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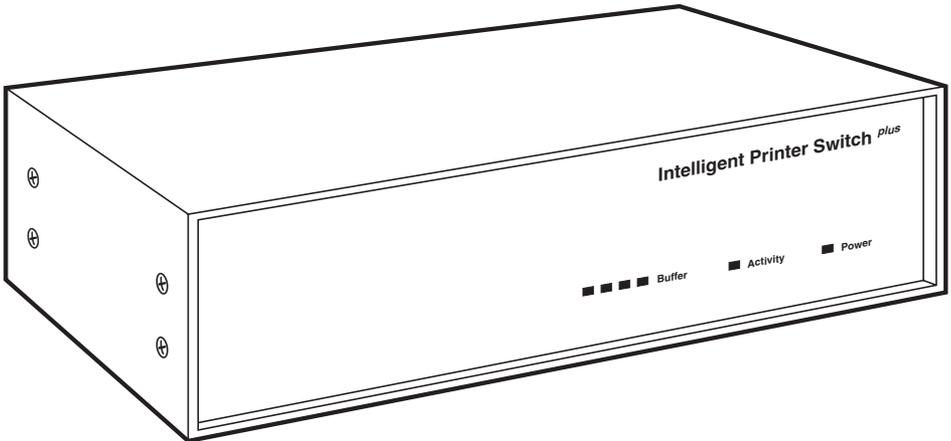
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NOVEMBER 1995

PI9120A	PI9120AE	PI9121A	PI9121AE	PI9122A	PI9122AE
PI9123A	PI9123AE	PI9124A	PI9124AE	PI9125A	PI9125AE
PI9126A	PI9126AE	PI9127A	PI9127AE	PI9128A	PI9128AE
PI9129A	PI9129AE	PI9130A	PI9130AE	PI9131A	PI9131AE
PI9140A	PI9140AE	PI9141A	PI9141AE	PI9145	PI9146

Intelligent Printer Switch *plus*



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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.
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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.

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1. Specifications

For all specifications in which the phrase “depending on the model” appears, refer to **Section 2.1** of this manual (especially to Table 2-1) for a breakdown of features by model.

System Hardware Required —	For included software: IBM PC, PC/XT, AT, or PS/2 computers
System Software Required —	For included ADMENU software: DOS 2.1 or later or Windows 3.0, 3.1, or 95; For included ADMODE software: DOS 2.1 or later
System Memory Required —	For included ADMENU software: 10 KB if installed for text only; 22 KB if installed for text and graphics; For included ADMODE software: 1 KB
System Disk Space Required —	Minimum (ADMENU and ADMODE): 30 KB; Maximum (all included software): 450 KB
Compliance —	FCC Part 15 Class A, DOC Class/ MDC classe A
Interface —	EIA RS-232 serial (DTE) or IBM PC parallel, depending on the model
Protocol —	Serial: Asynchronous only
Data Format —	Serial: 7 or 8 data bits, 1 or 2 stop bits, and odd, even, or no parity (user-selectable)
Flow Control —	Hardware (DTR/CTS) or software (X-ON/X-OFF or ETX/ACK), user-selectable
Operating Mode —	Serial: Full duplex
Data Rate —	Serial: 57,600, 38,400, 19,200, 9600, 4800, 2400, 1200, or 300 bps (user-selectable)

Throughput —	Up to 55,000 characters per second (cps) per printer port
Maximum Distance —	From computers to Intelligent Printer Switch <i>plus</i> . Distances above 33 feet (10 m) are not recommended; From Intelligent Printer Switch <i>plus</i> to printers: 328 feet (100 m); Maximum distance will be affected by data rate and cable quality
Internal Memory —	256 KB, 1 MB, 2 MB, or 4 MB of buffer RAM, depending on the model; Optional 1-MB and 4-MB Memory Expansion Kits are available (buffer can be expanded to a maximum of 4 MB)
User Controls —	Parallel models: (1) Bottom-mounted 6-position DIP switch for timeout, normal vs. burst mode, and Port 2 direction; Serial models: (3) Bottom-mounted 10-position DIP switches for data rate, data format, and flow control: (1) for Port 1, (1) for Port 2, and (1) for Ports 3 through 6 or 8
Indicators —	(6) LEDs: (1) Power, (1) Activity, (4) Buffer
Connectors —	(6) or (8) DB25 female, depending on the model: (1) dedicated printer port; (1) printer or computer port (user-selectable on parallel models, auto-configuring on serial models); (4) or (6) ports for computers only

Power —

Models with “A” suffix:

From wallmount power supply:

Input: 115-VAC, 50 to 60 Hz;

Output: 9-VAC, 1.5 A;

Models with “AE” suffix:

From desktop power supply:

Input: 230-VAC, 50 to 60 Hz;

Output: 9-VAC, 1.5 A

Size —

3.2"H x 10.2"W x 5.5"D (8.1 x 26 x 14 cm)

Weight —

4.3 lb. (2 kg)

2. Introduction

2.1 Overview

The Intelligent Printer Switch *plus* (IPSP) is a high-performance buffered data switch that provides fast turnaround for multiple PC users sharing one or two printers. Operation is fully automatic when sharing a single printer. With two printers, ADMENU PC software (included) or PC commands let you control operation.

The IPSP can accept data simultaneously from all the attached computers, buffering the overflow until your printer is ready for more. It accepts data files from each computer on a first-come, first-served basis and recognizes each as a single printable file. It won't start printing another file until there's been a break in transmission that exceeds the timeout period. Only then will the IPSP recognize input from the next computer.

The IPSP is available in a variety of models. Parallel models are compatible with PCs, printers, and plotters that support IBM® PC and Centronics® parallel interfaces. Serial models support the EIA RS-232 standard serial interface.

Table 2-1 provides a complete list of all the models. Unless otherwise noted, the information in this manual is applicable to all the models.

