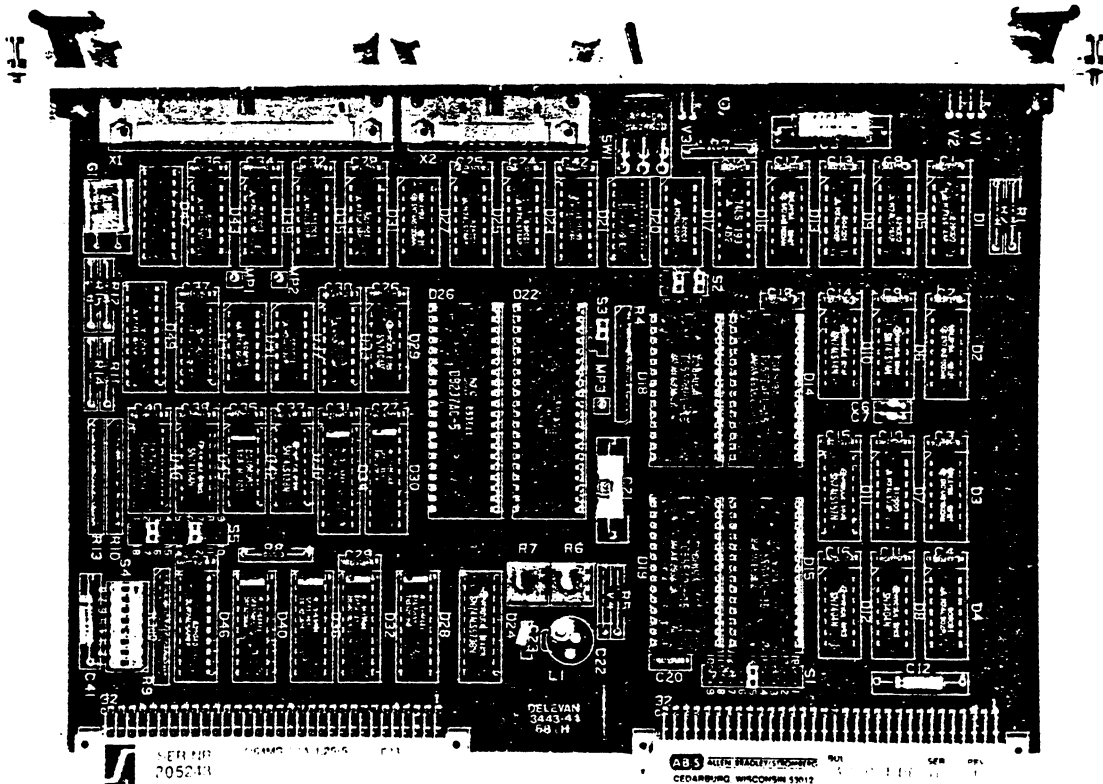


Bulletin 3250-FDC

DRC Floppy Disk Controller PC Card Series B



3100-FDC SERIES B

General Description

The 3250-FDC Floppy Disk Controller Card is rack mounted and allows for control of up to four 3-1/2" floppy disk drives packaged in either the 3250-FC1 or 3250-FC2 Disk Drive packages. The card contains the following major components:

- floppy disk controller circuit
- programmable Direct Memory Access (DMA) controller
- 32k bytes of RAM memory

Specifications

Location	DRC CPU Rack or DCG Rack
Power Requirements	-5V DC @ 1.5Amp
Environment	Temperature: 5°C to 50°C (40°F to 120°F) Relative Humidity: 20% to 80% non-condensing

Associated Functional Blocks

DSKCLO, DSKOPE, DSKRD, DSKWR

Indicators

DMA shared memory access LED
CPU shared memory access LED

Description of Operation

Several switches and jumpers located on the Floppy Disk Controller (FDC) Card are associated with the function of the circuitry on the card. The switches are integrally related with the internal configuration of the card and should not be changed from the initial settings listed in Tables 1 and 2. In addition to the hardware on the card, the associated functional blocks are directly linked to the operation of the card. Before using the FDC Card, become familiar with the blocks by reviewing the appropriate descriptions in the DRC Function Block Manual.

Memory

The FDC Card reserves a 256 byte area in the I/O memory of the main processor of the CPU Card. The beginning address of this memory is determined by DIP switch settings on switch S4 located on the FDC Card. Switch S4 has been divided into two words of 4 bits each, where positions 1 thru 4 are the low byte and positions 5 thru 8 are the high byte. Each byte represents the hexadecimal value of the high or low digit of the memory address. The address F8H has been reserved for use by the FDC Card and is selected by the switch settings shown in Table 1.

