECN25C-0010

Typical Output Cables:

- Serial Printer— ECN25C-0010
- Parallel Printer— EYN600-0010

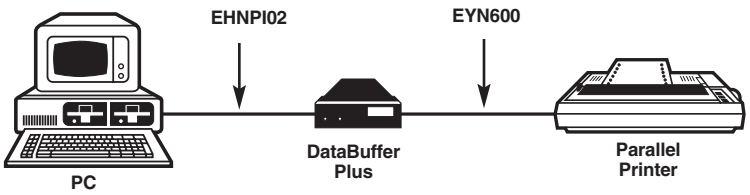


Figure 3-1. DataBuffer Plus in a Serial-to-Parallel Application.

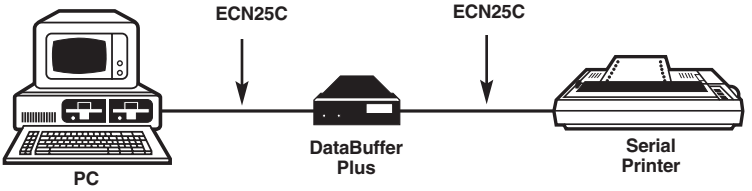


Figure 3-2. DataBuffer Plus in a Parallel-to-Serial Application.

3.1 Configuration

The DataBuffer Plus has one output port and one input port. Each serial port must be configured individually for speed, parity, data format, and handshaking method. **Table 3-1** lists these settings. The unit is also equipped with Copy/Pause and Reset buttons on the front panel. The 8-position DIP switches—S3 for the output port and S4 for the input port—are located on the rear panel of the unit. The switches are for setting speed, data format, and flow-control options on serial ports. Parallel ports do not have DIP switches.

S3 controls the output port and S4 controls the input port. Setting S3 or S4 to the "up" position opens the switch (OFF position); setting S3 or S4 to the "down" position closes it (ON position).

After you reset S3 or S4, either power down the unit or press the Reset switch again.

3.2 Self-Test

The DataBuffer Plus also has a self-test feature. To begin the self-test, press and hold the Reset switch while you press and hold the Copy/Pause switch. Release Reset, then release Copy/Pause. The unit transmits the test message to the output port only. The test message continues to print until you press the Reset switch again.

Table 3-1. Switch Settings (Up=Off, Down=On).

Switch Position (S3 input, S4 output)	1	2	3	4	5	6	7	8
Baud Rate								
115200	OFF	OFF	OFF					
57600	ON	OFF	OFF					
38400	OFF	ON	OFF					
19200	ON	ON	OFF					
9600	OFF	OFF	ON					
2400	ON	OFF	ON					
1200	OFF	ON	ON					
300	ON	ON	ON					
Data Bits								
8				OFF				
7				ON				
Parity								
Even					OFF			
Odd					ON			
Parity								
Disable						OFF		
Enable						ON		
Flow Control								
Hardware							OFF	
Software							ON	
Port Type								
Serial								OFF

4. Operation

You can set all the options with the Reset and Copy/Pause buttons. Different options and settings are described below. The placement of the buttons and switches is shown in **Figures 4-1** and **4-2**.

4.1 Switches and Pushbuttons

4.1.1 Reset Button

When pressed, Reset causes the unit to "read" the settings. If you change any of the DIP switches on the rear of the unit, you must press Reset for the unit to "read" those changes. Reset also clears the copy feature (see Copy/Pause) and clears all data in the buffer.

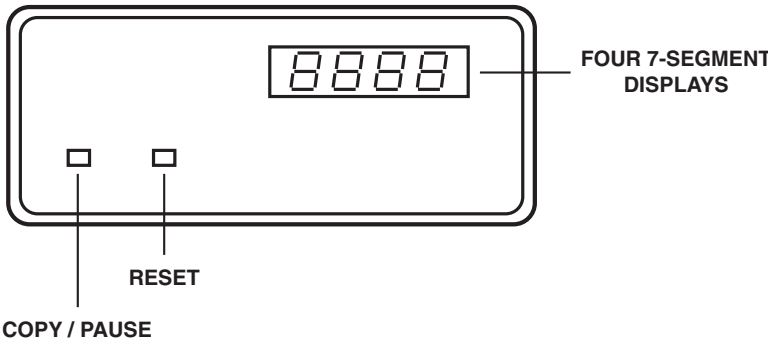


Figure 4-1. Front Panel of the DataBuffer Plus.

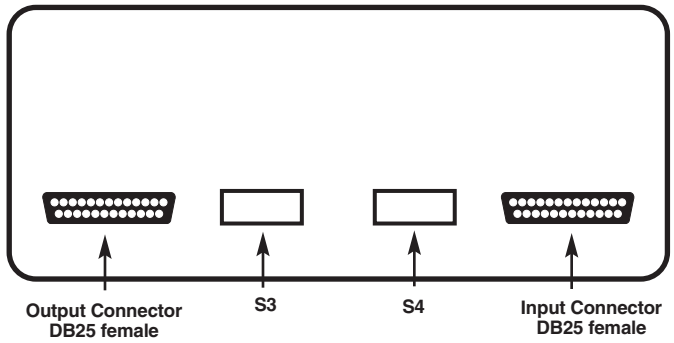


Figure 4-2. Rear Panel of the DataBuffer Plus.