2.2 Package Contents

- Intelligent Printer Switch *plus* (IPSP)
- Power supply
- 3.5" ADMENU software diskette for IBM compatible PCs
- This manual

Table 2-1. Available Intelligent Printer Switch ^{plus} Models

Name	Product Codes	Buffer Size
6 Port Parallel	PI9120A, PI9120AE	256 KB
	PI9121A, PI9121AE	1 MB
	PI9122A, PI9122AE	2 MB
	PI9140A, PI9140AE	4 MB
8 Port Parallel	PI9123A, PI9123AE	256 KB
	PI9124A, PI9124AE	1 MB
	PI9125A, PI9125AE	2 MB
	PI9141A, PI9141AE	4 MB
6 Port Serial	PI9126A, PI9126AE	256 KB
	PI9127A, PI9127AE	1 MB
	PI9128A, PI9128AE	2 MB
8 Port Serial	PI9129A, PI9129AE	256 KB
	PI9130A, PI9130AE	1 MB
	PI9131A, PI9131AE	2 MB
Optional Memory Expansion	PI9145	1 MB
	PI9146	4 MB

NOTE

Models with product codes ending in “A” have 115-VAC power adapters.
 Product codes ending in “AE” have 230-VAC adapters.

2.3 Cable Requirements

FOR MODELS WITH PARALLEL PORTS:

- PC to Intelligent Printer Switch ^{plus} (input ports)
 DB25 male to DB25 male, all lines connected.
 Cables longer than 25 feet (7.6 m) might not function reliably; you might be able to reach or exceed this distance by using a powered parallel extension cable (call your supplier for technical support).
- Intelligent Printer Switch ^{plus} to Printer (output ports)
 DB25 male to 36-pin Centronics male (standard printer cable).
 Maximum distance: Up to 330 feet (100 m).

FOR MODELS WITH SERIAL PORTS:

Cable requirements will vary depending on your equipment.
 See **Appendix B**.

3. Installation

3.1 Configuring Your Intelligent Printer Switch *plus*

Figure 3-1 below shows the rear panel of an eight-port Intelligent Printer Switch *plus* (IPSP). On a six-port model, the top two connector slots on the left would be empty. On all models, Port 1 is a dedicated printer-output port. Port 2 is a bidirectional input/output port. The remaining ports are all computer-input ports.

Refer to Figure 3-1 as you read the configuration instructions.

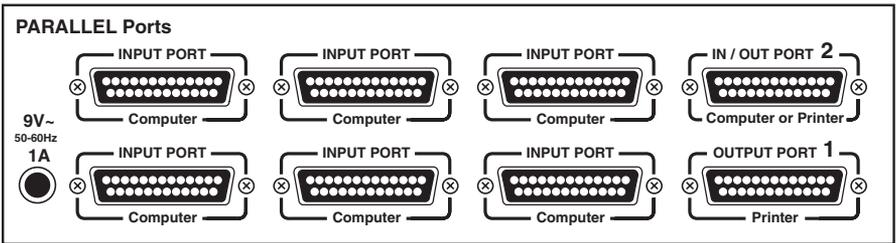


Figure 3-1. Rear view of an Intelligent Printer Switch *plus*.

3.1.1 PARALLEL MODELS

Set the option switches on the underside of the IPSP to the settings required by your system. (See Figure 3-2 on the next page.) The default settings are suitable for most installations. Note that the option switches are read only when the IPSP is first powered on.

Timeout

The IPSP switches between users on a timeout basis. If no data has been sent from the current user for the timeout period, the IPSP will switch to the next user. A timeout period of 16 seconds (the default setting) is suitable for most systems.

Mode

If you are using fast PCs and printers with enhanced parallel ports, burst mode may speed up your printing performance. For most systems normal mode (the default setting) will give the best overall performance.

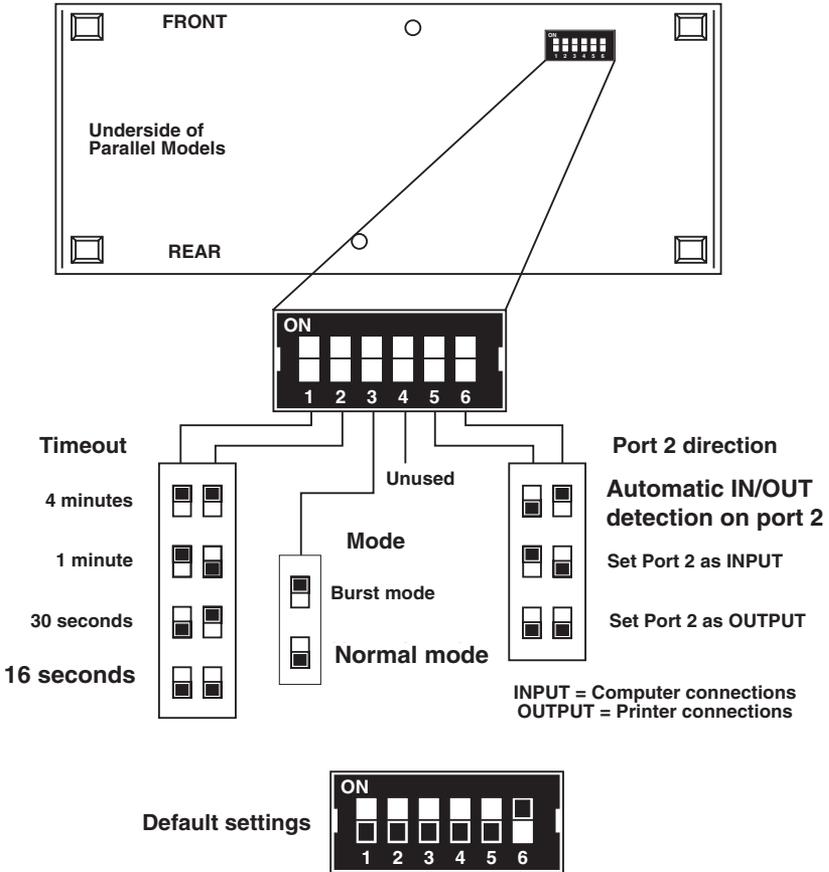


Figure 3-2. Option switches and settings for parallel models. (Factory-default settings are shown in larger type.)