Table 1. S4 Switch Settings

S4 POSITION							
8	7	6	5	4	3	2	1
X	X	X	X	X			
					X	X	X

Usage and Configurations

The FDC Card may be used to operate up to four 3-1/2" floppy disk drives. Floppy disk drives can be packaged with either one (3250-FC1) or two (3250-FC2) drives per package (refer to the Component Description for the Floppy Disk Drive). An Interface board located in the disk drive package is used to route information to the proper drive. Information between the Floppy Disk Controller Card and the Interface Board is transferred by means of a 40 pin ribbon cable. A single ribbon cable may be connected in parallel to two or more Interface Boards (Figure 1).

The FDC Card must be mounted in the CPU rack of either a Digital Reference Control (DRC) or a Digital Color Graphics (DCG) system. When mounted in the DRC CPU rack, the FDC Card can be used to store the function block program or real time process data to floppy disk. When used in the DCG system, the FDC Card will store both system data and picture pages.

Each disk drive is assigned a unique drive unit number ranging from 0 to 3. Unit numbers are defined by hardware switch settings on each Interface Board. Information flow between the disk drive and the DRC is controlled in the software by specifying the disk memory area and unit number. Memory areas are numbered from 1 to 5 and may span more than 1 unit. When disk memory is opened using the DSKOPE function block, the beginning position in memory is defined using the memory area and disk unit numbers. When used with the DRC, disk drive number 0 has been reserved for use by the command line interpreter for storage of the function block program. When used in the DCG system, the FDC Card will store information to disks as detailed in Table 2.

Table 2. DCG Disk Usage

DISK #	STORED INFORMATION
0	system data and 34 picture pages
1	65 picture pages
2	65 picture pages
3	26 picture pages

If a single, two disk drive package (3250-FC2) is used to store both the DRC function block program and real time process data and the system requires the use of two disks for storage of real time data, it is possible to store the function block program by first setting the switches to unit number 0 on the Interface Card, writing the program to disk, and then setting the switches to unit number 2.



CAUTION: Equipment damage may result from changing switch positions on the Interface Board while under power. Always remove power from the Interface Board before changing switch positions (front panel power switch).

Disk Formatting

Before information can be stored on the disk, the disk must be formatted. When used with the DRC, disks are formatted from the Programming Terminal using the FORM command (refer to the Terminal Operation Manual). When used with the DCG, disks are formatted from the DCG Programming Terminal (refer to the Supervisory System Manual).

Selections and Indications

The RAM memory on the FDC Card is used as a buffer memory in transferring data to or from the disk. The buffer memory is shared by both the Direct Memory Access (DMA) Controller located on the FDC Card and the main processor located on the DRC or DCG CPU Card. The DMA Light Emitting Diode (LED) located on the front of the FDC Card will be illuminated when the DMA is accessing the shared memory, while the CPU LED will be illuminated when the DRC CPU is accessing the shared memory. When data is being transferred to or from the disk drive, both LEDs will be flashing.

Power for the disk drives is provided thru a 20 pin ribbon cable connected between the FDC Card and the Interface Board located in the disk drive package. Control power is derived from the rack power bus and is controlled by the POWER ON/OFF switch located on the front of the FDC Card (Figure 2). With the switch in the ON position, +5V DC and +15V DC is fed thru the ribbon cable, and the POWER ON LED will illuminate. With the switch in the OFF position, power is disconnected and the POWER ON LED will be extinguished.

DRC Program Backup

The Disk Read/Write functions required to backup the DRC system program to disk are performed directly from the DRC programming terminal. In order to perform the read/write functions, one of the disk drives must be specified as Drive 0 using switch S1 on the disk drive Interface Board and the power switch located on the front of the 3250-FDC Card must be in the ON position.

Writing to Disk

To write to the disk, the programming terminal must be in either the Program or Test mode, and the system prompt (*) must appear on the screen. In addition, the disk must be formatted. If the disk is not formatted, type "FORM" and press the ENTER or RETURN key. At this point, the disk will be formatted. Once the format function is complete, the system prompt will appear. At this point, type "WD" and press the ENTER or RETURN key. The DRC will ask you if you wish to write to disk. If you reply with a yes, the screen will display several dots and the DMA and CPU LEDs on the 3250-FDC Card will flash. Once the write operation is complete, the programming terminal will return to the system prompt.



CAUTION: Formatting or writing to a disk will clear all data presently on the disk. Before formatting or writing to a disk, first ensure that any information on the disk is ok to erase.

Reading from Disk

To read from a disk which had been previously written to, the programming terminal must be in the Program mode and the system prompt (*) must appear on the screen. At this point, type "RD" and press the ENTER or RETURN key. The DRC will ask you if you wish to read from disk. If you reply with a yes, the DMA and CPU LEDs on the 3250-FDC Card will flash. Once the read function is completed, the programming terminal will return to the system prompt.



