INTRODUCTION — The VMIVME-4132 analog output board provides 32 high-quality analog output channels, which can be programmed with on-board jumpers to operate in a variety of voltage ranges. All outputs have 12-bit resolution, and can source or sink 10 mA at ±10 V. For offline testing, the analog outputs can be disconnected from the external circuits.

FUNCTIONAL CHARACTERISTICS

VMBus Compliance: The analog output board is a standard double height printed circuit board which is compatible with the VMEbus specification (Rev. C.1). VMBus A16:D16

Board Address: The physical address for the board may be selected by on-board jumpers. VMBus address lines A07 through A15 are decoded for board selection.

VMBus Access: Address modifier bits are jumper-selected and decoded to support both nonprivileged short I/O, supervisory short I/O, or both. The board is factory-configured for supervisory short I/O.

Output Data Transfer: Data for each analog output channel is written directly into an on-board register location dedicated to a specific channel. The data is then periodically retrieved from the register, and converted to an analog voltage which is transferred to one of 32 output sample-and-hold buffers.

A/D Data Format (Built-in-Test Data): Analog inputs are first digitized, then the 12-bit digital values (D11 to D00) are read at a single memory word location. In two’s complement mode, the upper four bits (D15, D14, D13, and D12) are read as the sign extension of the 12-bit digital value, otherwise they are read as logical zeros.

Built-in-Testing: Built-in-Test logic provides the user with the capability to test all of the active components on the board, including the output switches. This test scheme utilizes an on-board analog-to-digital converter (ADC) and multiplexers, as shown in Figure 1.

Memory Testing: This product is designed with dual-port on-board registers that may be tested by executing a user-defined memory test program for additional performance verification.

System Reset: Application of the system reset signal via the VMEbus initializes the board into a state with all analog outputs disconnected from the output.
Front Panel Fail LED: If an error condition occurs during diagnostics, a software-controlled LED can be used to visually indicate a failure. The LED is illuminated by system reset at power up and is extinguished under software control.

(Typical at +25 °C and rated power supplies unless otherwise stated.)

**ANALOG OUTPUTS**

**Number of Output Channels:**  Thirty-Two: One S&H per channel

**Full-Scale Analog Output (Jumper-Selective):**
- Unipolar: 0 to +10 V, 0 to +5 V
- Bipolar: ±2.5 V, ±5.0 V, ±10.0 V

**Analog Output Code:** The 12-bit digital-to-analog converter (DAC) accepts digital codes in straight binary, offset binary, or two’s complement

**Output Load Current:** ±10 mA, over the entire output voltage range of ±10 V

**Resolution:** 12 bits

**Output Impedance:** <0.1 Ω, online
>10 MΩ, offline

**Total Error:** ±0.05 percent of full-scale range

**Maximum Settling Time to 1 LSB:** 3.4 ms

**Refresh Update Rate:** 294 Hz (default); 940 Hz (FAST REFRESH). The FAST REFRESH rate provides a filtered output for complex functions; whereas, the 294 Hz rate provides settling to 0.05 percent for stepped outputs at each update. The 940 Hz rate provides settling to 0.2 dB (2.3 percent). Both rates provide settling to 0.05 percent in 3.4 ms.

**Output Short Circuit Protection:** Indefinite short to common; transient overvoltage protected to ±25 V

**Monotonicity:** Monotonic over the full temperature range

**BUILT-IN-TEST (BIT)**

**Configuration:** On-board 32-channel multiplexer and 12-bit ADC

**Output Monitor:** Multiplexers monitor the board outputs at P3 in online mode, or the S&H buffer outputs in offline mode.

**Scan Rate:** 26,000 channels/s

**PHYSICAL/ENVIRONMENTAL**

**Dimensions:** Standard VME double height board
160 mm x 233.5 mm

**Temperature:** 0 to 55 °C, operating
-25 to + 85 °C, storage

**Relative Humidity:** 20 to 80 percent, noncondensing

**Cooling:** Convection

**Power Requirements:** +5 VDC (±5 percent) at 3.5 A maximum

**MTBF:** 86,770 hours (217F)

**TRADEMARKS**

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Figure 1. VMIVME-4132 Functional Block Diagram

APPLICATION AND CONFIGURATION GUIDES — The following Application and Configuration Guides are available from VMIC to assist the user in the selection, specification, and implementation of systems based on VMIC’s products.

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