Port 2 Direction

Port 2 can be used as an input from a computer or an output to a printer. In automatic mode (the default setting), the port intelligently detects the type of device that it is connected and configures itself automatically. You can also manually switch the port from input to output using the option switches. When using data boosters or powered cables, you should set the direction of the port manually, because automatic detection might not work. If you experience any problems with Port 2, set the direction manually.

3.1.2 SERIAL MODELS

Set the option switches on the underside of the IPSP to those required by your system. (See Figure 3-3.) The default settings are suitable for most installations. Note that the option switches are read only when the IPSP is first powered on. The IPSP can be set to use these types of flow control (handshaking):

DTR/CTS (Hardware Handshake)—Uses hardware signal lines (Pins 5 and 20) to control the flow of data.

X-ON/X-OFF (Printer & Plotter Connections Only)—The flow of data is controlled by the receiving device, which transmits X-OFF (stop data flow) and X-ON (start data flow) characters to the IPSP. Use this setting only on ports connected to printers and plotters.

X-ON/X-OFF (Computer Connections Only)—The flow of data is controlled by the IPSP, which transmits X-ON (start data flow) and X-OFF (stop data flow) characters to the computer. Use this setting only on ports connected to computers.

NOTE

The X-ON/X-OFF setting for printer and plotter connections WILL NOT WORK correctly for computer connections and vice versa. The X-ON and X-OFF characters are not passed through the IPSP.

ETX/ACK—The flow of data is controlled by sending blocks of data and waiting for an ACKnowledgement character to be received.

3.2 Selecting Ports for Your Equipment

If you're sharing one printer, connect it to Port 1. You may use any of the other ports to connect to computers. If you have two printers, connect the most commonly used printer to Port 1 and the other to Port 2. By default, all print data will automatically be routed to Port 1.

All ports have equal-priority access to the Intelligent Printer Switch *plus*, and data output is handled on a first-come, first-served basis.

3.3 Connecting PCs and Printers

Turn off power to all computers and printers *before* connecting them to the Intelligent Printer Switch *plus*.

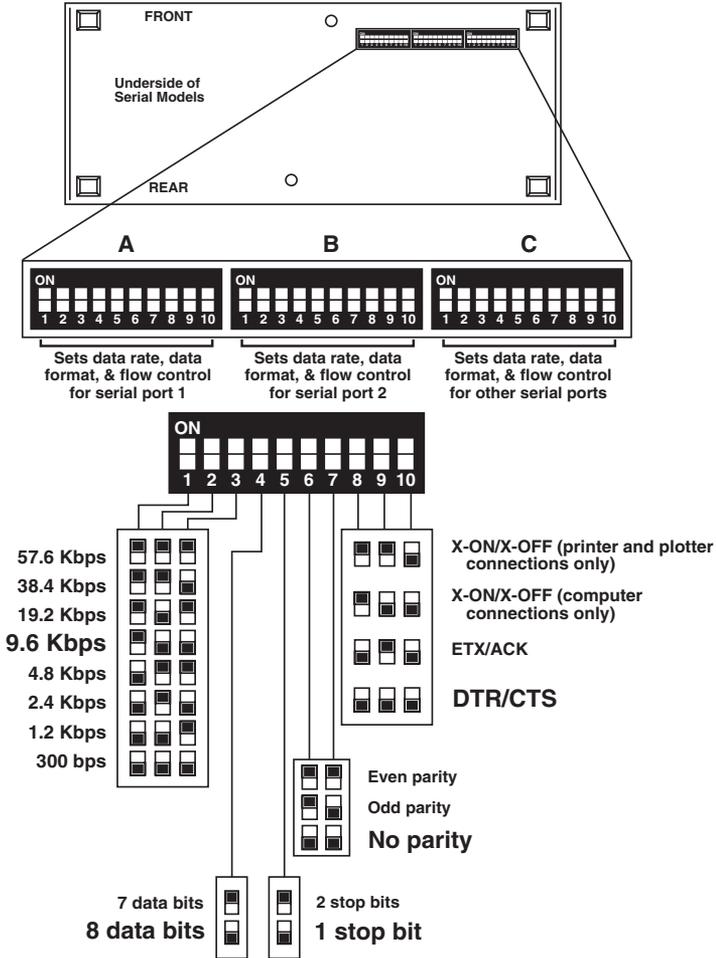


Figure 3-3. Option switches and settings for serial models. (Factory-default settings are shown in larger type.)

3.4 Powering On Attached Devices

You can switch on your equipment in any order; however, it is generally better to switch on all your devices at the same time or switch on the Intelligent Printer Switch *plus* last. When the IPSP is powered on, the Buffer and Activity LEDs will flash for a few seconds while the unit performs a self-test.

3.5 Enabling Your Computer Ports

3.5.1 FOR PARALLEL MODELS

Your PC's parallel interfaces do not normally need to be configured. However, for IBM PCs running DOS, PC timeouts may occur if the buffer on the Intelligent Printer Switch *plus* becomes full. To prevent timeouts in case of a full buffer, use the MODE command with the "P" parameter, like this:

```
>MODE LPT1 : , , P
```

This forces your PC to retry sending the data to the IPSP instead of timing out. Refer to your DOS manual for more information about the MODE command.

3.5.2 FOR SERIAL MODELS

To enable your PC's serial ports, set the required data rate and data format. On IBM compatible PCs this can be done with the DOS MODE command. You may also use the ADMODE software utility supplied with the IPSP (see **Chapter 6**). The MODE command can be used together with the ADMODE command.

The ADMODE settings will always override the MODE settings, and the MODE command (with "P" option) can be used to prevent application timeouts. The example shown below would set COM1 to 57,600 bps, no parity, eight data bits, one stop bit, and no application timeout. (See **Chapter 6**.)

```
>MODE COM1 : 9600 , N , 8 , 1 , P  
>ADMODE COM1 : 57600 , N , 8 , 1
```

On IBM PCs running DOS, you might also want to redirect all print data that would have been sent to the parallel printer port (LPT1) to the serial port. To do this, use the MODE command this way:

```
>MODE LPT1 : =COM1 :
```

3.6 Using the Intelligent Printer Switch ^{plus}

Once all the preceding connections are made, your Intelligent Printer Switch ^{plus} is ready for use. Each attached computer can commence printing as if directly connected to a printer. By default all print data is routed to Port 1.