CAUTION: Reading from a disk will clear all data presently in the DRC RAM memory. Before reading from a disk, first ensure that the existing DRC program in RAM is ok to erase.

IMPORTANT: If your system employs an EEPROM backup card(s), reading from disk does not change the information in the EEPROM card(s). Refer to the Terminal Operation Manual for a complete description of how to backup RAM memory to EEPROM.

Table 3. FDC Jumper Position and Switch Settings

SWITCH	POSITION	PURPOSE
S1	18-1	Interrupt line 0
	17-2	Interrupt line 1
	16-3	Interrupt line 2
	15-4*	Interrupt line 3
	14-5	Interrupt line 4
	13-6	Interrupt line 5
	12-7	Interrupt line 6
	11-8	Interrupt line 7
	10-9	Non-Maskable Interrupt (NMI)
S2	8-1	Disk drive type selection
	7-2*	
	6-3	
	5-4*	
S3	1-2*	Test switch for board set up
	2-3	Normal operation (board not in set-up mode) Test operation (board in set-up mode)
S4		Memory address setting (refer to Table 1)
S5	1-18	0 I/O wait cycles
	2-17	1 I/O wait cycles
	3-16*	2 I/O wait cycles
	4-15	3 I/O wait cycles
	5-14*	0 RAM wait cycles
	6-13	1 RAM wait cycles
	7-12	2 RAM wait cycles
	8-11	3 RAM wait cycles
	9-10	4 RAM wait cycles

