M-Systems
Flash Disk Pioneers

Section I - Product Specification

FFD 3.5" SCSI Flash Disk

JUNE-2003

45-SR-001-01-6L REV 4.1

Table of Contents

1 Scope

These specifications define the performance, design, manufacturing and acceptance requirements of the FFD 3.5" SCSI Flash Disk.

2 Applicable Documents

- ANSI X3.131-1994 American National Standard for Information Systems: Small Computer System Interface-2 (SCSI-2).
- ANSI X3T9.2/85-82 American National Standard for Information Systems: Common Command Set (CCS) of the Small Computer System Interface (SCSI).

3 Specifications

3.1 Critical Item Definition

The FFD 3.5" SCSI Solid State Flash Disk is a non-volatile, mass-memory storage unit equipped with a SCSI interface. The dimensions of the FFD 3.5" SCSI allow mounting in a standard 3.5" disk drive enclosure and contain the following subassemblies:

- CPU
- SCSI interface controller
- Flash memory

Figure 1 illustrates the FFD 3.5" SCSI block diagram.

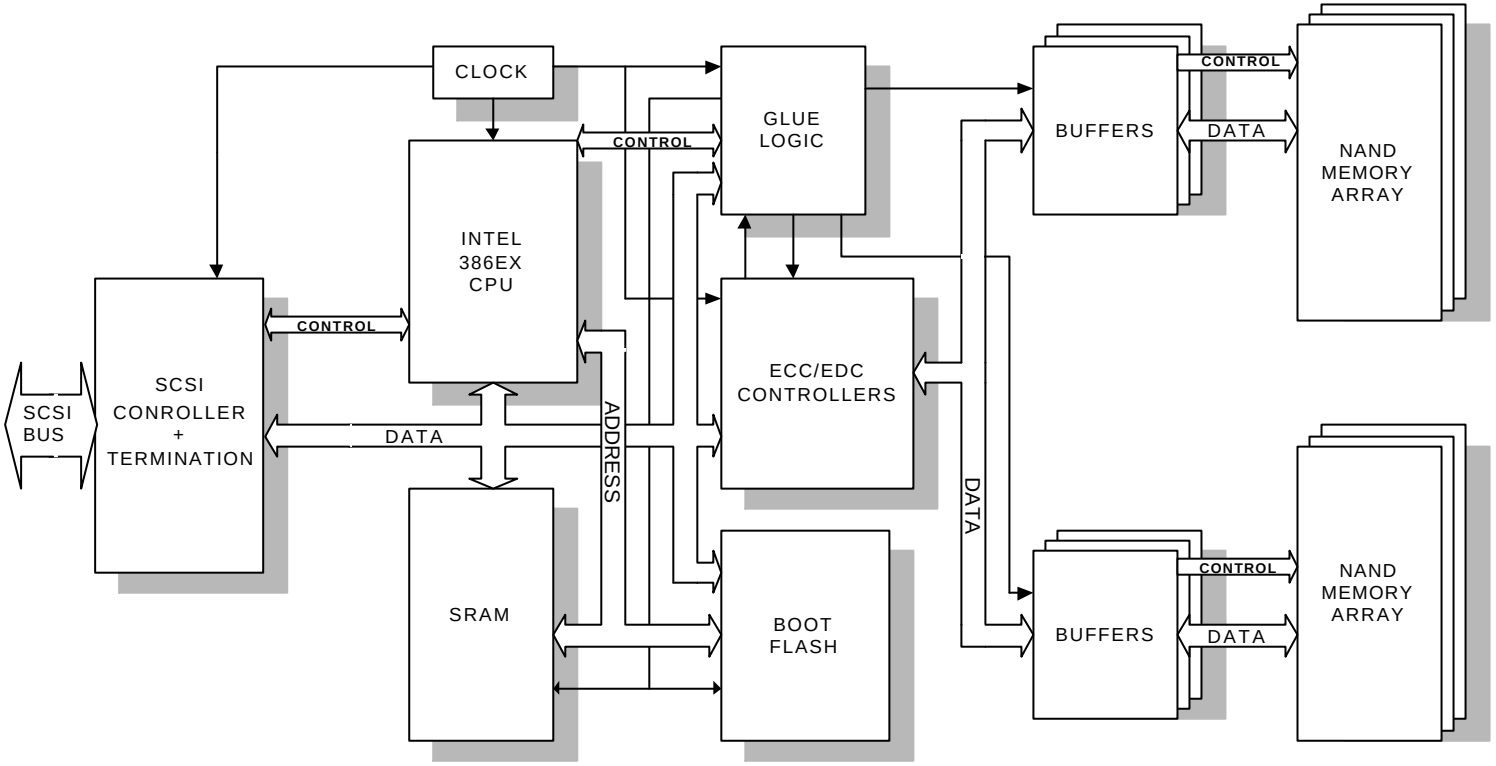


Figure 1: FFD 3.5" SCSI Block Diagram

3.1.1 Interface Definition

The FFD 3.5" SCSI interface complies with the SCSI-2 standard and supports the Common Command Set. For specific details, refer to Section 5.

