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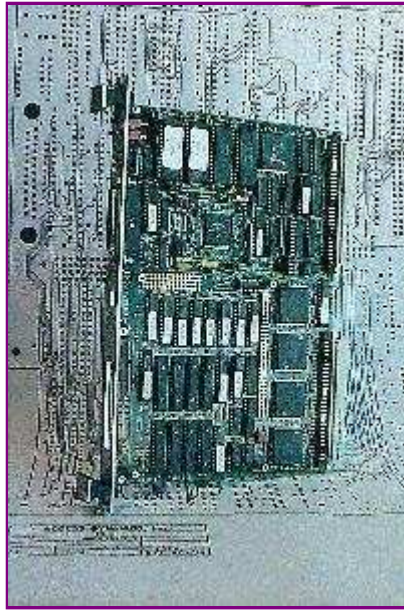
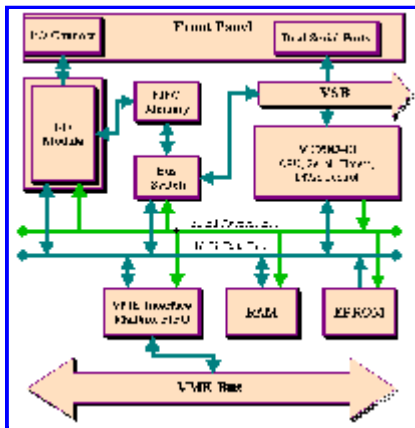
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Product Data

DC-1 VSB I/O Controller



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Summary of Features

- * 33 Megabytes/sec Sustained I/O
- * Large I/O Data FIFO Buffer
- * 4 Gigabyte DMA Transfer Size
- * 68000 Compatible Processor
- * VME Communications with a Two Way Mailbox FIFO and Two Way Interrupts
- * Flexible Plug-on I/O Module in 1 VME slot

- * Two General Purpose Timer/Counters
- * Two RS-232 Serial Ports

Typical DC-1 applications:

- * High resolution image acquisition
- * Fast frame rate image acquisition
- * Real-time vector processor I/O
- * Chassis to chassis data links
- * Telemetry buffering
- * Sonar or radar data acquisition
- * Simulation of cameras or other high rate data sources

General Description

The DC-1 is a high performance and versatile I/O controller which transfers data with complete independence from the VME bus using the VME Subsystem Bus (VSB). The DC-1 uses the VSB as an I/O path for data transfers with dual-port memory, array processors and other VSB slave devices. Since the DC-1 is an intelligent controller, the local microprocessor performs complex transfer sequences independently of the VME. A sophisticated mailbox FIFO is used for communication between the DC-1 and other VME devices. The DC-1 supports multiple bus masters on the VSB and block transfer sizes up to 4 Gigabytes in length. The DC-1 is adapted to peripherals with a plug-on I/O module which has a high speed path to a data FIFO on the main board and a control bus for communication with the local processor. Standard I/O modules are available or custom modules can be developed by the customer or Access Dynamics. The data FIFO allows high burst rates and isolates the timing of the VSB from the timing requirements of the peripheral device. Multiple DC-1 based VSB subsystems can be used in the same VME chassis to produce very high performance I/O architectures.

Software

The heart of the DC-1 is the Motorola MC68340 Integrated Processor with DMA. Based on the MC68000, the CPU32 processing core of the MC68340 uses the software base of the MC68000 family. There are several software development options available supporting assembly or C language environments with monitor ROMS, source level debuggers, etc. Extensive board support libraries are available for performing common low level tasks such as DMA control and higher level tasks such as data acquisition and VME communications.

I/O Module Description

The I/O Module is a daughtercard which connects the DC-1 to the external peripheral device. Most I/O Modules are relatively simple and consist of control and status registers for communication with the DC-1 processor, line drivers and receivers for connection to the peripheral and control logic which coordinates the transfer of data with the peripheral and with the data FIFO buffer on the DC-1. In addition, the I/O Module can use two versatile counter/timers on the DC-1 for a wide variety of tasks associated with data acquisition or output timing.