If you want to route data to a second printer attached to Port 2, you'll need to use the ADMENU software utility (see **Chapter 4**) or appropriate PC commands (see **Chapter 5**). Once a computer has selected a new printer, all print data from that computer will be routed to this printer until a different printer is selected, or until the IPSP is switched off.

3.7 Front-Panel Indicators

Activity LED

Lights — When data is available or a timeout is pending. (If data has been sent in on a port, the activity light will remain on until the port has timed out.)

Dark — When no data is being transferred and no data is available.

Flashes — When data is being transferred.

Buffer-Status LEDs

These show the current state of the internal buffer's memory capacity:

- | | |
|--|--|
| ■ — Buffer is more than $\frac{1}{4}$ full | ■ — Buffer is more than $\frac{1}{2}$ full |
| ■ ■ — Buffer is more than $\frac{3}{4}$ full | ■ ■ ■ — Buffer is completely full |

If your buffer frequently fills to the $\frac{3}{4}$ level, you should consider ordering the optional Memory Expansion to increase performance. The Intelligent Printer Switch ^{plus} will continue to operate even if its buffer is full.

4. ADMENU Printer-Control Software

4.1 Overview

The ADMENU printer-control software allows you to switch between printers and to control printer functions. It's located on the utility-software diskette supplied with your Intelligent Printer Switch *plus* and is for use with IBM compatible PCs. You can run the software as a memory-resident or nonresident program in both DOS and Windows® environments. Installing ADMENU as a memory-resident program allows you to “pop up” the menu on your screen using a hotkey combination.

4.2 Installing the ADMENU Software

The ADMENU installation program (INSTALL) will automatically copy files to your hard disk and install ADMENU as a memory-resident or nonresident program as required. You can also install the software by adding the ADMENU command line to your AUTOEXEC file (see **Section 4.5**).

The following commands refer to the floppy drive as drive “A”. If your floppy drive has a letter designation other than “A,” substitute that letter for “A” in these commands.

To install ADMENU:

- Insert the ADMENU disk in drive A and type:

```
A: <enter>
```

- Then (at the A: prompt) type:

```
INSTALL <enter>
```

- Follow the instructions given in the installation program.
- Reboot your PC.

4.3 Running ADMENU

When memory-resident

Press the hotkey combination shown in the ADMENU installation message.

When not memory-resident

Run the batch file MENU.BAT created by the installation program. You can also run ADMENU.COM by using the command line:

```
ADMENU /N
```

4.4 Installing ADMENU for use in Microsoft® Windows

Install the ADMENU software, for use with Windows 3.0 and 3.1, by following these steps:

Step 1 — Insert the ADMENU software diskette into your floppy-disk drive. Launch Windows, then choose **Run** from the Program Manager's File menu. Type:

```
A: \INSTALL
```

Follow the instructions given by the setup program, then reboot your PC.

Step 2 — Insert the ADMENU software diskette into your floppy-disk drive. Launch Windows, then choose **Run** from the Program Manager's File menu. Type:

```
A: \SETUP
```

Follow the instructions given by the setup program, then reboot your PC.

Once ADMENU is installed, an icon will appear on your Windows desktop in the program group "Printer Switch." Double click on this icon to start ADMENU. If ADMENU has not been loaded into memory, the nonresident version will be used (see the README file for details).

4.5 Command-Line Options

ADMENU supports a number of command-line options that allow the utility to be installed and run in several different formats. They also allow you to change a number of default settings and to select different hotkey combinations. Command options are preceded by a slash character on the command line. Any number of options can be specified. For example, the following command line would install the utility for use in text modes with LPT2 as the default port and <CTRL><SHIFT> as the hotkey combination:

```
ADMENU /T /L2 /H2
```

The rest of this section is a summary of all the options. The default settings (shown in parentheses) are assumed for all options that you do not specify.

/U (No default)

Deletes the utility from memory.

/T and /G (/G default)

The /G option allows use of the resident software in both text and graphics modes. When installed with the /G option, the software will occupy 22 KB of memory. Software installed with the /T option allows ADMENU to be used in text modes only and the memory requirement is reduced to 10 KB. The memory size used is confirmed in the installation message.

/Lx and /Cx (/L1 default) x=1, 2, or 3

These options specify the PC port that is displayed when the ADMENU software is initially invoked (any of LPT1, LPT2, LPT3, COM1, or COM2). The number of the required port (serial or parallel) is specified after the letters L or C respectively. The port to be used can be specified once the software has been invoked using the PC PORT function, so these options are primarily for convenience only.

/Hx (/H1 default)

This option lets you change the hotkey combination that invokes the resident ADMENU software. There are five possible options. Select the desired option by specifying the corresponding number after the letter H. The available hotkey combinations are:

```

/H1 selects <CTRL> <ALT> <SHIFT>
/H2 selects <CTRL> <SHIFT>
/H3 selects <ALT> <SHIFT>
/H4 selects <CTRL> <ALT>
/H5 selects <LEFT SHIFT> <RIGHT SHIFT>

```

<SHIFT> can be either the left or the right shift key. The selected combination is confirmed in the installation message.

/N and /R (/R default)

These options allow the ADMENU software to be run as a resident or non-resident utility. To install the menu as a resident program, use the **/R** option. To run the software as a non-resident utility, use the **/N** option.

/M (Standard color default)

/M ensures that the menu appears in monochrome mode. This option is provided for compatibility with certain types of monochrome screens found on some laptops and other computers. If the ADMENU menu bars on your screen are faint or non-existent, install the software using the **/M** option.

4.6 Using ADMENU

Invoking the ADMENU software causes a menu to appear on the screen. Options can be selected as follows:

- Use the **<up>** and **<down>** cursor keys to highlight the options in the menus.
- Use **<enter>** to select a highlighted option.
- Use **<escape>** to quit from any menu or the application.

