intel

iMDX-580/581
ISIS CLUSTER BOARD PACKAGES

- Converts Spare Slots in Series II, III, IV, or Model 800 Workstations into Additional Workstations.

- Up to Seven Additional NDS-II Workstations May Reside in One Development System Host.

- Utilizes the Powerful ISIS-III(C) Operating System.

- Supports all 8-Bit ISIS-Based Software Development Tools including the AEDIT-80, Text Editor, Program Management Tools, and NDS-II Electronic Mail.

- Supports 8-Bit Macroassemblers and High-Level Languages.

- Supports 16-Bit Development with local ASM-86 and PL/M-86, and via NDS-II Distributed Job Control.

- Provides Execution Environment for 8085-Based Application Programs.

- Compatible with a Variety of 9.6K or 19.2K Baud Terminals.

The ISIS Cluster Board Package is an NDS-II upgrade that cost effectively supports incremental software workstations on the network. Each Cluster board provides an 8085 CPU, 4K of ROM and 64K of RAM, and must reside in a Series II, Series III, Series IV, or Model 800 development system host. When attached to a user-supplied terminal, an ISIS Cluster workstation will boot onto the NDS-II and provide an ISIS environment which allows users to log on to the network and run Intellec®-supported 8-bit software, as well as "export" jobs to other network resources.
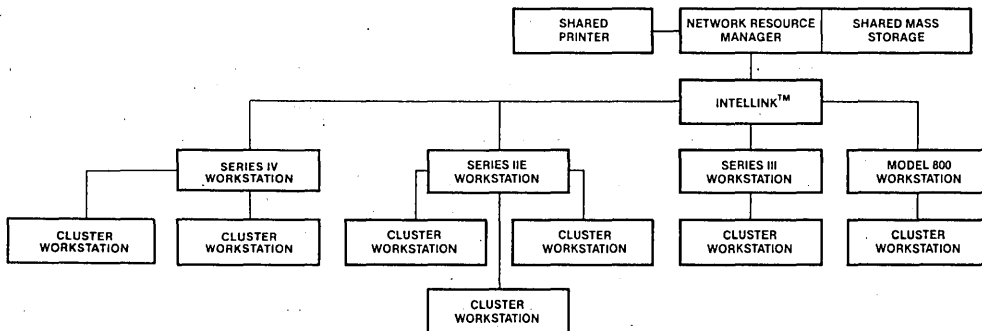

Figure 1. Example of an NDS-II Configuration

FUNCTIONAL DESCRIPTION

Summary: The ISIS Cluster board is a single-board computer centered around an 8085AH-2 CPU running at 4.0 MHz. 64K bytes of dual-ported RAM are provided on-board, along with 4K of ROM preprogrammed with a bootstrap program and self-test diagnostics.

The ISIS Cluster MULTIBUS® interface provides data and address interface latches. The serial I/O interface provides a full duplex RS232C serial data communications channel that can be programmed to handle serial data transmission at 19.2K or 9.6K baud. Software reset may be accomplished using the BREAK key on the terminal.

A block diagram of the ISIS Cluster board is shown in Figure 2.

Central Processing Unit

Intel's powerful 8-bit 8085AH-2 CPU running at 4.0 MHz is the central processor for the Cluster board. It is fully software compatible with all 8-bit ISIS-based languages and utilities which run on the Intellec® Model 800, Series II/80, Series II/85, or Series IIE.

System ROM

4K bytes of non-volatile read only memory are included on the Cluster board using Intel's 2732A EPROM. Preprogrammed with the ISIS Cluster Boot program, the system ROM provides boot-up and diagnostic capabilities, and a generalized I/O system.

The Boot program communicates with the operator via an interactive console. Upon reset of the Cluster system, execution is handled by the bootstrap PROMs which overlay 4K bytes of system RAM, initialize Cluster board devices, run self-test diagnostic, and perform a communication handshake before prompting the user.

