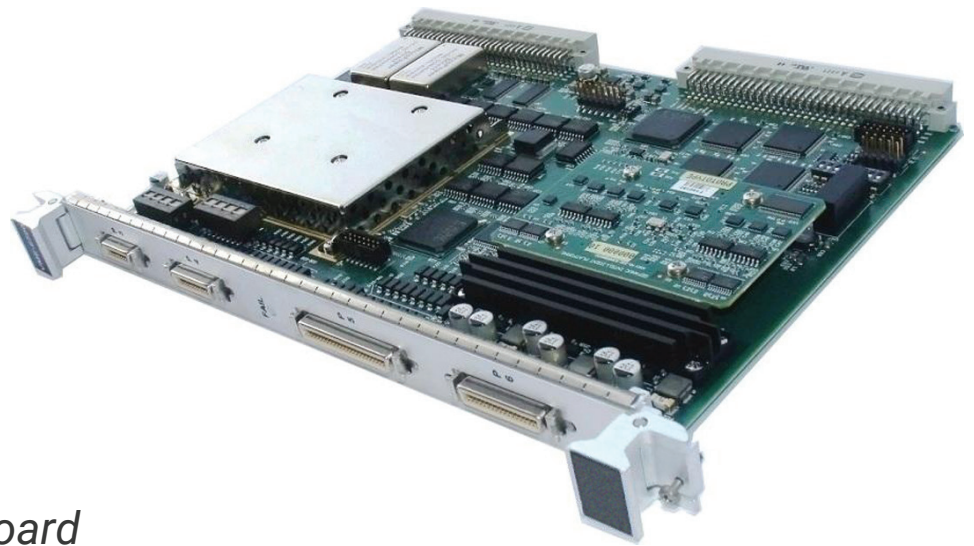




# VME-6500

## VME Multi Function IO Board

### Programmable Configuration

- Current sink/Voltage source/Contact Sense
- Positive true/Negative true logic
- Input threshold 1.25 V up to 60.2 V DC
- Any input can be programmed as a trigger for analog input.

### Analog Output

- 8 Single-Ended analog outputs.
- 16-bit D/A conversion for all eight outputs.
- Voltage output ranges selectable  $\pm 5$ ,  $\pm 10$  V; 5 V, or 10 V
- Current range selectable 4-20 mA, 0-20 mA, 5-25 mA, 0-25 mA
- 10 mA load capacity for voltage outputs over full  $\pm 10$  V range
- Waveform generation (8 Kword/output waveform memory)
- Selectable update rate up to 100 Ksps per output

### Digital Output

- 16 digital outputs
- Outputs individually configurable as either source or sink type
- Positive True / Negative True Logic
- Short Circuit / Over Current protection
- Thermal shutdown
- High current drivers (500 mA)
- High voltage drivers
  - External Voltage: 8VDC minimum, 35VDC maximum
- Under voltage lockout
- Built-in surge current protection

### Common Features

- 64 K word memory
- 6U form factor VME card
- Access modes - All as per VITA64 X standard
- Self-calibration and Built-In Test (BIT)
- 1,000 V peak field to VME Bus isolation.
- RoHS, UL60950 and CE Compliant
- Shielded IO connectors for EMI compliance
- Compatible with the Intelligent I/O Controller (IIOC) VME-9081

### FEATURES:

- Analog Input
- 8 Differential or Single-Ended Analog Inputs
- 16-bit A/D conversion for all eight inputs
- Programmable voltage gain 1, 10, 100
- Programmable input filter 50Hz, 1KHz or No filter
- Flexible Trigger selection (External, Digital, Software)
- Each Input configurable as either voltage or current input
- Programmable scan rate up to 100 ksps per channel
- Input range +5V, +10V,  $\pm 5$ V,  $\pm 10$ V, 4-20 mA, 0-20 mA, 5-25 mA
- Over voltage protection
- Digital Input
- 16 RS-485 compatible or Single-Ended Inputs
- Programmable input voltage threshold
- Programmable digital de-bounce per channel
- Scan rate of 10 KHz
- Over-voltage protection up to 100 V DC

## VME-6500 VME Multi Function IO Board

### Functional Characteristics

The VME-6500 is a member of Abaco Systems next generation multi function Input/Output boards for the VME bus. A high density, versatile design that provides 8 analog inputs and outputs as well as 16 digital inputs and outputs, all in a single 6U double Euro form factor. In addition to providing different types of inputs and outputs VME 6500 provides incredible flexibility by facilitating the configuration of individual I/O from the VME host.

