

OEM Boards, Systems & Software

1995 Product Selection Guide

*Multibus I
Products*

*Multibus II
Products*

*iRMX®
Real-Time
Software*



intel®

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Foreword

Dear Customer,

In 1976, history was made when Intel introduced its first single board computer, the iSBC 80/10. The iSBC 80/10 board integrated a microprocessor, memory, and I/O onto the first OEM single board computer. Today, the current revision of that board, the iSBC 80/10B, is still shipping—twenty years later.

Day after day, year after year, Intel has proven its reliability as a vendor of high quality, high performance products that meet the special needs of the industrial OEM. The board you bought last year will very likely be available this year, and the year after that. We understand the long lifecycles of your products, and adapt our own product lifecycles accordingly.

But we don't just keep doing the same old thing. Intel has always been on the forefront of providing the latest technology to the industrial OEM market. See page 2-2 for information on the highest performing Multibus II board available in the market today: our Pentium™ Processor-based, PC-Compatible CPU board. Or page 1-2 for our latest Multibus I CPU board, which is available with an IntelDX4™ processor, and supports the Pentium OverDrive™ processor. Both of these boards take advantage of the latest I/O technology via their on-board PCI local bus.

If your application calls for rapid data acquisition and transmittal, you'll be glad to hear about our new MIX 232 and MIX 422 Communications Modules (p. 2-6). Combined with Intel's MIX 486 baseboard, these modules can be used to build high-performance, cost-effective Multibus II communications platforms.

For the latest enhancements in Live Insertion on Multibus II, see p. 3-2. Live Insertion on Multibus II provides an unparalleled Open Systems solution for those applications that just cannot afford downtime.

Using the latest release of the iRMX® Operating Systems, real-time applications can now be developed using industry standard DOS development tools. See page 7-2 for the latest information.

If you'd like more information on any of the products listed in the guide, mail in the Reader Service Cards located in the back. For the name of a local distributor, or to talk with us directly, contact us at the numbers listed in the "For More Information" section. We're here to help!

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I/O Boards

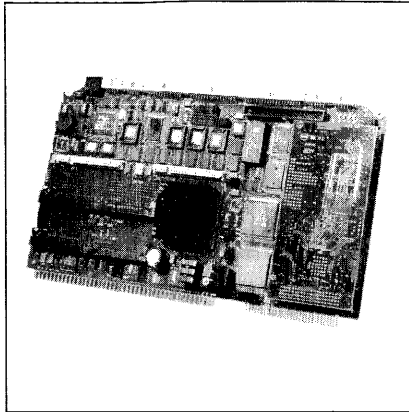
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Multibus I CPU Boards

iSBC PCP4 CPU Board

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Fact Sheet #281688-001

- Intel486™SX, IntelDX2™, and IntelDX4™ processors
- Intel 82424X PCI local bus with PCI to Multibus I Bridge ASIC
- 2 SIMM sockets supporting up to 64 MB (8mbx36) DRAM
- Integrated Intel 82595TX Ethernet controller
- Supported by the iRMX III Operating Systems, MS-DOS® 6.2, Windows® 3.1, and others.
- Integrated PCI-based IDE and Fast SCSI-2
- 128K L2 Cache, user configurable as write-through or write-back
- Standard PC features: 2 serial ports, 1 parallel port, keyboard, mouse
- Optional PCI-based SVGA Graphics Module available
- Supports Multibus "Real Mode" and "Protected Mode" memory space, Multibus I/O space, and dual-port memory

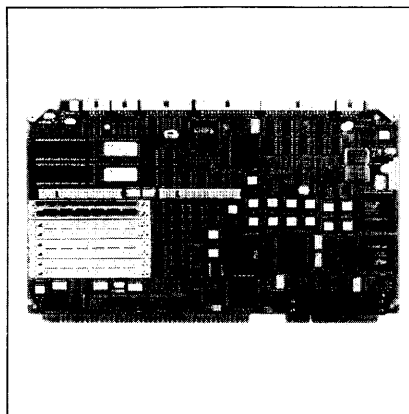
The Multibus I Embedded PC Single Board Computers are highly integrated, PC-compatible boards based upon the Intel486 processor family and PCI (Peripheral Component Interconnect) local bus I/O. The PCI local bus architecture provides an interface to on-board, high-performance industry standard I/O.

The Embedded PC family also offers traditional Multibus I features such as configurable dual-port memory, and Multibus memory address space in Real and Protected Mode—both with aliasing through Multibus address space. The combination of PC compatibility and traditional Multibus I functionality makes this family of products one of the most versatile offerings in the market today.

iSBC 386/SX CPU Board

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Fact Sheet #281111-002

- 16MHz i386™ SX CPU
- Supports iRMX® for Windows 32-bit real time operating system with DOS at the same time
- i387™ SX Math Coprocessor socket
- 512K or 2 MByte on-board DRAM, expandable to 8 MBytes
- Two 32-pin EPROM sockets plus two universal sockets for EPROM, SRAM or FLASH
- On-board IDE hard disk and floppy controllers
- Two serial and one parallel ports
- Two 8/16-bit iSBX connectors
- Graphics add-on module supporting VGA, EGA, CGA, Hercules Mono formats
- Ethernet add-on module
- PC AT and DOS software compatibility

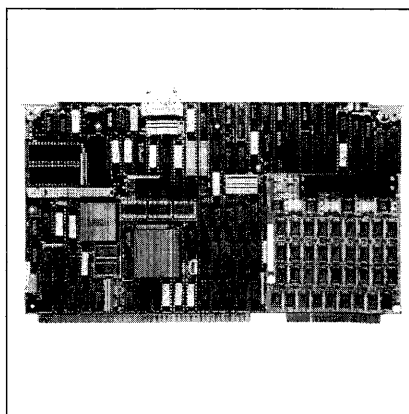
The iSBC 386/SX single board computer is a cost-effective way to add 32-bit performance and DOS software compatibility to a Multibus I application. Based on the i386 SX microprocessor and optional i387 SX Math Coprocessor, the iSBC 386/SX provides a 4X increase in compute power over most 8086 and 80186-based single board computers.

The iSBC 386/SX has the complete set of on-board I/O, real-time, and peripheral control resources found on a PC AT motherboard and a Multibus I CPU board. Included are an on-board floppy controller, Winchester hard disk controller, two serial ports, parallel port, interrupt controller, real-time clock, DMA and two full iSBX connectors. Options include the iSBC 272 VGA Graphics Module, the iSBC 282 Ethernet module, and the CABLESBC386SX Cable Kit.

iSBC 386/32/34/38 and iSBC 386/24/28 CPU Board

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Fact Sheet #280602-004

Hardware Reference Manual #147533-001

- i386 microprocessor with a 20 or 16 MHz clock
- Available with 2, 4 or 8 MB of on-board 32-bit memory, expandable to 16 MB
- High-speed 80387 floating point math coprocessor
- Two 32-bit JEDEC sites for up to 512 kilobytes of EPROM memory
- RS232C interface for local/remote control and diagnostics
- iSBX interface for low cost I/O expansion
- 16 levels of direct vectored interrupt control
- 64 kilobyte 0 wait-state cache memory

The iSBC 386/2X/3X series boards feature a 20 or 16 MHz i386 CPU, an i387 math coprocessor, a 64k byte 0 wait-state cache memory to support the CPU, and a 32-bit interface to 4 or 8 megabytes of dual-port parity DRAM. The boards employ a dual-bus structure, a 32-bit CPU bus for data transfers between the CPU and memory, and a 16-bit bus for data transfers over the Multibus interface, iSBX interface, EPROM local memory, and I/O interfaces. These boards take advantage of the i386 CPU's 32-bit performance while maintaining compatibility with the Multibus I interface. Incoming interrupts, from twenty interrupt sources, are handled by two cascaded on-board 8259A programmable interrupt controllers and by the i386 CPU's NMI line.

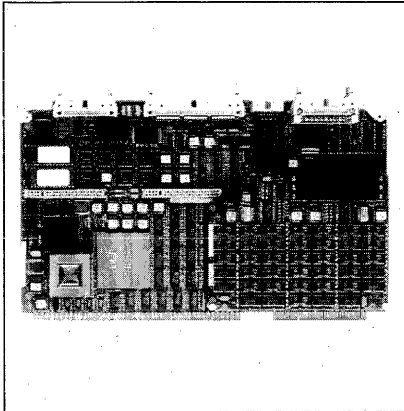
Call Our Factory Sales Team

Multibus I CPU Boards

iSBC 486/12X CPU Board

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016



- 66 MHz IntelDX2™ or 33 MHz i486™ Microprocessor
- 82258 Advanced DMA controller
- Optional SCSI interface at 5 MB/sec synchronous data rate
- Dual bus architecture-dedicated 32-bit processor execution bus
- Two 32-pin sites that support Intel flash or EPROM
- 2-64 MByte on-board 32-bit dual-port parity DRAM
- Multiprocessing support, including memory aliasing
- Functional superset of iSBC 86/XX, 286/1X, and 386/12 Single Board Computers

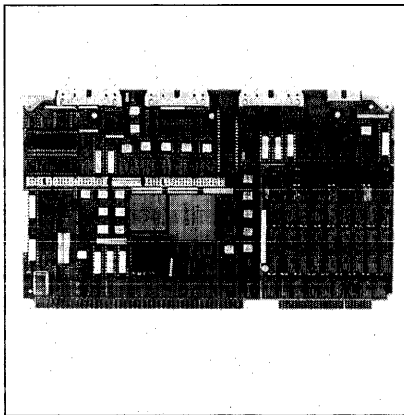
The iSBC 486/12 products are high performance, high integration Multibus I single board computers. These boards share a common core design with the iSBC 386/12 single board computer. The design provides functional compatibility with the iSBC 286/12 single board computer with up to a 5X performance improvement. The iSBC 486/12 family includes your choice of processor: 66 MHz DX2 or 33 MHz i486, I/O: with or without SCSI, and memory: 2 - 64 MB on-board DRAM. A 32-bit on-board system bus optimizes the compute performance of the i486 DX2 and i486 microprocessors. Numeric processing applications are easily handled by the i486 on-chip floating point unit (FPU).

Fact Sheet #281110-004

iSBC 386/12X CPU Board

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- i386 microprocessor with 20 MHz clock
- Optional SCSI interface; 5 MByte/sec synchronous data rate
- Select 1 - 8 MByte high-speed DRAM On-Board
- Dual bus architecture
- Two 32-pin sites for Intel flash, RAM/EPROM/ E2PROM, expandable to four sites
- Local Bus eXtension (iLBX) interface
- Reconfigurable memory addressing for use in multiprocessing applications
- Functional superset of iSBC 86/XX and 286/1X Single Board Computers
- Optional i387 math coprocessor and 82258 ADMA controller

The iSBC 386/12 products are high performance, high integration Multibus I single board computers. The iSBC 386/12 single board computer combines i386 microprocessor performance and the iSBC 286/12 I/O functionality on a single Multibus I CPU board for 2X or greater performance improvement over the iSBC 286/12. Two serial ports are provided via Intel's 8274 Multi-Protocol Serial Controller. An 82C55A Programmable Peripheral Interface provides support for the parallel line printer interface. Direct memory access transfers are provided by the 82258 ADMA controller; the DMA support is enhanced to increase flexibility and support synchronous transfers over the serial ports and SBX Bus.

The iSBC 386/12S series adds support for the industry standard, high-speed SCSI bus (Small Computer System Interface). SCSI data transfers to local DRAM are DMA supported and FIFO buffered enabling sustained synchronous SCSI data rates up to 5 MBytes/sec.

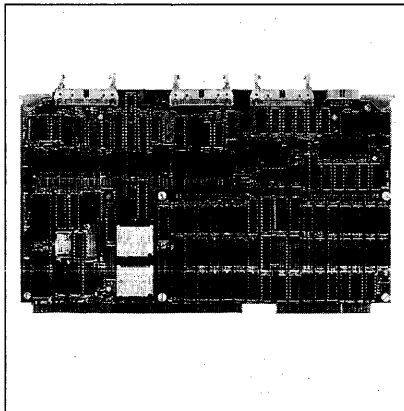
Fact Sheet #281110-004

User's Guide #459913-001

iSBC 286/12/14/16 CPU Board

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- 8 MHz 80286 Microprocessor
- Two JEDEC 28-Pin Sites for up to 128 KBytes of local EPROM Memory Expandable to 256 KBytes Using an iSBC 341 Expansion Module
- 1, 2, or 4 Megabyte, 0 Wait-State, Dual-Port, Parity Memory
- Supports User Installed 80287 Numeric Data Processor and 82258 Advanced DMA Controller Devices
- Two iSBX Bus Interface Connectors for I/O Expansion
- Synchronous High-Speed Interface for 0 Wait-State Read/Write to EX Memory Expansion Boards
- iLBX Interface for iLBX Memory Board Expansion
- 16 Levels of Vectored Interrupt Control
- Centronics-Compatible Parallel I/O Printer Interface
- Two Programmable Multiprotocol Synchronous/Asynchronous Serial Interfaces; One RS232C, the other RS232C or RS422/449 Compatible

The boards feature an 80286 microprocessor running at 8 MHz together with 1, 2, or 4 megabytes of dual-ported, 0 wait-state, parity memory. For those applications needing more memory, up to four memory expansion boards may be connected to the iSBC 286/12/14/16 boards over its P2 interface. The P2 interface supports both standard iLBX memory boards and Intel's EX series of synchronous, 0 wait-state, memory boards that provide up to 16 megabytes of system memory. The iSBC 286/12/14/16 boards also feature two sockets for user installed i287™ Numeric Data Processor and 82258 Advanced Direct Memory Access Controller devices. These components further increase board performance by off-loading time intensive tasks from the 80286 microprocessor.

Fact Sheet #280147-004

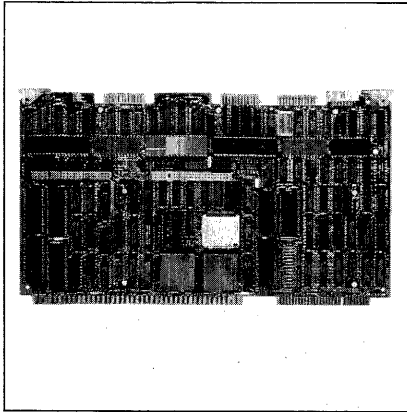
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Multibus I CPU Boards

iSBC 286/10A CPU Board

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Fact Sheet #280079-006

- 8 MHz 80286 Microprocessor
- Supports User Installed i287 Numeric Data Processor
- iLBX Interface for iLBX Memory Board Expansion
- 0 Wait-State Synchronous Interface to EX Memory Expansion Boards
- Eight JEDEC 28-Pin Sites for Optional SRAM/IRAM/EPROM/E2PROM Components
- Optional Expansion to Sixteen JEDEC 28-Pin Sites with Two iSBC 341 Boards

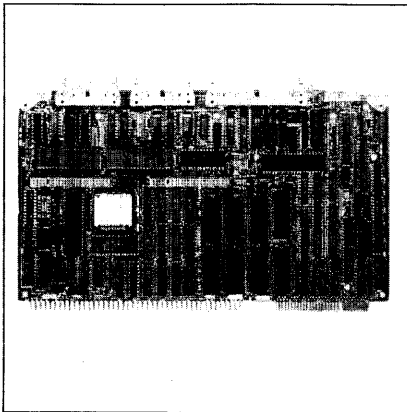
- Maximum On-Boards Memory Capacity 384 KB
- Two iSBX Bus Interface Connectors for I/O Expansion 16 Levels of Vectored Interrupt Control
- Centronics-Compatible Parallel I/O Printer Interface
- Two Programmable Multiprotocol Synchronous/Asynchronous Serial Interfaces; One RS232C, the other RS232C or RS422/449 Compatible

The iSBC 286/10A is an 8 Mhz, 80286-CPU-based Single Board Computer with two iSBX connectors for low-cost I/O expansion. The CPU, system clock, memory sockets, I/O ports and drivers, serial communications interface, priority interrupt logic and programmable timers all reside on the board. The iSBC 286/10A supports both the standard iLBX interface and the synchronous high speed interface (EX-series memory boards).

iSBC 186/03A CPU Board

Reader
Service
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005



Fact Sheet #230988-006

- 8.0 MHz 80186 Microprocessor with Optional 8087 Numeric Data Processor
- Eight (Expandable to 12) JEDEC 28-Pin Sites
- Six Programmable Timers and 27 Levels of Vectored Interrupt Control
- Multibus Interface for System Expansion and Multimaster Configuration

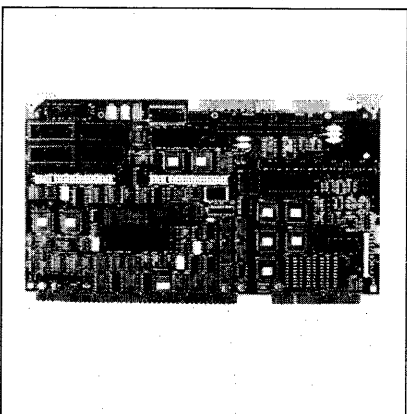
- 24 Programmable I/O Lines Configurable as a SCSI Interface, Centronics Interface of General Purpose I/O
- Two iSBX Bus Interface Connectors for Low Cost I/O Expansion iLBX (Local Bus Extension) Interface for High-Speed Memory Expansion
- Two Programmable Serial Interfaces; One RS232C, the other RS232C or RS422 Compatible

The iSBC 186/03A Single Board Computer is a 16-bit, 80186-based single board computer. The board is a complete microcomputer system on a 7.05x12.0 inch printed circuit card. The CPU, system clock, memory, sockets, I/O ports and drivers, serial communications interface, priority interrupt logic and programmable timers, all reside on the board. The iSBC 186/03A board incorporates the 80186 CPU and SCSI interface on one board. Extensive use of high integration VLSI has produced a high-performance single-board system. For large memory applications the iLBX local bus expansion maintains this high performance.

iSBC 86/35A CPU Board

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Fact Sheet #281143-001

- Complete compatibility with iSBC 86/30 and 86/35 boards
- Select 10, 8 or 5 MHz CPU operation
- 8087 numeric co-processor ready socket
- 512 KBytes of dual port DRAM installed with sockets for expansion to 1 MByte

- 960 KBytes of ROM support
- Two 16 bit iSBX Connectors
- I/O cycle support for 0-2 wait-states
- EPROM and DRAM support for 0-3 wait-states

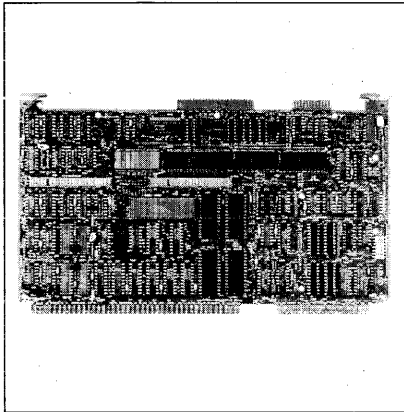
The iSBC 86/35A CPU board combines compatibility, high reliability, increased performance, and design longevity in a single new board. This new design features the latest components to ensure the longevity of designs incorporating the iSBC 86/35A. Configuration jumpers allow the iSBC 86/35A board to function as an iSBC 86/35, an 86/30, or an 86/14 Multibus I CPU board. 512K DRAM is provided with the board; user can easily expand to 1 MByte.

Multibus I CPU Boards

iSBC 86/05A CPU Board

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Fact Sheet #281143-002

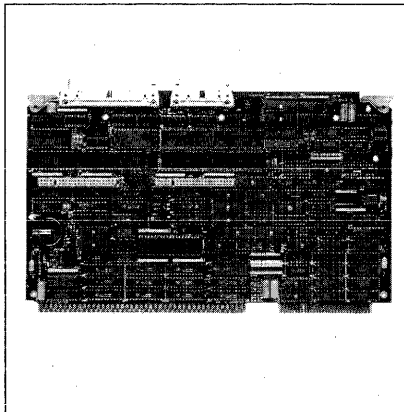
- 8086/10 (8086-2) Microprocessor with 5 or 8 MHz CPU Clock
- Software Compatible with 8086, 8088, 80186, 80286 Based 16-Bit Single Board Computers
- Optional Numeric Data Processor with iSBC 337A module
- 8 KBytes of Static RAM; Expandable On-Board to 16 KBytes
- Sockets for up to 256 KBytes of JEDEC 24/28-Pin Standard Memory Devices; Expandable On-Board to 512 KBytes
- Two iSBX Bus Connectors
- Programmable Synchronous/Asynchronous RS232C Compatible Serial Interface with Software Selectable Baud Rate
- 24 Programmable Parallel I/O Lines
- Two Programmable 16-Bit BCD or Binary Timers/Event Counters
- 9 Levels of Vectored Interrupt Control, Expandable to 65 Levels

The iSBC 86/05A Single Board Computer takes full advantage of Intel's technology to provide economical, self-contained, computer-based solutions for OEM applications. The CPU, system clock, read/write memory, Nonvolatile read only memory, I/O ports and drivers, serial communications interface, priority interrupt logic and programmable timers all reside on the board. The large control storage capacity makes the iSBC 86/05A board ideally suited for control-oriented applications such as process control, instrumentation and industrial automation.

iSBC 86C/38 CPU Board

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Fact Sheet #281143-002

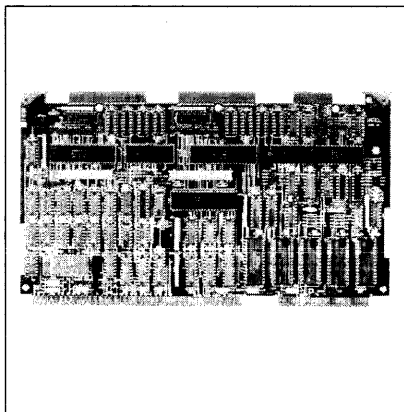
- Advanced CMOS 8MHz 80C86 microprocessor
- 1 Mbyte of dual-port, Zero wait-state DRAM with parity
- Sockets for up to 512 KBytes of standard 32 pin JEDEC EPROM devices
- Real-time clock/calendar with on-board battery backup
- Temperature-sensing device socket
- Optional 8087 numeric data processor with an iSBC 337A module

The iSBC 86C/38 has been implemented entirely in CMOS resulting in very low power consumption and low heat generation. Low heat generation allows the board to function without air flow in a sealed environment. Compatibility with the iSBC 86/35 is seamless with all of the same features supported. A full megabyte of dual port DRAM is installed with sockets for 512 KBytes of EPROM. In addition, the iSBC 86C/38 also provides a real-time clock/calendar with on-board battery and temperature sensing capability.

iSBC 80/24A CPU Board

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002



Fact Sheet #142927-005

- Upward Compatible Replacement for iSBC 80/20-4 Single Board Computer
- 8085A-2 CPU Operating at 4.8 or 2.4 MHz
- Two iSBX Bus Connectors for iSBX Board Expansion
- 48 Programmable Parallel I/O Lines with Sockets for Interchangeable Line Drivers and Terminators
- Programmable Synchronous/Asynchronous RS232C Compatible Serial Interface with Software Selectable Baud Rates
- Full Multibus Control Logic for Multimaster Configurations and System Expansion
- Two Programmable 16-Bit BCD or Binary Timers/Event Counters
- 12 Levels of Programmable Interrupt Control
- Auxiliary Power Bus, Memory Protect and Power-Fail Interrupt Control Logic Provided for Battery Backup RAM Requirements
- 8 KBytes of Static Read/Write Memory
- Sockets for Up to 32 KBytes of Read Only Memory

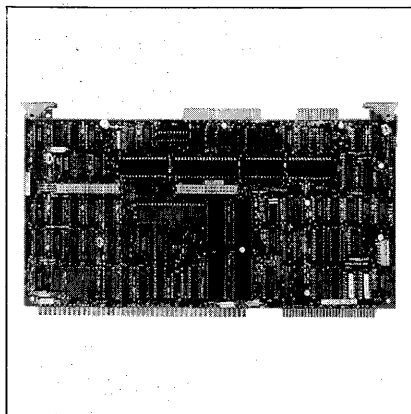
The Intel 80/24A Single Board Computer is a member of Intel's complete line of OEM microcomputer systems. The CPU, system clock, iSBX bus interface, read/write memory, read-only memory sockets, I/O ports and drivers, serial communications interface, priority interrupt logic, and programmable timers all reside on the board. Full Multibus interface logic is included to offer compatibility with the Intel OEM Microcomputer System family of Single Board Computers, expansion memory options, digital and analog I/O expansion boards, and peripheral and communications controllers.

