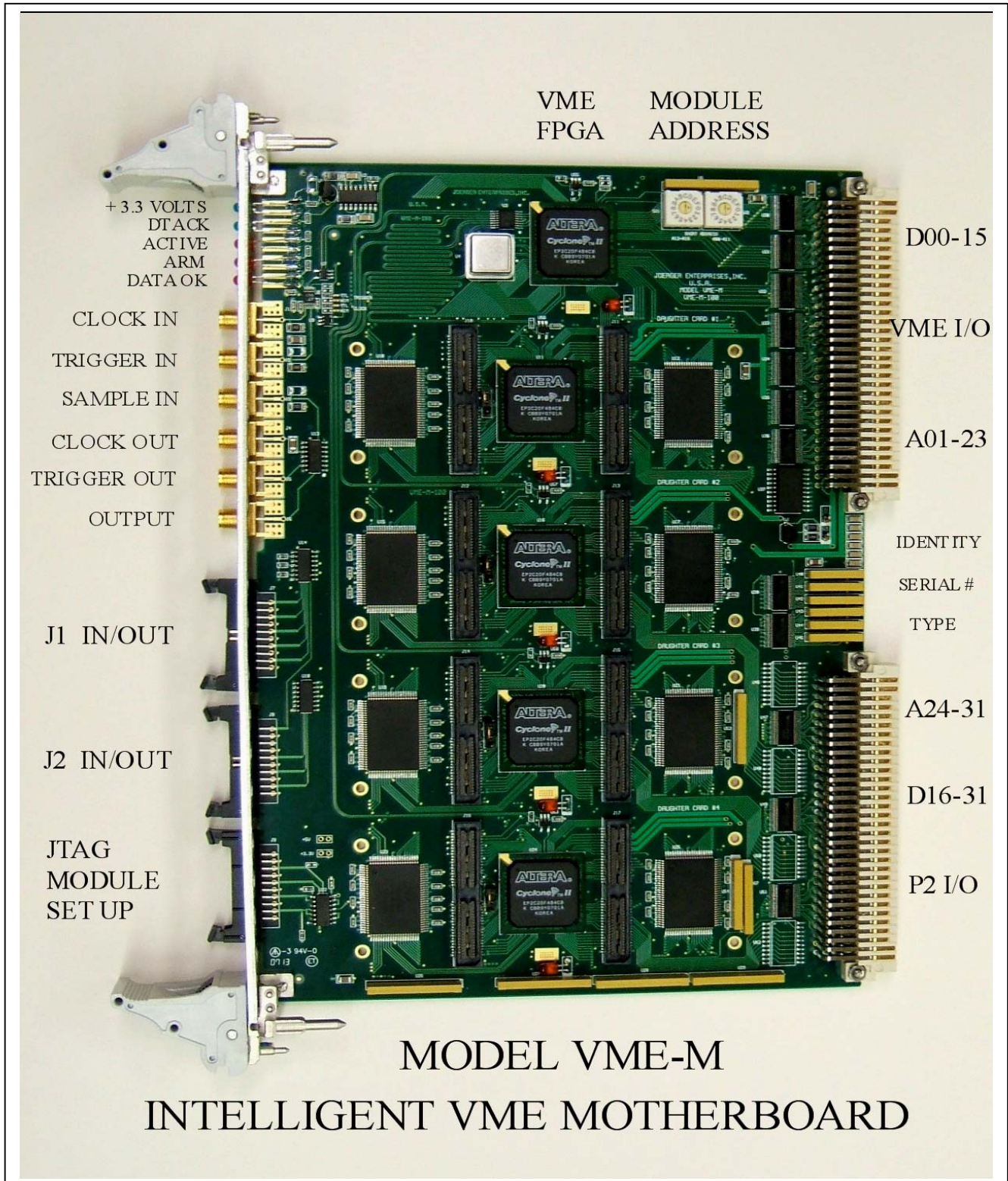


MODEL VME-M

INTELLIGENT "VME" MOTHER/DAUGHTER CARD



VME
FPGA MODULE
 ADDRESS

+ 3.3 VOLTS
DTACK
ACTIVE
ARM
DATA OK

CLOCK IN

TRIGGER IN

SAMPLE IN

CLOCK OUT

TRIGGER OUT

OUTPUT

J1 IN/OUT

J2 IN/OUT

JTAG
MODULE
SET UP

D00-15

VME I/O

A01-23

IDENTITY

SERIAL #

TYPE

A24-31

D16-31

P2 I/O

MODEL VME-M

INTELLIGENT VME MOTHERBOARD

DESCRIPTION:

JOERGER ENTERPRISES, INC along with many of the current manufacturers have realized that the availability of high performance Field Programmable Gate Array's (FPGA) has replaced the need for standard integrated circuits. They are faster, smaller, programmable and offer the user a denser, less expensive way to handle data. This coupled with the fact both digital and analog chips now being offered are denser with higher performance capabilities and lower prices. This means the products that could be made available are enormous. But the problem for manufacturers is that each new module must be designed from scratch. This is expensive and time consuming. There are a number of "VME" mother/daughter cards available and we have examined them in hopes of using one of them as a basis for our new products. But they do not offer the ability to perform the tasks that are required in higher performance devices.

