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Find the *Abaco Systems / VMIC VMIVME-3126A-100* at our website: *Click HERE*

VMIVME-3126
High Resolution, Isolated Analog-to-Digital Converter Board

- 8 or 16 isolated input channels with active guards
- 16-bit data
- 1,500 VDC (1,000 VAC) isolation, input-to-input and input-to-VMEbus
- Digitizer per channel
- Input ranges of ±50 mV to ±10 V, software-selectable on channel-by-channel basis
- Software-controlled bandwidth, 0.05 to 26 Hz (6-pole low pass filters implemented with internal DSP)
- DSP-based offset and gain correction in real-time
- DSP supported E^2PROM stores calibration coefficients (no trimpots)
- Conversion rate of 100 SPS (samples per second) per channel
- RTD excitation under software control (200 mA/400 mA per channel)
- Open transducer detection under software control
- Supported by VMIC's I/O controllers
- Optional current termination resistors
- Optional increased input range

APPLICATIONS

- Power plant monitoring
- Machine monitoring
- Data acquisition
- RTDs, strain gauges, and thermocouples

INTRODUCTION — The VMIVME-3126 is an 8- or 16-channel, high resolution, totally isolated ADC board. The inputs accept 2-wire isolated signals in the range of ±50 mV to ±10 V, and provide input-to-input and input-to-VME isolation. Each input is sampled and digitized by a dedicated 24-bit Analog-to-Digital Converter (ADC) per channel.

Automatic scanning of all inputs is executed on power up after the board performs self-test. The self-test includes reading and writing to the Random Access Memory (RAM), digitizing a reference voltage on each ADC, comparing the result to the actual digital value expected, and loading calibration and filter coefficients into the Digital Signal Processor (DSP). Accuracy is optimized with the use of internal corrections for gain and offset that are applied in real-time and determined during the calibration mode.

FUNCTIONAL CHARACTERISTICS

(At 25 °C and rated power supplies, unless otherwise stated.)

VMEbus Access and Compliance: Response to address modifiers is jumper selectable as:
A24 or A16 address space
Supervisory or user privilege, or both
D16/D8 (EO) DTB Slave
6U form factor

Board Address: The base VMEbus address is set by configuration of a jumper field. A jumper exists for each of the addresses A23 through A8; thus, the address space occupied by this board is 256 bytes.

NO PHOTO AVAILABLE

OPERATING MODES

Sample Mode: Board powers up sampling all inputs simultaneously after a successful self-test.

Calibration Mode: Calibration mode is entered by setting a bit in the Board and Status Register (BSR). Each channel is calibrated by the DSP using up to seven external calibration voltage inputs[1]. Gain and offset coefficients are stored in the DSP for real-time correction. The user can set another bit in the BSR to write the coefficients to the E^2PROM. The user also has the ability to enter their own gain and offset coefficients.

Configuration Mode: Configuration mode is entered by setting a bit in the BSR. Each channel can be individually configured for range, filter frequency, data output format, and type of input (Normal, RTD Excitation, Open Transducer Detect).

Autozero Mode: Autozero Mode is entered by setting a bit in the BSR. In this mode, each input is disconnected from the field connection via an electronic switch. A

1. Indicated accuracy applies after calibration at the selected input voltage range.

Ordering Options

July 30, 1997 800-003126-000 D	A	B	C	–	D	E	F
VMIVME-3126 –			0				

A = Number of Input Channels
0 = 8 Channels
1 = 16 Channels

B = Input Type
0 = Voltage Input Board
1 = Current Input Board
2 = Voltage Input Board with Increased Input Range

C = 0 (Option reserved for future use)

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
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ground reference is connected, digitized, and compared to an ideal ground reading. The offset coefficients are adjusted to eliminate this difference. This technique provides a method of compensating for temperature variations without requiring a calibration operation.

Self-Test: Self-Test is run automatically after a system or software reset. The on-board RAM and each ADC is tested. Status Registers indicate success or failure of each of these components.

Front Panel Indicator: Program-controlled front panel LED illuminates RED on power up, calibration, and reconfiguration of channels. The LED is turned off after successfully completing the above mentioned modes.

Board Identification: A Board Identification Register (BIR) contains the VMIVME-3126 identification code.

INPUT CHARACTERISTICS

Number of Input Channels: 8 or 16 isolated 2-wire channels with an active guard pin per channel

Isolation Voltage: Channel-to-channel, channel-to-VME; 1,500 VDC, 1,000 VAC

Input Ranges (Software Controlled):
Bipolar: ±50 mV, ±100 mV, ±500 mV, ±1 V, ±5 V, ±10 V
Unipolar: 0 to 50 mV, 0 to 100 mV, 0 to 500 mV, 0 to 1 V, 0 to 5 V, 0 to 10 V

Input Filters: 0.05 to 26 Hz low pass, 6-pole; Filter cut-off frequency under software control. Filtering performed by DSP software. Approximates Bessel response.

