ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Abaco Systems / VMIC VMIVME-9064/32-461* at our website: *Click HERE*

VMIVME-9064/32

Reflective Memory Intelligent I/O Controller (68040 SBC)

Features:

- 68040 single board computer (SBC) with 16 MB of shared DRAM, 32-bit wide, accessible from the VMEbus
  - System controller functions with full four-level arbiter
  - Front panel run-and-halt and fall status LEDs
  - Front panel reset and abort switches
- Firmware provides all required support for scanning inputs, updating outputs, EU and data-type conversions, fault detection, fault isolation, and error reporting
- Requires Abaco Reflective Memory (VMIVME-5550, -5565, -5576, or -5588)
- Optional host software support utilities
  - I/O point manager
  - Report generator
  - Configuration downloader
  - Real time interface software
  - Source code available in C
- Supports a wide variety of Abaco Built-in-Test I/O modules (BITMODULES™)
- Optional CRT-based control panel
- Low cost expansion

abaco SYSTEMS

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VMIVME-9064/32 *Reflective Memory Intelligent I/O Controller (68040 SBC)*

Ordering Options								
March 29, 2004 800-009064-000 J		A	B	C	–	D	E	F
VMIVME-9064/32	–				–			

A = Host Floating-Point Format
- 0 = Reserved
- 1 = Reserved
- 2 = Reserved
- 3 = Reserved
- 4 = IEEE (Harris Night Hawk; Sun Series 3 or 4; Motorola Delta Series; VAX; Masscomp)

B = Processor
- 1 = Reserved
- 5 = Reserved
- 6 = Reserved
- 7 = 25 MHz Motorola 68040 SBC

C = 1 (Number of SBCs)

D = Data Format
- 0 = Standard (Noninverted Digital Input and Bit 0 is LSB)
- 1 = Inverted Digital Inputs

E = ADC/Chassis Configuration Selection
- 0 = 3100 ADC (Note 1)
- 1 = 3101 ADC (Note 1)
- 2 = 3100 and 3101 ADC (Note 2)
- (E = 2 is recommended for all new orders)

F = DIO Attributes
- 0 = No DI Filters
- 1 = DI Filters 2 µs
- 2 = DI Filters 10 µs
- 3 = DI Filters 5 µs

Notes

Up to 15 total chassis (numbered 0 through 14) are supported with a maximum of 280 I/O boards. However, with this option, the following board models are not supported: VMIVME-1128, -1129, -2127, -2128, -3113A, -4132, -1150, -2210, -2528 and -6015.
Up to 12 total I/O chassis (numbered 1 through 12) are supported with a maximum of 228 I/O boards. With this option, all board models listed on the I/O board and support page are allowed. If the master chassis contains I/O boards, it is identified as chassis 1. Otherwise, the master chassis may be identified as chassis 0, and 12 slave I/O chassis may be used.

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
Email: support@abaco.com
Web Address: www.abaco.com
Copyright © 2004 by Abaco
Specifications subject to change without notice.

Functional Characteristics

Introduction: The VMIVME-9064/32 provides a flexible, compact solution including user-friendly software utilities for the user who requires I/O products coupled with a preprogrammed SBC for effective turnkey operation. It is designed to operate with Abaco Embedded Systems Reflective Memory (RM) products. VMIVME-9064/32 may reside on multiple nodes of a single RM link.

Subsystem Description: Abaco provides a complete product line of I/O interface equipment designed specifically for the simulation and training industry. This equipment utilizes state of the art building blocks organized around the VMEbus architecture, that provides a high density, high throughput, low cost solution to the I/O control problem. The real time interface equipment includes an Intelligent I/O Controller (IIOC) (based on the 68040 family of microprocessors) that is designed to operate in parallel with customer-furnished/programmed SBCs and other customer-furnished hardware.

Abaco's I/O board-level product line, trademarked BITMODULES, is comprised of digital input/output boards, analog input/output boards, and synchro/resolver input/output boards. Each product is designed with extensive Built-in-Test capability and a front panel Fail LED to enable quick fault detection and isolation. These products support both offline and real time fault detection and isolation.

Abaco real time interface equipment supports configuration data, generated by a customer-furnished/ programmed parallel processor(s), that allows user-definable scan lists, data conversion formats, and service order of each I/O type. The system is expandable through the use of building block board-level products. As requirements change, the I/O system can be easily reconfigured. This configuration concept allows independent mapping of I/O points to memory, thus enabling the hardware configuration to change without changing the software interfaces.

