DIO-500
MULTI-I/O CARD
USER'S MANUAL

- D01410624 -

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FCC STATEMENT ON CLASS B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio TV technician for help.*

NOTICE :

(1) The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

(2) Shielded interface cables must be used in order to comply with the emission limits.

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INTRODUCTION

The DIO-500 is a flexible and powerful Multi-I/O enhancement product for the IBM Personal Computer (PC) family. It provides powerful data I/O expansion capabilities for the IBM PC-AT and compatibles. The DIO-500 is space efficient using only one short slot in your PC. Standard features include one RS-232C asynchronous serial communication port, a parallel printer port, and a game adapter port. An optional secondary RS-232C serial port is also available.

STANDARD FEATURES

- One RS-232C serial interface to be used with modems, serial printers, remote display terminals, other serial devices, or for asynchronous communications software control.
- A parallel printer port to be used for connecting a parallel printer to the PC.
- A game adapter port which can be used with an IBM compatible joystick.

OPTIONS

- A secondary RS-232C serial port with a flat cable.

BOARD LAYOUT AND DESCRIPTION

The following is the board layout and brief description of relevant locations of ports, jumpers, and DIP switches on your DIO-500. (Figure 1-1)

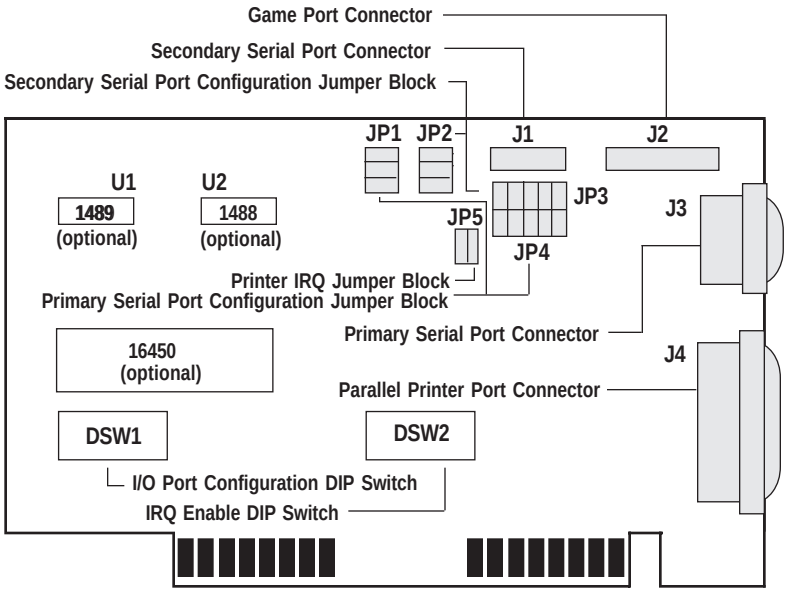


FIGURE 1-1. BOARD LAYOUT AND BRIEF DESCRIPTION OF THE DIO-500 I/O BOARD

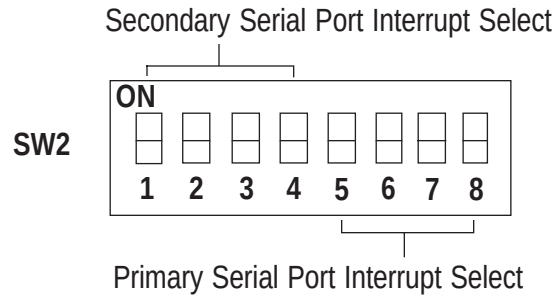


FIGURE 1-2. INTERRUPT SELECTION SWITCH

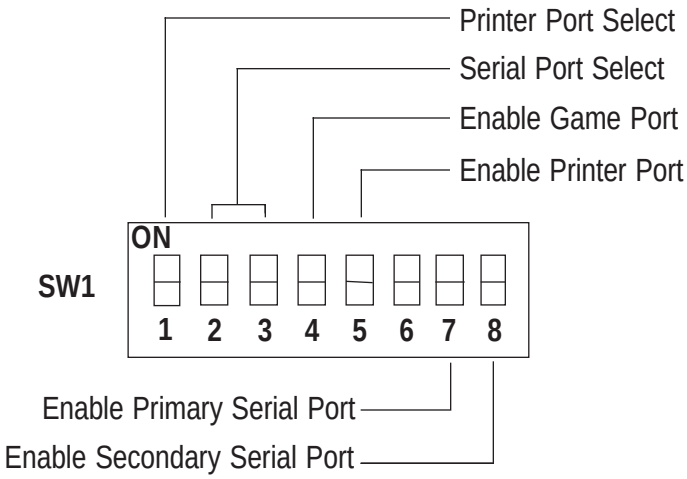


FIGURE 1-3. I/O PORT CONFIGURATION SWITCH

PARALLEL PRINTER PORT

The DIO-500 has a standard feature for interfacing your PC to a parallel printer. This port is completely compatible with the IBM PC and uses the same female DB25 connector as an IBM port.

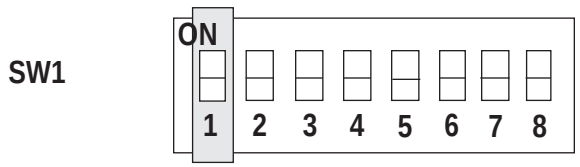