3.2 Characteristics

3.2.1 SCSI Modes

The FFD 3.5" SCSI supports the following SCSI modes:

- **Asynchronous Mode** : Entered on power-up.
- **Synchronous Mode**: If the host adapter enters Synchronous mode, the FFD 3.5" SCSI supports this negation to establish Synchronous mode.
- **Fast Synchronous Mode**

3.2.2 Bus Characteristics

The bus type is 8-bit, single-ended.

3.2.3 Performance

Performance testing was performed using the following setup:

- Computer: PENTIUM PC with a Bus Logic SCSI adapter
- SCSI Transfer Mode: Fast Synchronous
- O/S setup: DOS

A SCSI bus monitor was attached to the SCSI bus. The read and write operations were recorded and performance was calculated off-line according to the following formula:

$$\text{Write / Read\_ rate} = \frac{\text{Number\_of\_ blocks\_}\times\text{\_sector\_size}}{\text{Command\_complete\_time\_-\_selection\_time}}$$

The FFD 3.5" SCSI meets the performance requirements as specified in Table 1.

Table 1: FFD 3.5" SCSI Transfer Rates

Operation	Burst[1] Rate (Mbytes/sec)	Sustained[2] Rate 64 Kbytes Blocks (Mbytes/sec)
Read	9.7	3.0
Write	9.7	2.0

Notes:

1. Transfer of 16 bytes between the target and the initiator.
2. Transfer of multiple, sequential sectors between the target and the initiator.

3.2.4 Access Time

The maximum access time is <0.1 msec.

3.2.5 Seek Time

The FFD 3.5" SCSI has no seek time.

3.2.6 Power Supply

The FFD 3.5" SCSI input power requirements comply with the values defined in Table 2. The input voltage is +5VDC with a tolerance of ±0.25V.

For current consumption information for each disk capacity, please refer to Table 2.

3.2.7 Memory Capacity and Current Consumption

Table 2 describes the unformatted and formatted capacities available, and the current consumption for each capacity.

Table 2: FFD 3.5" SCSI Memory Capacity and Current Consumption

Unformatted Disk[1] Capacity (MB)	Formatted Disk Capacity (# of blocks) [2]	Cylinders	Heads	Sector/ Cylinder	Bytes/ Sector	Current (typ) mA DC[3,4]
32	F1FFH	3CH	10H	40H	512	450
64	1E3FFH	79H	10H	40H	512	550
128	3CF7FH	F3H	10H	40H	512	550
192	5BAFFH	16EH	10H	40H	512	550
256	7A67FH	1E9H	10H	40H	512	550
320	991FFH	264H	10H	40H	512	550
384	B7D7FH	2DFH	10H	40H	512	550
448	D68FFH	35AH	10H	40H	512	550
512	F547FH	3D5H	10H	40H	512	550
576	113FFFH	450H	10H	40H	512	800
640	132B7FH	4CAH	10H	40H	512	550
704	1516FFH	545H	10H	40H	512	800
768	17027FH	5COH	10H	40H	512	550
832	18EDFFH	63BH	10H	40H	512	800
896	1AD97FH	6B6H	10H	40H	512	550
960	1CC4FFH	731H	10H	40H	512	800
1,024	1EB07FH	7ACH	10H	40H	512	550
1,088	209BFFH	827H	10H	40H	512	800
1,152	22877FH	8A1H	10H	40H	512	800
1,216	2472FFH	91CH	10H	40H	512	800
1,280	265E7FH	997H	10H	40H	512	800
1,344	2849FFH	A12H	10H	40H	512	800
1,408	2A357FH	A8DH	10H	40H	512	800
1,536	2E0C7FH	B83H	10H	40H	512	800
1,664	31E3FFH	C79H	10H	40H	512	800
1,792	35BAFFH	D6EH	10H	40H	512	800
1,920	3991FFH	E64H	10H	40H	512	800

Unformatted Disk[1] Capacity (MB)	Formatted Disk Capacity (# of blocks)[2]	Cylinders	Heads	Sector/ Cylinder	Bytes/ Sector	Current (typ) mA DC[3,4]
2,048	3D68FFH	F5AH	10H	40H	512	800
2,176	413FFFH	1050H	10H	40H	512	800
2,304	4516FFH	1145H	10H	40H	512	800
2,432	48EDFFH	123BH	10H	40H	512	800
2,560	4CC4FFH	1331H	10H	40H	512	800
2,688	509BFFH	1427H	10H	40H	512	800
2,816	5472FFH	151CH	10H	40H	512	800
3,072	5C20FFH	1708H	10H	40H	512	1100
3,328	63CF7FH	18F3H	10H	40H	512	1100
3,584	6B7D7FH	1ADFH	10H	40H	512	1100
3,840	732B7FH	1CCAH	10H	40H	512	1100
4,096	7AD97FH	1EB6H	10H	40H	512	1100
4,352	82877FH	20A1H	10H	40H	512	1100
4,608	8A357FH	228DH	10H	40H	512	1100
4,864	91E3FFH	2479H	10H	40H	512	1100
5,120	9991FFH	2664H	10H	40H	512	1400
5,376	A13FFFH	2850H	10H	40H	512	1400
5,632	A8EDFFH	2A3BH	10H	40H	512	1400

Notes:

1. Memory capacity is specified by the customer when placing the order.
2. Number of logical blocks as reported by the read capacity command.
3. All operational modes except Security Erase.
4. In all cases TERMPWR is OFF.