Multibus I CPU Boards

iSBC 88/25 CPU Board

Reader
Service
Number

003



Fact Sheet #143847-004

- 8-Bit 8088 Microprocessor Operating at 5 MHz
- One MByte Addressing Range
- Two iSBX Bus Connectors
- Optional Numeric Data Processor with iSBC 337A module
- 4 KBytes of Static Ram; Expandable On-Board to 16K Bytes
- Sockets for up to 64 KBytes of JEDEC 24/28-Pin Standard Memory Devices; Expandable On-Board to 128 KBytes

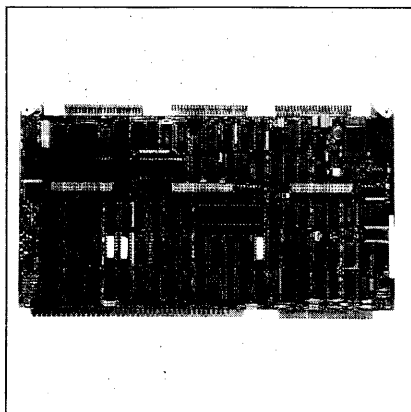
- Programmable Synchronous/Asynchronous RS232C Compatible Serial Interface with Software Selectable Baud Rates
- 24 Programmable Parallel I/O Lines
- Two Programmable 16-Bit BCD or Binary Timers/Events Counters
- 9 Levels of Vectored Interrupt Control, Expandable to 65 Levels
- MULTIBUS Interface for Multimaster Configurations and System Expansion

The iSBC 88/25 Single Board Computer takes full advantage of Intel's technology to provide economical, self-contained, computer-based solutions for OEM applications. The CPU, system clock, read/write memory, nonvolatile read only memory, I/O ports and drivers, serial communications interface, priority interrupt logic and programmable timers, all reside on the board. The large control storage capacity makes the iSBC 88/25 board ideally suited for control-oriented applications such as process control, instrumentation and industrial automation.

iSBC 88/40A CPU Board

Reader
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004



- 4.8/6.67 MHz 8088 8-Bit HMOS Processor
- 12-Bit KHz Analog-to-Digital Converter with Programmable Gain Control
- 16-Bit Differential/32 Single-ended Analog Input Channels
- Three iSBX Multimodule Connectors for Analog, Digital, and other I/O Expansion

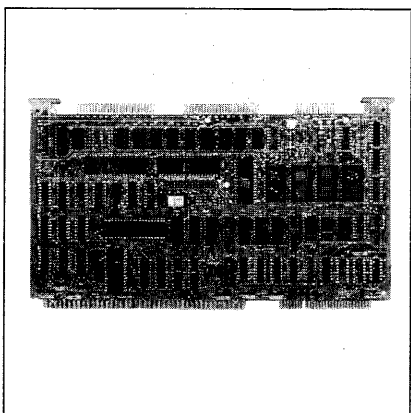
- 4 KBytes Static RAM, Expandable via iSBC 301 RAM module to 8 KBytes (1 KByte Dual-Ported)
- Four EPROM/E2PROM Sockets for up to 64 KBytes, Expandable to 128 KBytes with iSBC 341 Expansion Multimodule
- MULTIBUS Intelligent Slave or Multimaster

The iSBC 88/40 board consists of a 16 differential/32 single ended channel analog multiplexer with input protected circuits, A/D converter, programmable central processing unit, dual port and private RAM, read-only memory sockets, interrupt logic, 24 channels of parallel I/O, three programmable timers and MULTIBUS control logic on a single card. The iSBC 88/40A board is capable of functioning by itself in a standalone system or as a multimaster or intelligent slave in a large MULTIBUS system..

iSBC 80/10B CPU Board

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001



Fact Sheet #280217-003

- 8080A Central Processing Unit
- One iSBX Bus Connector for iSBX Multimodule Board Expansion
- 1 KByte of Read/Write Memory with Sockets for Expansion up to 4 KBytes
- Sockets for up to 16 KBytes of Read Only Memory
- 48 Programmable Parallel I/O Lines with Sockets for Interchangeable Line Drivers and Terminators

- Programmable Synchronous/Asynchronous Communications Interface with Selectable RS232C or Teletypewriter Compatibility
- Single Level Interrupt with 11 Interrupt Sources
- Auxiliary Power Bus and Power-Fail Interrupt Control Logic for RAM Battery Backup
- 1.04 Millisecond Interval Timer
- Limited Master MULTIBUS Interface

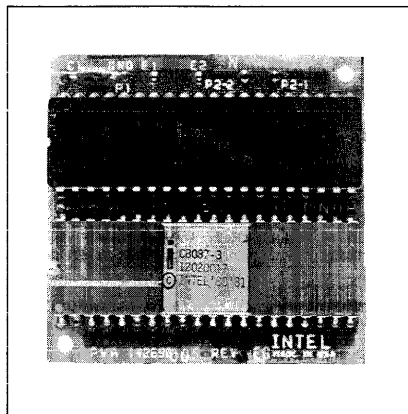
The Intel iSBC 80/10B board takes full advantage of Intel's LSI technology to provide economical, self-contained computer-based solutions for OEM applications. The CPU, system clock, iSBX bus interface, read/write memory, read-only memory sockets, I/O ports and drivers, serial communications interface, bus control logic, and drivers all reside on the board.

Multibus I CPU Boards and Memory Boards

iSBC 337A Math Module

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Service
Number

033



Fact Sheet #280077-002

- High speed fixed floating point functions for iSBC Boards
- Extends host CPU instruction set with arithmetic, logarithmic, transcendental and trigonometric instructions
- Supports seven data types including single and double precision integer and floating point
- Fully supported in the multi-tasking environment of the iRMX® I Operating System

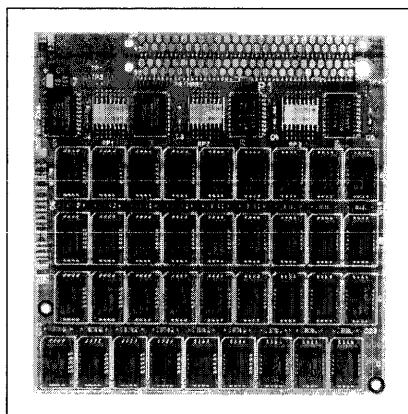
The Intel iSBC 337A Numeric Data Processor module offers numerics support for iSBC 86 and iSBC 88 Single Board Computer users. Potential applications including simulation, instrument automation graphics, signal processing and business systems. The coprocessor interface between the 8087 and the host CPU provides a simple means of extending the instruction set with over sixty additional numeric instructions supporting seven additional data types. The data types are 16-, 32-, and 64-bit integer, 32-, 64-bit floating point, 18 digit packed BCD and 80-bit temporary.

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iSBC MM0XFP, MM3XXX, MMXXFC Memory Boards

Reader
Service
Number

029



Fact Sheet #281010-002

- Provides Fast Page SMT memory expansion for Intel's iSBC 386/12, iSBC 386/2X, iSBC 386/3X, iSBC 386/133, iSBC 386/258 boards, and MIX Baseboards
- MM30XX Fast Page SMT memory modules are designed for iSBC486/133SE, iSBC486 and iSBC 486/12 series boards
- Fast Column SMT memory expansion modules for the iSBC 486/125, iSBC 486/150 boards are available
- Available in 1M, 2M, 4M, 8M, 16M and 32 Mbyte sizes
- 32 bits wide with bit parity
- Stackable to provide up to 64 MBytes of high speed memory for MBI and MBII boards
- Supports 32-bit, 16-bit and 8-bit data paths
- Supports independent read/writes

The iSBC MMXXFP and MM0XFC DRAM memory modules are part of Intel's complete line of iSBC memory and I/O expansion boards. The MM-Series of memory modules use a dedicated memory interface to maximize CPU/memory performance. These memory expansion modules provide high performance, 32-bit parity DRAM memory for the Multibus I and Multibus II boards. Memory addressing for the memory modules is controlled by the host CPU board over the memory module interface. The maximum system RAM size is 64 MBytes.

The dynamic RAM memory of the memory modules is accessed through the dedicated memory module interface. The MM memory module is designed for direct transfer of data between the CPU and the memory module without accessing the MULTIBUS interface. The memory modules use a 32-bit wide data path with storage for byte parity that can accommodate 8-bit byte, 16-bit or 32-bit word data transfers. In addition, the data path is capable of independent byte operations. This means that one byte can be written while the other three bytes (or any other combination) can be read.

One parity bit is provided for each of the four, 8-bit bytes in the 32-bit wide data path. For special applications, the parity bits can serve as data bits making possible 9-, 18-, or 36-bit data transfers. The module protocol supports standard dynamic RAM READ, WRITE, RAS only REFRESH cycles, and CAS before RAS REFRESH.

The iSBC MM-series memory modules are easily installed by the user. Each module includes all necessary connectors, screws, and other hardware for installation, either as a second stacked module or as a replacement for a module with less memory.

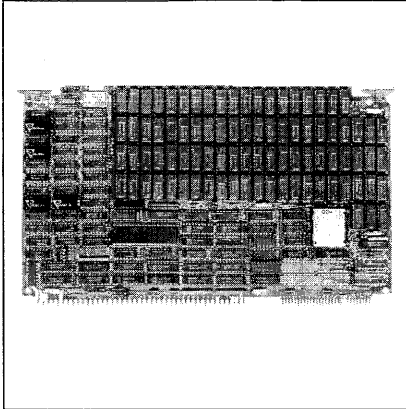
Multibus I Memory Boards

iSBC 020CX Memory Board

Reader
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026

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Fact Sheet #231023-004

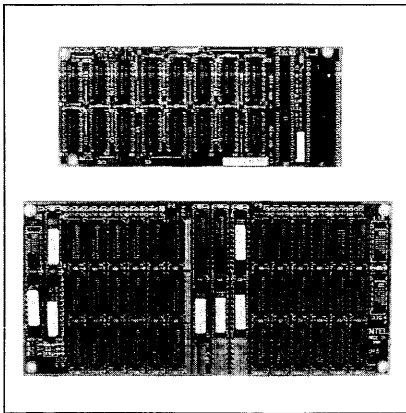
- Dual-port capability via Multibus and iLBX Bus interfaces
- Single bit error correction and double bit error detection utilizing Intel 8206 ECC device
- Control status register supports multiple ECC operating modes
- 16 megabyte addressing capability
- Error status register provides error logging by host CPU board
- Supports 8- or 16- bit data transfer and 24-bit addressing
- Auxiliary power bus and memory protect logic for battery back-up RAM requirements
- 2048 KByte

The iSBC 020CX iLBX RAM Board is a member of Intel's complete line of iSBC memory and I/O expansion boards. The dual-port feature of the CX series of RAM-boards allows access to memory of both the Multibus and iLBX bus interfaces. In addition to the dual-port features, the "CX" series of RAM-boards provide Error Checking and Corrections Circuitry (ECC) which can detect and correct single bit errors, but not correct, double and most multiple errors. The iSBC 020CX board contains 2048K bytes of read/write memory using 256K dynamic RAM components.

iSBC 302, 304, 314 Memory Boards

Reader
Service
Number

021



iSBC 302 Data Sheet #280225-001
iSBC 304 Data Sheet #210329-003
iSBC 314 Data Sheet #280000-003

- iSBC 302 expands on-board memory of iSBC 86/05A boards to 16 KB, and iSBC 88/25 boards to 12 KB
- iSBC 304 provides 128 KBytes of dual-port RAM expansion for the iSBC 86/30 or iSBC 86/35A board
- iSBC 314 provides 512 KBytes of dual-port RAM expansion for the iSBC 86/35A single board computer
- On-board memory expansion eliminates system use latency and increases system throughput

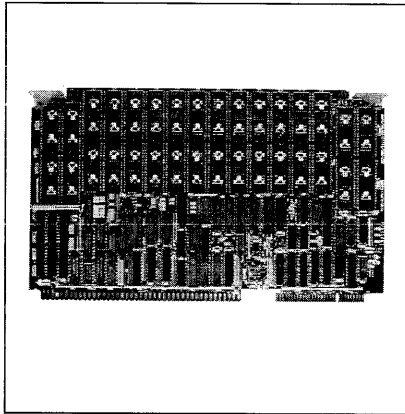
Intel's RAM options offer flexibility in defining and implementing Intel single board computer systems. RAM memory configurations can be expanded on-board, eliminating the need for accessing the additional memory via the Multibus system bus. Each RAM module contains dynamic RAM devices and sockets for the dynamic RAM controller. To install the module, the latches and controller from the host CPU board are removed and inserted into the RAM module. The module is then mounted on the host board.

Multibus I Memory Boards

iSBC 429 Memory Board

Reader
Service
Number

020



- Supports EPROM, Page mode EROM, E2PROM, Flash Memory, SRAM, and static NVRAM
- Thirty-two standard 32-pin JEDEC sites (supports both 28-pin and 32-pin devices) up to 4 MByte capacity
- iLBX Bus or Multibus Configurability
- Low power CMOS design
- Battery backup/memory protect support
- Assignable anywhere within a 16 MByte address space on 4 KByte boundaries

The iSBC 429 Universal Site Memory Expansion Board provides a wide range of memory expansion capabilities for Multibus designs. Up to 4 MBytes of memory can be installed using EPROM, Flash memory, SRAM, E2PROM or Static NVRAM. The CMOS implementation of the iSBC 429 makes it ideal for low power applications. All of Intel's Single Board Computers can communicate with the iSBC 429 using the Multibus System bus.

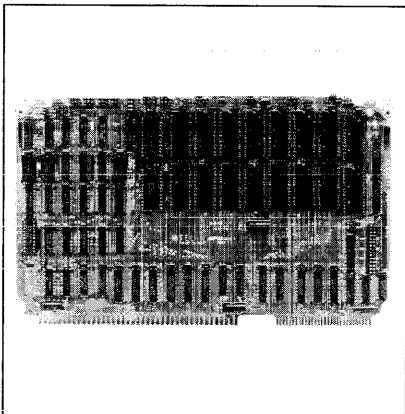
Hardware Reference Manual #457317-001

1

iSBC 428 Memory Board

Reader
Service
Number

019



- Sixteen 28-pin universal sites
- Each group of four sites are individually configurable for EPROM, ROM, E2PROM, SRAM, IRAM, and NVRAM
- iLBX Bus or Multibus selectable
- Provides support for battery backup/memory protect
- Assignable anywhere within a 16 MByte address space on 256K Byte boundaries
- Jumper-selectable base address on 4 KByte boundaries
- Capability of generating an interrupt for the write and erase operations of E2PROMs

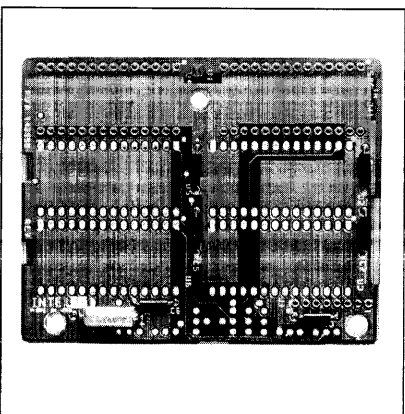
The iSBC 428 Universal Site Memory Expansion Board contains sixteen 28-pin sockets; the actual capacity of the board is determined by the type and quantity of components installed by the user. The board can be accessed (by configuring the board via jumpers) by either the Multibus System Bus or Intel's high-speed iLBX Bus. The iSBC 428 can operate in either 8 bit only mode or the 8/16 bit mode; the mode of operation is selected by on-board jumpers and is available for both Multibus and iLBX Bus configurations. The board supports battery backup operation via a connector on the board. An auxiliary power bus is provided to allow separate power to the memory array for systems requiring battery backup.

Hardware Reference Manual #145696-001

iSBC 341 Memory Board

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Number

018



- On-board memory expansion for iSBC 86/05A, iSBC 88/25, iSBC 88/45, iSBC 188/56, iSBC 186/03A, iSBC 286/10A, iSBC 286/12 series, and iSBC 88/40A microcomputers
- Supports JEDEC 24/28-pin standard memory devices, including EPROMs, byte-wide RAMS, and E2PROMs
- Sockets for up to 256 KBytes of expansion with Intel 27512 EPROMs
- On-board expansion provides "no wait-state" memory access with selected devices
- Simple, reliable mechanical and electrical interface

The iSBC 341 28-pin EPROM option effectively doubles the number of sockets available for EPROM on the base microcomputer board which it is mounted. The mechanical assembly integrity of the assembly is assured with nylon hardware securing the unit in two places. Since the iSBC 341 mounts directly on the host board, the benefits include low cost, no additional power requirements beyond the memory devices, and higher performance than Multibus-based memory expansion.

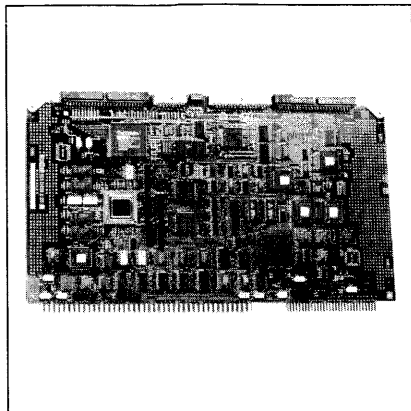
Fact Sheet #280214-001

Multibus I I/O Boards

iSBC 221S SCSI Peripheral Controller

Reader
Service
Number

049



- Supports up to 7 SCSI-2 peripherals with SIOPB protocol; up to 4 SCSI-2 hard drives with IOPB protocol
- 256 KB Flash Memory
- SCSI transfer rate—up to 10 MB/sec sustained synchronous; up to 7 MB/sec sustained asynchronous
- 10 MHz 80C186 Microprocessor
- Optional +12V, -12V via jumpers
- Several caching options
- Memory Size: 16KB Local RAM; 512 KB cache buffer
- NCR 53C94 SCSI controller

The iSBC 221S is a multifunction peripheral controller that provides access to high-performance SCSI-2 peripherals, including hard drives, floppy drives, and streaming tape.

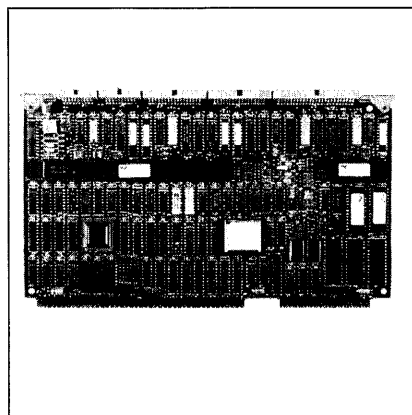
The iSBC 221S supports two operational protocols. The IOPB mode is fully compatible with the iSBC 214 and iSBC 221, requires no changes to existing software drivers, and also supports the same floppy and tape drives as the iSBC 214 and iSBC 221. The SIOPB protocol allows use of the full SCSI-1 and SCSI-2 functionality via pass-through SCSI commands to standard SCSI peripherals.

Fact Sheet #281151-001

iSBC 221 Peripheral Controller

Reader
Service
Number

046



- Support for ESDI and ST506/412 hard disk drives, SA 45X/46X/475 flexible disk drives, and QIC-02 streaming tape drives
- Multiple track caching via 128K on-board data buffer
- Dual bus structure
- 10 MHz 80186 Microprocessor
- Mirror backup/restore between tape and hard drive
- On-board self-test diagnostics
- Error checking and correcting code logic
- Support for 4,096 cylinders and 16 heads

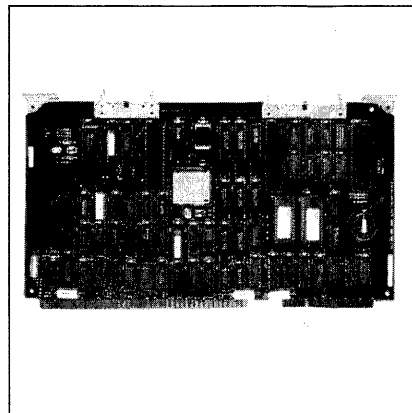
The iSBC 221 is a multi-function peripheral controller that provides access to high performance, high-capacity disk drives (hard, flexible, and streaming tape). This fast, reliable controller is particularly beneficial in I/O bound applications or those requiring high disk capacity.

Fact Sheet #281151-001

iSBC 548 Terminal Controller

Reader
Service
Number

038



- 8 MHz 80186 Microprocessor
- Supports transfer rates up to 19.2K Baud
- 128-Kbytes Zero Wait State DRAM (32K Dual Port)
- Supports Full Duplex Asynchronous Transmissions
- Jumper Selectable memory mapping, I/O mapping, and Multibus interrupts
- Supports eight channels asynchronous RS232 interface

The iSBC 548 is an intelligent terminal controller for Multibus I applications. The iSBC 548 provides basic multi-user support with 8 channels of RS232 asynchronous interface. Acting as an intelligent slave for communication expansion, this board provides high performance, low-cost solutions for multi-user systems.

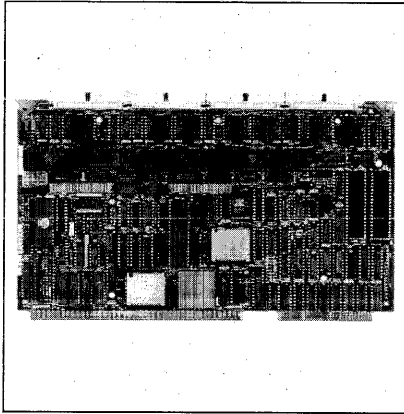
Fact Sheet #280674-003

Multibus I/O Boards

iSBC 188/56 Advanced Communicating Computer

Reader
Service
Number

034



Fact Sheet #280715-004

- iSBC Single Board Computer or Intelligent Slave Communications Board
- 8 Serial Communications Channels, Expandable to 12 Channels using optional iSBX 354
- 8 MHz 80188 Microprocessor
- Supports RS232C Interface on 6 channels, RS422A/449 or RS232C Interface Configurable on 2 Channels
- 7 On-board DMA Channels for Serial I/O, 2 80188 DMA Channels for the iSBX Bus
- Two iSBX Connectors for I/O Expansion
- 256 KBytes Dual-Ported RAM On-board
- Two 28-pin JEDEC PROM Sites Expandable to 6 Sites using optional iSBC 341 for a maximum of 192 KBytes EPROM

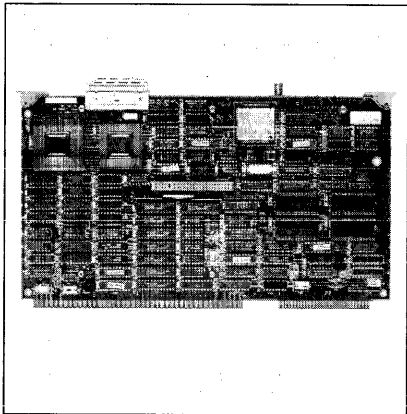
The iSBC 188/56-Advanced Communicating Computer is an intelligent 8-channel single board computer based on an 8 MHz 80188 microprocessor. Acting as a stand-alone CPU or as an intelligent slave for communication expansion, this board provides a high performance, low-cost solution for multi-user systems. The features of the iSBC 188/56 board are uniquely suited to manage higher-layer protocol requirements needed in today's data communications applications.