I/O PORT ASSIGNMENT AND PINOUTS

The printer port on the DIO-500 uses the following system I/O ports:

Port Configuration	I/O Ports
LPTA	378-37A Hex
LPTB	278-27A Hex

DIP Switch Bank 1 (SW) is utilized to select either LPTA or LPTB. Toggle switch 1 or SW1 as follows:

Port Configuration	S1
LPTA	OFF (default)
LPTB	ON



PARALLEL PORT-SYSTEM CONSIDERATIONS

The IBM PC allows installation of up to three parallel ports. These ports are called: LPT1, LPT2, and LPT3. The printer port on the Monochrome/Printer Adaptor which is addressed at 3BC (HEX) will be designated as LPT1 when it is installed, LPTA on your DIO-500 will be LPT2, and LPTB on your DIO-500 will be LPT3. If your system uses a Color/Graphic Adaptor, and a Monochrome/Printer Adaptor is not installed, then LPTA on your DIO-500 will be LPT1, and LPTB on your DIO-500 will be LPT2.

PARALLEL PORT-INTERRUPT ENABLE

Jumper 5 (JP5) is utilized to enable either IRQ5 or IRQ7 as an interrupt. The Jumper 5 (JP5) is shown as follows:

IRQ7 ENABLED (DEFAULT):

IRQ7 IRQ5

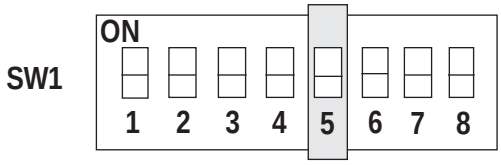
IRQ5 ENABLED:

IRQ7 IRQ5

PARALLEL PORT ENABLE/DISABLE

DIP Switch Bank 1 (SW1) is utilized to Enable/Disable your parallel port. Toggle switch 5 on SW1 as follows:

Status	S5
Enable	ON (default)
Disable	OFF



PARALLEL PRINTER PORT PINOUT

PIN	SIGNAL NAME
1	-STROBE
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5

PIN	SIGNAL NAME
8	DATA 6
9	DATA 7
10	-ACK
11	BUSY
12	PAPER EMPTY
13	+SELECT
14	-AUTO FDXT
15	-ERROR
16	-INIT
17	-SLCTIN
18	GROUND
19	GROUND
20	GROUND
21	GROUND
22	GROUND
23	GROUND
24	GROUND
25	GROUND

SERIAL PORT

Your DIO-500 has one serial port for asynchronous communications. (A second RS-232C serial port is optional.) This port can be used to connect your PC to a serial printer, modem, or any other devices which uses a RS-232C interface. The RS-232C interface can be configured as a DTE or DCE device. The primary serial port has a male DB9P connector on J3. The secondary serial port has a male DB25P connector linking to J1 via an extension cable.