* indicates normal jumper position

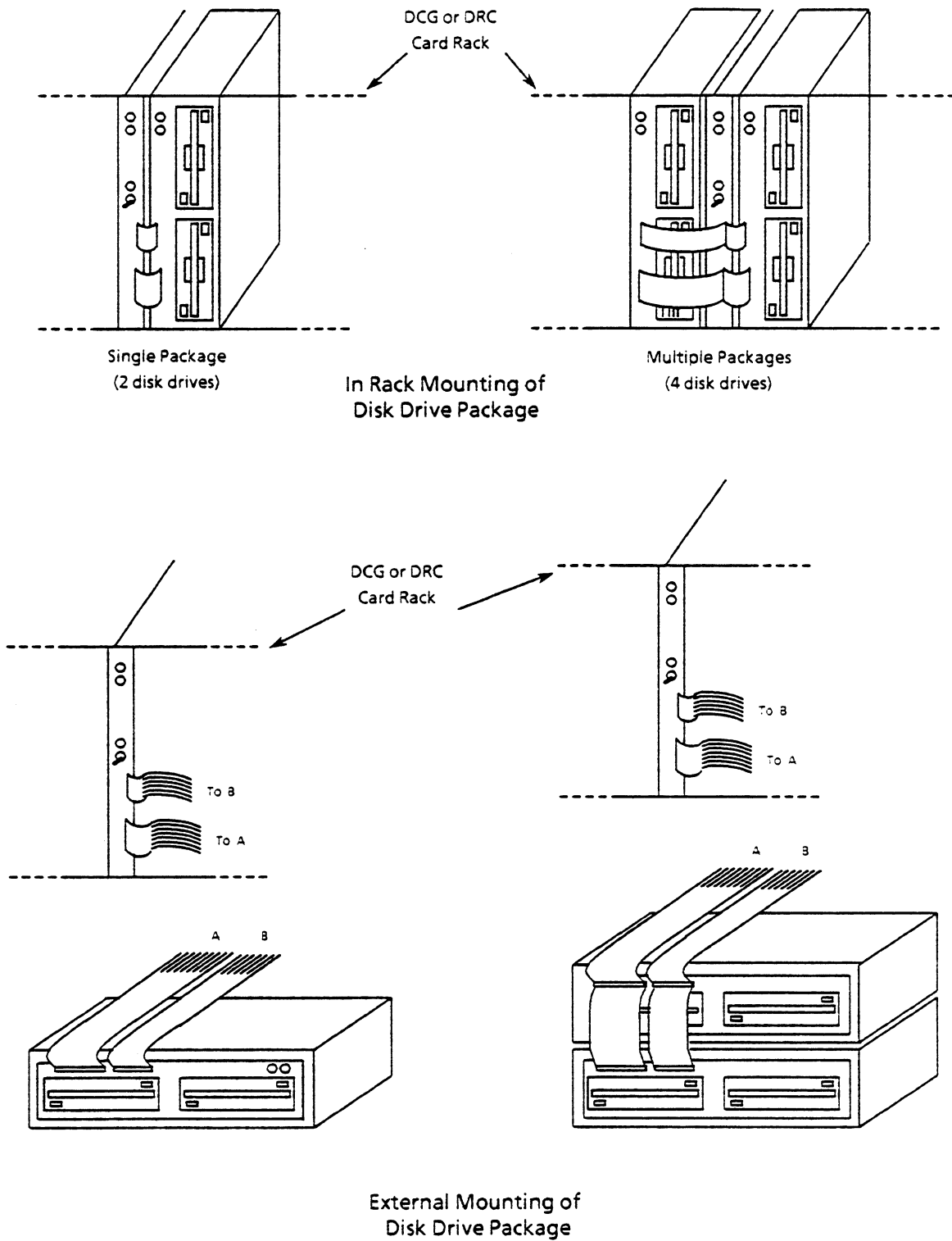


Figure 1. Floppy Disk Drive Configurations

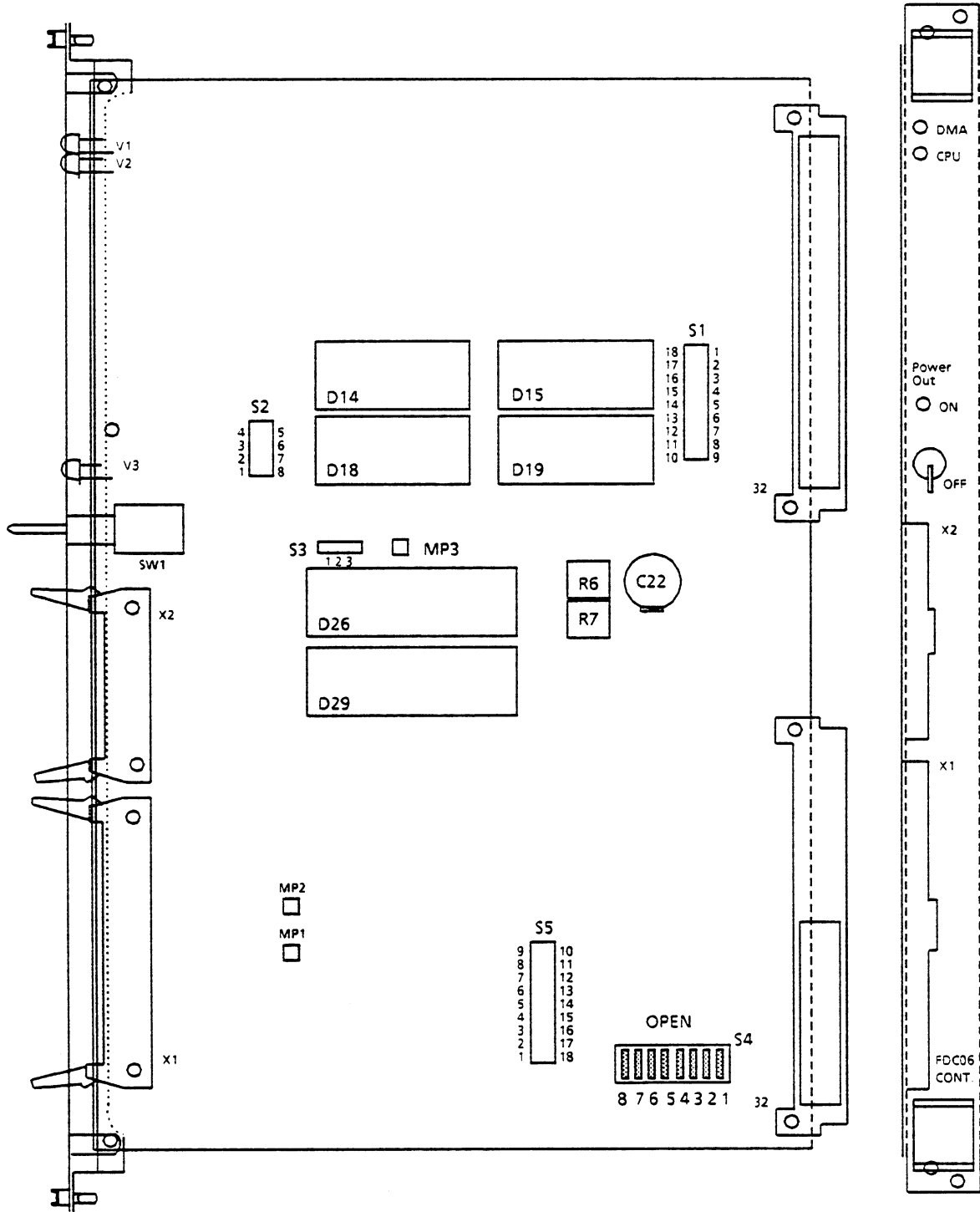


Figure 2. Location of Jumpers and Switches on the 3250-FDC Card