



iSBC® 012EX, 010EX, 020EX, and 040EX HIGH PERFORMANCE RAM BOARDS

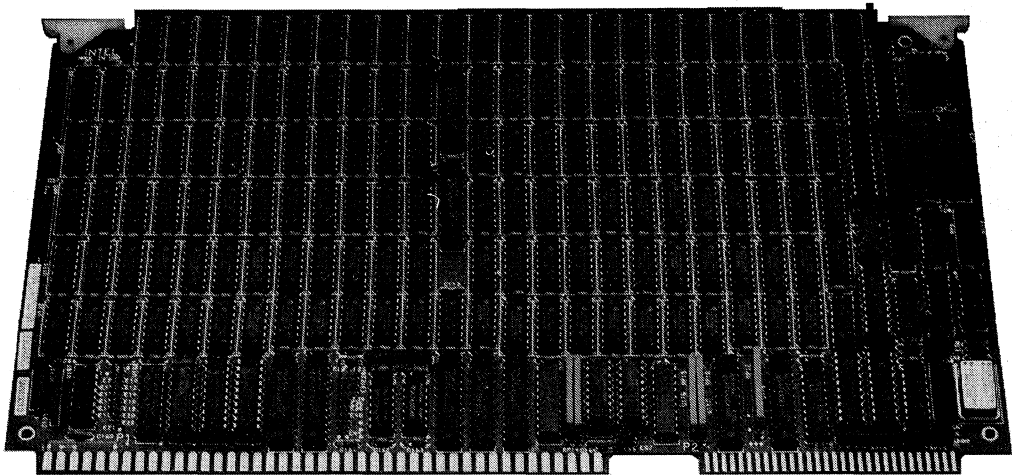
- 0 Wait States at 8 MHz Performance with the iSBC® 286/10A, iSBC 286/12 Board
- Dual Port Capability Via MULTIBUS® and High Speed Synchronous Interface
- Configurable to Function Over iLBX™ Bus
- On-Board Parity Generator/Checker
- Independently Selectable Starting and Ending Addresses
- 16 Megabyte Addressing Capability
- 512K Byte, 1024K Byte, 2048K Byte, and 4096K Byte Densities Available

The iSBC 012EX, iSBC 010EX, iSBC 020EX, and iSBC 040EX RAM memory boards are members of Intel's complete line of iSBC memory and I/O expansion boards. The EX boards are dual ported between the MULTIBUS interface and one of two types of dedicated memory buses. The dedicated buses are the iLBX bus and a high speed interface. The EX series of RAM-boards can be configured to be accessed over the iLBX bus, as well as MULTIBUS bus, to provide memory support for the iSBC 286/10 board, performing at 6 MHz and the iSBC 186/03A board, performing at 8 MHz. The EX boards are default configured to run over the MULTIBUS interface and the high speed interface. This provides 0 wait state 8 MHz memory support for the iSBC 286/10A and iSBC 286/12 boards.

The EX RAM-boards generate byte oriented parity during all write operations and perform parity checking during all read operations. An on-board LED provides a visual indication that a parity error has occurred.

The iSBC 012EX, iSBC 010EX, iSBC 020EX, and iSBC 040EX boards contain 512K bytes, 1M byte, 2M bytes, and 4M bytes of read/write memory using 256K dynamic RAM components.

Due to the high speed synchronous interface capability of the boards, they are ideally suited in applications where memory performance is critical.



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FUNCTIONAL DESCRIPTION

General

The iSBC 012EX, 010EX, 020EX, and 040EX RAM boards are physically and electrically compatible with the MULTIBUS interface standard, IEEE-796, as outlined in the Intel MULTIBUS architecture specification.

Dual Port Capabilities

The "EX" series of RAM-Boards can be accessed by the MULTIBUS interface, and either the iLBX Bus, or the high speed synchronous interface (see Figures 1 and 2). The EX series require jumper and PAL configuration to be accessed over iLBX Bus.

Intel's iLBX interface is an unarbitrated bus architecture which allows direct transfer of data between the CPU and the memory boards without accessing the MULTIBUS bus. Due to the unarbitrated nature of the iLBX interface, significant improvements in memory access times compared to the MULTIBUS bus accesses result. The EX Boards provide 1 wait state performance at 6 MHz and 2 wait states at 8 MHz over the iLBX board. The EX Memory Board Hardware Reference Manual should be consulted for details.