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iSBC 544A Intelligent Communications Controller

Reader
Service
Number

037



Fact Sheet #280239-002

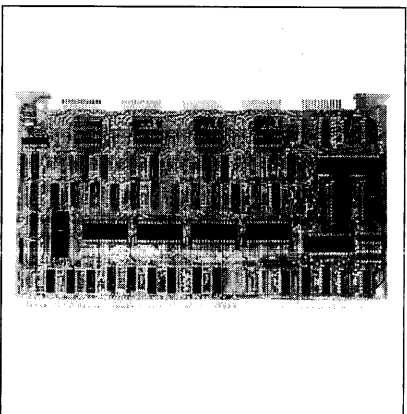
- Single Board Communications Computer or Intelligent Slave for Communications Expansion
- On-board, dedicated 8085A Microprocessor provides Communication Control and Buffer Management for Four Programmable Synchronous/Asynchronous Channels
- Sockets for up to 8 KBytes EPROM
- Ten Programmable Parallel I/O Lines Compatible with Bell 801 Automatic Calling Unit
- Twelve Levels of Programmable Interrupt control
- Three Independent Programmable Interval Timer/Counters
- Individual Software-programmable Baud Rate generation for each Serial I/O Channel
- 16 KBytes Dual Port Dynamic Read/Write Memory with on-board Refresh
- Interface control for Auto Answer and Auto Originate Modem
- Extended Multibus Addressing permits Board Partitioning into 16 KByte Segments in a 16 MByte address space

The iSBC 544A is an 8085A-based Intelligent Communications Controller. This single board computer contains on-board read/write memory, non-volatile read only memory, four synchronous/asynchronous serial I/O ports, RS232/RS366 compatible parallel I/O, programmable timers, and programmable interrupts.

iSBC 534 4 Channel Communication Expansion Board

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Service
Number

036



Fact Sheet #280238-002

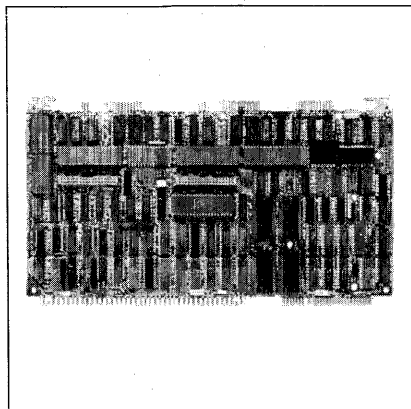
- Serial I/O Expansion through 4 Programmable Synchronous and Asynchronous Communications Channels
- Individual Software Programmable Baud Rate Generation for each Serial I/O Channel
- Jumper Selectable Interface Register Addresses
- 16-bit Parallel I/O Interface
- Two Independent Programmable 16-bit Interval Timers
- Sixteen Maskable Interrupt Request Lines with Priority Encoded and Programmable Interrupt Algorithms
- RS232C/CCITT V.24 Interfaces plus 20 mA Optically Isolated Current Loop Interfaces (Sockets)
- Programmable Digital Loopback for Diagnostics
- Interface Control for Auto Answer and Auto Originate Modems

The iSBC 534 Four Channel Communication Expansion Board interfaces directly to any single board computer via the Multibus to provide expansion of system serial communications capability. Four fully programmable synchronous and asynchronous serial channels with RS232C buffering and provision for 20 mA optically isolated current loop buffering are provided. Baud rates, data formats, and interrupt priorities for each channel are individually software selectable. Additionally, the iSBC 534 provides 16 lines of RS232C buffered programmable parallel I/O.

iSBC 88/45 Data Communications Processor Board

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Service
Number

042



Fact Sheet #210372-003

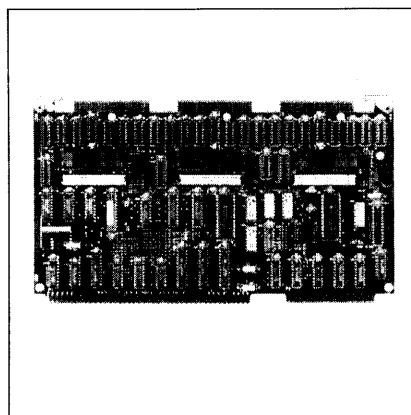
- 3 HDLC/SDLC Half/Full Duplex Communication Channels—Optional ASYNCH/SYNC on 2 Channels
- Supports RS232C, CCITT V.24, or RS422A/449
- 8088 (8088-2) Microprocessor, 8 MHz
- On-board DMA supports 800K Baud Operation
- Self-clocking NRZI SDLC Loop Data Link Interface
 - Point-to-Point
 - Multidrop
- Supports optional iSBC 337A Numeric Data Processor
- 16 KBytes Static RAM (12 KBytes dual-port)
- Four 28-pin JEDEC Sites for EPROM/RAM; 4 additional 28-pin JEDEC sites added with optional iSBC 341
- Two iSBX Bus Connectors
- Software Programmable Baud Rate Generation

The iSBC 88/45 is an 8 MHz, 8088-based Data Communications Processor board. It offers asynchronous, synchronous, SDLC, and HDLC serial interfaces for gateway networking or general purpose solutions. The iSBC 88/45 board provides the CPU, system clock, EPROM/ROM, RAM, serial I/O ports, primary interrupt logic, and programmable timers to facilitate higher-level application solutions.

iSBC 519A Programmable I/O Expansion Board

Reader
Service
Number

035



Fact Sheet #280230-002

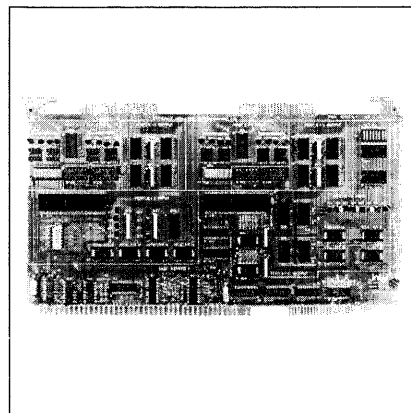
- 72 Programmable I/O Lines with Sockets for Interchangeable Line Drivers and Terminators
- Full 16-Bit I/O Addressability
- Three iSBX Connectors
- 16 Maskable Interrupt Request Lines
- Jumper Selectable 0.5, 1.0, 2.0 or 4.0 ms Interval Timer (real-time clock)
- 8 Maskable Interrupt Request Lines with Priority Encoded and Programmable Interrupt Algorithms
- I/O Expansion via Multibus Interface

The iSBC 519A Programmable I/O Expansion Board interfaces directly to any iSBC single board computer via the system bus to expand input and output port capacity. The iSBC 519A provides 72 programmable I/O lines. The system software is used to configure the I/O lines to meet a wide variety of peripheral requirements. The flexibility of the I/O interface is further enhanced by the capability of selecting the appropriate combination of optional line drivers and terminators to provide the required sink current, polarity, and drive/termination characteristics for each application. Address selection is accomplished via wire-wrap jumpers. The board operates with a single +5V power supply.

iSBC 556 Optically Isolated I/O Board

Reader
Service
Number

040



Fact Sheet #280231-002

- Up to 48 Optically Isolated Digital I/O Lines
- Choice of
 - 24 Fixed Input Lines
 - 16 Fixed Output Lines
 - 8 Programmable Lines
- Provisions for Plug-in, Optically Isolated Receivers, Drivers, and Terminators
- Voltage/Current Levels
 - Input up to 48 V
 - Output up to 30V, 60 mA
- Common Interrupt for up to 8 Sources
- +5V Supply Only

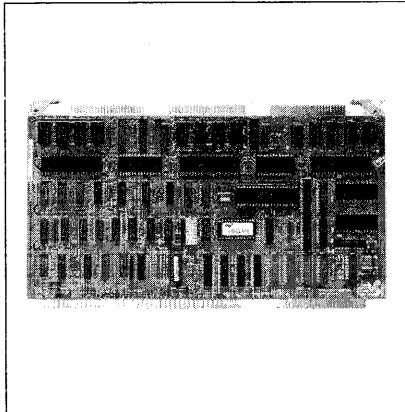
The iSBC 556 Optically Isolated I/O Board provides 48 digital input/output lines with isolation between process application or peripheral device and the system CPU board(s). The iSBC 556 contains two 8255A programmable interface devices. Sockets are supplied for user-supplied optically isolated drivers, receivers, and input resistor terminators, together with common interrupt logic and interface circuitry for the system bus. Input signals can be single-ended or differential types with user-defined input range (resistor terminator and opto-isolated receiver selection), allowing flexibility in design of voltage and threshold levels.

Multibus I I/O Boards

iSBC 569 Intelligent Digital Controller

Reader
Service
Number

041



Fact Sheet #280232-002

- Digital I/O Controller with up to 4 Microprocessors to share Signal Processing
- 3 MHz 8085A Central Control Processor
- Three Operational Modes
 - Stand-alone Digital Controller
 - Multibus Master
 - Intelligent Slave
- 2K Bytes of Dual Port Static Read/Write Memory
- Sockets for up to 8K EPROM
- 48 Programmable Parallel I/O Lines with sockets for Interchangeable Line Drivers or Terminators
- Three Programmable Counters
- 12 Levels of Programmable Interrupt Control
- Three Sockets for 8041/8741A Universal Peripheral Interface (UPI-41A) for Distributed Digital I/O Processing

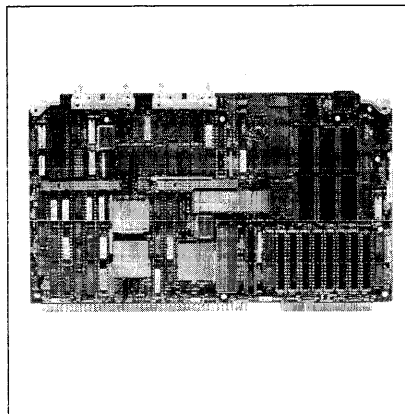
The iSBC 569 Intelligent Digital Controller is complete digital controller with up to four processors. This 8085A- based single board computer contains sockets for three 8041A/8741A Universal Peripherals Interface chips (UPI-41A). These devices, which are programmed by the user, may be used to off-load the 8085A processor from time consuming tasks such as pulse counting, event sensing, and parallel or serial digital I/O data formatting with error checking and handshaking.

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iSBC 186/51 Communication Computer

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Service
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043



Fact Sheet #280207-001

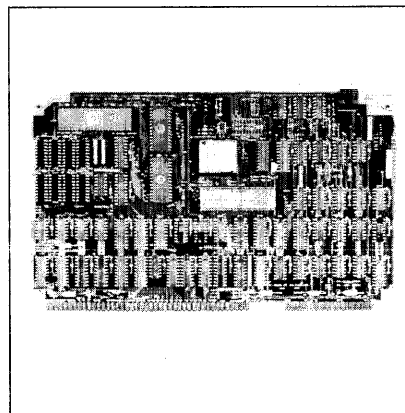
- 6 MHz 80186 Microprocessor
- 82586 Local Area Network Coprocessor for Ethernet/IEEE 802.3
- 128 KBytes of Dual-Ported RAM, Expandable on-board to 256 KBytes
- Sockets for up to 192 KBytes of JEDEC 28-pin Standard Memory Devices
- Two iSBX Bus Connectors
- 16 MBytes Address Range of Multibus Memory
- Two Serial Interfaces: RS232C and RS422A/RS449 compatible
- Supports Transport Layer Software (iNA 960) and Higher Layer Communications Software

The iSBC 186/51 Communications Computer is an economical, self-contained computer for applications in processing and local area network control. The combination of the 80186 Central Processing Unit and the 82586 Local Area Network Coprocessor makes it ideal for applications that require both communications and processing capabilities, such as networked workstations and factory automation. The iSBC 186/51 provides a CPU, Ethernet interface, serial communications interface, 128 KBytes RAM, up to 192 KBytes EPROM/ ROM, and I/O ports.

iSBC 552A Network Interface Adaptor

Reader
Service
Number

044



Fact Sheet #280385-002

- IEEE 802.3 Compatible
- Provides High-Performance Network Front-end Processing for all Multibus I systems
 - Intelligent Controller with an 8 MHz, 80186 Processor and 256K of DRAM memory
 - IEEE 802.3 Network port driven by the 82586 LAN Coprocessor
- Can Execute iNA 960/961 Software On-board
- Resident Network Software can be downloaded over the Bus or LAN
- On-Board Diagnostic and Boot Firmware

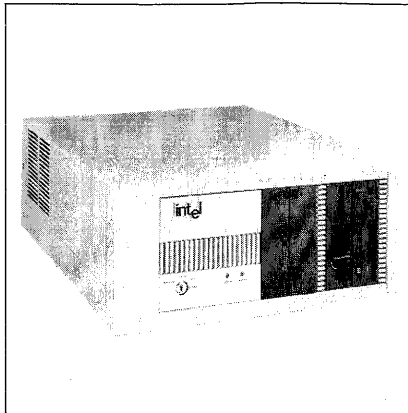
The iSBC 552A is a flexible, intelligent communications controller for IEEE 802.3 LANs. This Network Interface Adapter is dedicated to the network communications tasks within a system allowing the host to spend more time processing user applications. It can be used to network existing systems and established designs without forcing a redesign of the entire system architecture. The iSBC 552A can run with iRMX I and III Real-Time operating systems and requires only iRMX-Net to communicate with the host. Other operating systems require iNA 960 software.

Multibus I Packaging

B320E System Chassis

Reader
Service
Number

147



Fact Sheet #280502-002

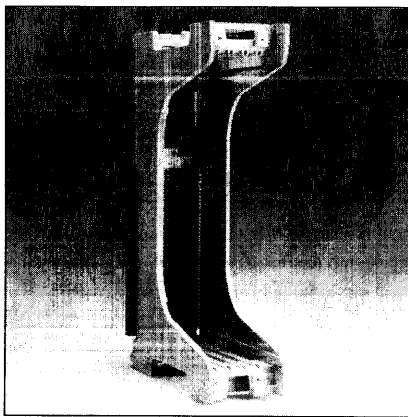
- Seven Slots, Multibus I IEEE 796 Specification
- 435 Watt Power Supply with switchable input for ~110 or ~220 VAC
- FCC Class B and VDE Limit Class B
- Four half-height (two full-height) 5 1/2" drives bays with front panel access
- One full-height 5 1/2" internal drive bay
- Control panel with key switch and indicator lights

This sturdy chassis has proved its worth in hundreds of performance-critical applications from Wall Street to the factory floor. The B320E is constructed to withstand harsh environments and can handle a broad range of operating conditions: Operating temperatures from 10°C to 40°C, wetbulb temperature 26°C maximum, relative humidity 85% at 40°C, and altitudes from sea level to 10,000 feet. The chassis layout allows for excellent cooling, multiple drive capacity, and easy serviceability.

iSBC 604 Modular Cardcage Assembly

Reader
Service
Number

047



Fact Sheet #280205-001

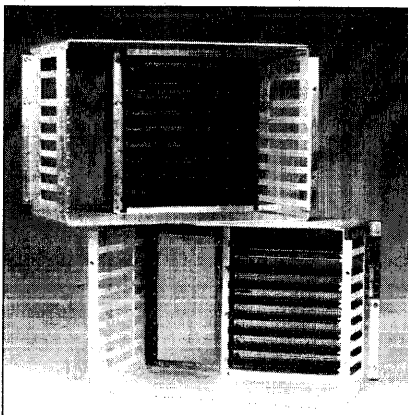
- Interconnects and Houses up to Four Multibus I Boards per Cardcage
- Strong Cardcage Structure Helps Protect Installed Boards from Warping and Physical Damage
- Compatible with 3.5 RETMA Rack Mount Increments
- Interleaved Grounds on Backplane Minimize Noise and Crosstalk
- Up to 3 CPU Boards per System for Multiprocessing Applications

The iSBC 604 Modular Cardcage Assembly unit provides low-cost, off-the-shelf housing for OEM products using two or more MULTIBUS boards. Each unit houses up to four boards. The iSBC 604 Cardcage Assembly contains a male backplane PC edge connector and bus signal termination circuits, plus power supply connectors. It is suitable for applications requiring a signal unit. A single unit may be packaged in a 3.5 inch RETMA rack enclosure. The unit is mountable in any of three planes.

iSBC 608 and iSBC 618 Cardcages

Reader
Service
Number

048



Fact Sheet #210373-001

- Houses up to Eight Multibus I iSBC Boards in an Aluminum Package
- Board-to-Board Clearance for iSBC Boards on All Slots
- Board-to-Board Clearance for iSBX Boards on Two Slots
- Parallel Priority Circuitry for up to Eight iSBC Boards
- Enhanced Bus Noise Immunity for High Speed Systems
- Plug on iSBC 618 Unit for up to Sixteen Board Systems
- NEMA-Type Backwall or 19-Inch Rack Mount Hardware Included
- Signal Line Termination Circuitry on iSBC 608 Cardcage

Intel's iSBC 608/618 Cardcages are matched to the latest generation of iSBC/iSBX boards which mount in the Multibus I system bus. Key features include board clearance, parallel priority circuitry, enhanced backplane noise immunity, and precision fit card guides.

The iSBC 608 Cardcage is the base unit housing up to eight iSBC boards and their multimodule boards. Additionally, this base unit includes mounting hardware and fan mounting bracketry. The iSBC 618 is the expansion unit, providing eight additional iSBC board slots to the iSBC 608 Cardcage for a total of sixteen board slots which can be NEMA-type backwall or 19-inch rack mounted. This is accomplished with the mounting hardware of the iSBC 608 Cardcage. The iSBC 618 expansion unit also includes fan mounting bracketry.

Call Our Factory Sales Team

Multibus II Section Index

CPU Boards

PC-Compatible

iSBC P5090	90 MHz Pentium™ processor	2-2
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Multibus II CPU Boards

PC-Compatible Baseboards

The PC architecture now operates in areas once considered the domain of only mainframe computers. Standard PC hardware and shrink-wrapped software are combined in powerful applications that serve thousands of different computing needs. Now, the power of the PC and the power of Multibus II are combined in a family of products that deliver standard PC hardware and PC software in a Multibus II form factor.

The Multibus II PC-Compatible family of products, including boards based on either the Pentium™ processor or on Intel486™ processors, provides a complete embedded PC solution. The highly integrated baseboards include the latest in I/O, such as SCSI, Ethernet, IDE, and SVGA. In addition, ISA expansion is available via optional ISA card carriers. To facilitate the use of popular PC operating systems, Intel has developed kits that allow the user low-level access to the Multibus II transport layer to ease CPU to CPU communication across the Multibus II backplane.

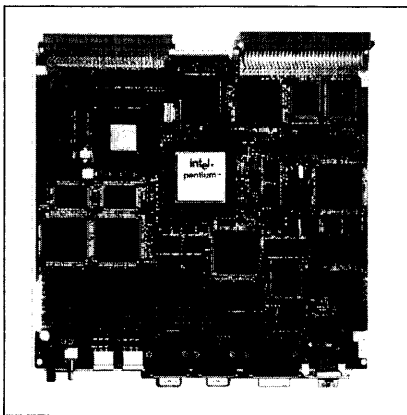
These boards are perfect for applications ranging from a GUI-based front end for a real-time system to those requiring a traditional Multibus II CPU.

2

iSBC P5090 PC-Compatible CPU Board

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Fact Sheet #281180-001

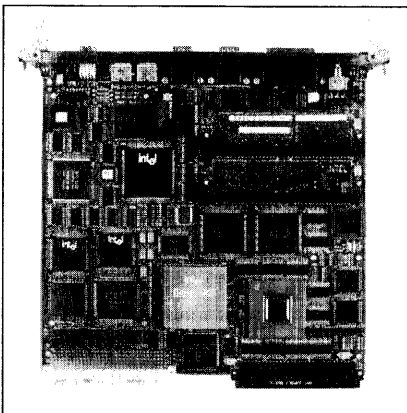
- Pentium™ processor operating at 90 MHz, with on-chip floating point unit (FPU), 8 KB code and 8 KB data cache
- 256 KB synchronous burst mode secondary (L2) cache; 3-1-1-1 clocks
- 4(4x36bit) SIMM sites for up to 128 MB of DRAM
- Intel 82430 PCI local bus with PCI-to-Multibus II bridge ASIC
- Integrated PCI-based fast IDE and fast SCSI-II
- PCI-based 64-bit graphics module available

The Multibus II PC-Compatible board combines the power of Intel's Pentium processor with the speed of the PCI local bus in a single board computer designed for maximum performance and integration. The Multibus II Architecture, coupled with high-end computer graphics, integrated I/O, and PC software, provides system designers with an unmatched 64-bit solution for multiprocessing applications.

iSBC 486/DX66, iSBC 486/DX33 & 486/SX25 PC-Compatible CPU Board

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Fact Sheet #281374-005

- Completely integrated PC with graphics, I/O, and memory in a single Multibus II slot
- 100% PC/AT compatible
- Select from three CPU speeds: IntelDX2 CPU at 66 MHz, Intel486 CPU at 33 MHz, or Intel486 SX CPU at 25 MHz.
- Up to 32 MBytes of on-board SIMM DRAM with parity protection
- IDE (Intelligent Drive Electronics) or SCSI (Small Computer Systems Interface) peripheral interfaces
- Super VGA graphics via an optional add-on module
- Standard PC Ethernet networking via an optional add-on module
- Industry standard AT BIOS and Multibus Systems Architecture firmware in Intel Flash Memory
- P2/aPC (ISA) bus on P2 connector
- Supports DOS, iRMX for Windows, and UNIX System V Release 4.2
- Front-panel recessed reset switch
- iSBC CSM/002 support

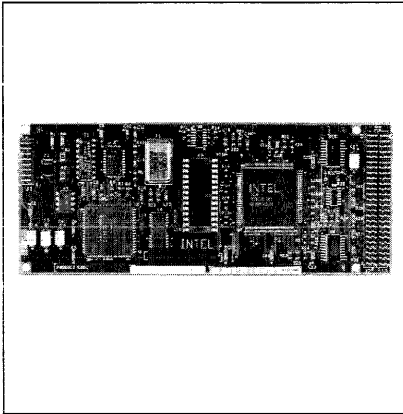
The iSBC 486/DX66, iSBC 486/DX33, and iSBC 486/SX25 boards bring the power and integration of today's high-end personal computers to Multibus II, the industry-standard cooperative multiprocessing system bus. The marriage of high-end personal computer graphics, integrated I/O, and standard software combined with the multiprocessing, high-bandwidth power of the Multibus II Architecture allows the OEM quick time to market with a system based on industry standards. The iSBC 486/DX66, iSBC 486/DX33, and iSBC 486/SX25 boards can be used as the front-end of a Multibus II system or as a compute engine.

Multibus II CPU Boards

iSBC EWENET Ethernet Adapter

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Number

063



- Connects iSBC 486/SX25, 486/DX33, or 486/DX66 Single Board Computers to an ETHERNET* network
- Functionally equivalent to Intel's EtherExpress™ LAN adapter
- No switches or jumpers; configuration is performed entirely by the SoftSet program. Manual configuration is also possible
- CPU board and adapter fit into a single Multibus slot

Intel's Embedded Workstation Ethernet (EWENET) LAN adapter allows users of iSBC 486/SX25, 486/DX33, or 486/DX66 Single Board Computers to connect their boards to an Ethernet network. The EWENET adapter is functionally equivalent to the Intel EtherExpress LAN™ adapter, and uses a short adapter cable between the sub-miniature connector on the front panel and the standard transceiver cable. The adapter installs onto the CPU board allowing the CPU board and the network adapter to fit into a single slot on the Multibus backplane.

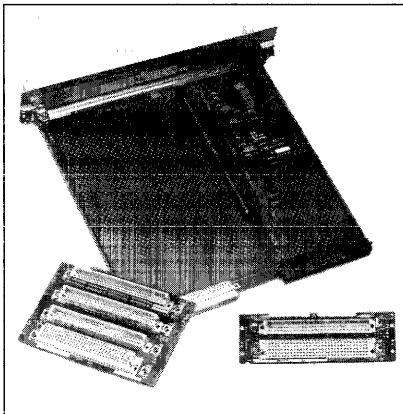
Installation Guide #611182-001

2

Accessories PC Card Carrier and Backplanes

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081



- SBCP2APC4**
 - Card carrier for four ½ length ISA based PC add-in cards
 - Connects to two or four slot IDE or SCSI backplanes
- SBCP2ATC**
 - Card carrier for one ½ length ISA based PC add-in cards
 - Connects to two or four slot IDE or SCSI backplanes
- SITP2APCIDE2 and SITP2APCIDE4**
 - Floppy and IDE connector
 - Expansion for 1 ISA slot (SITP2APCIDE2) or 2 ISA slots (SITP2APCIDE4)
 - Six Auxiliary Connectors for indicator lights, key switch, speaker, and remote services
- SITP2APCSCSI1, SITP2APCSCSI2 and SITP2APCSCSI4**
 - Floppy and SCSI connector
 - Expansion for 1 ISA slot (SITP2APCIDE2) or 2 ISA slots (SITP2APCIDE4)
 - Six Auxiliary Connectors for indicator lights, key switch, speaker, and remote services

The backplanes and ISA card carrier provide a facility to expand the PC services offered through the PC-compatible family. The SBCP4ATC can carry four single ½ length ISA based PC expansion cards in three Multibus II slots. The backplanes provide a standard connector for the on-board services such as floppy control and either IDE or SCSI control.