CONFIGURING YOUR SERIAL PORT

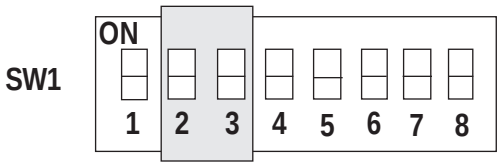
SELECTING THE SERIAL I/O PORT

The serial ports on your DIO-500 use the following system I/O ports:

Port Configuration	I/O Ports
COM1	3F8-3FF HEX
COM2	2F8-2FF HEX
COM3	3E8-3EF HEX
COM4	2E8-2EF HEX

DIP Switch Bank 1 (SW1) is utilized to disable or select the primary and secondary serial I/O port address. Toggle switches 2 and 3 on SW1 as follows:

Primary Serial Port	Secondary Serial Port	S2	S3
COM1	COM2	ON	ON (default)
COM2	COM3	OFF	ON
COM3	COM4	ON	OFF



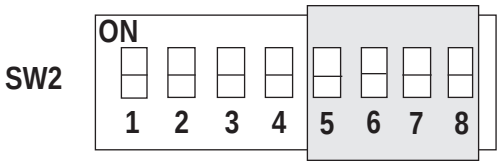
Note: *Switches 2 and 3 on SW1 cannot be both set to OFF.*

SETTING THE INTERRUPT REQUEST LINE

PRIMARY SERIAL PORT INTERRUPT REQUEST LINE SETTING

DIP Switch Bank 2 (SW2) is utilized to select IRQ2, IRQ3, IRQ4 and IRQ5 as an interrupt. Toggle switch 5, 6, 7, and 8 on SW2 as follows:

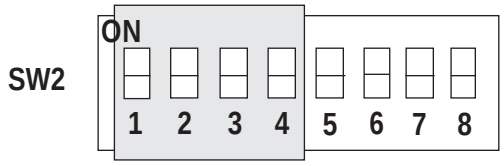
Primary Serial Port	S5	S6	S7	S8
IRQ2	ON	OFF	OFF	OFF
IRQ3	OFF	ON	OFF	OFF
IRQ4 (default)	OFF	OFF	ON	OFF
IRQ5	OFF	OFF	OFF	ON



SECONDARY SERIAL PORT INTERRUPT REQUEST LINE SETTING

DIP Switch Bank 2 (SW2) is utilized to select IRQ2, IRQ3, IRQ4 and IRQ5 as an interrupt. Toggle switch 1, 2, 3 and 4 on SW2 as follows:

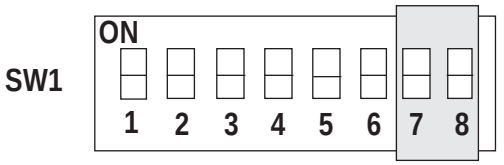
Secondary Serial Port	S1	S2	S3	S4
IRQ2	ON	OFF	OFF	OFF
IRQ3 (default)	OFF	ON	OFF	OFF
IRQ4	OFF	OFF	ON	OFF
IRQ5	OFF	OFF	OFF	ON



SERIAL PORT ENABLE/DISABLE

DIP Switch Bank 1 (SW1) is utilized to enable both your primary and your secondary serial ports. Toggle switches 7 and 8 on SW1 to Enable/Disable your serial ports. Refer to the table below:

Port	Status	S7	S8
Primary	Enable	ON	-- (default)
Secondary	Enable	--	ON (default)
Primary	Disable	OFF	--
Secondary	Disable	--	OFF



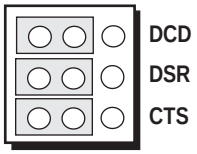
CONFIGURING THE RS-232C INTERFACE LINE

Your DIO-500 multi-I/O card adheres to the RS-232C engineering standards. All inputs to the serial port with the exception of Ring Indicator, pin 9, must be connected to a signal, even if the device connected to the port is not using one or more of the interface lines at connector J3 or J1. You can configure the serial ports as DTE (Data Terminal Equipment) (default) or as DCE (Data Communication Equipment) using jumper blocks JP4 and JP3.

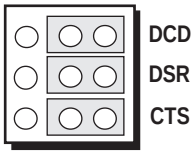
By adjusting jumper blocks JP1 and JP2, you can also configure the CTS, DSR, and DCD signals to be either "normal" (default) or "forced true". The three signals can be set independently of each other, i.e., one or two of the signals can be set as "normal", and the other signal(s) can be set as "forced true". You may want to set DSR to "forced true", for example, to suppress a "device timeout" error message that would occur if your printer were off-line.