4.7 Main Menu

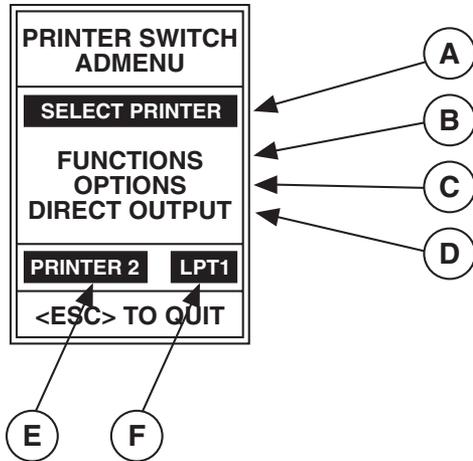


Figure 4-1. Map of the Main Menu Commands.

A) SELECT PRINTER — Used to connect your computer to the required printer or plotter.

B) FUNCTIONS — Lets you clear data, set priority, form feed the printer, or end a long timeout (see **Section 4.9**).

C) OPTIONS — Used to select the number of copies, timeout period, and the PC port that the menu will control (see **Section 4.10**).

D) DIRECT OUTPUT — Used to output characters and control codes directly from your keyboard (see **Section 4.11**).

E) DESTINATION PRINTER — Indicates the printer to which your print jobs are currently routed.

F) PC PORT — Indicates the port on your PC that the ADMENU software will use to send control commands to your Intelligent Printer Switch *plus*. Make sure that the port that is physically connected to the IPSP is displayed in this box (see **Section 4.10**).

E) + F) DIALOG BOX — Displays messages.

4.8 Selecting a Destination Printer

ADMENU initially assumes that the Intelligent Printer Switch ^{plus} is connected to the PC with a parallel link to LPT1*. If a different parallel PC port (LPT2 or LPT3) or one of the serial PC ports has been connected, you must first select that port (see **Section 4.10**).

Select the required printer from the **SELECT PRINTER** menu. The arrow shows the currently selected printer. The options are:

PRINTER 1 — The printer connected to Port 1 on the IPSP.

PRINTER 2 — The printer connected to Port 2 on the IPSP.

BOTH — Both of the printers connected to Port 1 and Port 2 on the IPSP.

EITHER — Either the printer connected to Port 1 or the printer connected to Port 2 (the first that is available for printing).

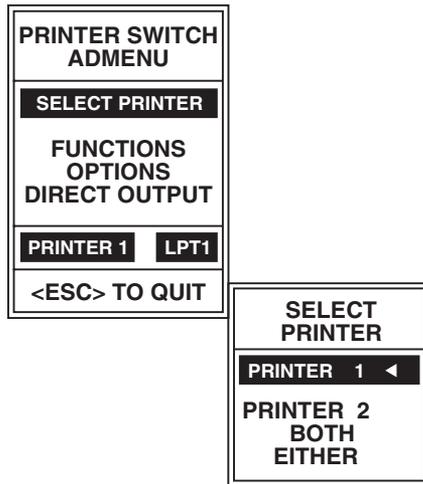


Figure 4-2. Main Menu Commands for Selecting a Printer.

* Specify other default ports using the /L or /C command-line options (see Section 4.5).

4.9 The FUNCTIONS Menu

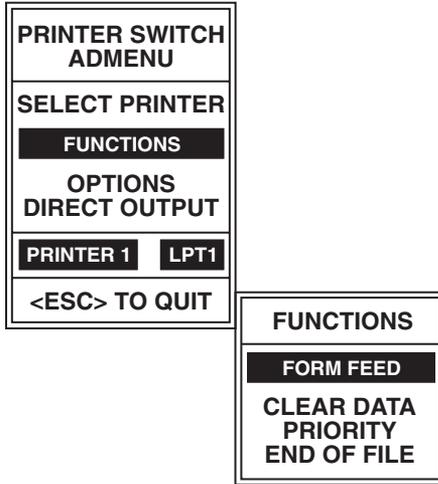


Figure 4-3. Main Menu Commands for Functions.

FORM FEED — Selecting FORM FEED will send a form-feed character to the currently selected printer. The dialog box will briefly respond with FORM FEED SENT to confirm that the character has been sent.

CLEAR DATA — Select CLEAR DATA to delete all the data that has been sent from your PC. This command will not affect any data sent from any other computer.

PRIORITY — Selecting PRIORITY ensures that the next print file you send to Intelligent Printer Switch *plus* will be given urgent priority. This print file will be sent at the earliest possible opportunity and before queued print jobs from other users. The priority status is automatically canceled once the priority print job has been sent from your PC.

END OF FILE — When an infinite (OFF) timeout has been set, an end-of-file instruction needs to be sent to the IPSP to allow other users to access the currently selected printer. The END OF FILE function can be used to do this. END OF FILE can also be used to end long timeouts.

4.10 The OPTIONS Menu

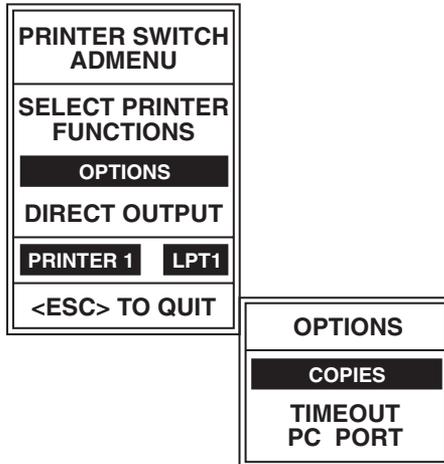


Figure 4-4. Main Menu Commands for Options.

COPIES — The Intelligent Printer Switch ^{plus} can generate multiple copies of a print file. Simply select the COPIES option, enter the number of copies required in the entry box (up to 255), and press **<enter>**. Send the document once, and when it has timed out (no more data sent for at least 16 seconds or the timeout period), the IPSP will start printing the extra copies. Note that the size of the data file must be less than the size of the buffer memory, otherwise only one copy can be produced.

TIMEOUT — You can set the timeout period to anything from one to 255 seconds, or you can disable it (infinite timeout). Use caution with the infinite timeout, because other users' data will not be sent to the printer until you have sent an END OF FILE instruction (see **Section 4.9**). The default timeout is set with the option switches mounted on the underside of the IPSP.

