

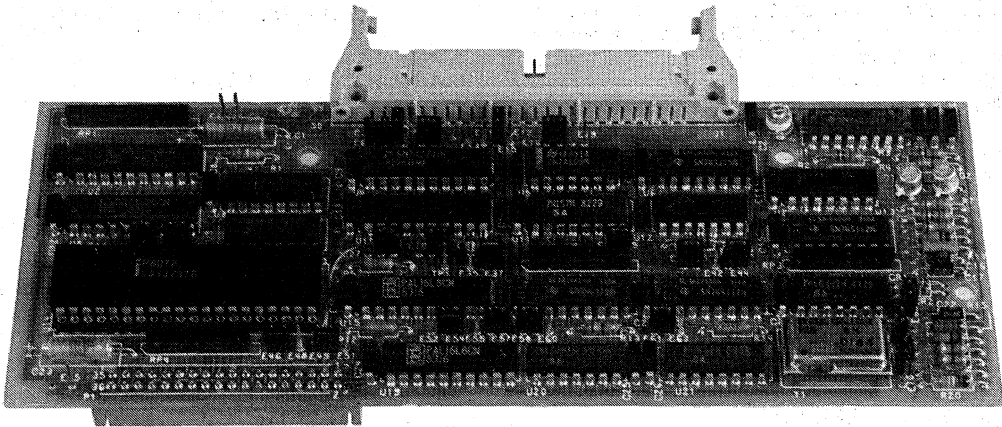


## ISBX™ 218A FLEXIBLE DISK CONTROLLER

- ISBX™ Bus Compatible 8" or 5.25" Floppy Diskette Controller Module
- Hardware and Software Compatible with ISBX 218 Module
- Controls Most Single/Double Density and Single/Double Sided Floppy Drives
- User Programmable Drive Parameters Allow Wide Choice of Drives
- Motor On/Off Latch Under Program Control
- Drive-Ready Timeout Circuit for 5.25 Inch Floppy Drives
- Phase Lock Loop Data Separator Assures Data Integrity
- Read and Write on Single or Multiple Sectors
- Single +5 Volt Supply Required

The Intel ISBX 218A Flexible Disk Controller module is a software and hardware compatible replacement for the ISBX 218 module and provides additional features. The ISBX 218A module is a double-wide iSBX module floppy disk controller capable of supporting virtually any soft-sectored, single/double density and single/double sided floppy drives. The controller can control up to four drives. In addition to the standard IBM 3740 and IBM system 34 formats, the controller supports sector lengths up to 8192 bytes. The ISBX 218A module's wide range of drive compatibility is achieved without compromising performance. The operating characteristics are specified under user control. The controller can read and write either single or multiple sectors.

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**FUNCTIONAL DESCRIPTION**

Intel's 8272 floppy Disk Controller (FDC) chip is the heart of the iSBX 218A Controller. On-board data separation logic performs standard MFM (double density) and FM (single density) encoding and decoding, eliminating the need for external separation circuitry at the drive. Data transfers between the controller and memory are managed by the intelligent device on the host board (usually an Intel 8-bit or 16-bit CPU). A block diagram of the iSBX 218A Controller is shown in Figure 1.

**Universal Drive and iSBX™ 218A Controller**

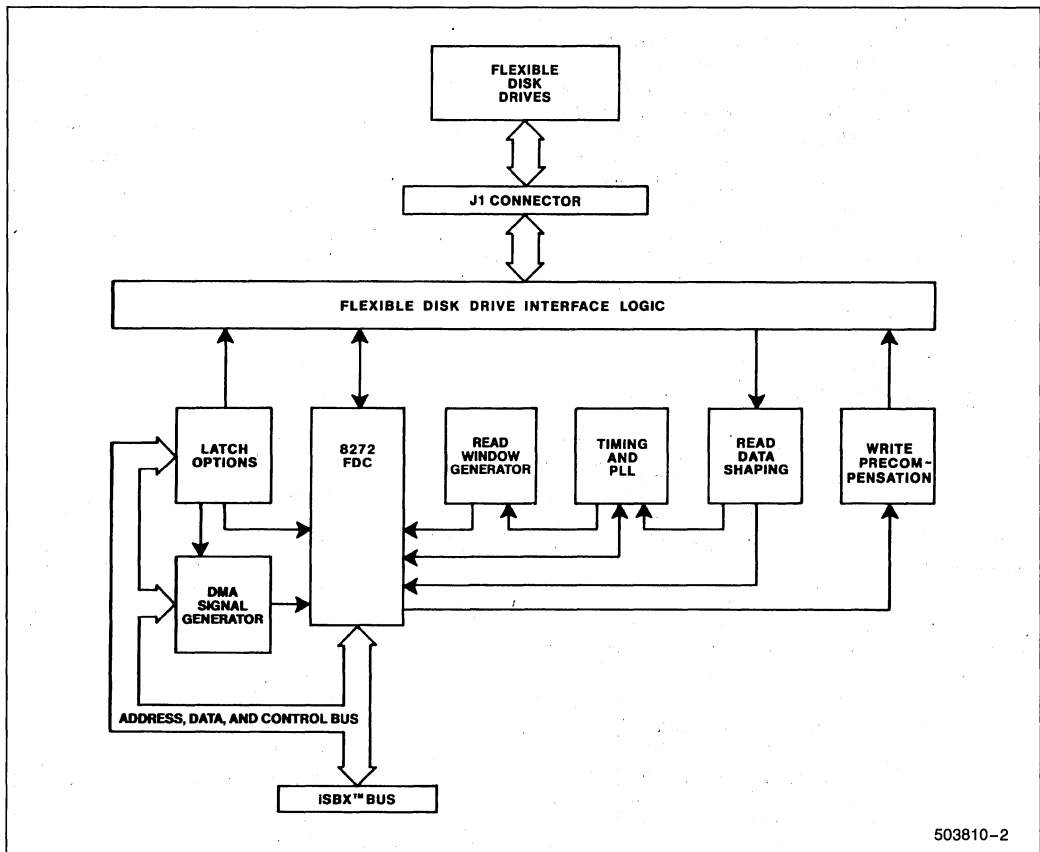
Because the iSBX 218A Controller has universal drive compatibility, it can be used to control virtually any standard-or mini-sized diskette drive. Moreover, the iSBX 218A Controller fully supports the

iSBX bus and can be used with any single board computer which provides this bus interface. Because the iSBX 218A Controller is programmable, its performance is not compromised by its universal drive compatibility. The track-to-track access, head-load, and head-unload characteristics of the selected drive model are program specified. Data may be organized in sectors up to 8192 bytes in length.

**Interface Characteristics**

The standard iSBX 218A Controller includes an Intel 8272 Floppy Disk Controller chip which supports up to four drives, single or double sided.

**SIMPLIFIED INTERFACE**—The cable between the iSBX 218A Controller and the drive(s) may be low cost, flat ribbon cable with mass termination connectors. The mechanical interface to the board



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Figure 1. Block Diagram of iSBX™ 218A Board

is a right-angle header with locking tabs for security of connection.

**PROGRAMMING**—The powerful 8272 FDC circuit is capable of executing high-level commands that simplify system software development. The device can read and write both single and multiple sectors. CRC characters are generated and checked automatically. Recording density is selected at each Read and Write to support the industry standard technique of recording basic media information on Track 0 or Side 0 in single density, and then switching to double density (if necessary) for operations on other tracks.

**PROGRAM INITIATION**—All diskette operations are initiated by standard iSBX bus input/output (I/O) operations through the host board. System software first initializes the controller with the operating characteristics of the selected drive. The diskette is then formatted under program control. Data transfers occur in response to commands output by the CPU.

**DATA TRANSFER**—Once a diskette transfer operation has been initiated, the controller will require a data transfer every 13 microseconds (double density) or 26 microseconds (single density). Most CPUs will operate in a polled mode, checking controller status and transferring bytes when the controller is ready. Boards utilizing the Intel 8080 chip, such as the iSBC 80/10B board, will be restricted to single density operation with the iSBX 218A Controller, due to these speed requirements.

**DMA OPERATION**—The iSBX 218A module can be used either with or without a DMA controller on the host board. Standard DMA controllers provide a DACK (DMA Acknowledge) signal for proper DMA operation with the 8272. The iSBX 218A's on-board DACK generator provides the interface to allow the iSBX 218A module to be used with DMA controllers such as Intel's 8089 and 80186 processors that do not provide a DACK signal.

## SPECIFICATIONS

### Compatibility

**CPU**—Any single board computer or I/O board implementing the iSBX bus interface and connector.

**Devices**—Double or single density standard (8") and mini (5¼") flexible disk drives. The drives may be single or double sided. Drives known to be compatible are indicated in the table to the right.

Standard (8")		Mini (5¼")	
<b>Caldisk</b>	143M	<b>Shugart</b>	450/400
<b>Remex</b>	RFD 4000	<b>Shugart</b>	460/410
<b>Memorex</b>	550	<b>Micropolis</b>	1015-IV
<b>MFE</b>	700	<b>Pertec</b>	250
<b>Siemens</b>	FDD 200-8	<b>Siemens</b>	200-5
<b>Shugart</b>	SA 850/800	<b>Tandon</b>	TM-100
<b>Shugart</b>	SA 860/810	<b>CDC</b>	9409
<b>Pertec</b>	FD650	<b>MPI</b>	51/52/91/92
<b>CDC</b>	9406-3		

## Data Organization and Capacity

### Standard Size Drives

	Double Density						Single Density					
	IBM System 34			Non-IBM			IBM System 3740			Non-IBM		
Bytes per Sector	256	512	1024	2048	4096	8192	128	256	512	1024	2048	4096
Sectors per Track	26	15	8	4	2	1	26	15	8	4	2	1
Tracks per Diskette	77			77			77			77		
Bytes per Diskette (Formatted, per diskette surface)	512,512 (256 bytes/sector) 591,360 (512 bytes/sector) 630,784 (1024 bytes/sector)			630,784			256,256 (128 byte/sector) 295,680 (256 bytes/sector) 315,392 (512 bytes/sector)			315,392		

**Diskette**—Unformatted IBM Diskette 1 (or equivalent single-sided media); unformatted IBM Diskette 2D (or equivalent double-sided).

### Equipment Supplied

iSBX 218A Controller

Reference Schematic

Controller-to-drive cabling and connectors are not supplied with the controller. Cables can be fabricated with flat cable and commercially-available connectors as described in the iSBX 218A Hardware Reference Manual.

Nylon Mounting Screws and Spacers

### Physical Characteristics

Width: 3.15 inches (8.0 cm)

Height: 0.83 inches (2.1 cm)

Length: 7.5 ounces (19.1 cm)

Weight: 4.5 ounces (126 gm)

Mounting: Occupies one double-wide iSBX MULTI-MODULE™ position on boards; increases board height (host plus iSBX board) to 1.13 inches (2.87 cm).

### Drive Characteristics

	Standard Size	Mini Size
	Double/Single Density	Double/Single Density
Transfer Rate (K bytes/sec)	62.5/31.25	31.25/15.63
Disk Speed (RPM)	360	300
Step Rate Time (Programmable)	1 to 16 ms/track in 1 ms increments	2 to 32 ms/track in 2 ms increments
Head Load Time (Programmable)	2 to 254 ms in 2 ms increments	4 to 508 ms in 4 ms increments
Head Unload Time (Programmable)	16 to 240 ms in 16 ms increments	32 to 480 ms in 32 ms increments

### ORDERING INFORMATION

**Part Number Description**

SBX 218A Flexible Disk Controller

### Electrical Characteristics

Power Requirements: +5VDC @ 1.7A max.

### Environmental Characteristics

Temperature: 0°C to +55° (operating); -55°C to +85°C (non-operating).

Humidity: Up to 90% Relative Humidity without condensation (operating); all conditions without condensation or frost (non-operating).

### Reference Manual

**145911-001**—iSBX 218A Flexible Disk Controller Hardware Reference Manual (NOT SUPPLIED).

Reference manuals may be ordered from any Intel sales representative, distributor office, or from Intel Literature Department, 3065 Bowers Avenue, Santa Clara, California 95051.