In addition to conventional VME I/O board functionality, VME 6500 can also be configured to use an on-board or external trigger for analog inputs. Analog outputs can be configured to generate arbitrary waveforms.

Digital inputs can be configured to use selectable threshold voltage while digital outputs can be configured as either current source or current sink outputs.

Most features of the board are programmable by the VME host.

**Programmable Threshold Level:** The input threshold voltage on each Digital input is software programmable from 1.25 V DC to 66.0 V DC. Threshold accuracy is 2%.

**Over voltage Protection:** An over voltage protection up to 100 V Dc is provided for all Digital inputs by a resistive divider on the input line.

**De-bounce:** All digital inputs are provided with input debounce that can be configured by the VME host individually for each input.

**Positive and Negative True Logic:** Digital inputs and outputs support Positive and Negative true logic options for current source and current sink mode configuration.

**Over Current Protection:** All digital Outputs are provided with over-current protection. The excess current causes the device to go in to thermal shutdown.

**Input Voltage Ranges:** Analog input voltage ranges are software programmable. Voltage ranges are  $\pm 5V$ ,  $\pm 10V$ ,  $0-5V$ ,  $0-10V$ . These ranges are programmable per channel.

**Conversion Rate:** The VME-6500 provides a maximum analog input conversion rate of 100 KSPS per channel. The analog input conversion rate determines the time taken for the conversion of the analog signal at the analog input connector to digitized data available at the output of ADC.

**Gain:** Analog inputs are software programmable per channel for gains of x1, x10 and x100.

**Trigger Input:** Analog inputs can be triggered from three sources- External trigger, Digital input trigger or Software trigger.

**Voltage output:** Analog output voltage mode ranges are 5V, 10V,  $\pm 5V$ , and  $\pm 10V$ . Voltage mode ranges are software programmable per channel.

**Current output:** Analog output current mode ranges are 4-20 mA, 0-20 mA, 5-25 mA, 0-25 mA. Current mode ranges are software programmable per channel.

**Waveform generation:** All analog outputs are capable of generating a waveform. 64Kwords of RAM are available for waveform generation. An 8Kword buffer is provided in the SRAM for waveform generation on each analog output channel.

**Auto Calibration:** An onboard Digital Signal Processor (DSP) and input/output 20-bit Analog-to-Digital Converter (ADC) are used to calibrate the offsets and gains of the DACs. The DSP utilizes the 20-bit Sigma-Delta ADC to read each of the output channels at various output values from 0x0000 to 0xFFFF

**Built-in-Test:** VME-6500 supports off-line and real-time fault detection and isolation. The off-line mode is enabled by executing a write to the CSR to set the Test Mode Bit.

**Shielded I/O Connectors:** All front panel I/O connectors are shielded for EMI compliance.

**Isolation:** All Inputs and outputs are isolated from the VME bus for voltages up to 1KV, 50 - 60Hz.

### Physical/Environmental Specifications

#### Dimensions

6U (4HP) single slot Eurocard form factor

- Height 9.2 in. (233.25mm)
- Depth 6.3 in. (160mm)
- Thickness 0.8 in. (20.3mm)

#### Backplane Connector

VME standard 96-pin DIN P1 and P2 connectors

#### Temperature

- Operating -40° C, to 75° C
- Storage -50° to 100° C
- Humidity Up to 95% RH, non condensing
- MTBF Contact factory

#### Operating System and Software Support

**I/O Support – VMISFT-9450 Board Drivers:** This driver supports Abaco Systems' extensive line of VMEbus I/O boards, and is available for Windows XP/Windows 2000. Support is also being added for VxWorks and Linux.