3.2.8 Endurance

The FFD 3.5" SCSI can sustain more than 5,000,000 erase cycles, and an unlimited number of read cycles that are enhanced by the following features:

- **Dynamic Wear-Leveling Algorithm**: This algorithm guarantees the use of all flash components at the same level of the write/erase cycle. The dynamic wear-leveling algorithm eliminates situations where the application repeatedly writes to the same physical location until the flash components wear out. It functions by virtually mapping of logical blocks to physical blocks (transparent to the customer application).
- **Garbage Collection Process**: This process eliminates the need to perform erasure prior to every write, thus eliminating excessive disk deterioration. Additionally, the garbage collection process accumulates data considered necessary for erasure until the block is full.
- **EDC/ECC (Error Detection Code/Error Correction Code)**: The EDC/ECC detects and then fixes errors in flash blocks based on a 48-bit Reed Solomon algorithm.
- **Bad-Block Mapping Algorithms**: This algorithm replaces bad blocks with new ones from available spares.

3.2.9 Physical Characteristics

Weight

The weight of the FFD 3.5" SCSI complies with the values defined in Table 3.

Table 3: FFD 3.5" SCSI Weight

Memory Capacity	Maximum Weight (Kg)
1024MB	0.255
2048MB	0.320
5632MB	0.435

Dimensions

Table 4 describes the nominal dimensions of the FFD 3.5" SCSI. Refer to Figure 2 for detailed mounting configuration dimensions.

Table 4: Nominal Dimensions

	Inches	Millimeters
H	1.00	25.40
W	4.00	101.60
L	5.75	146.05

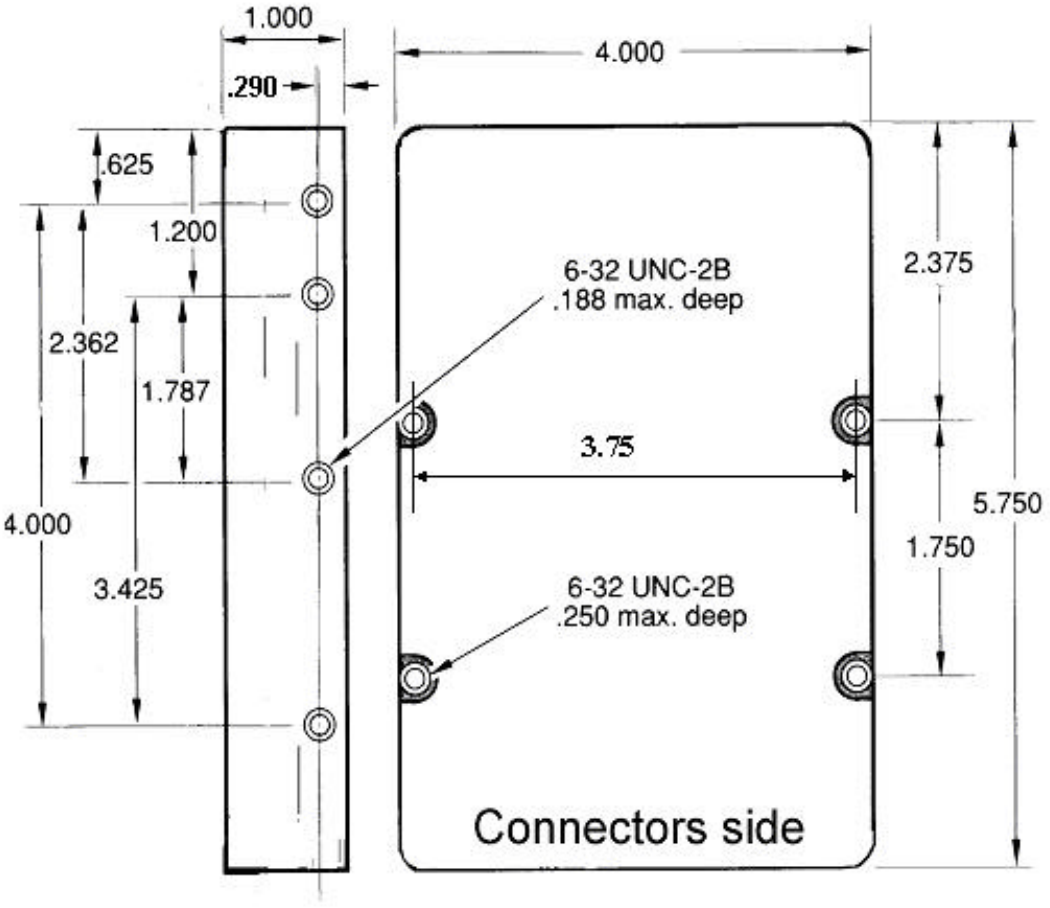


Figure 2: FFD 3.5" SCSI Assembly Dimensions (in mm)