Fact Sheet #281374-005

DOS and UNIX ODK Transport Access Software

Reader
Service
Number

084



- MBIIDOSODK**
 - Multibus II DOS drivers for network services, remote boot, file sharing, and low-level transport
 - FLASH Update Utility for MSA
 - FLASH Update Utility for AT-BIOS
- MBIUNIXODK**
 - Drivers for on-board SCSI chip
 - Add-on packages for transport, transport applications interface, and drivers for Multibus II I/O boards
 - FLASH Update Utility for MSA
 - FLASH Update Utility for AT-BIOS

MBIIDOSODK and MBIUNIXODK are OEM Developer's Kits (ODK) which allow DOS or UNIX applications running on the iSBC P5090 to use the power of the Multibus II backplane. CPU to CPU communication using the Multibus II backplane is supported by the transport and application downloading features in ODKs. The resulting system can have multiple SBCs and traditional Multibus II CPUs all communicating across the backplane and all using a different operating system.

MBIIMPDDOSWIN supports Multibus II transport layer communications when using the SBC P5090 PC-compatible board. This product includes transport layer support for DOS and Windows 3.1.

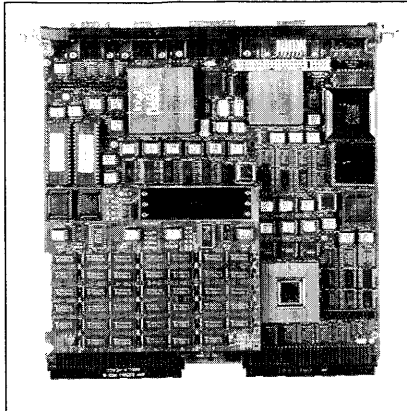
Fact Sheet #281374-005

Multibus II Boards

iSBC 486/166SE, iSBC 486/133SE CPU Board

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Fact Sheet #281140-002

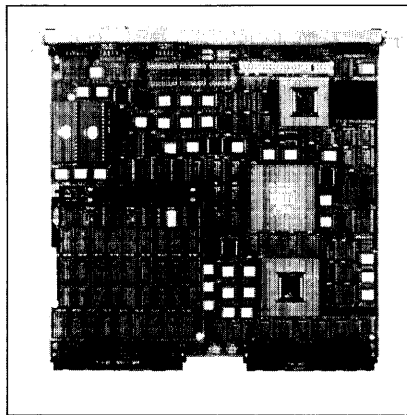
- iSBC 486/166SE CPU Board:
 - IntelDX2 CPU operating at 66 MHz
- iSBC 486/133 CPU Board:
 - i486 CPU operating at 33 MHz
 - On-chip FPU and 8 KByte Cache with Zero Wait State
 - 8, 16, or 32 MBytes On-board DRAM with Parity Error Detection, Expandable to 64 MByte
 - One SCSI port
 - On-board Ethernet using Intel 82596 LAN coprocessor at 33 MHz
- 82258 ADMA operating at 10 MHz
- One iSBX Connector for expansion of on-board I/O
- Two 32-pin JEDEC sites pre-configured with full MSA firmware in two 27020 EPROMs
- Two 32-pin PLCC Sites that support PROMs or Flash Memory Devices
- 82530 Serial Communications Control and Two RS232 Ports
- Parallel Port—Centronics Compatible
- iSBC CSM/002 Connector On-Board

The high-integration iSBC 486/166SE and iSBC 486/133SE accomplish in a single CPU board what previously required three Multibus II boards. Each board provides a 66 MHz Intel486™ DX2 or 33 MHz Intel486 microprocessor, SCSI and Ethernet interfaces, and up to 64 MB of fast-page DRAM. The iSBX bus interface is capable of supporting a single- or double-wide, 8- or 16-bit iSBX board. Two serial ports and one parallel port are also provided. The iSBC 486/166SE and iSBC 486/133SE are fully compatible with other Intel Multibus II CPU and I/O boards.

iSBC 486/125, iSBC 486/150 CPU Board

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Fact Sheet #281007-004

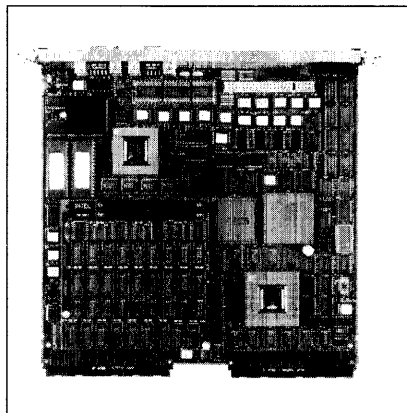
- iSBC 486/150 CPU Board: IntelDX2 CPU operating at 50 MHz
- iSBC 486/125 CPU Board:
 - i486 CPU operating at 25 MHz
 - On-chip FPU and 8 KByte Cache with Zero Wait State
 - 8 or 32 MBytes On-board DRAM with Parity Error Detection, Expandable to 64 MByte
 - 82258 ADMA with 16 Byte "Blast" Mode
- One iSBX Connector
- iLBX II Interface
- Full 32-bit Multibus II Parallel System Bus Interface
- Two 32-pin JEDEC sites pre-configured with full MSA firmware in two 27020 EPROMs
- 82530 Serial Communications Control and Two RS232 Ports
- CSM/002 Connector On-Board

The iSBC 486/150 contains a i486 microprocessor operating at 50 MHz; the iSBC 486/125 contains a i486 microprocessor operating at 25 MHz. Both boards offer an immediate performance boost for current Multibus II designs, since their feature set is compatible with earlier Intel Multibus II Single Board Computers. These CPU boards provide two serial ports based on Intel's 82530 Serial Communications Controller, and one iSBX connector, capable of supporting a single- or double-wide, 8- or 16-bit iSBX board. An iSBC CSM/002 connector provides an on-board CSM option. The 82258 ADMA coprocessor provides 4 DMA channels.

iSBC 386/133 CPU Board

Reader
Service
Number

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Fact Sheet #281007-004

- 32-bit i386 Processor Operating at 33 MHz
- i387 Numeric Coprocessor, 33 MHz
- 64 KByte SRAM Cache Providing Zero Wait State Reads
- 4, 8, or 16 MBytes On-board DRAM with Parity Error Detection, Expandable to 64 MByte
- 82258 ADMA with 16 Byte "Blast" Mode
- One iSBX Connector
- iLBX II Interface
- Full 32-bit Multibus II Parallel System Bus Interface
- Two 32-pin JEDEC sites pre-configured with full MSA firmware in two 27020 EPROMs
- 82530 Serial Communications Control and Two RS232 Ports
- CSM/002 Connector On-Board

The iSBC 386/133 Single Board Computer features an i386 microprocessor running at 33 MHz. It also includes an i387 floating point coprocessor running at 33 MHz. The 121 pin extended math coprocessor socket could also house a Weitek 3167 floating point unit (FPU) instead of the i387 FPU. The iSBC 386/133 provides two serial ports based on Intel's 82530 Serial Communications Controller, and one iSBX connector, capable of supporting a single- or double-wide, 8- or 16-bit iSBX board. An iSBC CSM/002 connector provides an on-board CSM option. The 82258 ADMA coprocessor provides 4 DMA channels.

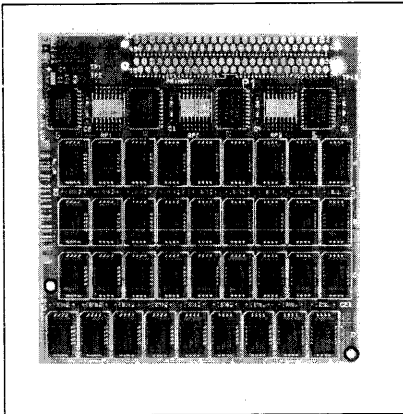
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Multibus II Boards

iSBC MM0XFP, MM3XXX, MMXXFC Memory Modules

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Service
Number

029



Fact Sheet #281010-002

- Provides Fast Page SMT memory expansion for Intel's iSBC 386/12, iSBC 386/2X, iSBC 386/3X, iSBC 386/133, iSBC 386/258 boards, and MIX Baseboards
- MM30XX Fast Page SMT memory modules are designed for iSBC486/133SE, iSBC486 and iSBC 486/12 series boards
- Fast Column SMT memory expansion modules for the iSBC 486/125, iSBC 486/150 boards are available
- Available in 1M, 2M, 4M, 8M, 16M and 32 Mbyte sizes
- 32 bits wide with bit parity
- Stackable to provide up to 64 MBytes of high speed memory for MBI and MBII boards
- Supports 32-bit, 16-bit and 8-bit data paths
- Supports independent read/writes

The iSBC MMXXFP and MM0XFC DRAM memory modules are part of Intel's complete line of iSBC memory and I/O expansion boards. The MM-Series of memory modules use a dedicated memory interface to maximize CPU/memory performance. These memory expansion modules provide high performance, 32-bit parity DRAM memory for the Multibus I and Multibus II boards. Memory addressing for the memory modules is controlled by the host CPU board over the memory module interface. The maximum system RAM size is 64 MBytes.

The dynamic RAM memory of the memory modules is accessed through the dedicated memory module interface. The MM memory module is designed for direct transfer of data between the CPU and the memory module without accessing the MULTIBUS interface. The memory modules use a 32-bit wide data path with storage for byte parity that can accommodate 8-bit byte, 16-bit or 32-bit word data transfers. In addition, the data path is capable of independent byte operations. This means that one byte can be written while the other three bytes (or any other combination) can be read.

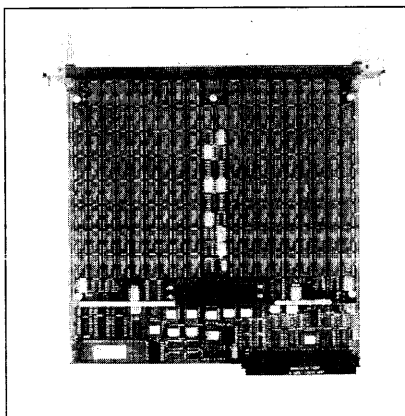
One parity bit is provided for each of the four, 8-bit bytes in the 32-bit wide data path. For special applications, the parity bits can serve as data bits making possible 9-, 18-, or 36-bit data transfers. The module protocol supports standard dynamic RAM READ, WRITE, RAS only REFRESH cycles, and CAS before RAS REFRESH.

The iSBC MM-series memory modules are easily installed by the user. Each module includes all necessary connectors, screws, and other hardware for installation, either as a second stacked module or as a replacement for a module with less memory.

iSBC MEM/128 Memory Module

Reader
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Number

089



User's Guide #467206-001

- 128 MBytes of Dynamic RAM (DRAM)
- 32-bit PSB Bus Replier Interface
- 200 ns Read Access Time
- Byte Parity Error Detection
- Interconnect Space Support for Identification, Configuration, and Diagnostics
- Standard Eurocard Form Factor
- Occupies Only One Slot
- All Control Signals, Power and Ground supplied via the PSB 96-pin DIN Connector (P1)
- Initialization Checks run automatically at Power-up

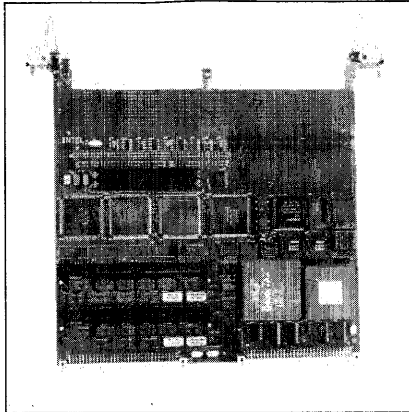
The iSBC MEM/128 is a one-slot, full-size Multibus II board with 128 MByte of DRAM. It is made up of a mother board which provides the bus interface and 64 MBytes of DRAM, and a daughter board which contains the other 64 MBytes of DRAM. The boards are connected via a 100-pin surface mount connector, and are functionally one unit. Board configuration is accomplished via interconnect space over the PSB bus.

Multibus II Memory Boards

MIX 486/DX66, 486/DX33, 486/SX33 MIX Baseboards

Reader
Service
Number

146



Fact Sheet #281009-004

- Intel486 SX and Intel486 DX CPUs running at 33 MHz or an IntelDX2 running at 66 MHz
- 33 MHz baseboard bus speed
- Two SIMM sockets which will accept up to 32MB DRAM using Industry Standard SIMMS (70ns)
- 128 KByte L2 Cache with parity
- 82C258 Advanced DMA (ADMA) controller operating at 16.5 MHz
- Integrated DMA address generator logic (DAG compatible) for 32-bit address range
- MIG compatible MIX control logic
- Order MIXSC10 for ten MIX stacking connectors

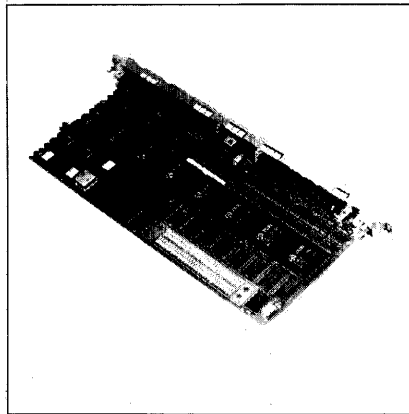
Intel's new MIX486 baseboard combines increased CPU performance with increased internal bus speed and improved DMA performance for increased throughput. The new baseboard is available with Intel486 SX, Intel486 DX or Intel486 DX2 microprocessors, operates at a bus speed of 33 MHz and is compatible with Intel's earlier MIX baseboards. On-board memory is expandable to up to 32 MB of DRAM using industry standard SIMMs (70 ns). The CDC provides all the control functions to implement a 128 KBytes secondary (L2) cache with parity.

2

MIX 232 Communications Controller

Reader
Service
Number

067



Fact Sheet #281181-001

- Supports RS-232 electrical and physical interface communications protocol
- Synchronous and asynchronous serial communications up to 64 Kbits/s
- 8 full-duplex, full-connectivity serial ports per module
- Each channel supported by Zilog Z16C32 integrated universal serial controller (IUSC) with individual 16MHz DMA controllers
- Full hardware and software support for HDLC/SDLC, SNA, Bisync/Async, and X.25
- X.25 software drivers provided as a standard feature of iRMX® III operating system
- Two 100-pin general purpose synchronous (GPSYNC) shielded connectors on the front panel
- Cables with 25 way D-type RS-232 connectors are available

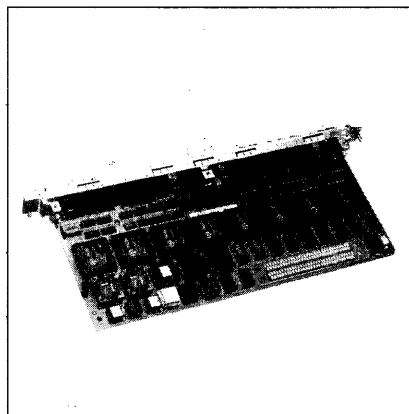
The MIX 232 module is an 8-channel high-speed synchronous and asynchronous communications controller designed for applications requiring rapid data acquisition and transmittal. Each of the eight independent Wide Area Network (WAN) channels is coupled with a dedicated integrated universal serial controller (IUSC) for full-duplex data exchanges. Data rates are enhanced by two full-capacity 16 MHz DMA channels in each IUSC.

The MIX 232 is compatible with the RS-232 electrical specification and physical layer communications protocol. It is designed to sustain full-duplex synchronous and asynchronous data rates up to 64 Kbits/sec. The MIX 232 module can be stacked to a maximum level of three modules for up to 24 channels on each MIX baseboard.

MIX 422 Communications Controller

Reader
Service
Number

070



Fact Sheet #281154-001

- Supports RS-422 electrical, and RS-449 and X.21 physical interface protocols
- Synchronous and asynchronous serial communications up to 2 Mbits/s
- 8 full-duplex, full-connectivity serial ports per module
- Each channel supported by Zilog Z16C32 integrated universal serial controller (IUSC) with individual 16MHz DMA controllers
- Full hardware and software support for HDLC/SDLC, SNA, Bisync/Async, and X.25
- X.25 software drivers provided as a standard feature of iRMX® III operating system
- Two 100-pin general purpose synchronous (GPSYNC) shielded connectors on the front panel
- Cables with 37 way D-type RS-422 connectors are available

The MIX 422 module is an 8-channel high-speed synchronous communications controller designed for applications requiring rapid data acquisition and transmittal. Each of the eight independent Wide Area Network (WAN) channels is coupled with a dedicated integrated universal serial controller (IUSC) for full-duplex data exchanges. Data rates are enhanced by two full-capacity 16 MHz DMA channels in each IUSC.

The MIX 422 is compatible with the RS-422 electrical specification and supports both the RS-449 and X.21 physical layer communications protocol. It is designed to sustain full-duplex data rates up to T-1 and E-1 speeds (1.544 Mbits/sec and 2.048 Mbits/sec respectively). The MIX 422 module can be stacked to a maximum level of three modules for up to 24 channels on each MIX baseboard.

2-6

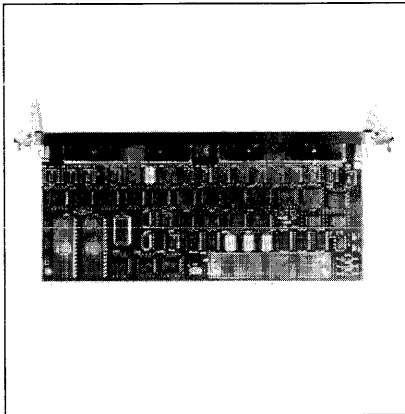
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Multibus II Boards

iSBC MIX 450 Asynchronous Terminal Controller

Reader
Service
Number

060



- Asynchronous Terminal Control Software (ATCS) for interrupt processing, character handling and modem support
- Multiple host support including dynamic line switching
- Resident firmware to support Built-In-Self-Tests (BIST)
- 12 ports per board, RS232C compatible
- 8 signal support, RJ45 (Phone Jack Style) shielded connectors

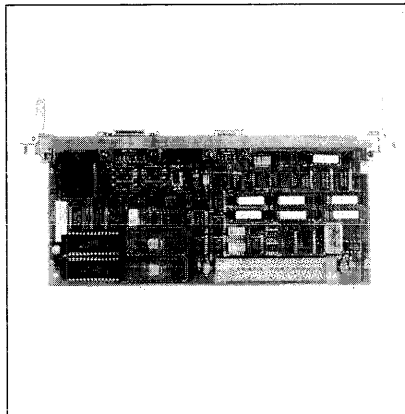
The MIX 450 Terminal Controller module, when combined with the i486 CPU-based MIX baseboard, provides high performance terminal server capability for Multibus II systems. The MIX 450 module, as a single module on the MIX baseboard, is a powerful 12 port terminal I/O controller. The module can also be stacked three high to expand the terminal support to 36 ports. Stacking the MIX 450 with other MIX modules allows the system designer to build a multifunction I/O server with terminal capabilities.

Fact Sheet #281009-005
User's Guide #500799-001

MIX 560 Ethernet Controller

Reader
Service
Number

062



- 82586 LAN Coprocessor operating at 10 MHz; 82501 Ethernet Serial Interface
- 64 Kbytes of SRAM data buffer for handling communications from the MIX baseboard to the Ethernet Interface
- Support for 128-256K EPROM
- Firmware contains Built-In Self Test code
- LED for 82586 activity
- Serial interface for system console or debug

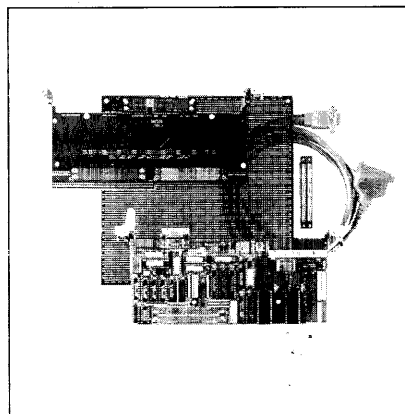
The MIX 560 Ethernet Module combines an 82586 LAN coprocessor, 82501 Ethernet Serial Interface, and 64K bytes of high speed SRAM data buffer to provide high performance Ethernet Modular Interface eXtension (MIX) I/O capabilities. The MIX 560 can be used either in a MIX module stack to provide Ethernet capabilities to a Multibus II MIX I/O server subsystem, or as a single module on the MIX baseboard to provide a high performance MIX-based Ethernet controller. The 82501 is software configurable to either Ethernet V1.0 or IEEE 802.3 (Ethernet V2.0). IEEE 802.3 is the default. The Ethernet interface operates at a fixed rate of 10 Mbits/sec. An Ethernet station address PROM is also provided.

Fact Sheet #281009-005
User's Guide #459622-001

MIXMODX, MIXSC10 MIX Development Modules

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073



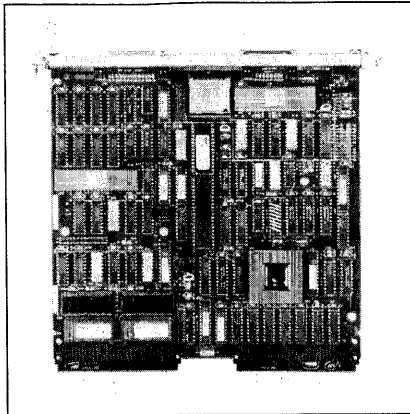
- The MIX development modules and documentation form a complete set of tools for developing custom MIX modules.
- MIXMOD1 Test Module—used for testing MIX module hardware and software designs.
- MIXMOD2 Breadboard Module—used for wire-wrapping and building a prototype module design.
- MIXMOD3 Debug Module—used to mount a MIX module with its component side up.
- Order MIXSC10 for ten additional MIX stacking connectors

The MIX development modules are designed to facilitate the MIX module development process, and are designed to stack on top of the MIX baseboard or another MIX module. The Test Module is used for testing MIX module hardware and software designs. This module contains a serial interface and an iSBX connector for communicating with the MIX baseboard. The Breadboard Module is used for wire-wrapping and building a prototype module design. It provides three separate wire-wrap areas, each surrounded by power and ground connections. The Debug Module is used to mount a MIX module with its component side up; this allows access to the module's components for easy probe connection and debug.

iSBC 186/530 Ethernet Controller

Reader
Service
Number

064



- Provides IEEE 802.3/Ethernet compatible networking capability for Multibus II systems
- Resident firmware to support Built-In Self Test (BIST), Initialization and Diagnostic eXecutive (IDX), and host-to-controller software download
- Four 28-pin JEDEC sites, expandable to 8 sites with iSBC 341 board for a maximum of 512 Kbytes of EPROM

- One RS232C serial port for use in debug and testing or as a console port
- Multibus II parallel system bus interface with full message passing capability

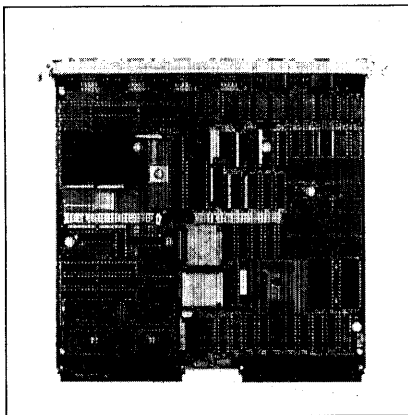
The iSBC 186/530 Multibus II Ethernet Controller is a dedicated IEEE 802.3 compatible front-end processor. The board's 8 MHz 80186, 512K DRAM, and host-to-controller software download capability allows the board to off-load LAN communications functions and I/O software processing from one or all of a Multibus II system's host CPU boards.