The high speed synchronous interface, like the iLBX Bus, is a bus architecture which allows direct transfer of data between the CPU and the memory boards without accessing the MULTIBUS bus. This high speed interface runs synchronously with the iSBC 286/10A and iSBC 286/12 to provide 0 wait state performance at 8 MHz.

System Memory Size

Maximum system memory size with this series of boards is 16 megabytes. Memory partitioning is independent for the MULTIBUS interface and the iLBX interface.

Address Selection/Memory

SELECTABLE STARTING ADDRESS

A 256K boundary select is implemented on the iSBC 012EX board. A 512K boundary select is implemented on the iSBC 010EX board. A 1M boundary is implemented on the iSBC 020EX and iSBC 040EX boards.

SELECTABLE ENDING ADDRESS

The ending address is selectable as memory size minus select options of 0, 128K, 256K, or 512K on all of the EX boards.

PARITY INTERRUPT CLEAR

The I/O address of the Parity Interrupt Clear circuitry is jumperable to any one of 256 addresses.

SPECIFICATIONS

Word Size Supported

8- or 16-bits.

Memory Size

524,288 bytes (iSBC 012EX board)
1,048,576 bytes (iSBC 010EX board)
2,097,152 bytes (iSBC 020EX board)
4,194,304 bytes (iSBC 040EX board)

Access Times (All densities)

MULTIBUS® SYSTEM BUS

Read/Full Write— 375 ns (max)
Write Byte— 375 ns (max)

HIGH SPEED SYNCHRONOUS INTERFACE

Read/Full Write— 167 ns (max)
Write Byte— 132 ns (max)

ILBX™ BUS

Read/Full Write— 295 ns (max)
Write Byte— 116 ns (max)

Cycle Times (All densities)

MULTIBUS® SYSTEM BUS

Read/Full Write— 625 ns (max)
Write Byte— 625 ns (max)



HIGH SPEED SYNCHRONOUS INTERFACE

Read/Full Write— 250 ns (max)
Write Byte — 250 ns (max)

iLBX™ BUS

Read/Full Write— 437.5 ns (max)
Write Byte — 437.5 ns (max)

Memory Partitioning

Maximum System memory size is 16M Bytes for the MULTIBUS, iLBX bus and the high speed interface.

BASE ADDRESS

Board	Base Address
iSBC 012EX Board	any 256K boundary in first 4 megabytes
iSBC 010EX Board	any 512K boundary in first 8 megabytes
iSBC 020EX Board	any 1M boundary
iSBC 040EX Board	any 1M boundary

Power Requirements

Voltage—5 VDC ±5%

Product	Current
iSBC 012EX Board	3.2A (typ) 4.9A (max)
iSBC 010EX Board	3.4A (typ) 5.0A (max)
iSBC 020EX Board	3.7A (typ) 5.2A (max)
iSBC 040EX Board	3.9A (typ) 5.5A (max)

ENVIRONMENTAL REQUIREMENTS

Operating
Temperature: 0°C to 60°C airflow of 5 cubic feet per minute

Storage
Temperature: -40°C to +75°C

Operating
Humidity: To 90% without condensation

PHYSICAL DIMENSIONS

Width: 12 inches (30.48 cm)
Height: 6.75 inches (17.15 cm)
Thickness: 0.50 inches (1.27 cm)
Weight: iSBC 012EX board: 6.8 ounces (1910 gm)
iSBC 010EX board: 9.0 ounces (2550 gm)
iSBC 020EX board: 13.5 ounces (3830 gm)
iSBC 040EX board: 18.0 ounces (5100 gm)