3.2.10 Connector Interface

The FFD 3.5" SCSI interface connector pinout is described in Table 5.

Table 5: Pin Assignment

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	-DB0
3	GND	4	-DB1
5	GND	6	-DB2
7	GND	8	-DB3
9	GND	10	-DB4
11	GND	12	-DB5
13	GND	14	-DB6
15	GND	16	-DB7
17	GND	18	-DB(P)
19	GND	20	GND
21	GND	22	GND
23	RESERVED	24	RESERVED
25	OPEN	26	TERMPWR
27	RESERVED	28	RESERVED
29	GND	30	GND
31	GND	32	-ATN
33	GND	34	GND
35	GND	36	-BSY
37	GND	38	ACK
39	GND	40	-RST
41	GND	42	-MSG
43	GND	44	-SEL
45	GND	46	-C/D
47	GND	48	-REQ
49	GND	50	-I/O

3.3 Reliability

The calculated Mean Time Between Failures (MTBF) of the FFD 3.5" SCSI is 3,717,000 hours, in accordance with the British Telecom Model for a grounded, fixed operating environment of +25°C and a capacity of 128MB.

3.4 Embedded Error Detection and Error Correction Codes (EDC/ECC)

The FFD has error detecting and error correcting code (EDC/ECC), embedded as both hardware and software mechanisms. The ECC/EDC is based on a 48-bit Reed Solomon algorithm.

3.5 Environmental Conditions

The FFD 3.5" SCSI complies with the performance requirements specified herein after exposure to non-operating environmental conditions, or during and after exposure to operating environmental conditions as specified.

3.5.1 Temperature

Operating

The FFD 3.5" SCSI operates without degradation over the following ambient air temperature range:

- **Commercial temperature version**: 0°C to +70°C
- **Enhanced temperature version**: 25°C to +75°C
- **Extended temperature version**: 40°C to +85°C

Non-Operating

The FFD 3.5" SCSI meets the performance requirements specified herein after withstanding exposure to a nominal ambient temperature of -55°C for 24 hours, and of +95°C for a period of 24 hours.

3.5.2 Altitude

The FFD 3.5" SCSI is capable of full operation at altitudes from sea level up to 50,000 feet, and can withstand air transportation in non-pressurized flights at altitudes of up to 50,000 feet.

3.5.3 Relative Humidity

The FFD 3.5" SCSI can withstand 5% to 95% non-condensing relative humidity.

3.5.4 Shock

The FFD 3.5" SCSI operates as specified after being subjected to shock testing in the vertical axis using 50G half-sine pulses of 11 ms or 1500G half-sine pulses of 0.5 ms.

Analysis performed per MIL-STD-810C, Method 516.2.

3.5.5 Vibration

The FFD 3.5" SCSI operates without degradation when subjected to the following vibration conditions:

- Category 5: Jet Aircraft, 16.4G RMS, random 5 Hz to 2000 Hz

  Analysis performed per MIL-STD-810E, figure 514.4-8.
- Category 6: Helicopter aircraft/installed, 12.8 G RMS, Random 5 Hz to 2000 Hz

  Analysis performed per MIL-STD-810E, figure 514.4-9.

4 FFD 3.5" SCSI Drive Configuration

Before mounting the drive in the drive bay, you must configure the FFD 3.5" SCSI by setting the DIP switches on the disk panel to meet your system requirements. Any changes to the DIP switch settings must be made while the FFD 3.5" SCSI is powered OFF, otherwise the FFD may be damaged or the new settings may not be recognized. Figure 3 illustrates the orientation of the DIP switches.

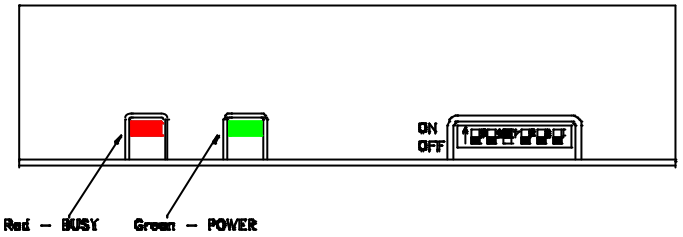


Figure 3: DIP Switches and LEDs

4.1 LED Display

Table 6 describes the color codes and status definitions of the LED display located on the front panel.