PC PORT — If the correct PC port is not shown on the main menu (see **Section 4.7**), use the PC PORT option to select this. Highlight the PC PORT option and type **<enter>**. Use the **<up>** and **<down>** cursor keys to select the desired port (highlighted) and then press **<enter>**. The PC port you have selected will now be displayed.

Note that the ADMENU software defines the routing from the selected port on your PC—it does not set the port that your software will use for output!

4.11 Direct Output of Typed Keyboard Characters

Normal keyboard characters and control characters can be sent to the printer using the DIRECT OUTPUT option. In the keyboard characters box all characters typed will be sent directly to the printer except <up>, <down>, and <escape>. Control characters such as those to set condensed or bold printing can be specified in hexadecimal ASCII format. In the hexadecimal ASCII characters box, the specified character is sent when <enter> is pressed.

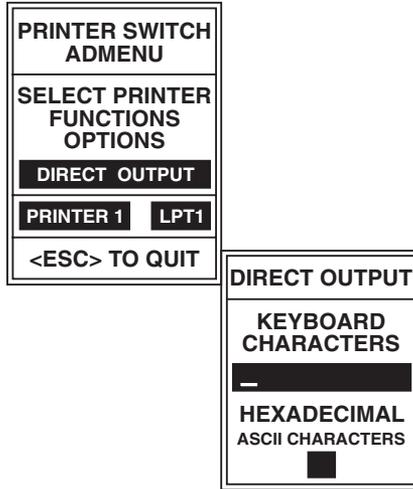


Figure 4-5. Main Menu Commands for Direct Output.

Note that characters such as line feeds are displayed using an unusual set of non-alphanumeric characters.

NOTE

The direct output will not be sent to the printer until 80 characters are exceeded or a carriage return is sent.

5. Controlling the Intelligent Printer Switch ^{plus} with PC Commands

5.1 Overview

The Intelligent Printer Switch ^{plus} can be controlled by sending software commands to it from any computer. The ADMENU software automatically generates the required software commands. This section gives the format and purpose of each command.

All software commands have the following format:

```
<PM command {parameters} >
```

Commands must begin with the three characters **<PM** and end with the single character **>**. In the command templates and examples that appear in this chapter, upper-case letters are used to represent a key word. Anything in braces { } is optional. Text in lowercase letters should be replaced by the key word or option that it represents.

For example, the command to connect to Port 2 would be:

```
<PM CONNECT 2>
```

A string of characters will be recognized as a command only if all the characters are correct, thus making confusion with normal text extremely unlikely.

Software commands should be sent to the IPSP as a string of ASCII characters. The best way to do this is to create a file containing the required command and then just “print” it as needed. There are many other ways to do this, however, such as inserting the required selection string at the top of a word-processor document (refer to the user’s manual for your word processor). Users of IBM compatible computers can even create batch files to send software commands (see **Section 5.5**).

Items in a software command can be separated by spaces, tabs, line feeds, or form feeds; however, only one of these may be used between each item.

5.2 The CONNECT Command

Selecting a Destination Port

By default, the Intelligent Printer Switch *plus* automatically sends all data to Port 1. To send data to a different port or route it back to Port 1, use the following command format, where **port** represents the port number (either “1” or “2”):

```
<PM CONNECT port>
```

The new destination will now be used for all subsequent data sent from the port that gave the command until either a new command is sent or the IPSP is powered off.

Printing Several Copies

To automatically generate multiple copies, use this command format:

```
<PM CONNECT port:copies>
```

For example, the following command would print three copies of a file on the printer attached to Port 1:

```
<PM CONNECT 1:3>
```

Note that the extra copies will not start printing until the IPSP has accepted the whole file into its memory (see **Section 4.10**). Also note that if the file is too large to fit inside the buffer, multiple copies will not print.

Broadcasting Data to Two Printers

To set the IPSP to broadcast data to two printers simultaneously, use this command:

```
<PM CONNECT 1 2>
```

First Available Printer

To send data to the first of two available printers, use this command:

```
<PM CONNECT G1>
```

Varying the Timeout Period

The timeout sets the length of time that the output port remains dedicated to the input port once the incoming data has ceased. It can be set anywhere between one and 255 seconds, or it can be switched off. With the timeout off, the output port remains constantly dedicated to the input port until an END OF FILE command (see **Section 5.4**) or a new connect command is sent. The timeout remains as set until it is changed again, or until the IPSP is turned off. To change the timeout, use this command format:

```
<PM CONNECT port TIMEOUT:value>
```

The timeout value is either a number from one to 255 or the word OFF. For example, if a computer requires uninterrupted use of the printer connected to Port 1 until further notice, you would send this command:

```
<PM CONNECT 1 TIMEOUT:OFF>
```

5.3 The CLEAR Command

The CLEAR command allows a computer to delete any data that has been sent into the Intelligent Printer Switch ^{plus} that has not yet been printed. As with all software commands, CLEAR affects only the data from the computer which sends the command. The command looks like this:

```
<PM CLEAR>
```

5.4 The END OF FILE Command

Sending the END OF FILE command terminates the present input file. It is used when the timeout option has been set “off” to allow other computers access to the printer. If multiple copies are required, the END OF FILE command indicates the end of the document. Note that a new connect command will also automatically terminate the present input file. The END OF FILE command looks like this:

```
<PM EOF>
```

5.5 Creating Batch Files for IBM PCs

On IBM compatible PCs, batch files are a convenient way of sending commonly used software commands. To create batch files:

Step 1: At the DOS prompt type:

```
COPY CON: {name}.TXT <enter>
<PM CONNECT {port number}>[F6] <enter>
```

{name} is the name of the text file you're creating to store the desired command, **{port number}** is the number of the port you're connecting to, and **[F6]** stands for pressing function key 6. For example:

```
COPY CON: CONNECT2.TXT <enter>
<PM CONNECT 2>[F6] <enter>
```

Note that no spaces should be typed after the ">" bracket and before function key 6 is pressed. After pressing function key 6, a ^Z will appear on the screen at the end of the line. When the enter key is pressed, the screen will display:

```
1 File(s) copied
```