4.1.2 LEDs

Four 7-segment LEDs are located on the front panel of the DataBuffer Plus. These LEDs are similar to a digital-clock display. The LEDs continuously display the amount of data in the buffer in kilobytes. These LEDs also aid you when you preset multiple copies. You don't have to remember how many copies you set, simply press the Copy/Pause button again and the LEDs will give you a digital display of the amount.

4.1.3 Copy/Pause Button

Presetting multiple copies. First, press the Reset button to clear all previous settings. Before you send the data, depress the Copy/Pause switch once for each copy you want printed. For example, if you want 10 copies of a document, press the Copy/Pause button 10 times before sending the document to the DataBuffer Plus. The LED displays the number of copies set each time you add a copy. You can set the unit to print up to 999 copies.

Printing one additional copy. For one additional copy of the data you just sent, press the Copy/Pause button. One copy of the most recent job sent to the buffer is sent to the printer. The LEDs display the original number of preset copies. As you add copies, the LEDs display your changes. If a 7-second time period of inactivity on the input port occurs, the unit considers it the end of a print job.

Stopping data output. Pressing Copy/Pause while data is being sent stops the output of data from the buffer while allowing data input to continue. The buffer remains in the "Pause" mode until you press Copy/Pause again. The LED display gives a readout of the current buffer status and flashes to indicates the unit is in pause mode.

4.2 Handshaking

The DataBuffer Plus usually accepts data much faster than the output devices (such as printers) to which it is attached. Handshaking is a form of flow control that prevents the unit's output from overrunning the printer's ability to accept the data.

Data loss is prevented if equipment connected to the input and output serial ports support hardware or X-ON/X-OFF handshaking.

4.2.1 Hardware Handshaking

When the unit's buffer is nearly full on the input end, it changes Pin 20 from a high voltage to a low voltage. When the output device (printer) has emptied the unit's buffer so that more input data can be accepted, the DataBuffer Plus raises Pin 20 to a high-level signal.

The DataBuffer Plus monitors Pin 20 for activity from the output device. When the device attached to the output port cannot accept any more data, it drops Pin 20. When the output device is ready to accept more data, it returns Pin 20 to a high level to the DataBuffer Plus.

4.2.2 X-ON/X-OFF HANDSHAKING

When the unit's buffer is almost full, it sends an X-OFF character to the input device via Pin 2. The unit sends an X-ON character via Pin 2 once the output device has accepted enough data to leave room in the buffer for more input data.

When the output device cannot accept any more data, it sends an X-OFF character to Pin 2 on the DataBuffer Plus's output port. When the output device is ready to receive more data, it sends an X-ON character via Pin 2.

4.3 DataBuffer Plus Input and Output Port Pinouts

Serial Pin Configurations (Input Port DTE) DB25 Female.

Pin	Name	Source	Function
1	FG		Chassis ground
2	TD	Buffer unit	Output from buffer
3	RD	Input device	Input to buffer
4	RTS	Buffer unit	Request to send (Held High)
5	CTS	Input device	Input to buffer
7	GND		Signal Ground
20	DTR	Buffer unit	Output from buffer (hardware handshaking pin)

Serial Pin Configurations (Output Port DCE) DB25 Female.

Pin	Name	Source	Function
1	FG		Chassis ground
2	TD	Output device	Input to buffer
3	RD	Buffer unit	Output from buffer
5	CTS	Buffer unit	Output from buffer
6	DSR	Buffer unit	Held high tied to 8
7	GND		Signal Ground
8	CD	Output device	Held high tied to 6
20	DTR	Buffer unit	Input to buffer (hardware handshaking pin)

Centronics® Port Pin Configurations (DB25 Input female, Output male).

Pin	Name	Function	
1	Strobe		
2	Data1		
3	Data2		
4	Data3		
5	Data4		
6	Data5		
7	Data6		
8	Data7		
9	Data8		
10	ACK		
11	Busy		
12	PE	GND	
13	Select	High	
14	Autofeed	NC	
15	Fault	High	
16			
17	NC		
18	NC		
19-25	GND		

5. Troubleshooting

Problem: No output to the printer.

Solution: Try outputting the self-test to the printer (see **Section 3.2**).

A. If the self-test works, the problem is with the input port. Check your cable and switch settings.

B. If the self-test will not work on the output serial port, the unit may be set up for hardware handshaking and Pin 20 (DTR) may not be set high on the output port. When the unit is set up for hardware handshaking, the unit must recognize a high voltage on Pin 20 to enable data to output from the unit.

Problem: The self-test works, but the data will not pass through the unit.

Solution: For serial-to-serial or parallel-to-parallel models, try to connect the two cables connected to the unit's input and output ports. Try to pass data through both cables. If this is unsuccessful, contact Black Box Technical Support.

NOTE

Parallel cables should not exceed 20 feet (6.1 m) for a valid test. Typical serial cables should not exceed 50 feet (15.2 m).