Fact Sheet #281009-004
User's Guide #149226-002

iSBC 186/410 Wide Area Network Controller

Reader
Service
Number

069



- 8 MHz 80C186 Microprocessor
- Six serial communications channels: two RS232C or RS422A, four RS232C only; front panel connections
- 82258 DMA controller provides four independent DMA channels

- 512 Kbytes DRAM provided, four 28-pin JEDEC sites available for EPROM
- Two iSBX connectors provided for I/O expansion

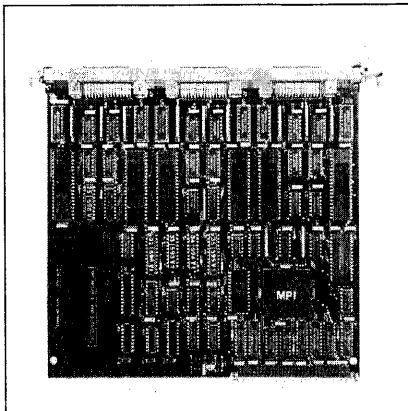
The iSBC 186/410 Multibus II serial communications board is an intelligent 6-channel communications processor that addresses the needs of many standard communication applications. The board brings flexibility to the application with its multiple serial channels as well as I/O expansion through the iSBX connections. The board is designed to support serial communication within the system. The iSBC 186/410 board supports asynchronous, byte synchronous, and bit-synchronous (HDLC/SDLC) communications on the two full/half duplex RS232C or ES422A channels. Each serial channel can be individually programmed for different baud rates to allow system configurations with differing terminal types.

Fact Sheet #281009-004
User's Guide #148941-003

iSBC MPI/519 Parallel I/O

Reader
Service
Number

065



- 72 channels of TTL level I/O in banks of 24 channels each
- Banks configurable for general purpose industrial I/O or as Centronics compatible ports
- Output lines may be read back to verify output status
- Socketed buffer drivers and resistor networks for configuring I/O as high or low

- 8 interrupt request lines, one can be configured for Broadcast interrupt
- Precision interval pulse triggering on three I/O lines, one on each bank
- Jumper-less configuration

The iSBC MPI/519 is a digital I/O interface board which provides 72 channels of TTL level I/O in Multibus II I/O space. The board is capable of receiving interrupts from other Multibus II agents, as well as generating interrupts from up to 8 sources. The iSBC MPI/519 is suitable for applications such as industrial automation, printer interface, or for low cost inter-chassis communications requiring multiple parallel I/O lines.

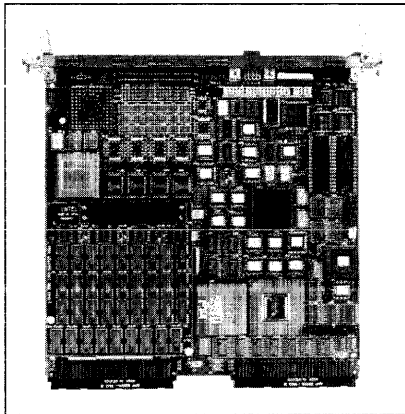
Fact Sheet #281009-004
User's Guide #502201-001

Multibus II I/O Boards

iSBC 386/258 Peripheral Controller

Reader Service Number

066



- 16 MHz i386 Microprocessor
- CMS002 module support
- Common Command Set (CCS) SCSI peripheral support
- Asynchronous SCSI to 1.5 MBytes/sec, synchronous to 4.0 MBytes/sec
- Two versions: single ended SCSI port only or differential SCSI ports
- Firmware support for BIST, IDX, slave test handler, and downloader
- 258 Peripheral Communications Interface (258-PCI) firmware
- Two MSA EPROMs are included in the shipping container

The iSBC 386/258 is a high performance peripheral controller that combines powerful I/O performance and access to SCSI peripherals for most Multibus II applications. Minicomputer-level I/O performance is achieved by utilizing the i386 microprocessor and a large data cache. The added power of the i386 processor gives the iSBC 386/258 capability of off-loading tasks from other system CPUs as an I/O server. The board supports communication with up to seven other peripheral adapters and up to 56 possible devices. Vendor-unique features of peripherals can be accessed using the pass through capability.

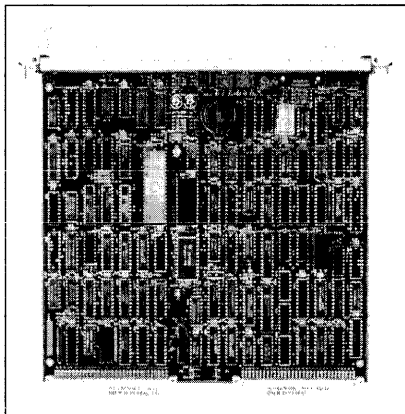
Fact Sheet #281009-005

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iSBC CSM/001 Central Services Board

Reader Service Number

090



- Integrates Multibus II Central System Functions on a Single Board
- Multibus II Parallel System Bus Clock Generation for all Agents Interfaced to the Multibus II PSB Bus
- Multibus II Interconnect Space for Software Configurability and Diagnostics
- System-wide Reset Signals for Power-up, Warm Start, and Power Failure/Detection
- System-wide Time-out Detection and Error Generation
- Built-in Self Test (BIST) Power-up Diagnostics with LED Indicator and Error Reporting Accessible to Software via Interconnect Space
- Slot I.D. and Arbitration I.D. Initialization
- General Purpose Link Interface to other Standard (Multibus I) or Proprietary Buses
- Time-of-Day Clock Support with Battery Back-up On-board

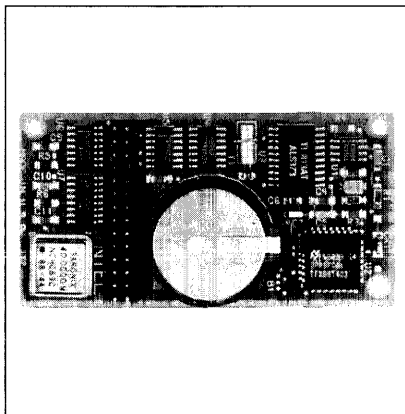
The iSBC CSM/001 Central Services board is responsible for managing the central system functions of clock generation, power-down and reset, time-out, and assignment of I.D.s defined by the Multibus II specification. The integration of these central functions improves overall board area utilization in a multi-board system since these functions do not need to be duplicated on every board. The iSBC CSM/001 board additionally provides a time-of-day clock and the general purpose link interface to other standard (Multibus I) or proprietary buses.

Fact Sheet #280070-004

iSBC CSM/002 Central Services Module

Reader Service Number

091



- Full IEEE/ANSI 1296 Compliance for CSM functions:
 - Arbitration and slot ID Initialization
 - BCLK and CCLK Generation
 - PSB Bus Time-out Monitoring
 - Reset Sequencing for Warm and Cold Resets
 - Power Fail Indication and Recovery
- Software Compatible with the iSBC CSM/001 board, but saves a card slot
- Battery Back-up Time-of-Day Clock
- Slot 0 Detection Circuit
- Clock-based Alarm Function for Periodic Interrupt
- 28 Bytes Non-volatile RAM
- Low Battery and Oscillator Failed Warnings

The iSBC CSM/002 is a small, surface mount circuit board that, when installed on a compatible baseboard, performs all central service module (CSM) functions as required by the IEEE/ANSI 1296 Multibus II specification. This credit card sized module mounts on a compatible base board. The combined host board and CSM module require only one card slot. The small size and high functionality of the iSBC CSM/002 module is achieved by taking advantage of silicon support for CSM functions on the MPC (Message Passing Coprocessor) bus interface component. The module reduces system cost while remaining software compatible with the iSBC CSM/001 full-size Multibus II board.

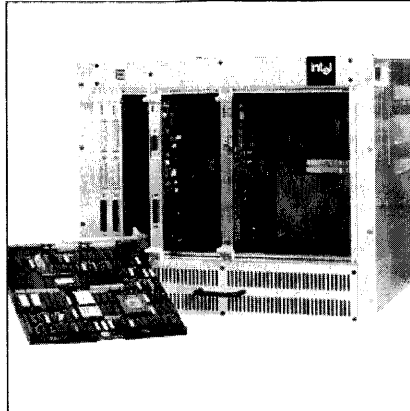
Fact Sheet #280694-002

Multibus II I/O Boards

CH541 20-slot Chassis

Reader
Service
Number

074



Fact Sheet #281029-002

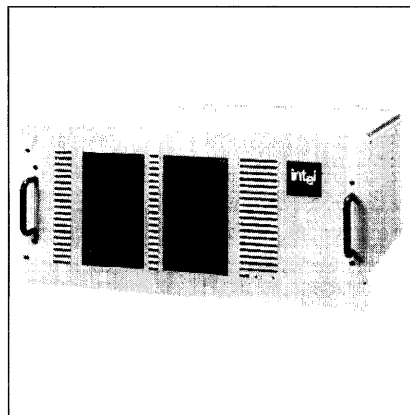
- 20-Slot Multibus II (IEEE/ANSI 1296) backplane
- EIA, 19 inch rack standard with provision for slidemounting. Fits 24" rack
- Heavy duty bus bars for negligible IR drop across card cage under maximum loading
- 750 Watt multiple output switching power supply. Jumper selectable 115/220 VAC
- Certified to UL, CSA, and TUV safety agency requirements
- High-volume and uniform cooling air flow across all card positions (250+ LFM). Air flow highly independent of adjacent equipment
- Front panel reset switch and power indicator
- Built-in P2 power connections points
- P2 backplane at Slot 0 provides "Reset", Remote Diagnostics Serial Port Interface (RSPI) functions and I/O connections.
- Unrestricted area behind P2 backplane for user I/O configuration
- Full One Year Warranty

Intel's 20-slot 541 chassis provides a basic platform for the integration of large capacity systems. The CH541's modular packaging allows for integration into standard 19-inch rack-mount cabinets and fits in a 24-inch deep rack. Each CH541 chassis is compactly built, ruggedly constructed, and features superior Intel quality and high reliability.

CH542R Rackmount Peripheral Chassis

Reader
Service
Number

075



Fact Sheet #281029-002

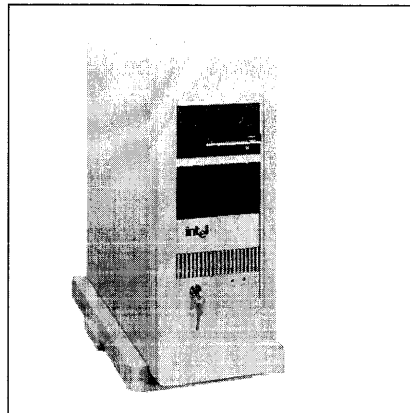
- Three Full-Height peripheral bays (2 front access, 1 internal), each able to mount two half-height devices
- 300 Watt power supply, switch selectable for 115/220 VAC
- Rigid lightweight chassis. Fits a standard EIA 19-inch wide, 24-inch deep rack
- Designed to comply with international safety agency requirements
- Air flow capable of supporting 40C operation
- Power distribution cables provided for all drive positions plus an adapter board.
- Cable manager with strain relief for rear entry signal cables.

Intel's 542 Rackmount Peripheral Chassis provides a basic platform for integrating large capacity systems. The CH542 chassis is a companion to Intel's CH541 20-slot chassis. However the CH542 chassis may be used with any system where additional peripheral capacity is required. Intel's modular packaging allows for integration into standard 19-inch rackmount cabinets and fits in a 24-inch deep rack. The CH542 has rugged, compact construction, superior Intel quality, and high reliability.

SYP520 Chassis

Reader
Service
Number

076



Fact Sheet #280672-004

- Eight Slot Multibus II (IEEE/ANSI 1296) Backplane
- 535 Watt Multiple Output Switching Power Supply Selectable for 115/230 VAC
- 3 Full Height (6 Half Height) Drive Bays with Front Panel Access
- Heavy Duty bus bars for negligible IR drop across card cage under maximum loading
- Floorstand or Tabletop models available
- Certified to UL CSA, IEC, and VDE

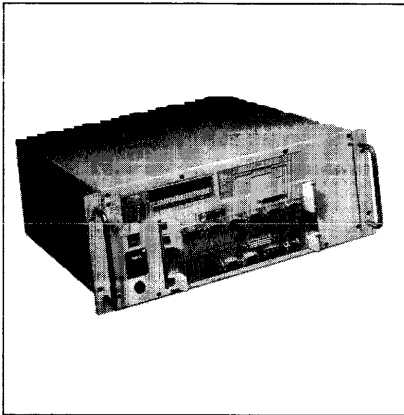
The eight slot SYP520FE and the SYP520TE provide a rugged and high performance chassis for integrated Multibus II systems. Superior Intel quality is evident in the safety, EMI protection, and durability of the 520 chassis. The outstanding features of these chassis make them the number one choice of OEM's for testing, development, and production systems. Select SYP520TE for tabletop unit or SYP520FE for floor-stand unit.

Multibus II Development Systems

SYP220 5-Slot Chassis

Reader
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Number

077



- Five slot Multibus II (IEEE/ANSI 1296) Backplane
- 302 Watt Multiple Output Switching Power Supply selectable for 115/230 VAC
- MTBF of the Power Supply is 50000 hours
- Three 3½" Half Height Drive bays
- Two 5¼" Half Height Drive bays with front panel access
- 17.8cm High (4U), 52.1cm Deep and 48.2cm Wide (19")
- Forced Air Cooling with 90 CFM Fan
- Removable Cooling Fan Filter
- Airflow averaging 255 LFM across the slots
- Designed for ease of Service and Maintenance
- Meets International EMI/RFI certification
- Intel Quality and Reliability

Intel's System 220 chassis is designed to provide a high quality, rugged, 19" rack-mountable solution for OEM's developing Multibus II products. The System 220 also meets the needs of the designers who require a low cost starter kit for a development environment. Combined with Intel's family of i386™, i486™ and Pentium™ processor CPU and I/O controllers, the 5 slot chassis System 220 can be used to build high-performance Multibus II platforms.

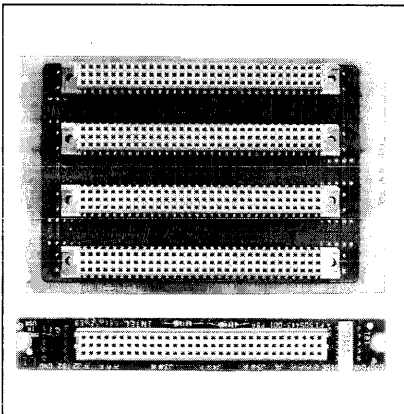
Fact Sheet #281700-001

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SITP2KIT, SITP204KIT Auxiliary I/O Backplane

Reader
Service
Number

086



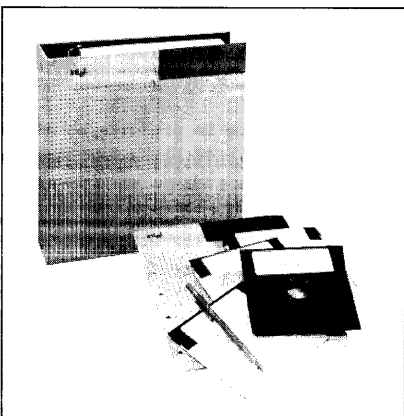
- Single Slot P2 backplane, SITP2KIT, or four slot P2 backplane, SITP204KIT
- SCSI signals available for SBC 486/133SE, 486/166SE, or 386/258
- CSM interconnect function for CSM/001, or other Multibus II board with CSM/002
- Jumper for cold or warm reset
- Power connectors for additional 5 VDC power

The SITP2KIT provides a single slot P2 backplane for auxiliary I/O. The SITP204KIT provides a four slot P2 backplane. The P2 backplane delivers the SCSI signal from the iSBC 486/166SE, 486/133SE, and 386/258. In addition, the P2 backplane provides CSM interconnect functions for CSM/001 or Multibus II boards with CSM/002 modules.

MSA Firmware Development Package

Reader
Service
Number

095



- Source Code and Binary files for: Master Test Handler, Console Controller, Bootstrap Loader, Initialization & Diagnostic Executive, and Core Function Set
- Complete Documentation: Installation and Generation Guide, Functional Specifications, BIST Writer's Guide, and MSA Specifications
- DOS generation environment
- Provided in C language
- Distributed via DOS diskettes, including make files compatible with PolyMake*
- Designed to facilitate customization

The Multibus II Systems Architecture (MSA) provides the framework and guidelines for the start-up and run-time operation of a multiple board, multiple operating system, heterogeneous microprocessor, Multibus II system. The MSA Firmware Development Package (FDP) enables customers who are developing i386 or i486 CPU Multibus II boards to easily incorporate firmware on the board that allows it to fully participate in an MSA environment.

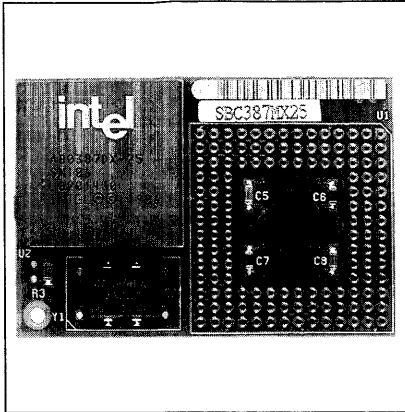
Data Sheet #281009-005

Multibus II Packaging

iSBC 387MX25 Math Extension Module

Reader
Service
Number

092



- Adds i387 Math Coprocessor Floating Point Math Capability to the iSBC 386/258
- Single-slot solution. Does not require an extra slot when Module is mounted
- Clock Rate is 25 MHz
- Size is 1.8" by 2.7"

The iSBC 387MX25 Math Extension Module add i387 Math Coprocessor floating point math capability to the iSBC 386/258. The clock speed is 25 MHz. The module is used in conjunction with the existing i386 microprocessor on the iSBC 386/258. A separate i386 microprocessor is not supplied with the iSBC 387MX25 module. The iSBC 387MX25 does not require an additional slot when mounted on the host single board computer.

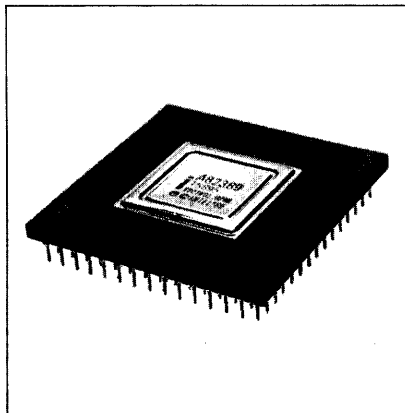
Fact Sheet #281009-005

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82389 Message Passing Coprocessor (MPC)

Reader
Service
Number

094



- Single Chip Interface for the Parallel System Bus (PSB)
- 1.0 u CMOS Technology
- 149-pin Ceramic PGA Package (15x15 grid)
- Optimized for Real-Time Response (Maximum 900 ns for 32-byte Interrupt Packet)
- Processor Independent Interface to the PSB
- Supports coexistence of dual port and message passing communication protocols
- Dual Buffer Input and Output DMA capabilities

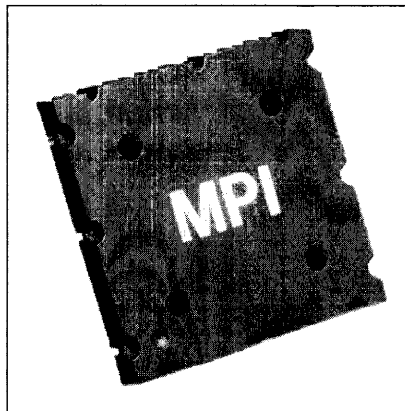
The 82389 MPC is a highly integrated VLSI CMOS device that maximizes the performance of a Multibus II multiprocessor system. The MPC implements the full message passing protocol as well as the functions (arbitration, transfer and exception cycle protocols) of the PSB bus interface control as defined in the IEEE/ANSI Standard 1296. The 82389 MPC is designed to interface with a 32-, 16-, or 8-bit processor. It provides support for message passing, interconnect space, memory, and I/O references on the PSB. Additionally, the 82389 MPC component is designed to simplify implementation of dual port memory functions for those designs that will co-exist with the message passing communications protocol.

Fact Sheet #281009-004

MPI Peripheral Interface

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093



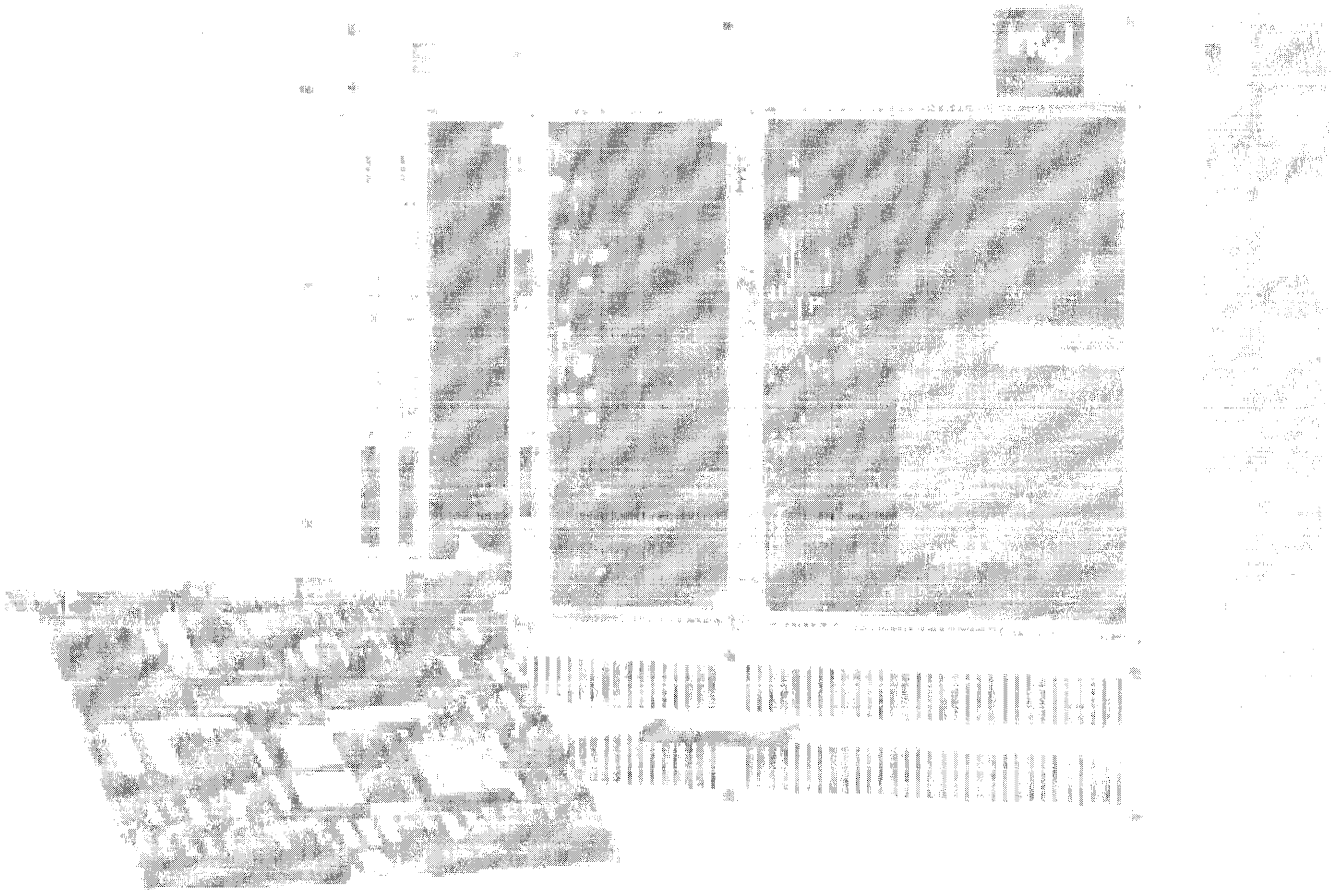
- Replier in I/O Space
 - 2 KBytes address on each board
 - 8/16 bus data width agents
- No application CPU required
- No support microcontroller required
- Supports up to 8 local interrupt sources
- Sends/Receives Broadcast messages
- Sends/Receives unsolicited messages (without data)
- Complete arbitration protocol
 - Normal and High Priority modes are supported
- Interfaces to Intel's 8259A PIC
- ANSI/IEEE 1296 compliant
- 124-pin plastic PGA package

The Multibus II Peripheral Interface, MPI, is a single chip, "replier only" Parallel System Bus interface device. This 16-bit integrated CMOS interface component is compliant with the IEEE/ANSI 1296 standard and is compatible with other board products using the 82389 Message Passing Coprocessor. It supports data transfer in I/O space as defined by the IEEE specification. The MPI is particularly suited to the design of low-cost, non-intelligent boards. All interface logic, except for five high current buffer drivers, is incorporated, which simplifies and accelerates I/O board design. The local interface is designed to provide a simple interface to I/O board components. The MPI also includes configuration registers which are programmed from the PSB to suit a variety of applications.

Fact Sheet #281009-005

Live Insertion Section Index

Live Insertion on Multibus II: An Introduction 3-2



3

An Introduction to Live Insertion on Multibus II

Historically, highly reliable computers have been used in military, industrial, aerospace, and communications applications where computer failure was of significant economic impact. Continuous operation is a requirement in a large number of those applications. Technological innovation is now making this hardware available to general applications.

Live Insertion is the latest technological innovation bringing continuous operation to the Multibus II system architecture. Live Insertion is a combination of hardware, software and operator protocols allowing Multibus II boards in a system to be replaced or added with minimal disruption to the operation of other boards.

3

The Live Insertion capabilities allow a developer to implement a “resilient” or “highly available” system. If, for example, a system utilizing live insertion experiences a board failure, that system can execute an application that could continue operation at reduced performance levels until the system is serviced.

Live Insertion is critical for such tasks as On-line Service and Repair or On-line System Modification. Live Insertion also supports scalability and upgradability in existing and new systems. Taking advantage of the Multibus II's Live Insertion capabilities allows application designers to create applications that are robust, fault resilient, and highly available.

The core of this new technological advancement resides in a new Central Services Module (CSM) and a new Multibus II backplane. The new CSM incorporates all the features of the SBC CSM/001 or SBC CSM/002, plus an 80186 CPU design which incorporates a user interface to achieve system power control. The new backplane integrates the standard features of the Multibus II backplane, plus additional power FETs for power control of each slot, switching +5V and $\pm 12V$.

For more information on how you can add Live Insertion capability to your Multibus II system, please contact your local Intel distributor or sales office.

iSBX Expansion Modules Section Index

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iSBX 351, iSBX 354	Single or Double Channel Serial I/O Board.....	4-2
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Parallel I/O Expansion Modules

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Ethernet*/LAN Controller Modules

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Math Modules

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Peripheral Controller Modules

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Graphics Modules

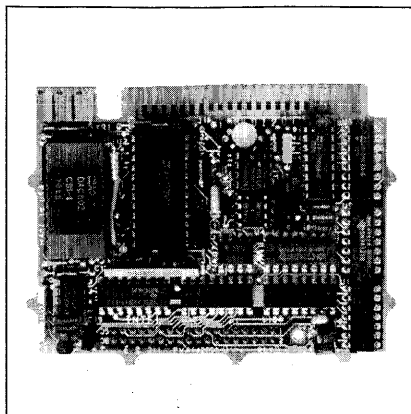
iSBX 279A	Graphics Subsystem.....	4-4
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iSBX Expansion Modules

iSBX 311 Analog Input Board

Reader
Service
Number

096



- Low Cost Analog Input
- 8 Differential/16 Single-Ended, Fault Protected Inputs
- 20 mV to 5V Full Scale Input Range, Resistor Gain Selectable
- 20 KHz Acquisition Rate
- Unipolar (0 to +5V) or Bipolar (-5V to +5V) Input, Jumper Selectable
- 12-Bit Analog-to-Digital Converter

The iSBX 311 Analog Input board provides simple interfacing of non-isolated analog signals to any iSBC board with an iSBX connector. The single wide iSBX 311 plugs directly onto the iSBC board, providing data acquisition of analog signals from eight differential or sixteen single-ended voltage inputs, which are jumper selectable. Resistor gain selection is provided for both low level and high level signals. Incorporating high quality IC components, the iSBX 311 board provides 12-bit resolution, 11 bit accuracy, and a simple programming interface, all on one low cost iSBX board.

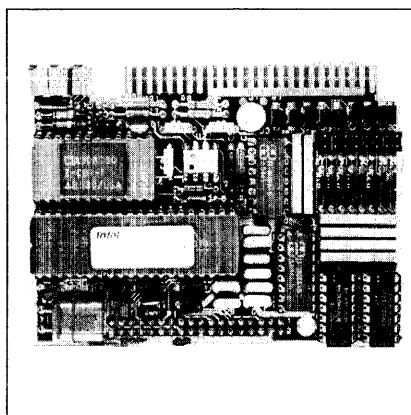
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Data Sheet #280233-003

iSBX 328 Analog Output Board

Reader
Service
Number

097



- Low Cost Analog Output
- 8 Channel Output, Current Loop or Voltage, in any mix
- 4-20 mA Current Loop; 5V Unipolar or Bipolar Voltage Output
- 12-Bit Resolution
- 0.035% Full Scale Voltage Accuracy @ 25 C
- Programmable Offset Adjust in Current Loop Mode
- 5 KHz updates (1 channel), 1 KHz (8 channels)

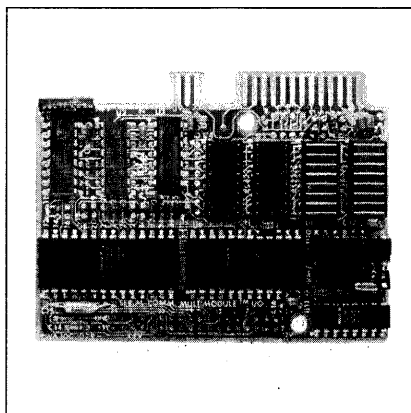
The iSBX 328 board provides analog signal output for any intelligent board with an iSBX I/O Expansion Bus connector. The single-wide iSBX 328 plugs directly onto the host board, providing eight independent output channels of analog voltage for meters, programmable power supplies, etc. Voltage output can be mixed with current loop output for control of popular 4-20 mA industrial control elements. By using an Intel single chip computer (8041) for refreshing separate sample-hold amplifiers through a single 12-bit DAC, eight channels are contained on a single iSBX board for high density and low cost per channel. High quality analog components provide 12-bit resolution, and slew rates per channel of 0.1V per channel. Maximum channel update rates are 5 KHz on a single channel to 1 KHz on all eight channels.

Data Sheet #80234-002

iSBX 351/354 Serial I/O Boards

Reader
Service
Number

098



- Low Cost Serial Input/Output
- Programmable Synchronous/Asynchronous Communications—RS232C or RS449/422
- Four Jumper Selectable Interrupt Request Sources
- Low Power Requirements
- Two Programmable 16-Bit BCD or Binary Timer/Event Counters
- Single +5V when configured for RS449/422
- iSBX 351 is single channel. iSBX 354 is double channel.

The iSBX 351/354 Serial I/O boards provide RS232C or RS449/422 programmable synchronous/asynchronous communications channels with software selectable baud rates. Two general purpose programmable 16-bit BCD or binary timers/event counters are available to the host board to generate accurate time intervals under software control. Incremental power dissipation is minimal, requiring only 3.0 watts (assuming RS232C interface.)

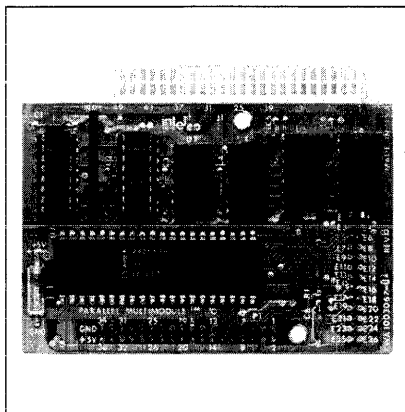
Data Sheet #280236-002

iSBX Expansion Modules

iSBX 350 Parallel I/O Board

Reader
Service
Number

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Fact Sheet #280235-003

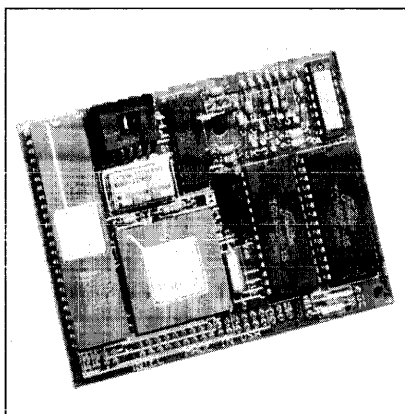
- 24 Programmable I/O Lines with Sockets for Interchangeable Line Drivers and Terminators
- Three Jumper-Selectable Interrupt Request Sources to Host Computer
- Accessed as I/O Port Locations
- Single +5V Low Power Requirement

The iSBX 350 module provides 24 programmable I/O lines with sockets for interchangeable line drivers and terminators. The board is closely coupled to the host board through the iSBX bus, which offers maximum on-board performance and frees Multibus system traffic for other system resources. Incremental power dissipation is minimal.

iSBX 586 Ethernet Data Link Engine

Reader
Service
Number

101



Fact Sheet #231668-001

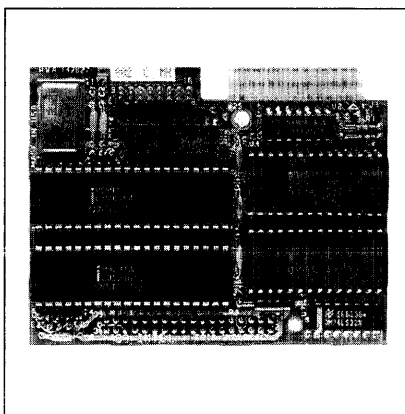
- Provides an IEEE 802.3 (Ethernet) Data Link Connection
- Based on Intel's 8 MHz 82586 LAN Coprocessor Chip, featuring:
 - Automatic Retransmission
 - On-Board Multicast Address Filtering
 - Host Interface via Buffer Chaining
- 16 K of Local Dual-Ported Buffer RAM
- Single-wide SBX Board
- Compatible with INA 960 ISO Transport Layer Software with:
 - Direct Support for iRMX Operating Systems
 - Source Code Support for other Operating Systems

The iSBX 586 Ethernet Data Link Engine is a single wide iSBX card that provides a low-cost Ethernet controller for single board computers with 16-bit SBX bus capability. Based on the 82586 Local Area Network Coprocessor, the iSBX 586 implements the data link (Layer 2) and physical (Layer 1) layers of the International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This allows the iSBX 586 to supply an IEEE 802.3 10 Mbps (Ethernet) connection.

iSBX 488 GPIB Board

Reader
Service
Number

102



Fact Sheet #143580-002

- Complete IEEE 488-1978 Talker/Listener Functions including:
 - Addressing, Handshake Protocol, Service Request, Serial & Parallel Polling Schemes
- Complete IEEE 488-1978 Controller Functions including:
 - Transfer Control, Service Requests, and Remote Enable
- Simple Read/Write Programming
- Software Functions built into VLSI hardware for high performance, low-cost and small size
- IEEE 488-1978 Standard Electrical Transceivers
- Five Volt Only Operation

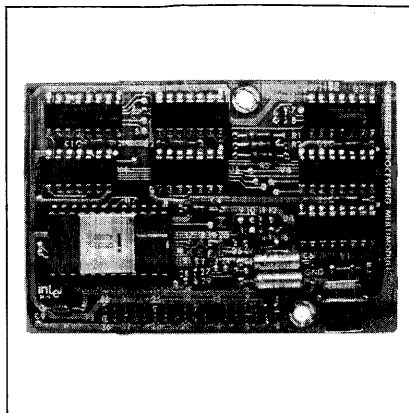
The iSBX 488 GPIB Talker/Listener/Controller board provides a standard interface to the numerous instruments and computer peripherals that use the IEEE 488-1978 General Purpose Instrumentation Bus (GPIB). By taking full advantage of Intel's VLSI technology, the single-wide iSBX 488 board implements the complete IEEE 488-1978 Standard Digital Interface for Programmable Instrumentation on a single low-cost board. The iSBX 488 board includes the 8291A GPIB Talker/Listener, an 8292 GPIB Controller, and two 8293 GPIB Transceiver devices. A simple user programming interface for easy reading, writing, and monitoring of all GPIB functions is provided. This intelligent interface minimizes the impact on host processor bandwidth.

iSBX Expansion Modules

iSBX 331 Math Module

Reader
Service
Number

103



- Math Board based on a 4 Mhz 8231
- Fixed Point 16 and 32 bit Operation
- Floating Point 32 bit operation
- 18 Programmable Data Manipulation Commands
- Fixed/Floating Point Conversion Commands
- Single width module
- Binary Data Formats
- Software Reset capability

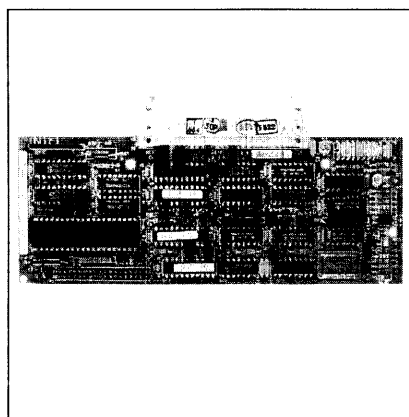
The iSBX 331 Fixed/Floating Point iSBX board adds single or double precision floating or fixed point arithmetic operations to any iSBC board that contains an iSBX bus connector. 43 floating point and fixed point commands are performed faster than is possible through alternative conventional programming routines. The iSBX 331 may be conveniently divided into two functional subsections: an arithmetic processor and an iSBC microcomputer interface.

4

iSBX 218A Flexible Disk Controller

Reader
Service
Number

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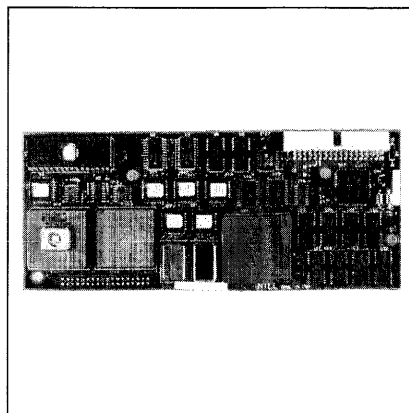
- Controls most single/double density, single/double sided disk drives
- Phase lock loop data separator assures data integrity
- User programmable drive parameters allow wide choice of drives
- Double-width module

The iSBX 218A, which mounts easily on any iSBC board that has an IEEE 959 iSBX I/O Expansion Bus connector, provides low cost control of 5.25" disk drives. Up to 4 drives can be supported. The maximum capacity disk or disk drive size (formatted) is 1MByte. Maximum power requirements +5V are 1.7 A.

iSBX 279A Display Subsystem

Reader
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Number

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- Intel 82786 Display Processor
- iRMX Operating System Device Drivers
- High Level Language Interface
- System Console Support Kits
- Windowed User Interface
- Terminal Emulator
- Standard Graphics Command Interpreter
- Network Transparent Graphics Protocol

The iSBX 279A is a complete graphics subsystem designed to provide users of Intel's iRMX III real-time systems with advanced interactive graphics functions. Based on Intel's 82786 Display Processor, the iSBX 279A efficiently off-loads bitmap and window manipulation from the application CPU, preserving real-time system performance. High-speed windowing, ASCII terminal emulation with system support, and powerful drawing commands are provided in a convenient system expansion package.

Use with SIT279Kit Interconnect board and cables in Multibus II systems.

Fact Sheet #280667-002

BITBUS Products Index

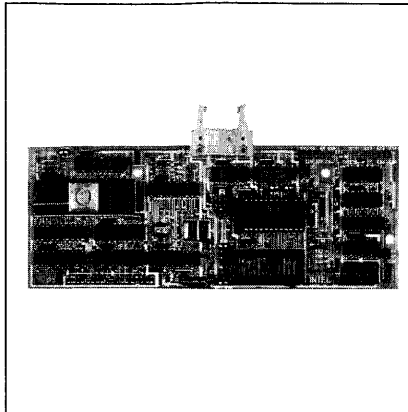
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iPCX 344A	PC Interface.....	5-2
iRCB 4410A	Digital I/O Control	5-2
iRCB 4420A	Analog I/O Control	5-2



iSBX 344A, iPCX 344A Controller Boards

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Fact Sheet #280247-002

- High Performance 12 MHz 8044 Controller
- Integral Firmware Including the iDCX 51 Executive Optimized for Real-Time Control Applications
- Full BITBUS Support
- 2 28-Pin JEDEC Memory Sites for User's Control Functions
- Power-Up Diagnostics

The iSBX 344A is the BITBUS gateway to all products that support the iSBX I/O Expansion Interface. Based on the highly integrated 8044 component (an 8-bit 8051 microcontroller and an SDLC-based controller on one chip) the iSBX 344A board extends the capability of other microprocessors via the BITBUS interconnect. With the other members of Intel's Distributed Control Modules (iDCM) family, the iSBX 344A expands system capabilities to include distributed real-time control.

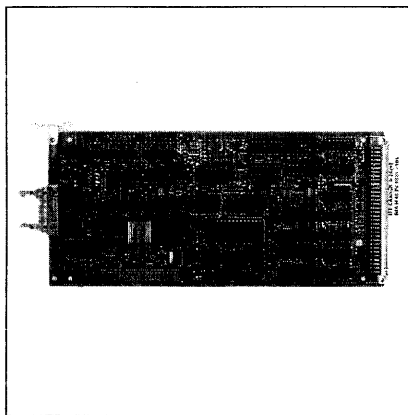
For PC users, the same feature set is also available as the iPCX 344A BITBUS Interface to the IBM PC. This XT format card is compatible with all DOS development tools, and fully supports Intel's Remote Control Board (RCB) product line.

5

iRCB 44/10A Remote Digital I/O Controller Board

Reader
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Fact Sheet #280213-003

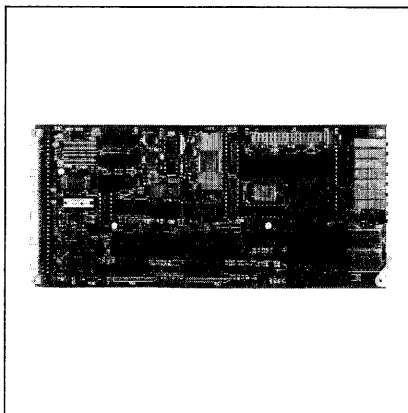
- High Performance 12 MHz 8044 Controller
- Programmable Control/Monitoring Using 24 Digital I/O Lines
- Integral Firmware: iDCX Executive Optimized for Real-Time Control
- Full BITBUS Support
- 2 28-Pin JEDEC Memory Sites
- Power Up Diagnostics
- I/O Expansion via iSBX Connector
- Standard Industrial Package: Eurocard, DIN Connector

The iRCB 44/10A BITBUS Digital I/O Remote Controller Board is an intelligent real-time controller and a remote I/O expansion device. Based on the highly integrated 8044 component (an 8 bit microcontroller and an intelligent SDLC-based controller on one chip) the iRCB 44/10A board provides high performance control capability at a low cost. The iRCB 44/10A board is well suited for industrial control applications such as data acquisition and monitoring, process control, robotics, and machine control.

iRCB 44/20A Analog I/O Controller

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Number

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Fact Sheet #280721-002

- Distributed Intelligence via BITBUS Serial Bus
- 16 Single-ended or 8 Differential Input Channels
- 2 Output Channels
- $\pm 10V$ Range or 4-20 mA Current Loop
- 8044 8-bit Microcontroller at 12 MHz
- 12-bit Analog Resolution
- Up to 20 KHz Acquisition Rate (50 us)
- Software Programmable Gain 1, 10, 100, 500
- Two 28-pin JEDEC Memory Sites
- I/O Expansion via iSBX Connector
- Standard Industrial Package: Eurocard, DIN Connector

The iRCB 44/20A BITBUS Analog I/O Controller is a fully programmable analog I/O subsystem on a single Eurocard form-factor board. The resident 8044 microcontroller operating at 12 MHz provides the ability to execute data acquisition and control routines remote from the host computer. Real-time capability is made possible by the iDCX 51 Distributed Control Executive, resident in the 8044 microcontroller. Distribution of real-time control is implemented by the BITBUS Serial Bus protocol, which is also managed integrally by the 8044.