Table 6: LED Status Description

Status	LED Color Indicator	Description
POWER	Green	Indicates that power is applied to the disk. The LED will either remain ON while the unit is operational, or will flash at a rate of 1 Hz to indicate that the power-up and built-in self test have failed and that the disk is malfunctioning.
BUSY	Red	Indicates that the FFD is being accessed. The LED illuminates when the disk is accessed (read/write/format) and remains lit until the access is completed.

4.2 SCSI ID

To select the required ID, set the DIP switches as described in Table 7.

Table 7: SCSI ID DIP Switch Settings

SCSI ID	Switch 3	Switch 2	Switch 1
0[1]	OFF	OFF	OFF
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	ON	ON
4	ON	OFF	OFF
5	ON	OFF	ON
6	ON	ON	OFF
7	ON	ON	ON

1 default factory setting

4.3 Termination

The FFD 3.5" SCSI has the option to use an internal active termination. When selecting this option, ensure that the SCSI bus is terminated at the two physical ends of the cable. To select the termination condition, set the DIP switches as described in Table 8.

Table 8: Termination DIP Switch Settings

Termination	Switch 4
Enabled[1]	ON
Disabled	OFF

1 default factory setting

4.4 Termination Power (TRMPWR)

The FFD 3.5" SCSI has an internal active TRMPWR (termination power) option. Set the DIP switches as described in Table 9 to enable TRMPWR.

Table 9: TRMPWR DIP Switch Settings

TRMPWR	Switch 5
Enabled	ON
Disabled[1]	OFF

1 default factory setting

4.5 Write Protection

The FFD 3.5" SCSI has an internal active write protection option. The write protection (WP) is software implemented, and the switch value is retrieved during the FFD 3.5" SCSI power cycle/bus [device] reset. Toggling the WP switch must be followed by a reset to activate the write protection option. Write protection disables the FORMAT, WRITE, WRITE EXTENDED, WRITE BUFFER AND SECURITY ERASE commands, but does not disable the hardware Security Erase interrupt. It is enabled/disabled by setting the DIP switch as described in Table 10.

If an attempt is made to execute the disabled commands, command returns under Check Condition status with a Write Protect sense key.

Table 10: Write Protection DIP Switch Settings

Write Protection	Switch 6
Enabled	ON
Disabled[1]	OFF

1 default factory setting

4.6 Interface Connectors

The FFD 3.5" SCSI has two interface connectors located on the rear panel. The DC power and the SCSI bus are input through a non-shielded, 50-pin flat cable.

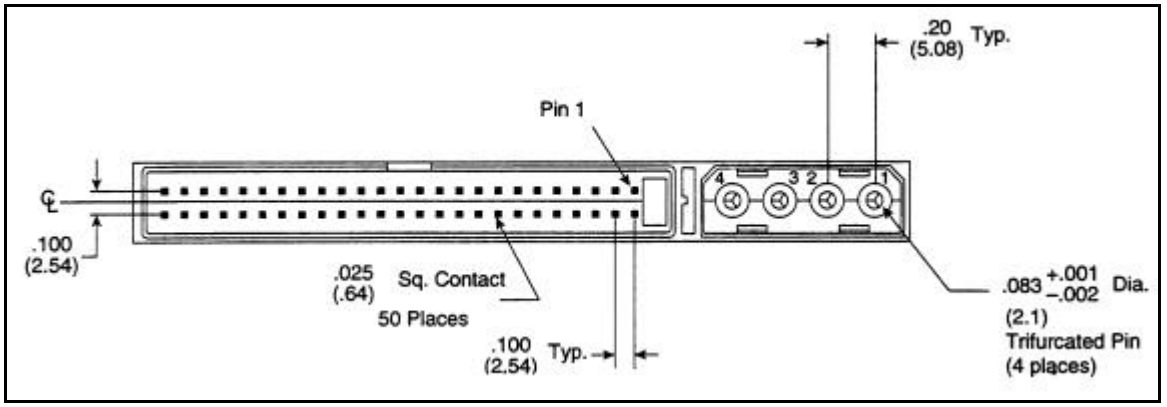


Figure 4: FFD 3.5" SCSI Bus and Power Connectors

Table 11 and Table 12 describe some types of connectors that may be used to interface with the FFD 3.5" SCSI connectors. The lists are partial, and additional compatible connectors may be used. Table 13**Error! Reference source not found.** describes the Power connector pin assignments.

Table 11: Recommended Power Mating Connector

Model Number	Type of Cable
Molex 8981-4P[1]	14 AWG

1. Equivalent parts may be used.

Table 12: Recommended SCSI Connector

Model Number	Description
DUPONT 71600-050[1]	With strain relief, with center key

1. Equivalent parts may be used.

Table 13: Power Connector Pin Assignments

Pin	Power
1	+12V
2	+12V RET
3	+5V RET
4	+5V

Remark: The +12V terminal is not connected in the FFD. The +12V RET is internally shorted to the +5V RET terminal.