This indicates that a file **{name}.TXT** has been created which contains the software command text. Normally it is not possible to use a word-processing package to create this file, because most of these insert a line feed and carriage-return character at the end of each line. *A file created with these extra characters could upset your printouts by inserting a blank line at the top of your printout page. This could offset label printers by one line and cause laser printers to output a blank page.*

Step 2: At the DOS prompt type:

```
COPY CON: {name}.BAT <enter>
TYPE {name}.TXT > {pc printer port}: [F6] <enter>
```

{name} is the name of the batch file you're creating, **{pc printer port}** is the port (COM1, COM2, LPT1, LPT2, or LPT3) that you wish to be routed to the required printer, and **[F6]** stands for pressing function key 6. For example:

```
COPY CON: CONNECT2.BAT <enter>
TYPE CONNECT2.TXT > LPT1: [F6] <enter>
```

As before, the screen will display "**1 File(s) copied**" which indicates that a batch file **{name}.BAT** has been created containing the text "**TYPE {name}.TXT > {pc printer port}:**".

To send the software command that you have stored in **{name}.TXT**, type the name of the batch file at the DOS prompt. This procedure can be used to create a batch file to send any software command to any of your PC's ports.

5.6 Setting Up Default Start-of-Day Destination Ports

Every time you switch on power to your PC or reboot it, each computer-input port will be routed by default to Port 1. For IBM compatible PCs, however, individual start-of-day destinations can be set for each computer port. To do this, create a text file containing the desired selection command (see **Section 5.5**) and modify your AUTOEXEC.BAT file to send this command when your computer powers up.

For example, by including the line **TYPE CONNECT2.TXT > LPT1:** in your PC's AUTOEXEC.BAT file (after copying the file CONNECT2.TXT from the utility-software diskette to a suitable directory on your PC) you can set the start-of-day default port for your computer to be Port 2.

6. ADMODE Serial-Port Control Utility

The ADMODE software utility allows serial ports on IBM compatible PCs to run at the high data rates supported by Intelligent Printer Switch *plus*. ADMODE can be used to control COM1 or COM2 and supports a wide range of data formats. In addition to saving time by running serial ports at higher data rates, ADMODE also ensures that the correct data format is used regardless of the settings on the application program.

Although DOS will normally only support data rates up to 9600 bps, most PCs with a 65550 serial UART are capable of running at much higher speeds: 19,200, 38,400, or even 57,600 bps. A number of high-speed utilities which act like the DOS MODE command are available. However, these utilities are of little practical use, because many application programs change the data rate and data format when they are run.

The ADMODE utility overcomes this problem by preventing application programs from changing the data rate or format of the serial port being controlled. This has two major advantages: First, the user doesn't need to worry about setting the data rate or format in the application program; and second, high data rates can be used for plotting from software packages that would normally only support lower rates.

To run ADMODE, copy the program ADMODE.COM from the IPSP utility disk into a suitable directory on your PC. At the DOS prompt, type a command following this format:

```
ADMODE COMn:data_rate, parity, data_bits, stop_bits
```

You only need to include a parameter after the data rate if it needs to be changed from the default values shown in Table 6-1 on the next page. The minimum command syntax is:

```
ADMODE COMn:data_rate
```

Example

To set serial port one (COM1) to 38,400 bps, eight data bits, one stop bit, and no parity, use the following command:

```
ADMODE COM1:38400,N,8,1 <enter>
```

Table 6-1. ADMODE Command Parameters

Parameter	Options	Entered As	Default
COMn (port)	COM1 or COM2	COM1:, COM2:	—
data_rate	300, 1200, 2400, 4800, 9600, 19,200, 38,400, or 57,600 bps	300, 1200, 2400 4800, 9600, 19200, 38400, 57600	—
parity	odd, even, or none	O, E, N	N
data_bits	7 or 8	7, 8	8
stop_bits	1 or 2	1, 2	1

High Data-Rate Limitations

In practice almost all modern PCs will support data rates of 38,400 bps; however, a number of PCs that we tested were not able to support data rates of 57,600 bps due to the design of their serial ports. If you experience problems with particular PCs, try reducing the data rate.

Increasing the data rate of serial connections reduces the maximum cable lengths. As a rule of thumb, doubling the data rate halves the maximum distance. At 57,600 bps, limit the cable lengths to 50 feet (15.2 m).

If you experience any problems using ADMODE, reduce the data rate. In practice, 38,400 bps is a “safe” setting for most applications.

Appendix A: Parallel-Port Specifications

Parallel Pin Assignments

Each parallel port uses a DB25 female connector, similar to those found on an IBM PC/XT™ or AT®. Figure A-1 shows the pin numbers as viewed from the rear of the Intelligent Printer Switch ^{plus}.

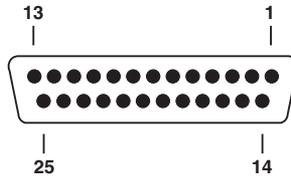


Fig./Table A-1. The IPSP's DB25 parallel connectors and their pinouts.

Pin	Name	Input from Computer	Output to Printer
1	STROBE	INPUT	OUTPUT
2-9	DATA 0 to 7	INPUT	OUTPUT
10	ACKNOWLEDGE	OUTPUT	no connection
11	BUSY	OUTPUT	INPUT
12	PAPER END	OUTPUT low	no connection
13	SELECT	OUTPUT high	no connection
14	AUTOFEED XT	no connection	no connection
15	ERROR	OUTPUT high	no connection
16	INIT	no connection	OUTPUT high
17	SELECT IN	no connection	OUTPUT low
18-25	SIGNAL GROUND	ground	ground

Cables for IBM PC/XT, AT, or Compatible Computers

Parallel cables to connect IBM compatibles to the IPSP require a DB25 male connector on both ends. All wires should be connected straight through (1 to 1, 2 to 2, etc.).

Printer Cables

Use DB25 male to 36-pin Centronics male parallel printer cables.

Appendix B: Serial-Port Specifications

B.1 RS-232 Pin Assignments

The serial ports on the Intelligent Printer Switch ^{plus} are DTE type. They use a DB25 female connector with the pin assignments shown in Figure B-1 below.