VMISFT-9450 board drivers take advantage of all the key benefits and features of each supported I/O board and new I/O boards are constantly being added.

VMISFT-9450 board drivers contain both C++ class library and a C function library that provide a common interface to Abaco I/O products for reading, writing and configuration.

You do not need to know the details of how an individual board is programmed. For instance, you can use the SetAttributes function on any supported Abaco board; the WriteAnalog function controls the output from any Abaco analog output board; or the GetScanMode function retrieves the scan mode for any Abaco analog board.



## VME-6500 VME Multi Function IO Board

### Analog Input Section

Number of Input Channels: 8 differential or single-ended channels

Full-Scale Input Ranges:  $\pm 5V$ ,  $\pm 10V$ , 0 to  $+5V$ , 0 to  $+10V$ ; programmable

Current Range: 4 to 20, 0 to 20, or 5 to 25 mA; See the Ordering Options

#### Input Impedance

| Source       | Ohms  |
|--------------|-------|
| DC Power ON  | 180 M |
| AC Power ON  | 18 K  |
| DC Power OFF | 20 K  |
| AC Power OFF | 40 K  |

Input Bias Current: 50 nA

#### Input Noise

| Gain | Noise RMS-mV |
|------|--------------|
| 1    | 0.3          |
| 10   | 0.03         |
| 100  | 0.02         |

Stability: Temperature drift

| Offset drift specification (PPM) |                                 |     |
|----------------------------------|---------------------------------|-----|
|                                  | Analog Output Voltage & Current | 10  |
| G1                               | Analog Input Voltage & Current  | 10  |
| G10                              | Analog Input Voltage            | 20  |
| G100                             | Analog Input Voltage            | 25  |
| Gain drift specification (PPM)   |                                 |     |
|                                  | Analog Output Voltage & Current | 10  |
| G1                               | Analog Input Voltage & Current  | 30  |
| G10                              | Analog Input Voltage            | 100 |
| G100                             | Analog Input Voltage            | 25  |

Input Filters: Optional low pass single-pole filters

- 3 dB at 50 Hz  $\pm 10\%$
- 3 dB at 1 kHz  $\pm 15\%$

Overvoltage Protection: 35V Sustained

### Transfer Characteristics

Resolution: 16-bit

Input Sampling: Parallel

A/D Conversion Rate: Up to 100 KSPS

Channel Sample Rate: Up to 100 KSPS

### Analog Input (AIP) Inter-channel Cross talk

| AIPCT-DC (min) | AIPCT-AC (min) |
|----------------|----------------|
| 78 dB          | 53 dB          |

Common-Mode Voltage:  $\pm 5V$

Common-Mode Rejection: (dB)

| Gain | CMRR-DC | CMRR-AC |
|------|---------|---------|
| 1    | 75      | 53      |
| 10   | 80      | 53      |
| 100  | 90      | 53      |

DataCoding: Program selectable as two's complement, or straight/offset binary

#### Voltage Accuracy

| Gain          | % of FSR |
|---------------|----------|
| x1 Unipolar   | 0.05     |
| x1 Bipolar    | 0.03     |
| x10 Unipolar  | 0.08     |
| x10 Bipolar   | 0.05     |
| x100 Unipolar | 0.5      |
| x100 Bipolar  | 0.3      |

Analog Input (AIP) Current Accuracy:

AIP current accuracy 0.02% FSR

AIP Conversion Rate: 381 SPS to 100 KSPS

### Analog Output Section

Number of Output Channels: 8 (Single Ended)

Resolution: 16 bits

#### VOLTAGE OUTPUTS

Voltage Ranges:  $\pm 5V$ , and  $\pm 10V$ , 0-5 V, and 0-10 V

Output Drive:  $\pm 10$  mA

Output Impedance: 3 Ohm (Max)

#### Current outputs

Current Range: 4-20 mA, 0-20 mA, 5-25 mA, 0-25 mA

Span: 16 or 20 mA, depending on current range

Compliance Voltage:

Internal Loop Supply: 10 VDC

External Loop Supply: 35 VDC maximum

### Digital Input Section

Input Threshold Voltages (Software programmable)

|       |       |
|-------|-------|
| 1.25  | 12.80 |
| 3.15  | 14.82 |
| 4.70  | 22.00 |
| 6.70  | 24.96 |
| 11.00 | 25.60 |
| 34.10 | 43.80 |
| 60.2  |       |

Threshold voltage accuracy:

$\pm (2\% + 200mV)$  of set threshold value.