The system provides extensive data type and engineering unit conversions. Digitals may be represented as bit, byte, word, or longword logicals. In addition, the host's definition of logical true may be designated as least significant bit (LSB) on, most significant bit (MSB) on, or all bits on for byte, word, and longword digital points. Analog and synchro values may be represented as host floating-point format or integer numbers. Engineering unit conversions for analogs include: offset binary, scaled, first-, second-, and third-order polynomial, two's complement integer, sine, cosine, arcsine, arccosine, and table lookup. Engineering unit conversions for synchros include: offset binary, degrees +180 to -180, degrees 0 to 360, scaled, unscaled, and first-order polynomial.

The equipment supports an optional user-friendly CRT-based control panel that allows an engineer or maintenance technician to monitor all I/O points during real time, examine and modify all I/O points in nonreal-time, and initiate and control offline diagnostics. The control panel also provides for the display of the current status of the system, errors found during real time or offline diagnostics, and the current system configuration. The control panel provides a maintenance and test interface that will facilitate integration and checkout of the I/O system independent of other customer-furnished/programmed hardware.

The Abaco real time I/O configuration can be organized as a star network, as shown in Figure 1. The central node of the I/O subsystem is the IIOC that is responsible for all communications, CRT control, data format, engineering unit conversion, and communication with the satellite or slave nodes. The slave nodes contain the I/O boards. For small I/O systems (less than 14 boards; approximately 900 digital points), only the IIOC chassis is required. Although this device is designed to support up to 12

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VMIVME-9064/32 *Reflective Memory Intelligent I/O Controller (68040 SBC)*

slave chassis, typical applications will involve only one to three chassis including the master chassis. Each slave node supports up to 19 I/O boards. Abaco's high performance VMEbus multidrop repeater link (VMIVME-5504L) provides a 32-bit parallel data path between the IIOC and a slave node up to 1,000 feet from the IIOC, and reduces cable requirements and cost.

A Host Software Support Package (HSSP) is available that provides the user the basis for interactive tools to diagnose, configure, document, and communicate with the IIOC. The software package also includes sample real time source code to aid the user in generating project-specific software. For additional information on host software utilities, the reader should refer to Abaco's IIOC HSSP Specification (Abaco's Document Number 820-900000-000).

Abaco real time interface equipment is an established product line with catalog prices available to any governmental or industrial user.

Abaco provides complete system support, including technical manuals, systems configuration manuals, training material, training classes, field support, depot repair, and board swap-out services. Abaco has established a worldwide network of sales representatives to provide customer support before and after the sale.

Abaco offers a highly flexible I/O system configuration designed for high reliability requirements. The system building blocks provide high performance solutions at low cost, and the IIOC provides the user with the capability of configuring an I/O scanning device based entirely on the industry standard VMEbus architecture.

Software Communications Protocol: The VMIVME-9064/32 IIOC communications protocol utilizes a simple, memory-mapped control window and interrupt scheme to simplify control by the RM host computer. The host initializes a memory-mapped RM allocation page and interrupts each VMIVME-9064/32 IIOC on the RM link. Each IIOC uses its node number, read from the local RM board, as an index into the RM allocation page to locate its control window and buffer space. The host may then write commands for the IIOC to the appropriate control window and issue a command interrupt. The IIOC fields the locally generated interrupt, interprets the command, and executes the requested action. After I/O configuration, the IIOC posts the locations and word counts of the configured I/O buffers in the control window. The host and IIOC then read and write I/O data to these shared RM buffers.

Command List Processing: The VMIVME-906x IIOCs provide for command list processing to reduce or eliminate host command interaction during real time processing. These command lists are configured after the host has configured all I/O scan lists. Up to three command lists are supported by the embedded host IIOCs. These lists contain the scan commands, with associated data transfer addresses that would be utilized during a real time frame. Each command list may contain only one scan command for each of the twelve supported scan list types (that is, primary DO, secondary DO, primary AI, etc.). Each of the configured command lists may be executed with a single command each I/O frame, or may be configured with an execution interval which allows the host to command autoscanning of each list at the execution interval provided with the command list configuration data. Command lists may not contain digital input scan commands when VMIVME-1110 digital input boards with the 5 ms filter option are present in the IIOC.

