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DATA SHEET

MODEL 411

Connects two VMEbus systems

Share memory and special purpose boards between two VMEbus systems with Bit 3's easy-to-use, cost-effective Model 411 Adaptor. Model 411 provides high speed data transfers between two systems, and requires minimal software support.

The Model 411 Adaptor expands your computing environment by combining the power, memory and card capacity of two systems. Interconnected by the Bit 3 Adaptor, each system can:

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

Plus, the Model 411 can function as a coprocessor or as the only bus controller in the remote VMEbus chassis.

The Adaptor can be configured in a transmitter/receiver or transmitter/transmitter relationship. In a transmitter/receiver configuration, the Adaptor card in one system functions as a slave device allowing memory references to it to pass to the other chassis. When configured for transmitter/transmitter capability, both systems can function as a transmitter and appear as a bus master processor on the other system. No intermediate software drivers are required for the bus master to communicate with memory or I/O on the other system.

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.

Other Bit 3 Adaptors, supporting a wide variety of buses, can be used with Model 411 Adaptors to connect multiple computers and systems in star, daisy-chain or modified star/daisy-chain configurations.

COMMUNICATION BETWEEN SYSTEMS

The Model 411 Adaptor uses Memory Mapped inter-system communication to control random access to remote VMEbus RAM, dual-port memory, and remote VMEbus 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. One VMEbus system can access all memory in the other VMEbus system through a window in the transmitting VMEbus system's address space.

Memory Mapping permits high-speed random access reads and writes to either system at speeds comparable to reads and writes to local memory. The address location and size of three separate memory windows are selected by configurable jumpers. The windows provide access to the following:

- Remote VMEbus memory space,
- Remote VMEbus I/O space,

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- Optional Dual Port RAM.

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

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

Page Mode permits addressing of all remote VMEbus RAM locations through a small window in the local system's address space. The upper remote VMEbus address bits are provided by an 8-bit page register. The remaining lower address bits are provided by the address offset in the local RAM window.

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

INTERRUPT AND ERROR HANDLING

Up to four 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 IRQ4 - 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 411 Adaptor can function as the VMEbus system controller. If the VMEbus system is to be used primarily as an expansion chassis for slave VMEbus cards, this feature saves the expense of an additional VMEbus system controller.

If configured as the system controller, the Model 411 Adaptor card provides level 3 bus arbitration, the VMEbus system clock and system reset.

TECHNICAL HIGHLIGHTS

- Random access reads and writes from system to system.
- Flexible mapping of address spaces.
- A16 or A24 Addressing, and D32, D16 or D8 Data Transfer mode support.
- Add up to 8M bytes of shared memory via optional Dual Port RAM cards.
- Interrupts can be exchanged between systems.
- Parity checking on address control and data lines and on the interface between Adaptor cards.
- Power requirements -

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The VMEbus Adaptor cards draw 4.5A at 5V.

- Environment -

Temperature: 0 to 60 degrees C operating;

-40 to 85 degrees C storage.

Humidity: 0% to 90% non-condensing.

- Round EMI-shielded copper-conductor cable to 25 feet. Cable is available in standard 8-foot and 25-foot lengths.
- Fiber-Optic Interfaces are available as an option.
- Meets IEEE 1014 revision C specifications.
- Recognized under the component program of Underwriter Laboratories, Inc.

REQUIRED COMPONENTS

- Two 6U VMEbus Adaptor cards (included in Model 411 package).
- A round EMI-shielded cable to connect the Adaptor cards (purchased separately from Bit 3).

Each Model 411 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

32K byte Model 400-201

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 Interfaces

Two Fiber Card Model 400-5

Two Fiber Module Model 400-50

(Fiber-Optic Cards or Modules may be used with either VMEbus system. Two Fiber-Optic Interfaces are required. For more information, request the Model 400 Fiber-Optic Interface 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 cables are 5 meters (approximately 16') in length; custom lengths to 2 km are available.

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