Differential Signal Input Characteristics: RS485 or RS422

Single-Ended Signal Input Characteristics: Voltage input, or Contact sense.

Input Scan rate: 10KSPS

Built-in-Test available: This board is designed with internal self-test logic that exercises all active components.

Over Voltage protection: 100V

### Digital Output Section

Number of Channels: 16

Output Type: Source or Sink

Load Capacity: 500mA (per channel)

Update Rate: 40 Hz

Operating Voltage: 8V – 35V DC

Load types: Resistive or Inductive

Digital Output logic options:

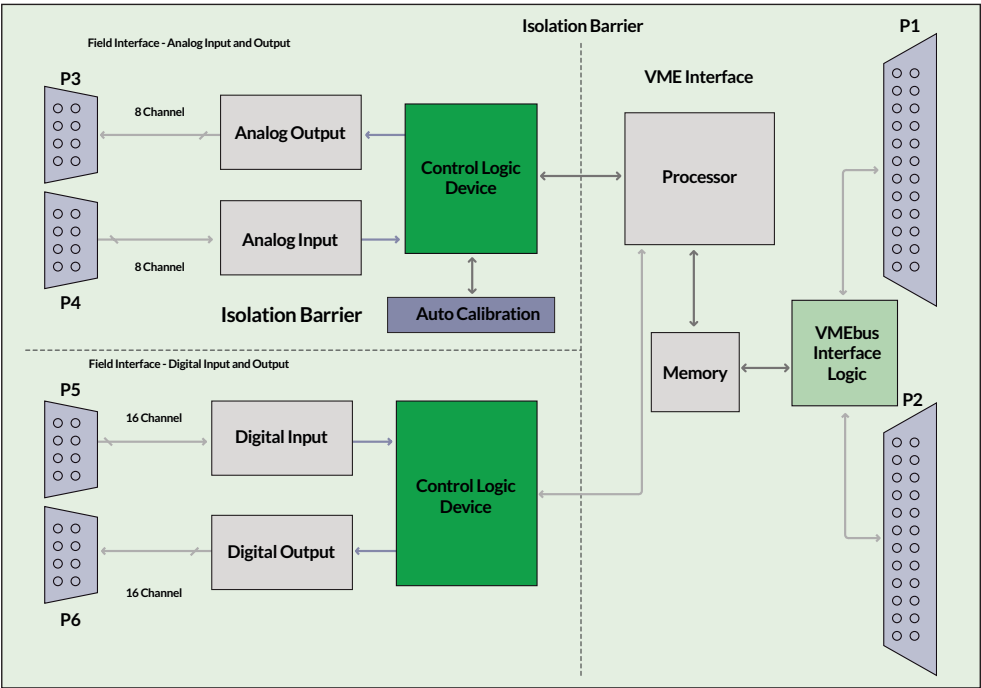
Positive True/Negative True

Over Current Protection Threshold: 650mA – 1250mA



VME-6500 VME Multi Function IO Board

Block diagram



Ordering information

|                            |   |   |   |   |   |   |
|----------------------------|---|---|---|---|---|---|
| February 2, 2010 GFA-1729A | A | B | C | D | E | F |
| VME-6500                   | - |   | 0 | 0 | 0 |   |

- A = Input Types  
0 = All 8 Analog Voltage Inputs  
1 = All 8 Analog Current Inputs  
2 = 4 Voltage and 4 Current Inputs
- B = Current Terminations  
0 = All 8 Analog Voltage Inputs  
1 = 200 Ohm Termination  
2 = 400 Ohm Termination
- F = Special Sales Order  
0 = Without Conformal Coating  
1 = With Conformal Coating

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