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DATA SHEET

MODEL 412

Adapter connects two VMEbus systems

Share memory and special purpose boards between two VMEbus systems with Bit 3's easy-to-use, cost-effective Model 412 Adaptor. Model 412 provides high speed data transfers between two systems, with minimal software support.

The Model 412 Adaptor expands your computing environment by combining the power, memory and card capacity of two systems. Interconnected by a Bit 3 Adaptor, each system can:

- Directly address the other's resources as though they were local.
- Pass blocks of data, I/O commands, and interrupts to the other system.
- Execute random access reads and writes to the remote VMEbus.

Plus, the Model 412 can function as a coprocessor or as the only bus controller in the remote VMEbus chassis.

With the Bit 3 Adaptor, each bus operates independently. The timing of the two buses is linked only when a memory or I/O reference is made to an address on one system that translates to a reference on the other. The integrity of the interface between the Adaptor cards is maintained by parity checks on address, control and data lines.

A32/D32 random access cycles, from either system, are supported by the Adaptor.

Other Bit 3 Adaptors, supporting a wide variety of buses, can be used with Model 412 Adaptors to connect multiple computers and systems in star, daisy-chain or modified star/daisy-chain configurations.

COMMUNICATION BETWEEN SYSTEMS

Model 412 supports Memory Mapped inter-system communication. Memory Mapping controls random access to remote bus RAM, dual-port memory, and remote bus I/O.

Memory Mapping provides an easy-to-use, flexible interface with low overhead that permits two processors to communicate via random-access memory reads and writes. The transmitting system can access up to 4G bytes of memory in the receiving system through a window in the transmitting system's bus address space.

Memory Mapping permits high-speed random access 32-bit reads and writes to either system at speeds comparable to reads and writes to local memory. Also, a portion of memory space can be mapped in the opposite direction allowing either system to become a bus master on the other system's bus.

Two Memory Mapping techniques are supported: Direct Mode (with address biasing) and Page Mode. Either technique may be used to control access to remote bus memory and dual-port memory. Access to remote bus I/O is not affected by the mapping mode.

Direct Mode has a one-to-one relationship between address windows. Data are transferred through one window directly into an equal size window on the other bus. Window size is configured via jumper settings.

In Page Mode, a window in the transmitting bus address space is coupled with a 16-bit programmable register. The address within the window provides the lower 16-29 address bits. The I/O register provides the upper 16-12 bits of the 32-bit receiving bus address. Thus, the transmitting system can scan 4G bytes of memory in the receiving system by paging through the receiving system's address space.

Memory Mapping also controls access to dual-port memory. Dual Port RAM is an optional card installed on either Adaptor

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card. Dual Port RAM provides a memory buffer; saves the cost of additional memory cards; and requires no additional VMEbus card slots.

Optional Dual Port RAM provides shared memory space accessible by random access reads and writes from either system. Dual Port RAM access uses only the bandwidth of the accessing bus. Consequently, transfer speed is increased and data can be exchanged with minimal impact on the performance of the other system's bus. Both systems can access Dual Port RAM simultaneously; the Adaptor arbitrates accesses.

Dual Port RAM cards now available from Bit 3 include: 32K, 128K, 1M, 2M, 4M, and 8M byte cards.

Memory Mapping is also used to control access to remote bus I/O.

INTERRUPT AND ERROR HANDLING

Any of the seven VMEbus interrupts may be passed to the remote system for handling by that system's processor. Programmed interrupts may be passed in either direction by writing to an I/O register on an Adaptor card.

There are three sources of interrupts from the Adaptor:

- Interrupts from the remote VMEbus backplane. Interrupt lines IRQ7 - IRQ1 may be passed from the remote VMEbus.
- Programmed interrupts from the remote card.
- An interface error interrupt that is activated when a timeout, parity error or bus error condition is detected on an Adaptor card.

VMEbus SYSTEM CONTROLLER CAPABILITY

In addition to VMEbus control and bus master capabilities, the Model 412 Adaptor can function as the VMEbus system controller, if no other card is doing so. If the VMEbus system is to be used primarily as an expansion chassis for slave VMEbus boards, this feature saves the expense of an additional VMEbus system controller.

If configured as the system controller, the Model 412 Adaptor card provides level 3 bus arbitration, the VMEbus system clock and system reset, and the BERR global timeout.

TECHNICAL HIGHLIGHTS

- Random access reads and writes from system to system.
- Flexible mapping of address space between the systems' memory and I/O address space.
- A16, A32 or A24 Addressing, and D32, D16 and D8 Data Transfer mode support.
- Page Mode allows access to 4G bytes of memory through page size from 64K to 1M byte.
- Add up to 8M bytes of shared memory via optional Dual Port RAM cards.
- Support for byte and word swapping in hardware.
- Interrupts can be exchanged between systems.
- Parity checking on address control and data lines and on the interface between Adaptor cards.
- Round EMI-shielded cable to 25 feet.
- Meets IEEE 1014C specifications.
- Recognized under the component program of Underwriter Laboratories, Inc.

REQUIRED COMPONENTS

- Two 6U VMEbus Adaptor cards (included in Model 412 package).
- A round EMI-shielded cable to connect the Adaptor cards (purchased separately from Bit 3).

Each Model 412 package contains: two VMEbus Adaptor cards, and a manual. A cable is required but is ordered separately so that you can specify the appropriate length and type for your installation.

OPTIONS

- Dual Port RAM

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32K byte          Model 400-201
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128K byte Model 400-202

1M byte Model 400-203

2M byte Model 400-204

4M byte Model 400-205

8M byte Model 400-206

- Cable (one required)

8' Round EMI-Shielded Model 400-101

25' Round EMI-Shielded Model 400-102

Bulkhead connector configurations (contact Bit 3 for configurations)

- Fiber-Optic Interface Cards

Provide a high-speed fiber-optic link between two VMEbus chassis equipped with Bit 3 VMEbus Adaptor.

Model 400-5 Two-Fiber cards supports two fiber-optic data paths.

Model 400-6 Four-Fiber supports four fiber-optic data paths.

For more information, request the Model 400-5 & Model 400-6 data sheet.

- Fiber-Optic Cable

High-quality, OFNP-grade, 62.3/125 micron glass duplex cable with tight buffer construction and ST-style connectors; standard cable are 5 meters (approx. 16') in length; custom lengths to 2 km are available.

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