Accuracy: Full-scale range accuracy[1]

Full-Scale Range	% Full-Scale
±10 V, ±5 V, 0-10 V, 0-5 V	0.0030%
±1 V	0.0076%
* ±500 mV, ±100 mV, 0-1 V, 0-500 mV	0.012%
* ±50 mV, 0-100 mV	0.017%
* 0-50 mV	0.060%

*Tested with 0.05 Hz filter setting.

Stability: Temperature drift, per degree Celsius = ±5 PPM Reading ±6 PPM full-scale ±2 µV. Offset errors due to temperature can be eliminated by autozeroing.

Input Noise: Typical and maximum noise referred to input, inputs Hi, Low, and AGND shorted together at front panel connector, noise units are µV RMS

Filter Setting

Typical								
Range	26 Hz	10 Hz	4 Hz	1.7 Hz	0.7 Hz	0.3 Hz	0.12 Hz	0.05 Hz
±10 V	350	210	145	105	55	40	0	0
±5 V	210	110	85	55	40	20	0	0
±1 V	45	30	16	10	7	6	3	0
±500 mV	40	20	10	8	6	4	2.5	0
±100 mV	35	20	10	7.5	6	2	2	1.5
±50 mV	30	20	10	8	4.5	4	2.5	1
0-10 V	325	190	125	85	60	40	0	0
0-5 V	162	100	80	45	35	20	0	0
0-1 V	65	40	25	15	13	13	8	5
0-500 mV	80	35	25	15	10	10	10	2
0-100 mV	85	35	25	15	10	10	10	3
0-50 mV	60	35	25	15	15	10	7	3
Maximum								
±10 V	750	325	250	155	130	110	0	0
±5 V	475	200	110	85	70	70	0	0
±1 V	85	50	25	20	18	14	8	0
±500 mV	60	35	25	15	10	8	7	4
±100 mV	50	30	20	15	12	8	4	2
±50 mV	45	30	20	15	8	6	4	2
0-10 V	425	220	150	120	90	75	50	30
0-5 V	230	150	100	60	45	40	25	20
0-1 V	150	100	60	35	25	20	15	10
0-500 mV	150	90	55	35	25	20	15	5
0-100 mV	130	80	45	30	20	20	15	5
0-50 mV	125	80	50	40	30	25	15	5

Bandwidth, Each Input: DC to Fc, where Fc is 0.05 to 26 Hz[2]

Input Impedance: 10 MΩ, minimum, power on. (Does not apply to boards equipped with the current-input option.)

Interchannel Crosstalk: -150 dB maximum at 1 kHz, Fc = 1 Hz

Isolation-Mode Rejection: 160 dB at 60 Hz, Fc = 1 Hz

Overvoltage Protection: ±25 V line-to-line

RTD Excitation (Software Controlled Per Channel): 200 µA/400 µA, ±20 percent maximum, 20 PPM/°C typical

2. Default cutoff frequency is 26 Hz.

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Open Transducer Detection (Software Controlled Per Channel): 200 µA, functional on all ranges below ±1 V (0-1 V)

Channel Guard: Active output with unity gain and 1 kΩ source impedance

Current Termination Resistor: See the Available Options section.

TRANSFER CHARACTERISTICS

Transfer Function:

$$E_{IN} = E_{LO} + \left[E_{fsr} \times \frac{N_{ADC}}{65{,}536} \right];$$

Where:

E_{IN} = Channel input voltage
E_{LO} = Lower end of input range
E_{fsr} = Full-scale input range
N_{ADC} = Output code

Example:
For +3.75 V input on ±10 V Range:

$$3.75 = -10 + \left[20 \times \frac{N_{ADC}}{65{,}536} \right];$$

N_{ADC} = 0xB000

Resolution: 16 bits

Input Sampling: All inputs are sampled simultaneously

Integral Nonlinearity: ±0.005 percent maximum from best straight line

Channel Sample Rate: 100 SPS per channel; 1,600 SPS aggregate

Data Coding: Software programmable, two's complement or straight/offset binary

DATA BUFFER MEMORY

Buffer Size: 16 contiguous 16-bit data words

Access Time: 400 ns from DS to DTACK

VMEbus Access: D8 or D16

AVAILABLE OPTIONS (See the Ordering Options)

Number of Input Channels: Either 8 or 16 2-wire channels

Current Termination Resistor: 400 Ω resistor placed across the inputs. ±25 mA maximum sustained input current. (Calibration inputs are specified in current units instead of voltage units.)