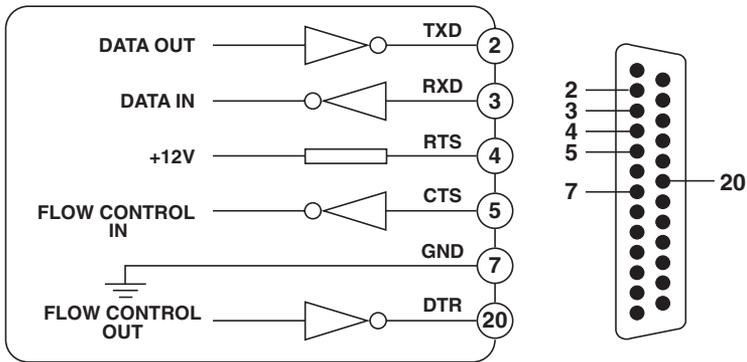


Figure B-1. Pin assignments of the IPSP's DB25 serial ports.

B.2 Connecting to Computers

RS-232 serial ports on computers tend to vary considerably. The RS-232 standard recommends a DB25 connector, but some machines, such as the IBM AT and compatibles, currently employ a DB9 connector. Computer ports intended for connection to a modem are not configured like those intended for connection to a serial printer. Therefore, a "standard" RS-232 cable does not exist.

NOTE

Refer to your computer's user's manual to determine the type of cable required. The following specifications may also help. If you are uncertain which type of cable is right for your application, call your supplier.

B.2.1 Connecting to IBM PC and Compatible Computers

The IBM PC and its compatibles provide a parallel port and (usually) a serial port. Both use a DB25 connector. However, the parallel port is usually a female connector and the serial port is usually a male connector. The cable wiring required for connection to a serial port on the IPSP is shown in Figure B-2.

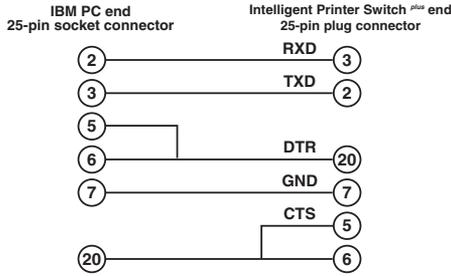


Figure B-2. Pinning Chart for Connecting IBM PC and Compatibles.

If you already have a cable that works directly between your IBM PC and serial printer, it can be used as the input cable to your IPSP.

B.2.2 Connecting to IBM AT and Compatible Computers

IBM AT and compatible PCs provide a DB9 male connector for the serial port. For those computers, the cable required to connect to the IPSP is wired as in Figure B-3.

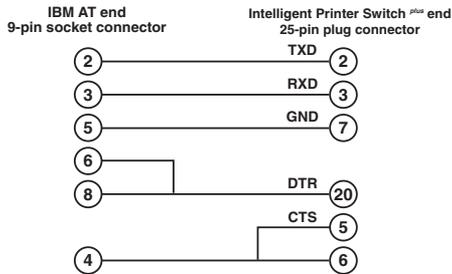


Figure B-3. Pinning Chart for Connecting IBM AT and Compatibles.

B.3 Connecting to Printers

Most printers provide a standard DB25 connector for serial data. The required cable pinning is shown in Figure B-4. This wiring configuration is suitable for popular printers such as HP® LaserJet®, Diablo®, QUME®, OKIDATA®, and Epson® (with a serial-port card).

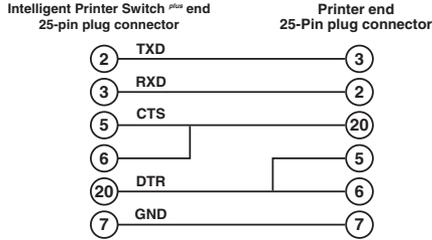


Figure B-4. Pinning Chart for Connecting to Printers.

B.4 Connecting to Modems

The cable pinning shown in Figure B-5 is used to connect to most standard modems. A DB25 cable with all 25 lines pinned straight-through is suitable.

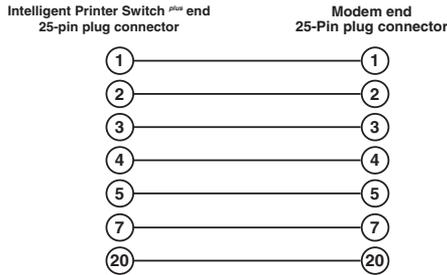


Figure B-5. Pinning Chart for Connecting to Modems.

B.5 Connecting to Plotters

A wide range of different pinning configurations are used on plotters' serial ports. A cable pinned as shown in Figure B-6 can be used for most plotters, including those manufactured by Hewlett-Packard® and Roland. Notable exceptions are Calcomp® plotters, which need a straight-through cable (the same as that used for modems—see **Section B.4**).

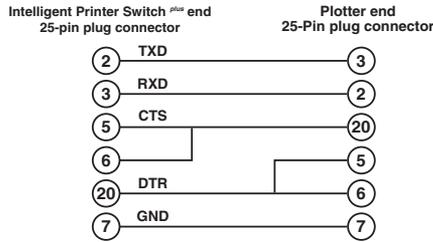
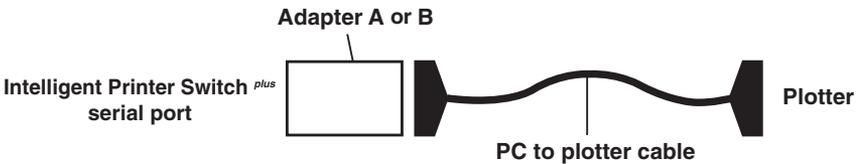


Figure B-6. Pinning Chart for Connecting to Plotters.

If you have a cable that currently works between your PC and plotter, then this can be used between the Intelligent Printer Switch *PLUS* and your plotter with the addition of a separate adapter (not included) as shown below.



Adapter A—DB25 male/DB25 male (all leads connected) gender matcher (our product code FA402).

Adapter B—DB25 male/DB9 male AT converter (call us for a quote).

NOTES