VMIVME-9064/32 — IIOC Firmware1:

- Diagnostic firmware
  - Processor
  - Local memory
  - Global memory
  - Local diagnostic control
  - Error reporting
  - Offline and real time fault detection and isolation
- Diagnostic control
  - Power up initialization
  - Host initiated (from customer-furnished host computer)
  - Local terminal control
- Failure reporting
  - Front panel fail LEDs
  - Local terminal option
  - Host report (to VMEbus host)
- Real time firmware
  - Floating-point to fixed-point conversion
  - Fixed-point to floating-point conversion
  - Bit-to-byte conversion
  - Byte-to-bit conversion
  - I/O data transfers
  - Real time fault detection
  - Synchro smoothing
  - Analog output smoothing
  - Analog input filtering

VMIVME-9064/32 — Required:

1. 68040 SBC
2. 20-slot VMEbus chassis assembly
3. Reflective Memory host interface, one of options 2 through 5 from the option list below

1 For a detailed explanation of the performance, features and operation of the IIOC, refer to Abaco's IIOC Family Instruction Manual (Document No. 500-009000-000).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VMIVME-9064/32 *Reflective Memory Intelligent I/O Controller (68040 SBC)*

VMIVME-9064/32 — Optional:

1. 68040, 25 MHz CPU, Abaco firmware (Motorola 162)
2. Reflective Memory VMIVME-5550
3. Reflective Memory VMIVME-5565
4. Reflective Memory VMIVME-5576
5. Reflective Memory VMIVME-5588
6. P1 backplanes
7. P2 backplane expansions
8. Power supplies
9. Fan assemblies

Trademarks

All registered trademarks are the property of their respective owners.

I/O Board Support

The following Abaco I/O boards are supported by VMIVME-9064/32:

Digital I/O boards	Model No.
- 64-bit high-voltage digital input	VMIVME-1110[2]
- 64-bit high-voltage and/or differential digital input	VMIVME-1111
- 128-bit high-voltage digital input board	VMIVME-1128
- 128-bit high-voltage filtered digital input	VMIVME-1129
- 64-bit optically isolated digital input	VMIVME-1150
- 64-bit high-voltage digital output	VMIVME-2120
- 128-bit voltage source digital output	VMIVME-2127
- 128-bit high-voltage digital output board	VMIVME-2128
- 64-bit high-current source digital output	VMIVME-2130
- 64-bit high-current sink/source digital output	VMIVME-2131
- 64-channel relay board	VMIVME-2210
- 32-channel relay board	VMIVME-2232
- 64-bit TTL digital I/O	VMIVME-2510B
- 128-bit TTL digital I/O	VMIVME-2528[3]
- 32-bit high-voltage digital output and 32-bit high-voltage digital input	VMIVME-2532A[1]
- 32-bit differential digital output	VMIVME-2533
- 32-bit high-voltage digital input and/or output with P2 I/O and Built-in-Test	VMIVME-2534
Analog I/O boards	
- 12-bit ADC (jumper-selectable gain)	VMIVME-3100[4]
- High speed 12-bit ADC with autocal	VMIVME-3101[3]
- 12-bit analog-to-digital converter, 48 inputs, and 2 D/A outputs	VMIVME-3111
- 64-channel scanning 12-bit analog-to-digital converter board	VMIVME-3113A
- High-resolution analog-to-digital converter board	VMIVME-3116[5]
- 8-channel, 16-bit resolution analog output board	VMIVME-4116
- 32-channel analog output board	VMIVME-4132
- 16-channel (S&H per channel) analog output board with single-ended analog input multiplexer	VMIVME-4500A
- 16-channel, 12-bit analog I/O board (AIO) with Built-in-Test on-board	VMIVME-4512
- 16-channel, 12-bit analog I/O board (AIO) with Built-in-Test and P2 I/O	VMIVME-4514A
Synchro/resolver boards	
- Dual channel digital-to-synchro/resolver	VMIVME-4900
- Dual channel digital-to-synchro/resolver with 5.0 VA option	VMIVME-4905
- Quad channel synchro/resolver-to-digital converter	VMIVME-4911
Generic boards	
- Quad serial port board	VMIVME-6015[6]