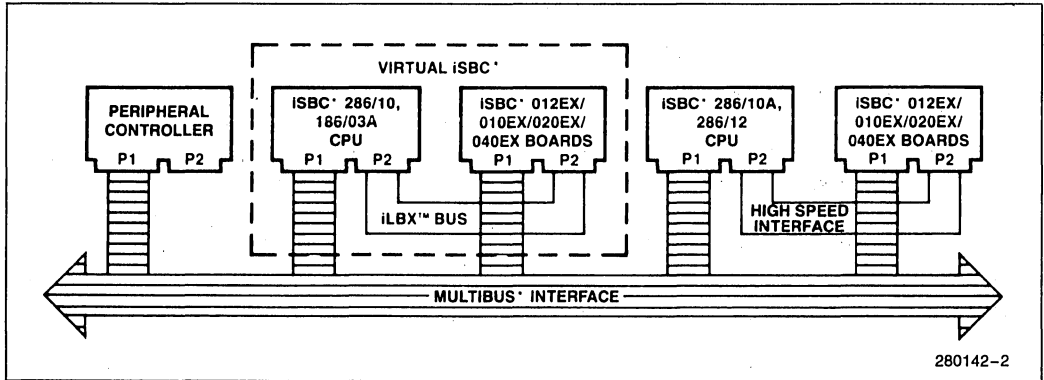
REFERENCE MANUALS

- 147783-001— iSBC 012EX/iSBC 010EX/iSBC 020EX/iSBC 040EX Hardware Reference Manual
- 9800683-03— Intel MULTIBUS Specification
- 144456-001— Intel iLBX Specification

Manuals may be ordered from any Intel Sales Representative, Distributor Office or from the Intel Literature Department, 3065 Bowers Avenue, Santa Clara, CA 95051.

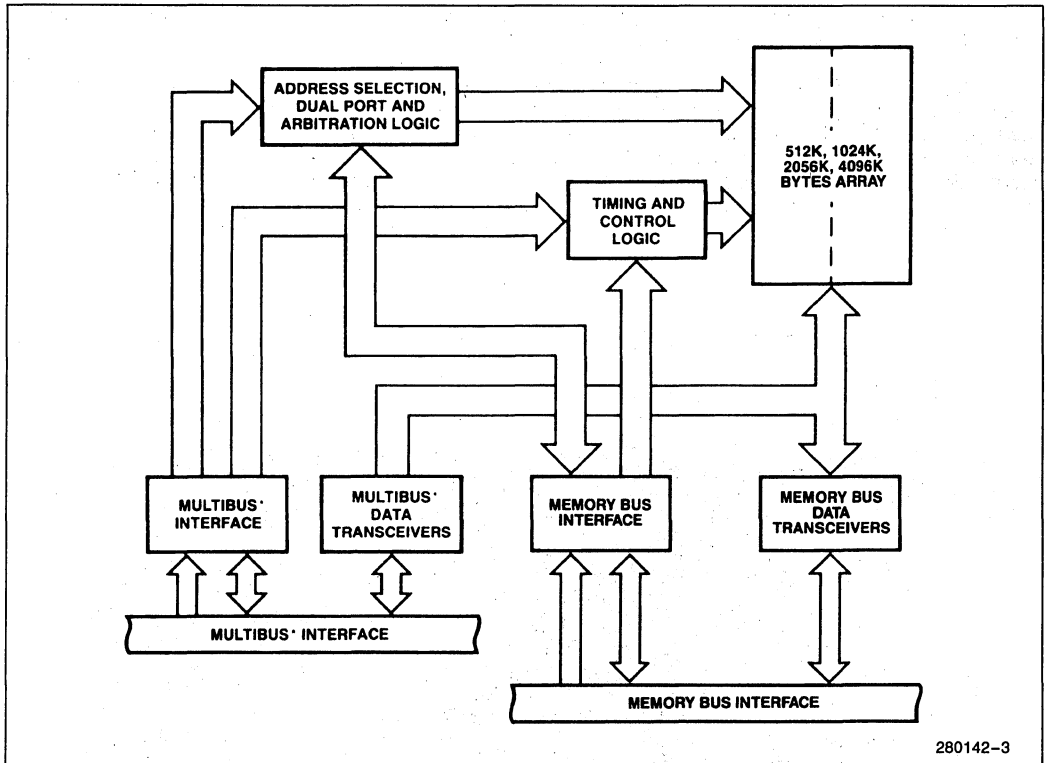
ORDERING INFORMATION

Part Number	Description
iSBC 012EX	512K byte RAM board with parity, iLBX connectors, and high speed interface
iSBC 010EX	1M byte RAM board with parity, iLBX connectors, and high speed interface
iSBC 020EX	2M byte RAM board with parity, iLBX connectors, and high speed interface
iSBC 040EX	4M byte RAM board with parity, iLBX connectors, and high speed interface
EX ASYNCPKG	Jumper scheme and PAL's required to configure EX memory boards for iLBX function with the iSBC 186/03A and iSBC 286/10



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Figure 1. Typical ILBX™ System Configuration



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Figure 2. ISBC® EX Memory Board Block Diagram