Networking Products Index

Local Area Network Boards

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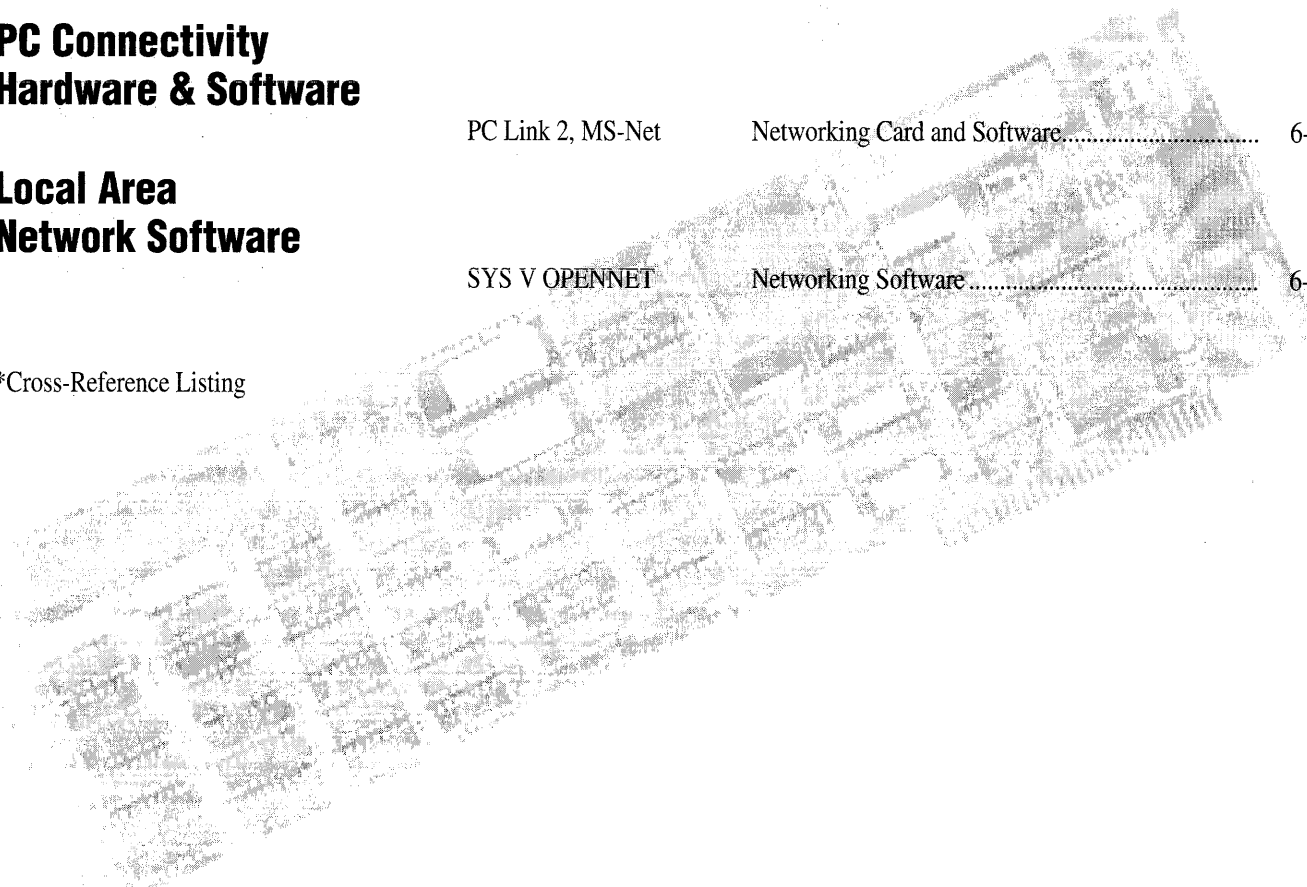
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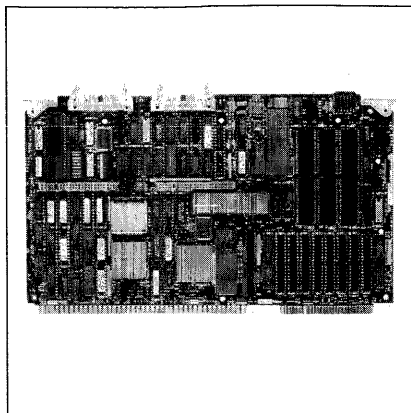
*Cross-Reference Listing



iSBC 186/51 Communication Computer

Reader
Service
Number

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Fact Sheet #280207-001

- 6 MHz 80186 Microprocessor
- 82586 Local Area Network Coprocessor for Ethernet/IEEE 802.3
- 128 KBytes of Dual-Ported RAM, Expandable on-board to 256 KBytes
- Sockets for up to 192 KBytes of JEDEC 28-pin Standard Memory Devices
- Two iSBX Bus Connectors
- 16 MBytes Address Range of Multibus Memory
- Two Serial Interfaces; RS232C and RS422A/RS449 compatible
- Supports Transport Layer Software (iNA 960) and Higher Layer Communications Software

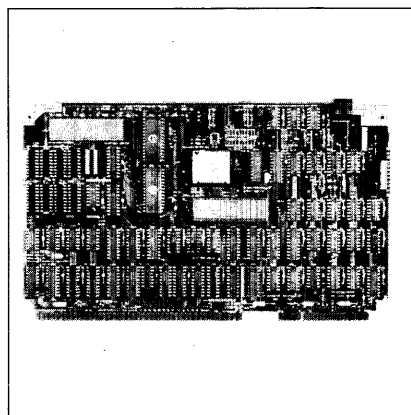
The iSBC 186/51 Communications Computer is an economical, self-contained computer for applications in processing and local area network control. The combination of the 80186 Central Processing Unit and the 82586 Local Area Network Coprocessor makes it ideal for applications that require both communications and processing capabilities, such as networked workstations and factory automation. The iSBC 186/51 provides a CPU, Ethernet interface, serial communications interface, 128 KBytes RAM, up to 192 KBytes EPROM/ ROM, and I/O ports.

iSBC 552A Network Interface Adaptor

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Number

044

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Fact Sheet #280385-002

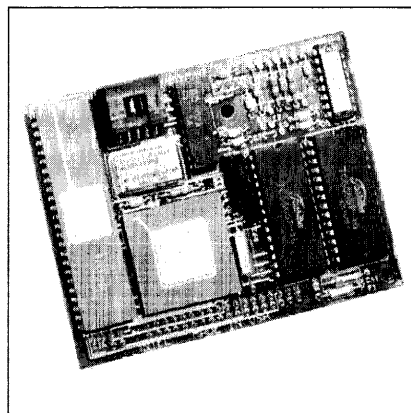
- IEEE 802.3 Compatible
- Provides High-Performance Network Front-end Processing for all Multibus I systems—Intelligent Controller with an 8 MHz, 80186 Processor and 256K of DRAM memory
 - IEEE 802.3 Network port driven by the 82586 LAN Coprocessor
- Can Execute iNA 960/961 Software On-board
- Resident Network Software can be downloaded over the Bus or LAN
- On-Board Diagnostic and Boot Firmware

The iSBC 552A is a flexible, intelligent communications controller for IEEE 802.3 LANs. This Network Interface Adapter is dedicated to the network communications tasks within a system allowing the host to spend more time processing user applications. It can be used to network existing systems and established designs without forcing a redesign of the entire system architecture. The iSBC 552A can run with iRMX I and III Real-Time operating systems and requires only iRMX-Net to communicate with the host. Other operating systems require iNA 960 software.

iSBX 586 Ethernet Data Link Engine

Reader
Service
Number

101



Fact Sheet #231668-001

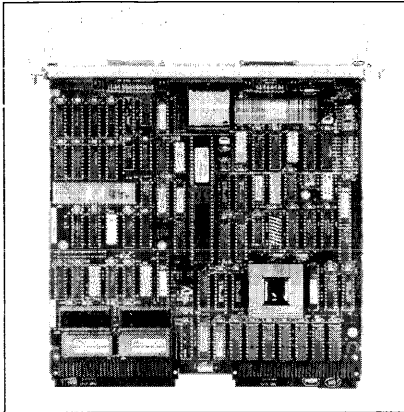
- Provides an IEEE 802.3 (Ethernet) Data Link Connection
- Based on Intel's 8 MHz 82586 LAN Coprocessor Chip, featuring:
 - Automatic Retransmission
 - On-Board Multicast Address Filtering
 - Host Interface via Buffer Chaining
- 16 K of Local Dual-Ported Buffer RAM
- Single-wide SBX Board
- Compatible with iNA 960 ISO Transport Layer Software with:
 - Direct Support for iRMX Operating Systems
 - Source Code Support for other Operating Systems

The iSBX 586 Ethernet Data Link Engine is a single wide iSBX card that provides a low-cost Ethernet controller for single board computers with 16-bit iSBX bus capability. Based on the 82586 Local Area Network Coprocessor, the iSBX 586 implements the data link (Layer 2) and physical (Layer 1) layers of the International Standards Organization (ISO) Open Systems Interconnect (OSI) reference model. This allows the iSBX 586 to supply an IEEE 802.3 10 Mbps (Ethernet) connection.

iSBC 186/530 Ethernet Controller

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- Provides IEEE 802.3/Ethernet compatible networking capability for Multibus II systems
- Resident firmware to support Built-In Self Test (BIST), Initialization and Diagnostic eXecutive (IDX), and host-to-controller software download
- Four 28-pin JEDEC sites, expandable to 8 sites with iSBC 341 board for a maximum of 512 Kbytes of EPROM
- One RS232C serial port for use in debug and testing or as a console port
- Multibus II parallel system bus interface with full message passing capability

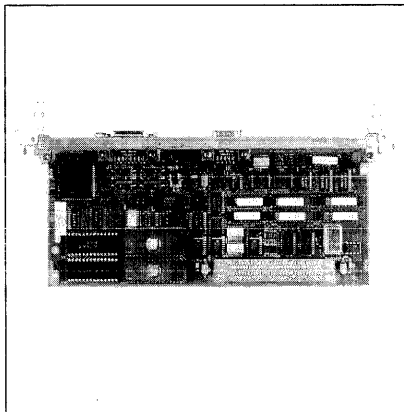
The iSBC 186/530 Multibus II Ethernet Controller is a dedicated IEEE 802.3 compatible front-end processor. The board's 8 MHz 80186, 512K DRAM, and host-to-controller software download capability allows the board to off-load LAN communications functions and I/O software processing from one or all of a Multibus II system's host CPU boards.

Fact Sheet #281009-004
User's Guide #149226-002

MIX 560 Ethernet Controller

Reader
Service
Number

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- 82586 LAN Coprocessor operating at 10 MHz; 82501 Ethernet Serial Interface
- 64 Kbytes of SRAM data buffer for handling communications from the MIX baseboard to the Ethernet Interface
- Support for 128-256K EPROM
- Firmware contains Built-In Self Test code
- LED for 82586 activity
- Serial interface for system console or debug

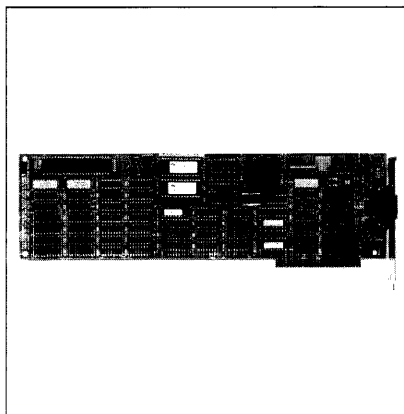
The MIX 560 Ethernet Module combines an 82586 LAN coprocessor, 82501 Ethernet Serial Interface, and 64K bytes of high speed SRAM data buffer to provide high performance Ethernet Modular Interface eXtension (MIX) I/O capabilities. The MIX 560 can be used either in a MIX module stack to provide Ethernet capabilities to a Multibus II MIX I/O server subsystem, or as a single module on the MIX baseboard to provide a high performance MIX-based Ethernet controller. The 82501 is software configurable to either Ethernet V1.0 or IEEE 802.3 (Ethernet V2.0). IEEE 802.3 is the default. The Ethernet interface operates at a fixed rate of 10 Mbits/sec. An Ethernet station address PROM is also provided.

Fact Sheet #281009-004
User's Guide #459622-001

PC LINK2 Network Interface Adaptor; MS-Net* Networking Software

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- PC LINK2 Network Interface Adaptor (NIA)
- Intelligent, high-performance PC board
- Compatible with IBM PC, PC/XT*, PC/AT* and true-compatible PC systems
- Fits a single, full size PC I/O slot
- Contains 16 Kbytes EPROM and 256 K or 512 K RAM
- Fully compatible with IEEE 802.3 Ethernet V1.0 and Ethernet V2.0 LAN transceivers and cables
- Contains an 8 MHz Intel 80186 microprocessor for processing resident software
- 16-bit wide internal data paths
- MS-Net*—PC LINK2 NIA
- MS Net - OpenNET for MS-DOS
- PC Link2 NIA with MS Net implements the SMB Protocol for easy access to files on other operating systems, such as iNDS, XENIX, UNIX, iRMX, or VAX/VMS

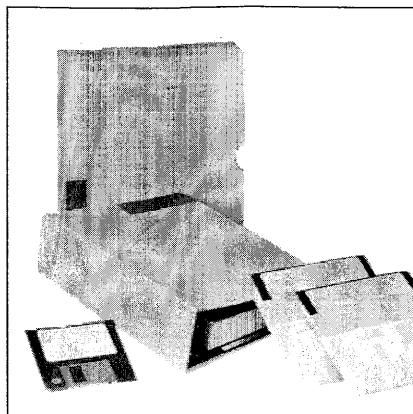
Users of IBM PC AT, PC XT and other compatible computers can access Intel's OpenNET networking family through the OpenNET PCL2 hardware and software products. The hardware connection is provided by an 80186/82586-based intelligent expansion board, the PC LINK2 Network Interface Adapter. The software package incorporates: MS-NET for transparent file access under DOS, iNA 961, NetBIOS interface, dynamic name resolution and user friendly installation software. The NetBIOS interface provides the flexibility to use the PC LINK2 NIA with commercially available NetBIOS applications. Optionally, the MS-NET networking software is available for the upper layers.

Hardware Reference Manual #450772-001

System V OpenNET Networking Software

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- Transparent file access between DOS, iRMX, XENIX, UNIX, and iNDX systems
- Both Server and Consumer functionality supported
- Remote Batch Execution (RBE) through "rexec"
- Compatible with XENIX-NET
- File-based Nameserver compatible with XENIX-NET/net/data files
- Supports MMDF
- Interoperates with XENIX-Net mail
- OpenNET/MS-NET VT protocols supported
- Both Server and Consumer functionality
- Interface through "rprint"
- Supports Core printer spooling protocol
- Interface via AT&T supplied TLI(Streams) library, allowing all TLI applications to interoperate with SV-OpenNET
- SV-OpenNET provides a library, NSI, for high-level Virtual Circuit (VC) creation and name to address translation. The NSI then communicates directly with the UNIX TLI

SV-OpenNet connects Intel SYSTEM V systems with all the OpenNET nodes. SV-OpenNET is available for Multibus I and Multibus II. The product includes a complete solution: communications board, Mail, VT, print spooling, nameserver interface library (NSD), and networking management. SV-OpenNET allows application interfacing through the UNIX TLI library. Applications may also access SV-OpenNET via the higher level NSI library. SV-OpenNET can also coexist with the UNIX networking, RFS.

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iRMX® III Operating System



iRMX III Real-Time Operating System

616983-001

Migration Strategies for the iRMX OS

281141-001

- 32-bit multi-tasking, multi-user OS for Intel386™, Intel486™, and Pentium™ microprocessor based systems, including embedded, Multibus I, Multibus II, and Intel PC-compatible platforms
- i387™ numeric coprocessor support
- 4 Gigabyte addressability
- iRMX or PC hosted development
- Priority-based and/or round robin scheduling
- Object-structured architecture
- Make support
- Loadable File Driver support
- Unrestricted multitasking
- Multiple users
- Loadable device drivers/jobs/OS extensions
- Efficient memory use with shared C-libraries
- Increased functionality and performance with the iRMX Kernel
- TCP/IP network protocol software supported
- Microsoft C and Watcom C compiler support
- SCSI II support
- Easy upgrades from iRMX® II
- DOS file driver support

The iRMX® Operating System is designed specifically for real-time applications, providing deterministic and high performance response to external events, excellent support for special purpose hardware, and sophisticated real-time programming facilities.

Using Release 2.1 of the iRMX Operating System, three distinct operating system variations can be generated: iRMX III, iRMX for Windows, and iRMX for PCs.

iRMX III—Multibus Targets

The iRMX III Operating System is the foundation of the family, providing expanded configurability and Multibus compatibility. The Interactive Configuration Utility (ICU) allows users to configure almost every aspect of the operating system. Using the ICU provided with the iRMX III OS, a developer can generate a custom configuration by modifying the default definition file provided with the operating system software.

iRMX for Windows—PC-Compatible Targets—DOS/Windows

iRMX for Windows adds support for MS-DOS* 6.2 and Microsoft Windows* 3.1 Standard Mode on an Intel PC-compatible system. These operating systems provide the systems designer with a powerful real-time extension to the standard MS-DOS/Windows environment.

iRMX for PCs—PC-Compatible Targets—iRMX

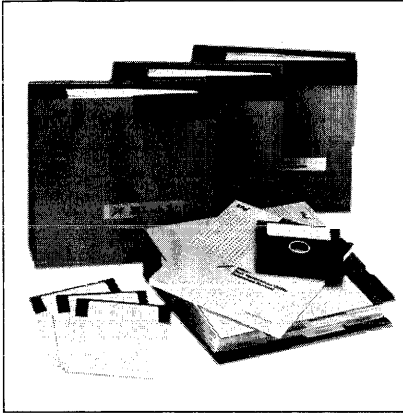
iRMX for PCs provides the ability to execute an application on a PC-compatible system using the ROM BIOS, thus insulating the OS from the many possible peripherals. Using both iRMX for Windows and iRMX for PCs, the designer can develop an application using industry-leading DOS development tools. The target hardware can be embedded, Multibus I, Multibus II, or Intel PC-compatible platforms.

Binary compatibility with 16-bit iRMX II software lets iRMX II users easily move their application to 32 bits on the iRMX III operating system, gaining control of the full 32-bit power of the Intel386™, Intel486™, and Pentium™ microprocessors.

iRMX® I Real-Time Operating System

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- Multitasking real-time operating system
- Multi-user and multi-terminal support
- (P)ROM or RAM-based
- 8086, 8088, 80186, 80188, 80286, i386 and i486 microprocessor support
- 8087/i287/i387 numeric coprocessor support
- Application software portable to next generation of Intel microprocessor
- Support for industry-standard languages and development tools

CORE MODULE

- Nucleus

OPTIONAL MODULES

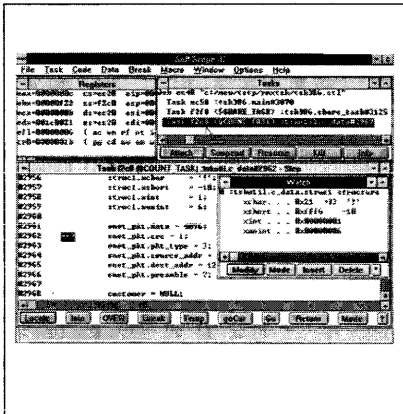
- File system
- Basic I/O system includes device drivers for many Intel MULTIBUS I/O boards
- Extended I/O system
- Bootstrap loader
- Application loader
- Human interface supports on-target development and end user reprogramming
- System debugger

The iRMX I operating system is a real-time, multitasking, multi-user multiprogramming software system designed to support high performance, time-critical applications such as factory automation, industrial control and communications networks. It is highly configurable for easy customization and offers abundant development tool and language support for fast, easy application development.

Soft-Scope* Source-Level Debugger

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- Microsoft Windows compatible
- Debug multiple user-loaded applications
- Full support for iRMX® tasking features
- Data breakpoints
- Watch window

Soft-Scope® III for iRMX® III offers iRMX users the debugging power and convenience of operating in the Microsoft Windows environment. This product is a truly dynamic debugger designed to debug multitasking applications running in the iRMX operating system.

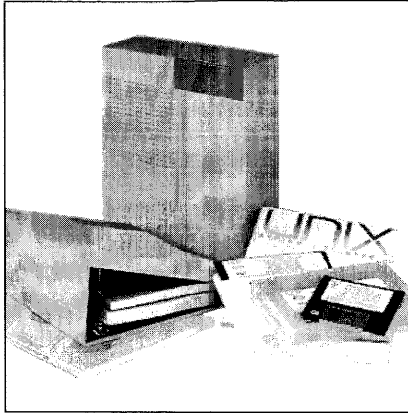
A Tasks window gives you full control over the tasks in your application, and as you change between them, Soft-Scope III automatically adjusts the Code window and Registers window to display information for the selected task. Using the Tasks window you can monitor multiple tasks simultaneously at break, and suspend and resume tasks.

Soft-Scope III provides symbolic display of all iRMX system objects (mailboxes, job trees, etc.) which helps you determine the current state of your system.

UNIX* System V Rel. 4.03 for Multibus II

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- Based on UNIX System V Release 4.03
- Networking support includes TCP/IP, NFS, and SV OpenNet
- X Windows Support with OpenLook (Motif available separately)
- Includes Drivers for Multibus II I/O cards
- Boots directly on iSBC 486/166SE or 486/133SE
- Can use the iSBC 386/258 as a boot server
- Supports most 512 BPS DOS drives

Intel's UNIX* System V Release 4.03 for Multibus II delivers the flexibility, integration, and power of UNIX* to Multibus II systems. UNXV4II and UNXV4IISE deliver full support for Intel's Multibus II System Architecture, MSA, Multibus transport, and driver support for Intel's popular Multibus II I/O cards.

UNIX* System V Release 4.03 has the benefits of 20 years of refinement and thousands of applications and tools designed for the UNIX* environment. Networking support is complete with TCP/IP, NFS, and System V OpenNET. Graphical User Interfaces are provided through X Windows and OpenLook*. Motif* is also available, but sold separately.

The UNIX* System V Release 4.03 operating system running on Multibus II is an excellent manager for real-time boards and systems running iRMX® operating system or a real-time kernel such as iRMK. UNXV4II and UNXV4IISE provide message passing, application down loading, standard GUIs, and standard networking. These products communicate with any other OS in the system with Multibus II transport capability.

iRUG Intel Real-Time User's Group

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iRUG is an international organization whose mission is to explore any real-time technology (hardware or software) which is based on or enhances an Intel Operating System or Architecture.

iRUG hosts an annual Conference in October bringing members, Intel management and technical staff together for three days of intense technical seminars. This is not a sales conference by Intel; iRUG approves all papers presented by users and Intel for sound technical content and merit.

Members of iRUG are also kept informed through the Human Interface newsletter, CompuServe REALTIME forum, and local iRUG chapters. And, the iRUG Program Library, containing hundreds of useful programs on the iRMX® operating systems, is available to members.

To join iRUG contact: iRUG

801 W. Lancaster Ave.
Suite 2
Downington, PA 19335

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Systems Engineering Consulting Services

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Intel Systems Engineers can work with you to:

- Guide your development effort
- Provide solutions to your problems
- Help you utilize new products more effectively
- Create your new application
- Provide you with personalized training
- Customize an Intel product to fit your needs

Intel's Systems Engineers have extensive experience and engineering expertise with Intel boards, systems, software, and tools. They can work at your site or from a local Intel office, helping you get your application to market sooner, boost your productivity and ensure compatibility with future Intel projects.

Product Cross References

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Multibus I Products

CPU Boards: 8-Bit

Product	CPU	Clock Rate (MHz)	RAM CAP/ Supplied	iLBX Interface	ROM/EPROM/ CAP/Supplied (Bytes)	Serial Ports	Parallel I/O Lines	Timers	Interrupts	iSBX Connectors	Math/ Memory Expansion
iSBC 80/10B	8080A	2.05	4 KB/1 KB	—	16 KB/0	1 RS232C	48	1	1 level 11 sources	1	iSBX 331
iSBC 80/24A	8085A -2	4.84	8 KB/4 KB	—	32 KB/0	1 RS232C	48	3	12 levels 23 sources	2	iSBX 331

CPU Boards: 16-Bit

iSBC 86/05A	8086	5.0/8.0	16 KB/8KB	—	256 KB/0	1 RS232C	24	3	9 levels 24 sources	2	iSBC 302A
iSBC 86/35A	8086	5.0/8.0/10	1 MB/ 512 KB	—	960 KB/0 Flash-512 KB/0	1 RS232C	24	3	9 levels 28 sources	2	8087
iSBC 86C/38	80C86	8.0	1 MB/1 MB	—	512 KB/0	1 RS232C	24	3	9 levels 37 sources	2	iSBC 337A
iSBC 88/25	8088	5.0	16 KB/ 4 KB	—	16 KB/0	1 RS232C	24	3	9 levels 24 sources	2	iSBC 302A
iSBC 88/40A	8088	5.0	8 KB/4 KB	—	128 KB	1 RS232C	24	3	9 levels 26 sources	2	
iSBC 186/03A	80186	8.0	64 KB/0	Yes	768 KB/0	2 RS232C or 1 RS232C +1 RS422A	24 SCSI or general purpose	6	27	2	iSBC 341
iSBC 286/10A	80286	8.0	128 KB/0	Yes	512 KB/0	2 RS232C or 1 RS232C +1 RS422A	24	3	16 levels 26 sources	2	i287 iSBC 341
iSBC 286/12 286/14 286/16	80286	8.0	4 MB/1 MB 4 MB/2 MB 4 MB/4 MB	Yes	256 KB/0	2 RS232C or 1 RS232C +1 RS422A	24	3	16 levels 26 sources	2	i287 iSBC 341

CPU Boards: 32-Bit

iSBC 386/12; 386/12S	i386	20	16 MB/1, 2, 4, or 8 MB	iLBX, SCSI on S-models	512 KB/0	2 RS232C or 1 RS232C & 1 RS422A	24	3	16 levels 26 sources	2	387, 82258, iSBC MM0XFP
iSBC 386/24 or 28	i386	16	16 MB 4, or 8 MB	—	512 KB/0	1 RS232C		3	16 levels 26 sources	1	387, iSBC MM0XFP
iSBC 386/ 32, 34, or 38	i386	20	16 MB 4, or 8 MB	—	512 KB/0	1 RS232C		3	16 levels 26 sources	1	387, iSBC MM0XFP
iSBC 486/12; 486/12S	i486	33	64 MB/1, 2, 4, or 8 MB	iLBX, SCSI on S-models	512 KB/0	2 RS232C or 1 RS232C & 1 RS422A	24	3	16 levels 26 sources	2	82258 on S models, iSBC MM30XX
iSBC 486/12DX2; 486/12DX2S	i486	66	64 MB/1, 2, 4, or 8 MB	iLBX, SCSI on S-models	512 KB/0	2 RS232C or 1 RS232C & 1 RS422A	24	3	16 levels 26 sources	2	387, 82258, iSBC MM30XX

Multibus I Products

Baseboard/Memory Board Compatibility

Expansion	Product	Access Time (ns)	386/2X	386/3X	386/12	486/12	486/12DX2
1 MB RAM	iSBC MM01FP	85	Y	Y	Y		
2 MB RAM	iSBC MM02FP	85	Y	Y	Y		
4 MB RAM	iSBC MM04FP	85	Y	Y	Y		
8 MB RAM	iSBC MM08FP	85	Y	Y	Y		
16 MB RAM	iSBC MM16FP	85	Y	Y	Y		
8 MB RAM	iSBC MM3008	70				Y	Y
16 MB RAM	iSBC MM3016	70				Y	Y
32 MB RAM	iSBC MM3032	70				Y	Y