VMIVME-9064/32 with Motorola CPU-162

SPECIFICATIONS

CPU Type	68040
FPCP Type	None
CPU Clock Frequency	25 MHz
Shared DRAM Capacity	16 MB
SRAM Capacity with On-Board Battery Backup	128 KB
RS-232 Compatible Serial I/O Interface (Z85230 SCC)	1
VMEbus Interface	A32, A24, A16: D8, D16, D32, UAT, RMW
RESET and Abort Switches	Yes
Power Requirements	+5 VDC (±5%) at 3.5 A typical, 4.5 A maximum +12 VDC (±5%) at 100 mA maximum -12 VDC (±5%) at 100 mA maximum
Operating Temperature with Forced Air Cooling	0 to 55 °C
Storage Temperature	-40 to +85 °C
Relative Humidity (Noncondensing)	5% to 90%
Board Dimensions (mm: in.)	233 x 160 mm: 9.2 x 6.3 in.
No. of Slots Used	1

2 The use of 5 ms filters on VMIVME-1110 digital input (DI) boards or on VMIVME-2532A digital input/output (DIO) boards requires a delay of 10 ms before DI scanning in the event the I/O service interrupt occurs during DI real time testing. This delay is necessary to preclude erroneous real time data because of filter capacitor discharge/charge time. By placing the transfer DI and scan DI commands at the beginning of the frame, the 10 ms may be absorbed by the processing of the other I/O types. Abaco offers a product (VMIVME-1111) that allows the use of 5 ms filters without any real time input service delay.

3 The VMIVME-2528 board is supported as an output board only. Inputs are not supported.

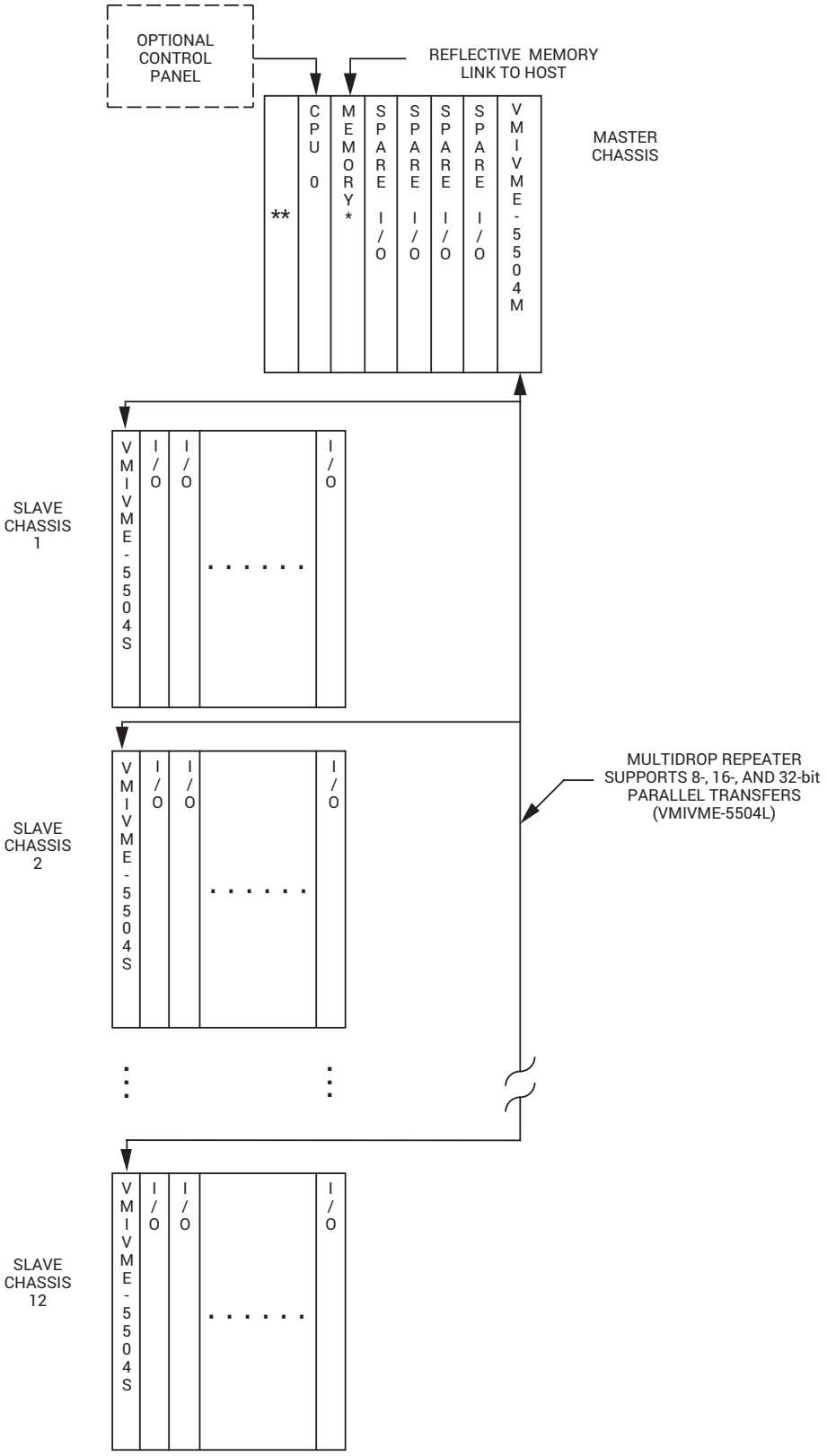
4 Front panel inputs are not supported.