VME Interface Description

The VME interface on the DC-1 is used for communication with a host VME processor. The main communication path is a bi-directional FIFO buffer which is used as a mailbox for the posting of high level command blocks by the host processor and the return of status blocks by the DC-1. Notification of command and status blocks can be done with interrupts in either direction or by polling bits in status registers. In addition, the host processor can directly trigger the I/O Module by writing to a location in the DC-1 VME address space and avoid the command processing overhead for time critical data reception or transmission.

VSB Interface Description

The VSB interface is the high speed data path on the DC-1. High speed data transmission is performed by two DMA controllers which move data between the data FIFO buffer and the VSB. DMA transfers use 32 bits of addressing, 32 bit data and block transfers for high performance. The DC-1 processor accesses the VSB with 32 bit addressing and 8 or 16 bit data.

Specifications

Processor -

Motorola MC68340 Integrated Processor with DMA.

ROM -

Two 32 pin JEDEC EPROM sockets, supporting 8Kx8 through 1Mx8 devices for up to 2 Megabyte EPROM.

RAM -

Two 32 pin JEDEC static RAM sockets, supporting 32Kx8, 128Kx8, or 512Kx8 devices for up to 1 Megabyte of RAM.

Data FIFO -

Bidirectional, 32 bits wide, 4K deep for input data, 2K deep for output data, 25 nsec. access time

VME Mailbox FIFO -

Bidirectional, 16 bits wide x 512 words deep.

DMA -

Two channels, 32 bit address, 32 bit data, 32 bit transfer count, 33 Megabytes/sec. sustained data transfer rate. rate.

I/O Module to Data FIFO Interface -

32 bit data bus. Independent read and write signals for each byte. Full, Half-Full and Empty signals for the input channel. Data Available and Full signals for the output channel.

Processor to I/O Module Interface -

- 16 bit data bus
- 20 bit address bus
- Processor interrupt request and acknowledge
- Dual timers
- Hardware reset
- Buffered VME SYSCLK
- VME direct module trigger signal
- +5VDC and +/-12VDC power

VME Functions -

- A VME Bus Master can -
 - Read and write the VME Mailbox
 - Interrupt the DC-1 processor
 - Read board and mailbox status
 - Reset the board
 - Directly trigger the I/O module
- The DC-1 processor can -
 - Read, write and configure the VME Mailbox
 - Write to a VME status register
 - Request a VME interrupt on any level with a programmable vector

VME Compliance -

- A16,A24,D16,D08(EO) Data Transfer Slave
- I(1-7),D08(O), ROAK Interrupter

VSB Data transfer MASTER support -

- 32 bit addressing
- 8 or 16 bit data transfer with the processor
- 32 bit data transfer with DMA using block transfer
- System, Alternate or I/O address space
- Data Broadcast and Broadcast
- Bus LOCK during processor RMW access

VSB Bus Arbitration -

- RWD Serial Requester with early release
- Optional single master mode with requester disabled
- Optional Slot 1 Serial Arbiter

VSB Interrupts -

- IHP Polled Interrupt Master

VSB Signals not supported -

- CACHE, GA0-GA2

Counter/Timers -

Two independent 16 bit timers with 8 bit prescale
Internal clocking or external clocking from the I/O Module
External gating from the I/O Module
Outputs available on the I/O Module
Timebase and waveform generation
Pulse generation
Event counting
Period and pulse measurement

Serial Ports -

Two RS-232 ports
50 to 76.8K baud
Software or hardware flow control

Physical -

Standard 6U VME board size
DC-1 with a standard I/O Module occupies a single VME slot
All I/O connections on the front panel

Power -

+5VDC @ 1.5A
+/-12VDC @ 10mA each

Environmental -

Operating temperature: 0 to +60C
Storage temperature: -40 to +85C
Relative Humidity: Up to 90% without condensation

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