Increased Input Range: Input structured to handle input ranges up to ±200 VDC

PHYSICAL/ENVIRONMENTAL

Temperature Range:
0 to +65 °C (standard VME slot), operating
-40 to +85 °C, storage

Humidity: 10 to 80 percent relative, noncondensing

Altitude: Operation to 10,000 ft (3,048 m)

Cooling: Forced air convection (standard VME slot)

Dimensions: Double height Eurocard (6U) board, 160 x 233.35 mm

Weight: 700 g, maximum

Input Connectors: Two 64-pin DIN connectors

Connector Data		
Style	***Recommended Connecting Component***	***P3 and P4 I/O Connectors***
64-pin Discrete Wire	Mating Connector (96-pin Discrete)	AMP 925486-1*
	Female Crimp Contacts (64-pin Discrete)	AMP 530151-6**
	Connector Housing (for 64-pin Connectors)	Harting 09 02 064 0501
Notes		
* Center row not connected. ** AMP Crimp tool part number 90301-2.		

Power Requirements: +5 VDC (±5%) at 2.8 A maximum

MTBF: 97,850 hours (217F)

TRADEMARKS

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Note: It is recommended that twisted, shielded pairs be used to connect to the VMIVME-3126.

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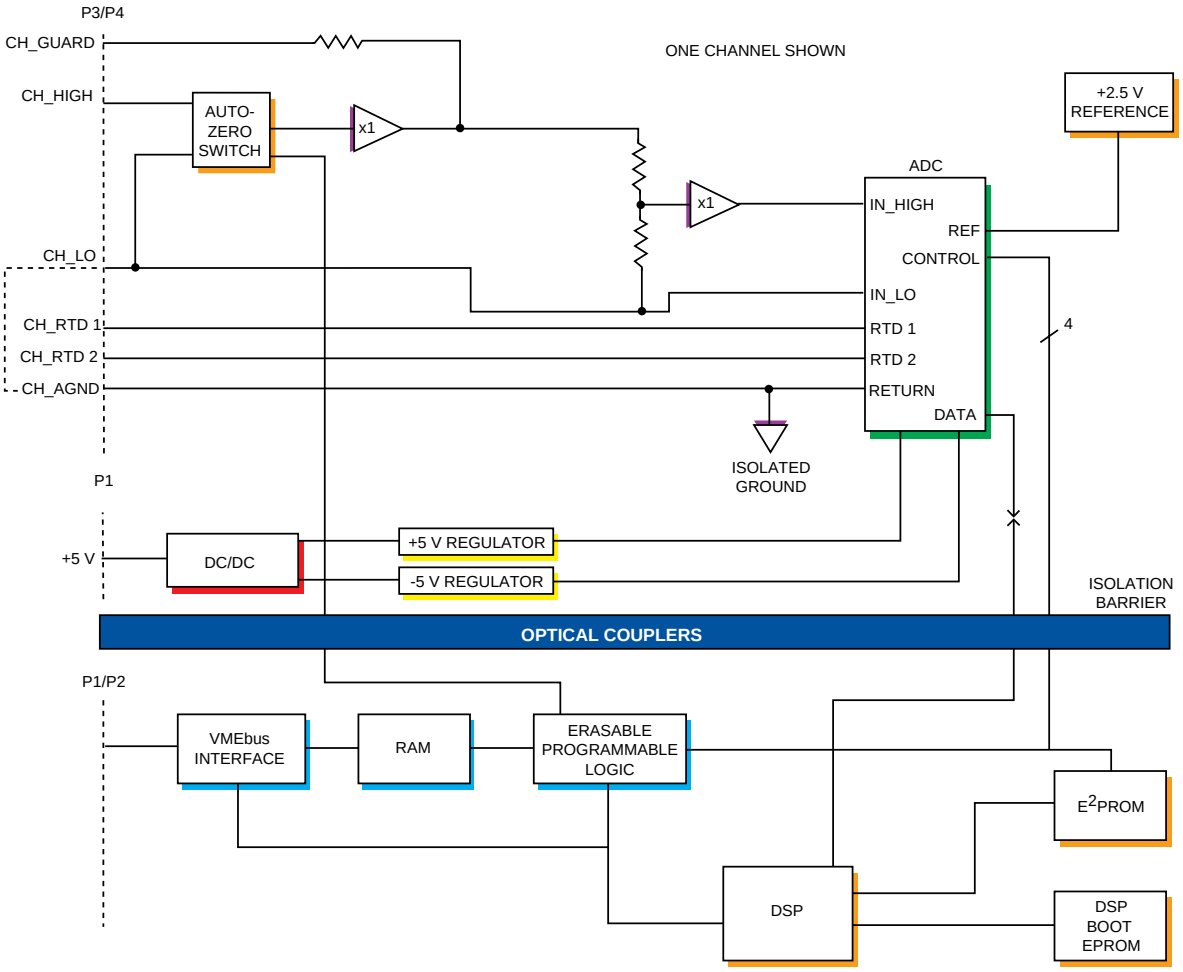


Figure 1. VMIVME-3126 Block Diagram

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