PC-Compatible CPU Boards

Product	CPU	Clock Rate (MHz)	RAM CAP/ Supplied (SIMMS)	System Interfaces	Peripheral Controllers	Serial Ports	Parallel Port	Other I/O Ports	Optional Graphics Module	Other Features
iSBC PC P4SX33 iSBC PC P4DX2 iSBC PC PXDX4	i486 IntelDX2 IntelDX4	33 66 100	64MB/0	MULTIBUS I	SCSI-2, IDE, Ethernet	Two RS232	Centronics compatible	AT-style mouse, keyboard	iSBC PCICLV, PCI-based SVGA	128KL2 cache, Full dual-port memory, user Flash sites
iSBC 386/SX	i386 SX	16	8 MB/512 KB or 2 MB	MULTIBUS I	IDE, Floppy	Two RS232C	Centronics compatible	AT-style Mouse, keyboard	Via iSBC 272: VGA, EGA, CGA, MDA, HGC	interrupt controller, two 32-pin EPROM sites, watchdog timer, real-time clock

iSBC Memory Boards

Model No.	Memory Size (Bytes)	Address Range/Boundary	ECC or Parity	iLBX	Access Time (ns)	Supports Battery Backup
iSBC 020CX	2 MB	0-16 MB/16 MB boundary for MULTIBUS access, 64 KB boundary for iLBX access	ECC	Yes	380	Yes

EPROM Expansion Boards

Model No.	Memory Size (Bytes)	Memory Type	CPU Board Compatibility	Notes
iSBC 341	256 KB/0	EPROM SRAM	iSBC 86/05, 88/25, 88/40A, 88/45, 186/03A, 286/10A, 286/12/14/16	Mounts in existing baseboard EPROM/ SRAM sockets
iSBC 428	512 KB/0 16 28-pin JEDEC sites	EPROM, ROM, E ² PROM, SRAM, NVRAM	All MULTIBUS I and iLBX	Supports iLBX and MULTIBUS access, 0 to 16 MB address range on 4 KB boundaries
iSBC 429	4 MB/0 32 32-pin JEDEC sites	Flash memory, EPROM page mode; EPROM, ROM, E ² PROM, SRAM, static NVRAM	All MULTIBUS I and iLBX	Supports iLBX and MULTIBUS access, 0 to 16 MB address range on 4 KB boundaries

Multibus I Products

Serial Communication Boards

Model No.	CPU	RAM	EPROM ROM	Serial I/O Ports	Protocol	Parallel I/O Lines	Interrupts	Timers
iSBX 351				1 RS232C or RS422	Async/Sync	—	4 (to baseboard)	2
iSBX 354				2 RS232C or 1 RS232C + 1 RS422	HDLC/SDLC	—	4 (to baseboard)	
iSBC 534	—	—	—	4 TTY or RS232C	Async/Sync	16	16 levels 16 sources	2
iSBC 544A	8085A	16 KB (dual port) 256 static	8 KB max.	4 RS232C	Async/Sync	10	12 levels 21 sources	3
iSBC 548	80186	128 Dynamic (32 dual port)	64 KB max.	8 RS232C	Async	—	8 levels	3
iSBC 88/45	8088 8 MHz	16 KB	128 KB	3 RS232C/RS422A	3 HDLC/SDLC Async/Sync on 2	2	9 levels 23 sources	2
iSBC 188/56	80188 8 MHz	256 KB/256 KB (48 KB dual port)	192 KB	8 RS232C or 6 RS422C + 2 RS422A	Async/Sync HDLC/SDLC	—	22 levels 59 sources	6

Local Area Network Boards

Model No.	CPU	RAM (Bytes)	EPROM ROM (Bytes)	Serial I/O Ports	Protocol	Interrupts	Timers	Notes
iSBC 186/51	80186 8 MHz	256 KB/ 128 KB	192 KB/0	1 Ethernet 2 RS232C or RS422A	IEEE 802.3 Async, Sync	9 levels 28 sources	3	
iSBC 552A	80186 8 MHz	256 KB/ 256 KB	128 KB/0	1 Ethernet	IEEE 802.3			
iSBX 586	82586	16 KB/16 KB	—	1 Ethernet	IEEE 802.3	—	—	Requires 16-bit iSBX slot

Parallel I/O Boards

Model No.	RAM	EPROM ROM	Serial I/O Ports	Parallel I/O Lines	iSBX Connectors	Interrupts	Notes
iSBX 350				24 programmable	0	3	
iSBC 519A	—	—	—	72 programmable	3	8 levels 10 sources	
iSBC 556	—	—	—	24 in + 16 out + 8 programmable	0	2 levels 8 sources	Optical isolated I/O
iSBC 569	2 KB dual port	16 KB	1	54 (3 UPI-41As)	0	12 levels 22 sources	

Peripheral Controllers: Flexible Disk, Winchester, SMD, Tape

Model No.	System Interface	Floppy Interface	Disk Interface	Tape Interface	Notes
iSBX 218A	iSBX	SA 450, SA 460 (4 drives)			
iSBC 221	MULTIBUS I	SA 45X, SA 46X, 475	ESDI, ST 506, ST 412	QIC-02	
iSBC 221S	MULTIBUS I	SCSI-2, SA 45X SA 46X, 475	SCSI-2	SCSI-2, QIC-02	Compatible with 214 and 221

Multibus I Products

Analog I/O Boards

Model No.	Size	Analog Input	Analog Output	Differential Input	Current Output	Voltage Output
iSBX 311	Single-wide	16	—	8	—	—
iSBX 328	Single-wide	—	8	—	1	Uni or Bipolar

Graphics Boards

Model No.	Screen Resolution	Color or B/W	Frame Rate	Pixel Clock	CRT Interface
iSBX 279A	640 × 480	256 colors	60 Hz, 31.5 Hz	25 MHz	NEC MultiSync

Math Module

Model No.	Math Coprocessor	Speed (MHz)	End of Opn. Interrupt	Compatible Boards
iSBC 337A	8087	5	1	iSBC 86/05A, 88/25, 88/40A
iSBX 331	8231 APU	2/3.2/4 MHz	1	iSBC 80/10B, 80/24A

Support Products

Model No.	Board Type
iSBX 488	GPIB Single-wide

Chassis

Model No.	Board Capacity	Peripheral Bays	Output Power (Watts)	Multiprocessor Capability
B320E	7	3 full-height	435	1-7 Bus masters, using bus arbitration

Cardcages

Model No.	Number of Slots	Terminators	Slot Spacing
iSBC 604	4	included	4 × 0.6 inch
iSBC 608	8	included	6 × 0.8 inch; 2 × 1.2 inch
iSBC 618	8	not required	6 × 0.8 inch; 2 × 1.2 inch

MULTIBUS I Hardware/Software Compatibility

Product	iRMX® I.8	iRMX® III.2	DOS/WINDOWS	iRMX® for WINDOWS	iRMX® for P/Cs
CPU Boards:					
iSBC 86/05A	Y				
iSBC 86/35A	Y				
iSBC 86C/38	Y				
iSBC 186/03A	Y				
iSBC 286/10A	Y				
iSBC 286/12	Y				
iSBC 386/2x/3x	Y	Y			
iSBC 386/12/12S	Y	Y			
iSBC 486/12/12S	Y	Y			
iSBC 486/12DX2	Y	Y			
iSBC PCP4		Y	Y	Y	Y
PC Compatible CPU Boards:					
iSBC 386/SX			Y	Y	Y
Peripheral Controllers:					
iSBC 221S	I	I			
iSBC 221	I	I			
Serial I/O:					
iSBC 188/56	I	I			
iSBC 534, 544A	I	I			
iSBC 88/45	I	I			
iSBC 548, 549	I	I			
Networking:					
iSBC 552A	I	I			
iSBC 186/51	Y/I	I			

Multibus II Products

CPU Boards: 32-Bit

Product	CPU	Clock Rate (MHz)	RAM CAP/ Supplied	High-Speed Interfaces	ROM/EPROM/ CAP/Supplied	Serial I/O Ports	Timers	Interrupts	iSBX Connectors	Expansion
iSBC 386/133/ MM01, 02, 04, 08	i386	33.0	32 MB/ 1 MB, 2 MB, 4 MB, 8 MB	iLBX II	512 KB/256 KB	1 RS232C	3	15 levels 255 sources	1	iSBC MM0xFP
iSBC 486/125/ MM08,32	i486	25.0	64 MB/ 8 MB or 32 MB	iLBX II	512 KB/256 KB	1 RS232C	3	15 levels 255 sources	1	iSBC MM0xFC
iSBC 486/133 SE/MM08, 16, 32	i486	33.0	64 MB/8 MB, 16 MB, or 32 MB	SCSI Ethernet	512 KB/256 KB	1 RS232C	3	15 levels 255 sources	1	iSBC MM30xx
iSBC 486/150/ MM08, 32	i486	50.0	64 MB/ 8 MB or 32 MB	iLBX II	512 KB/256 KB	1 RS232C	3	15 levels 255 sources	1	iSBC MM0xFC
iSBC 486/166 SE/MM08, 16, 32	i486	66.0	64 MB/ 8 MB, 16 MB, or 32 MB	SCSI Ethernet	512 KB/256 KB	1 RS232C	3	15 levels 255 sources	1	iSBC MM30xx

MIX Baseboards: 32-Bit

Product	CPU	Clock Rate (MHz)	RAM Cap/ Supplied	High-speed Interfaces	Serial I/O Ports	Parallel I/O Ports	Expansion	Other features
MIX 486/SX33	i486 SX	33.0	32 MB/0 MB via SIMMs	MIX-	On modules	On module	MIX modules	82258 ADMA 128 KB L2 cache
MIX 486/DX33	i486	33.0	32 MB/0 MB via SIMMs	MIX-	On modules	On module	MIX modules	82258 ADMA 128 KB L2 cache
MIX 486/DX66	i486	66.0	32 MB/0 MB via SIMMs	MIX-	On modules	On module	MIX modules	82258 ADMA 128 KB L2 cache

Baseboard/Memory Board Compatibility

Expansion	Product	Access Time (ns)	386/120	386/133	486/125	486/133SE	486/150	486/166SE	MIX386/020A MIX486/020A
1 MB RAM	iSBC MM01FP	85	Y	Y					
2 MB RAM	iSBC MM02FP	85	Y	Y					
4 MB RAM	iSBC MM04FP	85	Y	Y					
8 MB RAM	iSBC MM08FP	85	Y	Y					
16 MB RAM	iSBC MM16FP	85	Y	Y					
32 MB RAM	iSBC MM32FP	85	Y	Y					
8 MB RAM	iSBC MM08FC	70			Y		Y		Y
32 MB RAM	iSBC MM32FC	70			Y		Y		Y
8 MB RAM	iSBC MM3008	70				Y		Y	
16 MB RAM	iSBC MM3016	70				Y		Y	
32 MB RAM	iSBC MM3032	70				Y		Y	

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Multibus II Products

PC-Compatible CPU Boards

Product	CPU	Clock Rate (MHz)	RAM CAP/ Supplied (70 ns SIMMS)	System Interfaces	Peripheral Controllers	Serial Ports	Parallel Port	Other I/O Ports	Optional Graphics Module	Other Expansion Available
iSBC P5090	Pentium™ processor	90 MHz	256MB/0MB	MULTIBUS II P2/aPC (ISA)	Fast SCSI, IDE, Ethernet, Floppy	2 RS232C	Centronics-compatible	AT-style Mouse, keyboard	SVGA, VGA, EGA, CGA, MDA, HGC	IDE or SCSI backplanes, Ethernet module
iSBC 486/SX25	i486 SX	25	32 MB/0	MULTIBUS II P2/aPC (ISA)	SCSI, IDE, Floppy	2 RS232C	Centronics-compatible	AT-style Mouse, keyboard	SVGA, VGA, EGA, CGA, MDA, HGC	IDE or SCSI backplanes, Ethernet module
iSBC 486DX/33	i486 DX	33	32 MB/0	MULTIBUS II P2/aPC (ISA)	SCSI, IDE, Floppy	2 RS232C	Centronics-compatible	AT-style Mouse, keyboard	SVGA, VGA, EGA, CGA, MDA, HGC	IDE or SCSI backplanes, Ethernet module
iSBC 486DX/66	i486 DX2	66	32 MB/0	MULTIBUS II P2/aPC (ISA)	SCSI, IDE, Floppy	2 RS232C	Centronics-compatible	AT-style Mouse, keyboard	SVGA, VGA, EGA, CGA, MDA, HGC	IDE or SCSI backplanes, Ethernet module

Memory Boards

Model No.	Memory Size (Bytes)	Address Range/Boundary	ECC or Parity	iLBX	Access Time (ns)	Supports Battery Backup
iSBC MEM/128	128 MB	0-4 GB/1 MB	Parity	No	200	No

Terminal Controllers

Model No.	CPU	RAM	EPROM ROM	Serial I/O Ports	Protocol	Interrupts	Timers
iSBX 351				1 RS232C or RS422	Async/Sync	4 (to baseboard)	2
iSBX 354				2 RS232C or 1 RS232C + 1 RS422	HDLC/SDLC	4 (to baseboard)	
MIX 450	On base	On base	On base	12 to 36 RS232C 110-19.2 k baud	Async	On base	On base

Wide Area Network Controllers

Model No.	CPU	RAM	EPROM ROM	Serial I/O Ports	Protocol	Interrupts	Timers
iSBC 186/410	80186 8 MHz	512 KB/256 KB	256 KB/0	6 RS232C or 4 RS422C + 2 RS422A	Async/Sync HDLC/SDLC	16 levels 15 sources	3
MIX 420	On base	On base	Base plus two 32-pin sites	2 RS422 110-64 k baud	Sync	On base	3
MIX 422	On base	On base	On base	8 RS422 T.1	Sync/Async	On base	N/A
MIX 232	On base	On base	On base	8 RS232 110-64K baud	Sync/Async	On base	N/A

Local Area Network Boards

Model No.	CPU	RAM	EPROM ROM	Serial I/O Ports	Protocol	Interrupts	Timers
iSBC 186/530	80186 8 MHz	512 K/512 KB	256 KB/0	1 Ethernet 1 RS232C	IEEE 802.3 Async	5 levels 5 sources	3
MIX 560	On base	Base plus 64 KB	Base plus two 32-pin sites	1 Ethernet 1 Ethernet serial 1 RS232C	IEEE 802.3	Base plus 14	Base plus 3
iSBC EWENET (for P/C compatibles)	On base	On base	Base plus one 32-pin site	1 Ethernet	IEEE-802.3	Base plus 2	On base

Parallel I/O Boards

Model No.	RAM	EPROM ROM	Serial I/O Ports	Parallel I/O Lines	Interrupts
iSBX 350				24 programmable	3
iSBC MPI/519				72 programmable	8 levels 10 sources

1-800-438-4769

Multibus II Products

Peripheral Controllers: Flexible Disk, Winchester, SMD, Tape

Model No.	System Interface	Floppy Interface	Disk Interface	Tape Interface	Notes
iSBC 386/258S	MULTIBUS II	SCSI-1	SCSI-1	SCSI-1	SCSI single-ended
iSBC 386/258D	MULTIBUS II	SCSI dual	SCSI dual	SCSI dual	Dual SCSI: single-ended and differential

Analog I/O Boards

Model No.	Size	Analog Input	Analog Output	Differential Input	Current Output	Voltage Output
iSBX 311	Single-wide	16	—	8	—	—
iSBX 328	Single-wide	—	8	—	1	Uni or Bipolar

Graphics Boards

Model No.	Screen Resolution	Color or B/W	Frame Rate	Pixel Clock	CRT Interface
iSBX 279A	640 x 480	256 colors	60 Hz, 31.5 Hz	25 MHz	NEC MultiSync

Support Products

Model No.	Board Type
iSBX 488	GPIB Single-wide
CSM 001	Central Services Module, full-size MULTIBUS II board
CSM 002	Central Services Module, baseboard add-on module

Chassis

Model No.	Board Capacity	Peripheral Bays	Output Power (Watts)	Multiprocessor Capability	Notes
CH 541	20	0	750	Y	Rackmount
CH 542R	0	3 full-height	300	N/A	Rackmount
SYP 520	8	3 full-height	535	Y	Floor or table
SYP 220	5	2	302W	Y	Rackmount

MULTIBUS II Hardware/Software Compatibility

Product	iRMX® III.2	System V	DOS/WINDOWS	iRMX® for WINDOWS	iRMX® for P/Cs
CPU Boards:					
iSBC 386/133	Y	Y			
iSBC 486/125	Y	Y			
iSBC 486/133SE	Y	Y			
iSBC 486/150	Y	Y			
iSBC 486/166SE	Y	Y			
MIX 486/SX33	Y	Y			
MIX 486/DX33	Y	Y			
MIX 486/DX66	Y	Y			
PC Compatible CPU Boards:					
iSBC P5090	Y		Y	Y	Y
iSBC 486SX/25			Y	Y	Y
iSBC 486DX/33			Y	Y	Y
iSBC 486DX/66			Y	Y	Y
Peripheral Controllers:					
iSBC 386/258D	Y/I	I		I	I
iSBC 386/258S	Y/I	I		I	I
Terminal Controllers:					
MIX 450	I	I		I	I
Serial I/O:					
iSBC 186/410	I	I		I	I
iSBC 186/420	I	I		I	I
Networking:					
iSBC 186/530	I	I		I	I
MIX 560	I	I		I	I

Y: Runs on I: Supported for I/O

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BITBUS Products

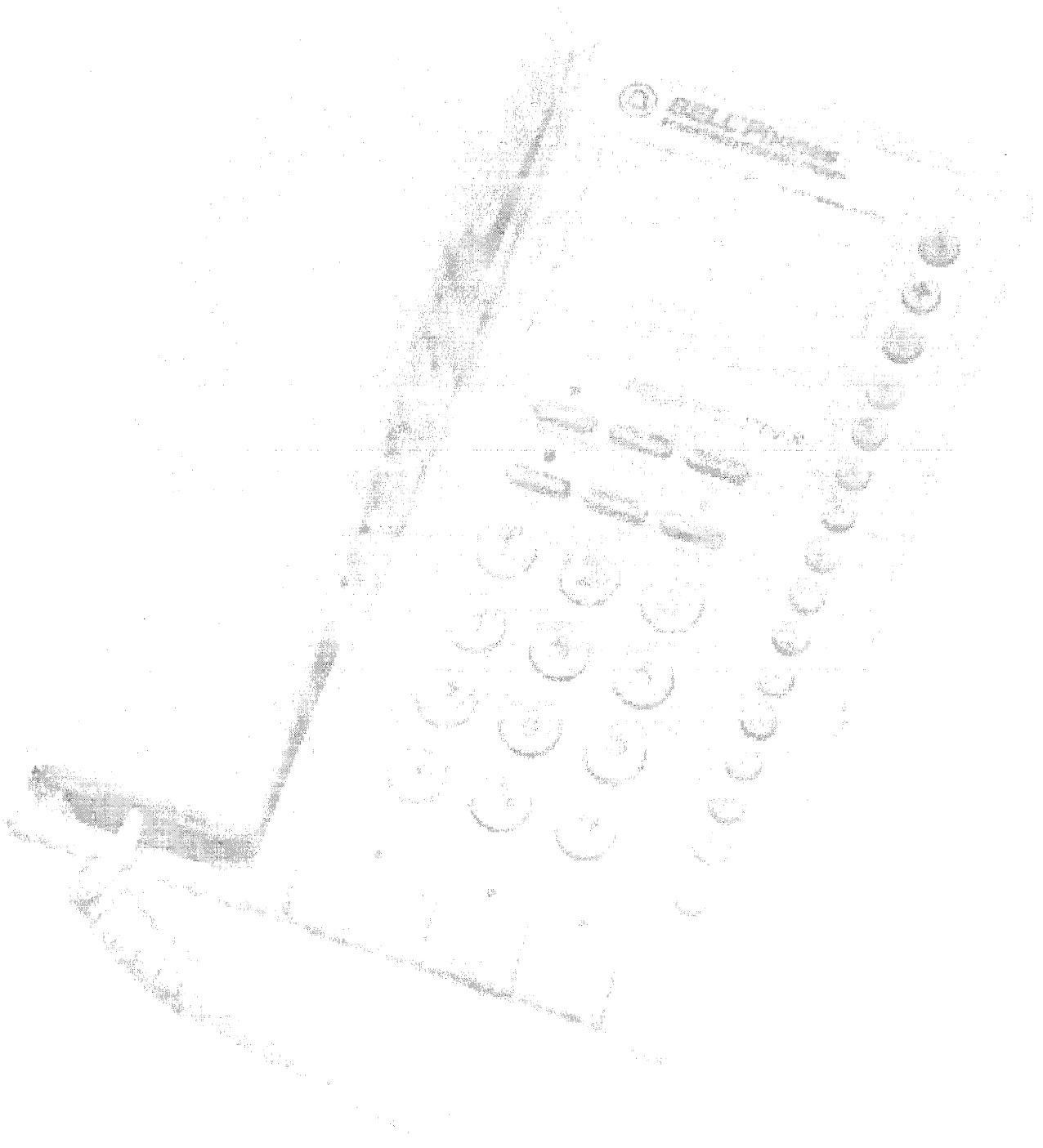
BITBUS Distributed Control Modules

Product	CPU	Clock Rate (MHz)	RAM (Bytes)	E ² PROM EPROM (Bytes)	Timers	Interrupts	iSBX Connectors	Interfaces	I/O Lines	Software
iPCX 344A	8044 (8-bit)	12	2-64 KB (two 28-pin sites)	0-64 KB	2	3	—	BITBUS PC Bus	—	DCS 100/110/120* PL/M 51, ASM 51
iSBX 344A	8044 (8-bit)	12	2-64 KB (two 28-pin sites)	0-64 KB	2	3	—	BITBUS iSBX	—	DCS 100/110/120* PL/M 51, ASM 51
iRCB 44/10A	8044 (8-bit)	12	2-64 KB (two 28-pin sites)	0-64 KB	2	3	-1	BITBUS	24 digital	DCS 100/110/120* PL/M 51, ASM 51
iRCB 44/20A	8044 (8-bit)	12	2-64 KB (two 28-pin sites)	0-64 KB	2	3	-1	BITBUS	16 SE, 8 DE analog input 2 analog output	DCS 100/110/120* PL/M 51, ASM 51

*Bitbus Firmware is Public Domain

For More Information

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■ For More Information

Multibus and iRMX® Products Customer Support

Contacting us is easy! For support issues, have the following information available:

- Your phone and FAX numbers ready
- A complete description of your hardware or software configuration
- Product codes
- The current version of all software you are using
- A complete problem description

Type of Service	Description	How to contact us
FaxBack* fax-on-demand system Operational 24-hrs a day, 7 days a week	Using any touch-tone phone, have technical documents or product fact sheets sent to your fax machine. Know your fax number before calling.	U.S. and Canada: (800) 628-2283 (916) 356-3105 Europe: +44-1793-496646
Intel's Application Bulletin Board (BBS) Operational 24-hrs a day, 7 days a week	Contains information on products, documentation, software drivers, firmware upgrades, tools information, presentations, and troubleshooting information.	U.S. and Canada: (916) 356-3600 Europe: +44-1793-496340 Autobaud detection; 8 data bits; no parity; 1 stop bit
CompuServe* Information Service Operational 24-hrs a day, 7 days a week	World-wide customer support service offering information and technical support for designers, engineers, and users of the 32-bit iRMX® Operating System family of products and the Multibus family of products.	Worldwide Locations: (check your local listing) Type: GO INTEL C once on-line
Customer Support	Intel Multibus Support engineers offering technical advice and troubleshooting information on the latest Multibus products.	U.S. and Canada: (800) 257-5404 Hrs: M-F; (503) 696-5025 8-5 PST FAX: (503) 681-8497 Europe: +44-1793-641469 Hrs: M-F; FAX: +44-1793-496385 8-5:30 UK
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