RAM

The Cluster board uses eight 2164 RAMs and a dual port RAM controller to provide 64K of dual-ported dynamic read/write memory. Slave RAM decode logic allows extended MULTIBUS addressing with a 1 Megabyte address space, so that RAM accesses may occur from either the Cluster board or from the network communication boards interacting via the MULTIBUS interface. Since on-board RAM accesses do not require MULTIBUS accesses, the bus is available for other concurrent operations. Dynamic RAM refresh is accomplished automatically by the Cluster board.
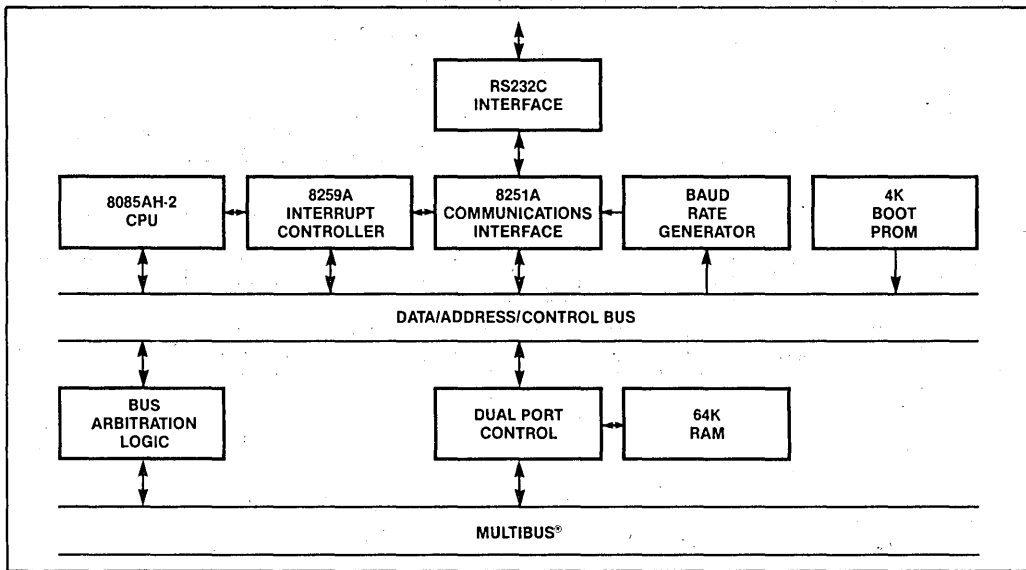

Figure 2. Block Diagram of the ISIS Cluster Board

Serial I/O

A programmable communications interface using the Intel 8251A USART (Universal Synchronous/Asynchronous Receiver/Transmitter) is on the Cluster board, and provides a full duplex RS232C serial communications channel. The transmit and receive lines are link exchangeable to enable a data set or data terminal to be used with the Cluster board. The board is pre-set for 9600 baud, but may be jumpered for 19.2K baud.

Programmable Timers

The interval timer capability is implemented with an Intel 8254 Programmable Interval Timer. The 8254 includes three 16-bit BCD or binary counters. The first two counters are not used. The output from the third counter is applied to the serial I/O interface and provides the baud rate frequency for serial communications.

Interrupt Controller

The Cluster board also includes an Intel 8295A Interrupt Controller. It is pre-configured with Interrupt 1 triggered by the BREAK key on the user-supplied terminal.

MULTIBUS® Interface

The Cluster board is a complete computer on a single board, capable of supporting a variety of 8-bit development tools. For applications requiring additional processing capacity, the Cluster board provides full MULTIBUS arbitration control logic. The bus arbitration logic operates synchronously with a MULTIBUS clock. All memory references made by the CPU refer to the on-board RAM. The Cluster board cannot access devices local to the host development system, but all of the shared network resources are accessible.

The Cluster board communicates with the Network Resource Manager via the MULTIBUS interface and the network communication board set in the host development system.

System Configuration

Each ISIS Cluster board requires one master slot in an Intellec cardcage. The host development system may be a Model 800, Series IV, Series II or IIE, or Series III or IIIE with an optional expansion chassis. A Series II or IIE with an expansion chassis will support a maximum of seven ISIS Cluster workstations, since the Integrated Processor Card and Network Communication boards occupy three of the ten cardcage slots. A Model 800 will support a maximum of 2 ISIS Cluster workstations, and Series IV workstation will support a maximum of 4 ISIS Cluster workstations. Each ISIS Cluster workstation counts as one additional network workstation, so the maximum number of Cluster workstations on a network is constrained only by the total number of users supported by the NDS-II Network Resource Manager. NDS-II iNDX Release 2.8 or later will support ISIS Cluster workstations in any Intellec development system host, including the Series IV.