Our solution is an intelligent motherboard, the Model VME-M, capable of accepting up to four, independent daughter cards. It is a single width, 6U, VME module. The key to the design was selecting a high performance FPGA. The one chosen can perform at over 200Mhz has a high level of I/O and the capability to perform the tasks at hand and offer the user the ability to custom the module to its task. One array interfaces to the VME bus and one is provided for each daughter card. In addition each daughter card has available two independent SRAM memories and two high-speed connectors to interface to its daughter card. The daughter cards interface to the outside world. They contain the front panel connectors and the programming chip to tell its motherboard array what functions to perform. Each daughter card is completely independent. They can be mixed to perform various system requirements or be identical. The module is programmed via a front panel JTAG connector. The arrays are large offering a user the ability to perform many tasks. Examples are:

- FFT responses
- FIR filtering
- DSP operations
- Calculations
- Read/Write functions, like those required in gamma ray experiments

To make the motherboard suitable for the various functions a VME module may require it is available in three configurations. All the boards contain a complete VME bus interface with the number of daughter cards to match the application. A complete motherboard can accept four individual daughter cards with an array and two memories for each. This provides the user the maximum capability the module can perform. In applications that do not require such complexity the motherboard can handle one daughter card with an array and memories. The last version is a motherboard that can accept four daughter cards but there are no arrays or memories. Each card has two I/O connectors and uses the VME array to operate the module. This provides an inexpensive solution to many data acquisition requirements. This configuration would provide for functions like ADC's, DAC's, counters, I/O modules and motor controllers can be provided which do not need an intelligent interface and its associated cost.

The module is VME64x compatible, with live insertion and extraction capabilities. The two memories for each daughter card are independent. They can be used together, or separately, each with its own address counter. The standard memory is 256k by 32 bits each. As an option they can be purchased with 512k, 1M, or 2M capacities.

Front panel control is provided with six SMA connectors and two multi-pin connectors. Two of the SMA connectors are for a fast read and fast trigger input. These can be set to accept TTL, ECL or NIM inputs.

To provide accurate timing on the master card the clock and a set of I/O signals are laid out so each daughter card receives these signals at the same time. In addition, to provide the ability to operate the module for a particular task there is one input SMA and three output SMA's. The user via the JTAG connector can program these I/O's. When not user programmed they are assigned during set up. In addition there are 6 TTL inputs and 4 TTL outputs provided via multi-pin connectors. These signals all go to the VME array and can be programmed via JTAG. Again when not user programmed they are assigned during set up. All programming is via the front panel JTAG connector. The ribbon connectors are 3M, series 1552 connectors.

FEATURES:

- VME64x compatible
- VME interface providing live insertion and extraction
- High-speed, programmable FPGA's
- Selection of memory capacity
- Front panel JTAG programming for system set-up, manufacturer updating and user programming
- Ability to transfer single ended or differential I/O data between mother and daughter cards
- Control bus
- Front panel I/O controls, multi-pin connectors and 3 SMA inputs and 3 SMA outputs
- LED's for visual indications
- Rear access with 32, P2 I/O's, 8 to each daughter card, direct connection standard. Digital I/O with direction and enabling programmable, an option
- Module type and serial number read out
- Global commands for multiple module operations
- D16, D32, MBLT 64 bit access
- 2eVME capability
- On board jumpers providing the ability to operate with 1, 2, 3 or 4 daughter cards
- Each daughter card is independent, the VME module can use identical cards or vary them to handle a particular application
- +3.3v, +5v, +12v, -12v and multiple ground connections for use by daughter card
- "Timed" system clocks and a set of I/O connections to insure synchronous operation of all daughter cards
- Phase Locked Loops (PLL) to control clocks
- Control buses from daughter card to its array and to the VME array
- 160 pin, 5 row VME connectors
- "Averaging" for improved SNR, or "Decimation"
- "SPARSE" scan mode for efficient data read out
- Master triggering bus for internal or external use
- Module timing counter for system operation

POWER REQUIREMENTS: +3.3V, +5V, +12V, -12V

SIZE: Single width, 6U, VME64x module

OPTIONS:

Model VME-M-1	Mother Board with one intelligent daughter slot
Model VME-M-4	Mother Board with four intelligent daughter slots
Model VME-M	Mother Board with four daughter slots, no daughter arrays

JEI0807
datasheets/VME-M_c.doc



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