5 Supported SCSI Commands

The FFD 3.5" SCSI supports the commands described in Table 14. For a complete description of these commands, refer to the following document: Small Computer System Interface-2, ANSI X3.131-1994, American National Standard for Information Systems. The standard is available from: American National Standards Institute 11 West 42nd St. New York, NY 10036.

Table 14: SCSI Commands

Command	*Option	Command Code
Group 0: 6-Byte Commands		
TEST UNIT READY	M	0x00
REZERO UNIT	O	0x01
REQUEST SENSE	M	0x03
FORMAT UNIT	M	0x04
REASSIGN BLOCKS	O	0x07
READ	M	0x08
WRITE	O	0x0A
SEEK	O	0x0B
INQUIRY	M	0x12
MODE SELECT	O	0x15
RESERVE	M	0x16
RELEASE	M	0x17
MODE SENSE	O	0x1A
START/STOP UNIT	O	0x1B
SEND DIAGNOSTICS	M	0x1D
Groups 1 and 2: 10-Byte Commands		
READ CAPACITY	M	0x25
READ	M	0x28
WRITE	O	0x2A
SEEK	O	0x2B
WRITE AND VERIFY	O	0x2E
VERIFY	O	0x2F
READ DEFECT DATA	O	0x37

Command	*Option	Command Code
WRITE BUFFER	O	0x3B
CHANGE DEFINITIO N	O	0x40
MODE SELECT	O	0x55
MODE SENSE	O	0x5A
Vendor-Specific: 6-Byte Commands		
SECURE ERASE	V	0xDF

***Note:** M = Mandatory
O = Optional
V = Vendor Specific

6 SCSI Messages

The FFD 3.5" SCSI indicates its ability to respond to SCSI messages by responding to the ATN signal through entering the MESSAGE OUT phase. Table 15 describes the supported SCSI messages.

Table 15: Message Codes

Status	Code	Direction (Relative to the Initiator)
COMMAND COMPLETE	00h	In
ABORT	110	Out
INITIATOR DETECTED ERROR	5h	Out
MESSAGE PARITY ERROR	9h	Out
MESSAGE REJECT	7h	In/Out
NO OPERATION	8h	Out
BUS DEVICE RESET	0Ch	Out
IDENTIFY	80h- FFh	Out
SYNCHRONOUS DATA TRANSFER REQUEST	01h (extended)	In/Out

6.1 Command Complete

The Command Complete message is sent from the FFD 3.5" SCSI to an initiator, indicating that the execution of a command has been completed and that the initiator has received a valid status. After successfully sending this message, the FFD 3.5" SCSI enters the BUS FREE phase by negating the BSY signal.

6.2 Abort

The Abort message is sent from an initiator to the FFD 3.5" SCSI to clear the present operation. Upon identifying this message, the FFD 3.5" SCSI enters the BUS FREE phase.

6.3 Bus Device Reset

The Bus Device Reset message is sent from an initiator to the FFD 3.5" SCSI to clear all current commands. This message forces the FFD 3.5" SCSI into an initial state with no operations pending. Upon identifying this message, the FFD 3.5" SCSI enters the BUS FREE phase.

6.4 Identify

An Identify message is sent by the initiator to the FFD 3.5" SCSI to establish a physical path connection between an initiator and the FFD 3.5" SCSI for a particular logical unit (LUN)*.

***Note:** The FFD 3.5" SCSI only supports one logical unit number (LUN), LUN 0.

6.5 Initiator Detected Error

The Initiator Detected Error message is sent from an initiator to inform a target that an error, which does not preclude the target from retrying the operation, has occurred.

6.6 Message Parity Error

The Message Parity Error message is sent from an initiator to the target to indicate that it has received a message byte containing a parity error.

6.7 Message Reject

The Message Reject message is sent from either the initiator or target to indicate that the last message or message byte it received was inappropriate or has not been implemented.

6.8 No Operation

The No Operation message is sent from an initiator in response to a target's request for message when the initiator currently does not have any valid message to send.

6.9 Synchronous Data Transfer

The SYNC DATA TRANSFER message exchange establishes an agreement between two SCSI devices regarding the timing of SCSI signals and REQ/ACK protocol during the DATA transfer phases. This agreement applies only to the DATA IN and the DATA OUT phases.

All other information transfer phases use asynchronous timing parameters.

7 Vendor-Specific Commands

7.1 Security (Fast) Erase Command

The SECURITY ERASE function quickly erases all data on the FFD 3.5" SCSI. This function is activated by the vendor-unique SCSI command code DFH, or by the SECURITY ERASE interrupt (if available).

When the SECURITY ERASE function is activated, all NAND flash components are erased. The time required to erase the entire media is less than 5 sec (typically).

Bit Byte	0	1	2	3	4	5	6	7
0	Operation Code (DFH)							
1	Reserved							
2	Secondary Operation Code (4DH)							
3	Reserved							
4	Reserved							
5	Link	Flag	Reserved				Vendor Unique	

Without the secondary operation code 0x4D in the 3rd byte, the security command will be rejected. This is done to protect against programs that scan the SCSI device for supported commands.

To make the FFD 3.5" SCSI fully operational after the completion of the Security Erase process, the unit must be powered OFF and ON and low-level formatted.

For details regarding the hardware Security Erase interrupt, please contact the business unit.

8 Firmware Upgrade

The FFD 3.5" SCSI is an upgradeable disk. The upgrade process is performed using the FFDUPDAT.EXE utility. This utility assumes the presence of the ASPI manager. The ASPI manager is a device driver used by many applications to enable issuing various SCSI commands.

The following command line must be included in your config.sys file:

```
Device= <path><device_driver_name><device_parameters>
```

For example: the ASPI manager for the Adaptec model 1542 SCSI adapter uses the line:

```
device = d:\devdir\aspi4dos.sys /d /p230
```

Where 230 is the I/O address of the Adaptec card.

FFDUPDAT.EXE is used as follows:

```
ffdupdat.exe microcode= <new_firmware_code_name> -finally
```

9 Status Byte

The STATUS phase allows the target to request that status information be sent from the target to the initiator. A status byte is sent from the FFD 3.5" SCSI to the initiator during the STATUS phase at the termination of each command. Table 16 defines the supported SCSI status codes.

Table 16: Status Codes

Status	Code
GOOD	00h
CHECK CONDITION	02h
RESERVATION CONFLICT	18h

9.1 Good

This indicates that the FFD 3.5" SCSI has successfully completed the requested command.

9.2 Check Condition

Any error, exception, or abnormal condition that causes the sense data to be valid, initiates a CHECK CONDITION status. The Request Sense command can be issued following a CHECK CONDITION status to determine the nature of the incident.

9.3 Reservation Conflict

This status is returned whenever a SCSI device attempts to access a logical unit (LUN) reserved for that type of access to another SCSI device.

10 Sense Key and Extended Sense Key Codes

Table 17 lists the Sense Key codes and Table 18 lists the Extended Sense Key codes.

Table 17: Sense Key Codes

Sense Code Description	Sense Key Code
NO SENSE	0
RECOVERED ERROR	1
NOT READY	2
MEDIUM ERROR	3
HARDWARE ERROR	4
ILLEGAL REQUEST	5
UNIT ATTENTION	6
DATA PROTECT	7

Table 18: Extended Sense Codes

Extended Sense Code Description	Sense Key Code
NO ADDITIONAL SENSE INFORMATION	0x0000
LOGICAL UNIT NOT SUPPORTED	0x0025
INVALID BITS IN IDENTITY MESSAGE	0x003D
INVALID COMMAND OPERATION CODE	0x0020
INVALID FIELD IN CDB	0x0024
INVALID FIELD IN PARAMETER LIST	0x0026
UNRECOVERED READ ERROR	0x0011
DATA PHASE ERROR	0x004B
PERIPHERAL DEVICE WRITE FAULT	0x0003
LOGICAL UNIT IN PROCESS OF BECOMING READY	0x0104
INTERNAL TARGET FAILURE	0x0044
LOGICAL UNIT IS NOT READY INITIALIZING COMMAND REQUIRED	0x0204
POWERON RESET-OR BUS DEVICE RESET OCCURRED	0x0029
MICROCODE HAS BEEN CHANGED	0x013F
WRITE PROTECTED	0x0027
SAVING PARAMETERS NOT SUPPORTED	0x0039

11 Startup Time

The time required for the FFD 3.5" SCSI to mount the media and respond to media-related commands (read, write or verify) depends on the media capacity. During the startup period, the unit responds to media-related commands issued by the initiator with a BUSY status. The maximum startup delay is less than 3 sec for the 1024MB (1GB) drives. For lower-capacity drives, the delay is shorter.

12 Low-Level Format

The drive is shipped from the factory low-level formatted and ready for use. To initiate a low-level format, the initiator must issue a SCSI format command (opcode 04h). Refer to the adapter instructions for information on how to generate this command.

The amount of time required to format the FFD 3.5" SCSI depends on the media capacity. The maximum delay is 10 min for a 1024MB device.

13 SCSI Reset

The RESET condition is used to immediately clear all SCSI devices from the bus.

Upon detection of the RESET condition, the FFD 3.5" SCSI does the following:

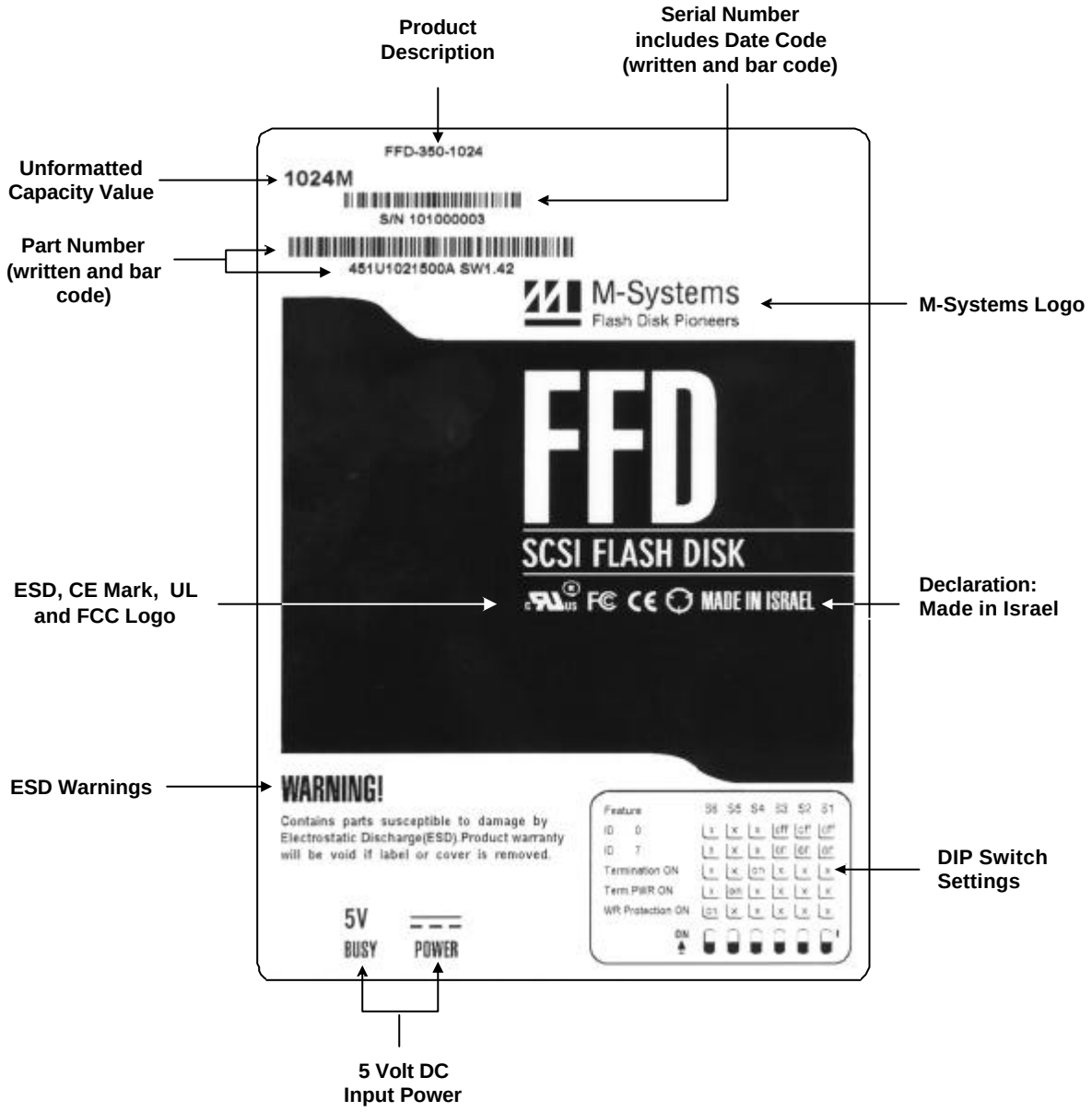
- Clears all uncompleted commands.
- Releases all SCSI device reservations.
- Returns operating modes to default conditions.

14 CE, UL and FCC Compatibility

The FFD 3.5" SCSI is guaranteed to conform with the requirements of the CE, UL and FCC class B standards.

15 Label Information

The cover label contains the following information:



16 Built-In Test (BIT)

The FFD 3.5" SCSI performs a power-up BIT test to ensure that its basic components are operational. Upon power-up, the following is tested:

- RAM
- Boot flash
- SCSI controller
- Timers
- DMA controller
- Flash media

17 Factory Setup

Table 19 details the preset factory switch settings for the FFD 3.5" SCSI.

Table 19: Factory Switch Settings

SWITCH	STATE
S1 – SCSI ID	OFF
S2 – SCSI ID	OFF
S3 – SCSI ID	OFF
S4 – Termination	ON
S5 – Termination Power (TRMPWR)	OFF
S6 – Write Protect	OFF

18 Ordering Information

FFD-350-CCCC-T		
CCCC:	Unformatted Capacity (MB)	32, 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1536, 1664, 1792, 1920, 2048, 2176, 2304, 2432, 2560, 2688, 2816, 3072, 3328, 3584, 3840, 4096, 4352, 4608, 4864, 5120, 5376, 5632
T:	Operating Temperature Range	Blank- Commercial 0°C to +70°C N - Enhanced -25°C to +75°C X - Extended -40°C to +85°C

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