Programming Capability

The Cluster workstation's ISIS environment supports all 8-bit Intellec-supported ISIS-based software, including the programmer-oriented AEDIT-80 text editor, PMT-80 Program Management Tools, NDS-II Electronic Mail, 8-bit macroassemblers, and PL/M, FORTRAN, PASCAL, and BASIC high-level 8-bit languages. 16-bit development is supported by the ASM86 cross assembler and the PL/M-86 cross compiler, or by "exporting" any 16-bit job to a 16-bit workstation for execution.

SPECIFICATIONS

CPU: 4.0 MHz 8085AH-2

MEMORY:

On-board RAM, 64K bytes, dual-ported

On-board ROM, 4K bytes preprogrammed with the ISIS Cluster Bootstrap Program

Interfaces

SERIAL I/O: RS232C compatible, programmable interface

BUS: MULTIBUS compatible, TTL level

TIMER: 3 programmable 16-bit BCD or binary counters, 1 used as baud rate timer

INTERRUPTS: 1 interrupt level available to user via the BREAK key on the terminal

Physical Characteristics

Two-sided printed circuit board fits into Intellec cardcage:

Length: 12 inches

Width: 6.75 inches

Depth: 0.062 inches

Internal flat ribbon cable connects ISIS Cluster board edge connector to the development system rear panel.

External 10-foot RS232C compatible cable connects the development system rear panel to a user-supplied terminal.

Electrical Characteristics

DC Power Requirements (from Mainframe)

V_{CC} = +5V, 4.5 Amps
V_{DD} = +12V, 25 mA
V_{AA} = −12V, 23 mA

Environmental Specifications

Operating Temperature: 0°C to 55°C
Humidity: up to 90%, without condensation

Documentation

ISIS Cluster Installation, Operation, and Service Manual (#122100)

Series IV iMDX-580 and iMDX-582 ISIS Cluster Board Package Installation, Operation, and Service Manual (#134650)

NDS-II ISIS-III(C) User's Guide Supplement (#122098)

Equipment Required

Recommended Terminals* (one per ISIS Cluster Board)

The following terminals meet Intel environmental specifications and are recommended for use with the ISIS Cluster Board Package:

ZENTEC, MODEL ZMS-35, COBRA

The following terminals have been tested and found to be interface compatible with the ISIS Cluster board; configuration files are provided for these terminals. However, they do not meet Intel environmental specifications: adverse electrostatic conditions may produce unpredictable screen output, requiring terminal reset.

Hazeltine, Model 1510

Televideo, Model 910+, 925, 950

Lear Seigler, Model ADM 3A

Adds Viewpoint, Model 3A+

Qume, Model 102

*All of the recommended terminals run at 9.6K or 19.2K baud.

CAUTION: Other RS232C-compatible devices may not meet Intel environmental specifications, and could degrade overall system performance.

Host Development System (requires one open 6.75 x 12 in. master slot in system cardcage per ISIS Cluster board):

Series II/85 or Series IIE*

Series III or Series IIIE*

Model 800**

Series IV

*with optional Expansion Chassis
**supports maximum of 2 ISIS Cluster Boards

Workstation Upgrade Kit (one per host system):

iMDX-455 for Series II, III, or Model 800

iMDX-456 for Series IV

NDS-II Network Resource Manager with Winchester or Hard Disk Mass Storage

Software Required

For Series II, III, or Model 800 Host:

NDS-II iNDX Operating System, Release 2.0 or later

ISIS-III(N)/III(C) Operating System, Version 2.0 or later*

For All Development System Hosts, Including Series IV:

NDS-II iNDX Operating System, Release 2.8 or later

Series IV iNDX Workstation Operating System, Release 2.8 or later**

ISIS-III(N), version 2.2 or later**

ISIS-III(C), version 2.2 or later**

*included with NDS-II Release 2.0
**included with NDS-II Release 2.8

ORDERING INFORMATION

Part Number	Description
iMDX-580	ISIS Cluster Board Package for Series II, Series III, or Model 800 -includes processor board, cables, and documentation. Must be installed on NDS-II in a Model 800, Series II or Series III workstation and connected to a user-supplied terminal.
iMDX-581KIT	ISIS Cluster Board Package for Series IV - Includes iMDX-580 and iMDX-582. Must be installed on NDS-II in a Series IV (or Series II, III, or Model 800) workstation and attached to a user-supplied terminal.
iMDX-582	ISIS Cluster Upgrade Kit for Series IV - Includes internal cable, mounting hardware, and documentation required for installing an existing iMDX-580 ISIS Cluster Board in a Series IV host.

AFN-210938C