PRIMARY SERIAL PORT

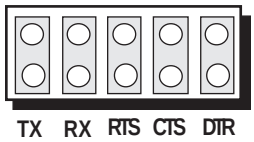
JP1 Normal Setting



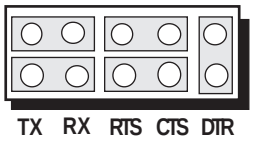
JP1 Forced True Setting



JP4 DTE Setting

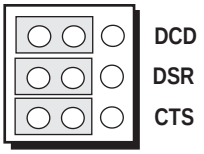


JP4 DCE Setting

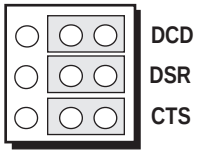


SECONDARY SERIAL PORT

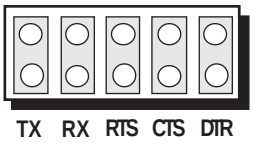
JP2 Normal Setting



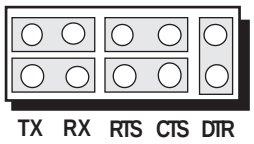
JP2 Forced True Setting



JP3 DTE Setting



JP3 DCE Setting



SERIAL I/O PORT PINOUTS

PRIMARY SERIAL PORT J3/SECONDARY SERIAL PORT J1

RS-232C Name	J1, J3 Pin No.	Signal Name
CF	1	DCD (Data Carrier Detect)
BB	2	RX (Receive Data)
BA	3	TX (Transmit Data)
CD	4	DTR (Data Terminal Ready)
AB	5	GND (Signal Ground)
CC	6	DSR (Data Set Ready)
CA	7	RTS (Request To Send)
CB	8	CTS (Clear To Send)
CE	9	RI (Ring Indicator)

CONNECTING YOUR SERIAL PORT TO A DEVICE WITH A DB25S CONNECTOR

Your DIO-500 primary serial port has a DB9P connector at J3. Also provided in the DIO-500 package is an interface cable which has a DB9S connector at the bracket end and a DB25P connector at the remote RS-232C interface end. This interface cable let your primary serial port connect to a device with a DB25S connector.

The secondary serial port connector on your DIO-500 is a 10-pin connector (J1), 9 pins are used. The interface cable for secondary serial port has a DB25P connector at the bracket end and a 10-pin rectangular connector at the PC board end. Plug the 10-pin connector to the PC board at J1.

The connector must be attached to the PC board with the red or blue cable orientation line set next to pin 1 of J1. Proper cable installation is critical; your serial device and/or DIO-500 may be damaged by improper cable orientation.

The following is the wiring diagram for the DB9S to DB25P adaptor cable.

Signal Name	DB9S Connector	DB25P Connector
DCD (Data Carrier Detect)	1	8
RX (Receive Data)	2	3
TX (Transmit Data)	3	2
DTR (Data Terminal Ready)	4	20
GND (Signal Ground)	5	7
DSR (Data Set Ready)	6	6
RTS (Request To Send)	7	4
CTS (Clear To Send)	8	5
RI (Ring Indicator)	9	22

INSTALLING THE SECONDARY SERIAL PORT

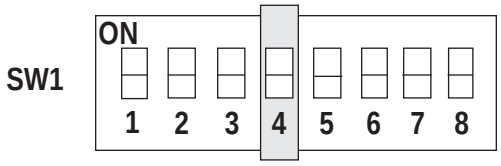
To install the Secondary Serial Port, insert IC 16450 into U11, SN75189 into U1 and SN75188 into U2 to activate the secondary serial port.

Note: *Contact your dealer for the optional secondary serial port kit.*

GAME ADAPTER PORT

One Game Adapter Port is included on the DIO-500. The I/O port address is defined as 200-207. A game adapter cable is required. Any IBM compatible joystick cable can be used. You can enable or disable the game port by setting switch 4 on DIP switch bank 1 (SW1) as follows:

Status	S4
Enable	ON (default)
Disable	OFF



GAME PORT PINOUT

Line Name	J2 Pin	DIO-500 Adapter Cable Output DB-15S
+5VDC	1	1
Button 4	2	2
Position 0	3	3
Ground	4	4
Position 1	6	6
Button 5	7	7
+5VDC	8	8
+5VDC	9	9
Button 6	10	10
Position 2	11	11
Ground	12	12
Position 3	13	13
Button 7	14	14
+5VDC	15	15