5 Front panel inputs are supported.

6 19.2 Kbaud maximum.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VMIVME-9064/32 *Reflective Memory Intelligent I/O Controller (68040 SBC)*



*Reflective Memory.
**Blank front panel.

Figure 1. Intelligent I/O Controller Subsystem Block Diagram Using Multidrop Repeater Link

VMIVME-9064/32 *Reflective Memory Intelligent I/O Controller (68040 SBC)*

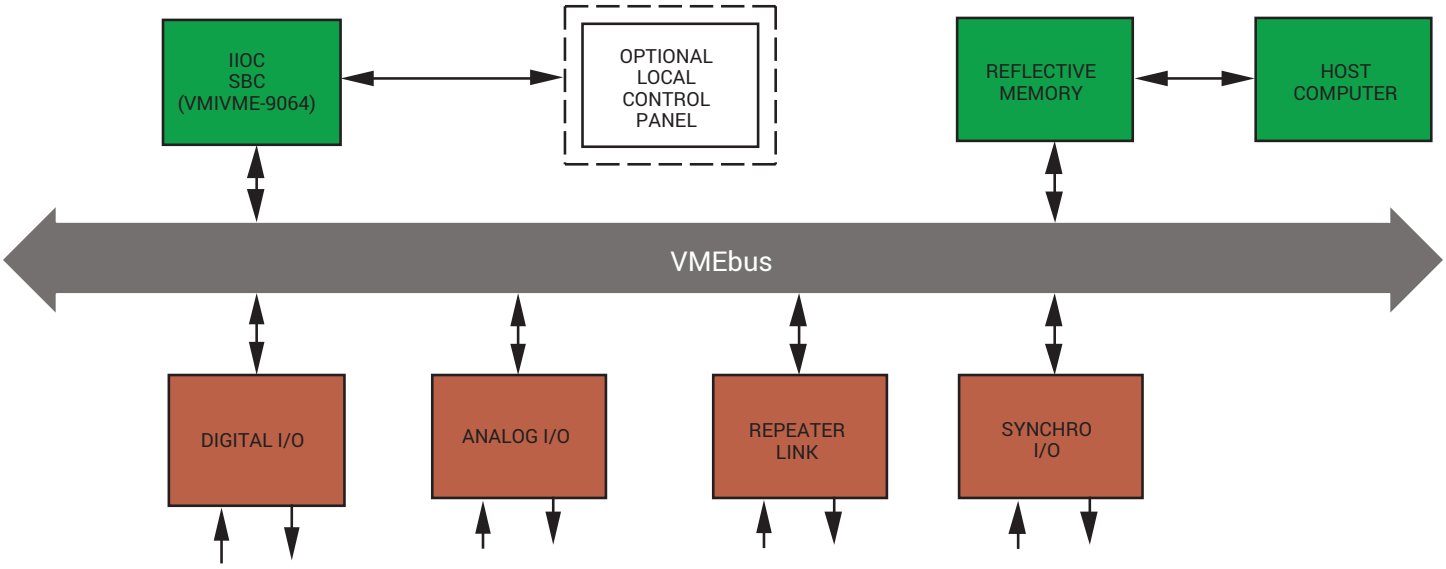


Figure 2. Bus Structure Block Diagram

WE INNOVATE. WE DELIVER. YOU SUCCEED.

Americas: 866-OK-ABACO or +1-866-652-2226 **Asia & Oceania:** +81-3-5544-3973
Europe, Africa, & Middle East: +44 (0) 1327-359444
Locate an Abaco Systems Sales Representative visit: abaco.com/products/sales

abaco.com | @AbacoSys

©2017 Abaco Systems. All Rights Reserved. All other brands, names or trademarks are property of their respective owners. Specifications are subject to change without notice.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP