



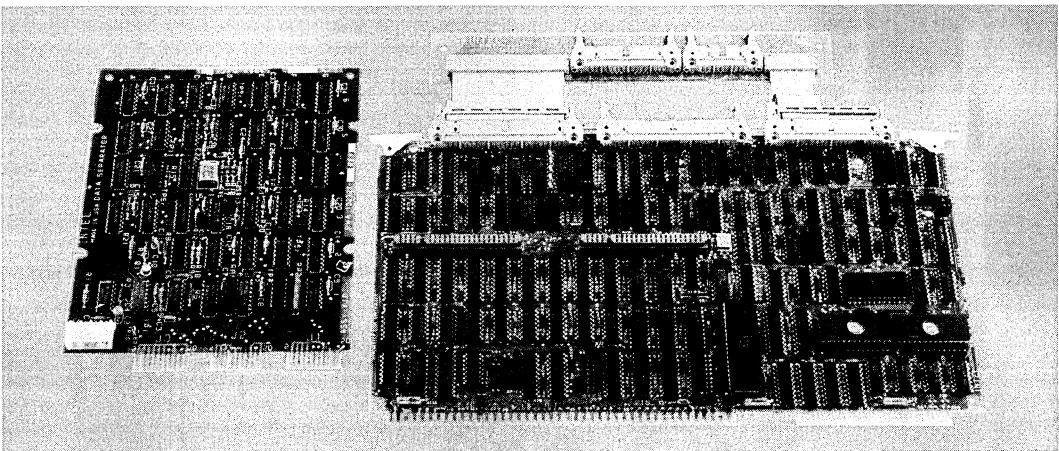
iSBC® 215G 5.25" WINCHESTER CONTROLLER KIT

- Includes iSBC® 215 Generic Winchester Controller and iSBC® 213 Data Separator Kit
- Controls up to two disk drives compatible with industry standard ST506/412 interface
- Data Separator board is form factor compatible to mount on 5.25" drive
- Software drivers available for iRMX™ 86, iRMX™ 88 and XENIX* Operating Systems
- Intel 8089 I/O Processor provides intelligent DMA capability
- On-board diagnostics and ECC
- Full sector buffering on-board
- Capable of directly addressing 16 MB of system memory
- Removeable back-up storage available through the iSBX™ 218A Floppy Disk Controller and the iSBX™ 217C 1/4" Tape Controller

The Intel iSBC® 215 Generic Winchester Controller Kit supports up to two 5.25" Winchester disk drives, compatible with the industry standard Seagate ST506/412 interface, which support buffered step pulses. The Kit consists of Intel's iSBC 215 Generic Winchester Controller (GWC) and the iSBC 213 Data Separator Kit. The data separator is designed to handle data transfers to 5 megabits per second and uses MFM (modified frequency modulation) data encoding/decoding for writing/reading on the drives. A scrambler card matches the pinout of the iSBC 215 Generic Winchester Controller to the pinout of ST506/412 compatible drives.

Optional integrated backup is available via two iSBX™ connectors on the iSBC 215 GWC and two iSBX modules: the iSBX 218A Floppy Disk Controller module and the iSBX 217C 1/4" Tape Controller module.

The iSBC 215G 5.25" Winchester Controller Kit is used in Intel's popular System 86/310 product.



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FUNCTIONAL DESCRIPTION

Disk Interface

The iSBC 215G 5.25" Winchester Controller Kit consists of the iSBC 215 Generic Winchester Controller and the iSBC 213 Data Separator Kit. The iSBC 213 Kit consists of a data separator board and a scrambler card and allows the iSBC 215 Generic Winchester Controller to interface to two 5.25" Winchester drives utilizing the Seagate ST506/412 interface. The data separator converts data from MFM (modified frequency modulation) format to NRZ (non-return to zero) format for reading from Winchester disk drives and from NRZ format to MFM format for writing on Winchester disk drives. The data separator board also provides write precompensation, address mark generation/detection and a multiplexer that allows interfacing to two disk drives. The scrambler card matches the pinout of the iSBC 215 Generic Winchester Controller to the pinout required for the ST506/412 interface. A typical configuration using two 5.25" Winchester drives and the iSBC 215G Winchester Controller Kit is shown in Figure 1.

The cables that connect the iSBC 215 Generic Winchester Controller to the scrambler card are

included. The customer provides the cables going to the drives and between the scrambler board and the data separator board. These may be made with low cost, mass terminated, flat ribbon cable.

Full On-Board Buffer

The iSBC 215 GWC contains enough on-board RAM for buffering one full data sector. The controller is designed to make use of this buffer in all transfers. The on-board sector buffer prevents data overrun errors and allows the iSBC 215 Generic Winchester Controller to occupy any priority slot on the MULTIBUS® System Bus.

ECC

High data integrity is provided by on-board Error Checking Code (ECC) logic. When writing sector ID or data fields, a 32-bit ECC, for burst error correction, is appended to the field by the controller. During a read operation, the same logic regenerates the ECC polynomial and compares this second polynomial to the appended ECC. The ECC logic can detect an erroneous data burst up to 32 bits in length and using an 8089 algorithm

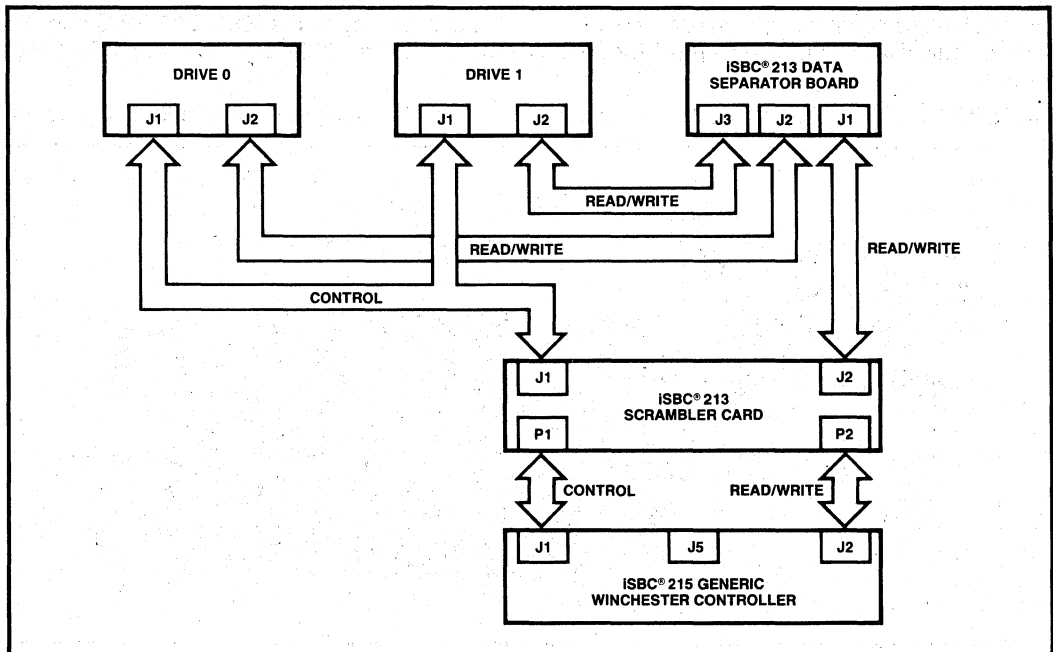


Figure 1. Configuration for Connecting Two 5.25" Winchester Disk Drives Compatible With ST412 Interface

can correct an erroneous burst up to 11 bits in length.

iSBX™ Interface

Two iSBX bus connectors provide I/O expansion capability for the iSBC 215 GWC. With the optional addition of the iSBX 218A Flexible Disk Controller MULTIMODULE™ and or the iSBX 217C 1/4" Tape Interface Module, the iSBC 215 GWC can be configured into one of four types of peripheral subsystems, see Table 1.

Table 1. Peripheral Subsystem Configurations

| | iSBC® 215G | iSBX™ 218A | iSBX™ 217C |
|---------------------------------|------------|------------|------------|
| Winchester Only | ✓ | | |
| Winchester + Floppy | ✓ | ✓ | |
| Winchester + 1/4" Tape | ✓ | | ✓ |
| Winchester + Floppy + 1/4" Tape | ✓ | ✓ | ✓ |

Expanded I/O Capability

The iSBC 215 GWC allows the execution of user-written 8089 programs located in on-board or MULTIBUS system RAM. Thus the full capability of the 8089 I/O processor can be utilized for custom I/O requirements.

MULTIBUS® Interface

The iSBC 215 Generic Winchester Controller interfaces to the system CPU(s) through MULTIBUS memory. The iSBC 215 GWC directly addresses 16 megabytes of system memory. Commands are passed to and from the iSBC 215 GWC via memory based parameter blocks; these parameter blocks are executed directly by the iSBC 215 GWC thus off-loading the system CPU(s). Data transfers to and from the iSBC 215 GWC are done via the high speed DMA capability of the Intel 8089 I/O processor.

A block diagram of the iSBC 215 GWC is shown in Figure 2.

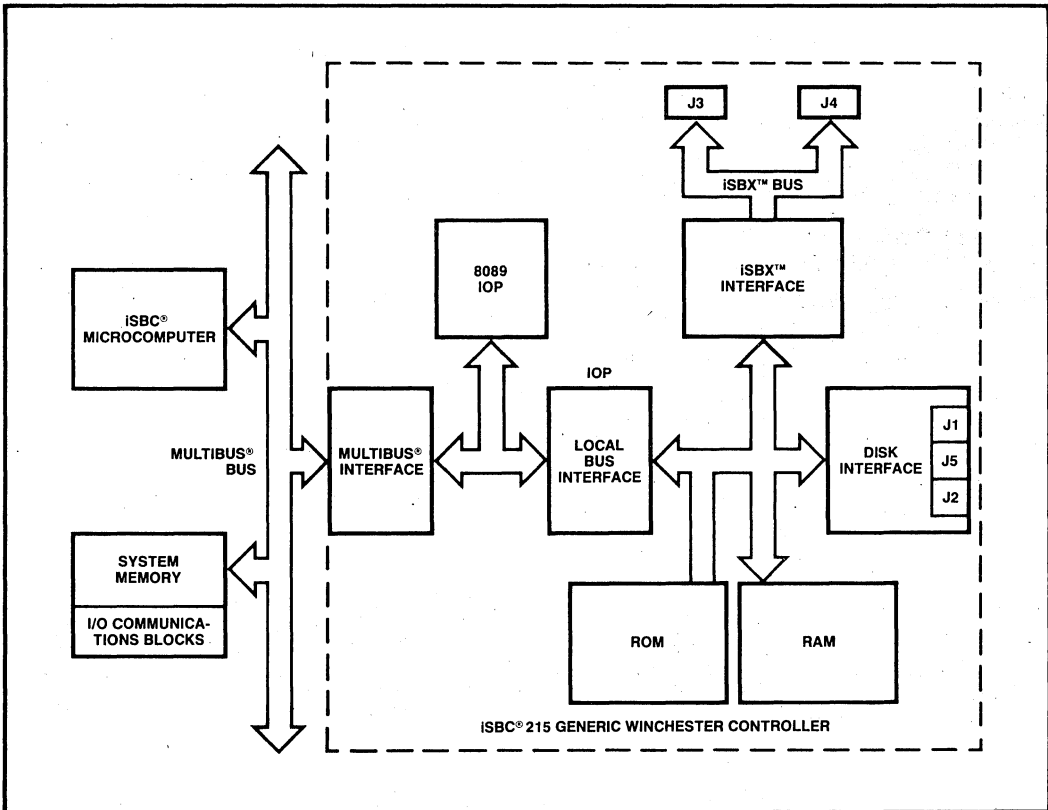


Figure 2. Block Diagram of iSBC® 215 Generic Winchester Controller

SPECIFICATIONS

Compatibility

CPU — Any MULTIBUS computer or system mainframe.

Disk Drives — 5.25" Winchester disk drives compatible with the industry standard Seagate ST506/412 interface. Computer Memories Inc. (CMI) Model 5412 and 5619 drives have been extensively evaluated with the board and are known to function properly. Other drives should be extensively evaluated by the customer if they are to be used.

Transfer rate — 5 megabits per second.

Equipment Supplied

iSBC 215 Generic Winchester Controller
iSBC 213 Data Separator Board
iSBC 213 Scrambler Card
iSBC 213 Data Separator Kit Installation Guide
Reference Schematic

Scrambler to data separator and drive cabling and connectors are not supplied with the kit. Cables can be fabricated with flat cable and commercially available connectors as described in the iSBC 213 Installation Guide.

Physical Characteristics

iSBC® 215 GWC — Width: 6.75 in. (17.2 cm); Length: 12.0 in (30.5 cm); Height: 0.5 in. (1.3 cm)

Data Separator — Width: 5.50 in. (13.9 cm); Length: 7.25 in. (18.3 cm); Height: 0.5 in. (1.3 cm)

Scrambler — Width: 1.4 in. (3.6 cm); Length: 9.0 in. (22.9 cm); Height: 0.4 in. (1.0 cm)

Electrical Characteristics

iSBC® 215 GWC — +5 VDC @ 4.52A (max.); -5 VDC @ 0.015A (max.)¹; +12 VDC @ 0.15A (max.)²; -12 VDC @ 0.055A (max.)^{1,2}

iSBC® 213 Data Separator — +5 VDC @ 1.5A (max.)

NOTES:

1. On-board regulator and jumper allows -12 VDC usage from MULTIBUS.
2. Required for some iSBX modules.

Drives Per Controller

5.25" Winchester Disk Drives — Up to two drives; compatible with the industry standard ST506/412 interface.

Floppy Disk Drives — Up to four drives via the optional iSBX 218A Floppy Disk Controller module connected to an iSBX connector on the iSBC 215 GWC board

1/4" Tape Drives — Up to four drives via the optional iSBX 217C 1/4" Tape Controller module connected to an iSBX connector on the iSBC 215 GWC board.

Environmental Characteristics

iSBC® 215 GENERIC WINCHESTER CONTROLLER

Temperature — 0°C to 55°C (operating) at 200 linear feet per minute (LFM) air velocity; -55°C to +85°C (non-operating)

Humidity — Up to 90% relative humidity without condensation (operating); all conditions without condensation or frost (non-operating)

iSBC 213 DATA SEPARATOR

Temperature — +10°C to 46°C (operating); -40°C to +62°C (non-operating)

Humidity — 8% to 80% (operating); 1% to 95% (non-operating)

Reference Manual

144780 — iSBC 215 Generic Winchester Controller Hardware Reference Manual (NOT SUPPLIED)

146232 — iSBC 213 Data Separator Kit Installation Guide (SUPPLIED)

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

ORDERING INFORMATION

Part Number Description

| | |
|---------------|---------------------------------|
| iSBC 215G Kit | 5.25" Winchester Controller Kit |
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