VMIVME-1160A
32-bit Optically Coupled Digital Input with Change-of-State Interrupts

- 32 optically coupled digital inputs
- 5 V to 48 VDC input range
  - — Voltage sourcing
  - — Current sink/contact sense (internal pull-up resistors available)
- High isolation
- Input debouncing option for both *make* and *break* contacts
- Does not require *form C* (single-pole double throw) input signals
- Interrupt available on both rising edge and falling edge
- Change-of-State interrupts on any of seven levels eliminate CPU polling overhead
- Positive or negative true input options
- Nonprivileged short I/O, supervisory short I/O, or both
- High reliability DIN-type connectors
- 8- or 16-bit transfers
- Double Eurocard form factor

OPERATIONAL OVERVIEW — This product is designed with standard Change-of-State (COS) control and interrupt logic that detects any COS and provides an interrupt vector to the byte level. It incorporates an MC68153 Bus Interrupter Module (BIM) and interrupts are supported on any of seven levels.

Each byte (8 bits) of input may have a unique interrupt vector that is generated upon a COS in any bit of that byte. This product also has an Interrupt Enable Register which is used to allow interrupts to be enabled on a byte-by-byte basis. The input data may be accessed as a D8 or D16 transfer.

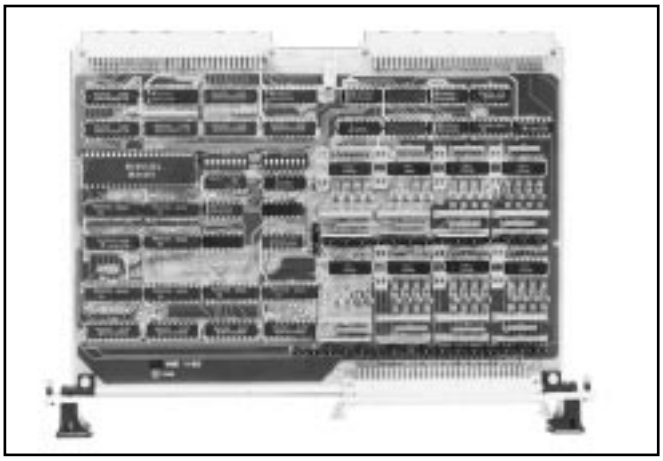
A functional block diagram of this product is shown in Figure 1. Interrupts are generated on any COS (positive or negative transition). Polarity is determined by reading the input port after the COS interrupt.

POSITIVE/NEGATIVE TRUE ORDERING INFORMATION — This board may be ordered with positive or negative true data. For positive true boards, when current flows in the opto-isolator diode, a logical *one* will be presented to the VMEbus.

For negative true boards, when current flows in the opto-isolator diode, a logical *zero* will be presented to the VMEbus. In either case, the data sent to the BIM is always positive true and not affected by the ordering option.

RELATED PRODUCTS AND APPLICATIONS — VMIC offers a broad range of digital I/O products for VMEbus systems and supports these products with comprehensive applications information. Contact the factory for a description of current products.

State changes that occur during the interrupt processing window (internal request to interrupt acknowledge cycle complete) will not be detected. The time between user input state changes must not be less than the computer interrupt processing time; otherwise, the state changes will be lost.



FUNCTIONAL CHARACTERISTICS

Compatibility: The VMIVME-1160A is a standard, double height printed circuit board that is electrically and mechanically compatible with the VMEbus

Input Organization: Four input ports, each eight bits wide. The ports are arranged as four contiguous 8-bit, read-only registers.

Addressing Scheme: Four 8-bit ports, individually addressable on 8- or 16-bit boundaries.

Board Address: The board address is selected by on-board DIP switches. Operation is supported in any slot on the VMEbus backplane, except slot one.

Ordering Options

October 28, 1994 800-101160-000 B	A	B	C	–	D	E	F
VMIVME-1160A –				–			

A = Polarity/Input Type
- 1 = Positive True/Voltage Source
- 2 = Negative True/Voltage Source
- 3 = Positive True/Contact Sense
- 4 = Negative True/Contact Sense

B = Input Voltage
- 0 = 5 V (TTL Compatible)
- 1 = 12 V
- 2 = 24 V
- 3 = 48 V

C = Debounce Selection
- 0 = N/A
- 1 = 2 µs
- 2 = 10 µs
- 3 = 5 ms
- 4 = 1 ms

Connector Data

Compatible Cable Connector	Panduit No. 120-964-435E
Strain Relief	Panduit No. 100-000-032
PC Board Header Connector	Panduit No. 120-964-033A

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
E-mail: info@vmic.com Web Address: www.vmic.com

VMEbus Access: Address modifier bits are decoded to support either short supervisory I/O, nonprivileged short I/O access, or both. A dual jumper is provided to support this option, and is factory configured for short supervisory I/O access.

Data Transfer Type: D8, D16

Access Time: 250 ns maximum

Data Polarity: Order as positive true or negative true*

INTERRUPTS

Type: VMEbus slave/interrupter; ROAK

Levels: Any of the seven available interrupt levels I(1) to I(7)

Interrupt Event: Each 8-bit input port is assigned an interrupt level. A COS of any bit(s) in a port causes an interrupt to be generated at the assigned level.

Interrupt Vector Location: D08(O)

INPUT CHARACTERISTICS

Signal Conditioning: Inputs can be either voltage sourcing or current sink/contact sense with voltages accepted in the range from 5 to 48 V.

Input Voltage Options: Input voltage can be ordered as 5, 12, 24, or 48 V. Typical input circuit configurations are illustrated in Figure 2. Detailed specifications are provided in Tables 1 through 4.

Input Configurations: Voltage source or logic level
Current sink or contact sense

Debounce Selection: Debounce logic for all 32 inputs are available, with standard time constants of 2 µs, 10 µs, 1 ms, or 5 ms

Isolation: 10 MΩ, minimum

Isolation Voltage: 1,000 V maximum sustained voltage; 7,500 V for one second

PHYSICAL/ENVIRONMENTAL

Dimensions: Standard VME double width board (166 mm x 233.4 mm x 12 mm)

Input Connector: One 64-pin DIN connector, type **C**

Ambient Temperature: 0 to +55 °C, operating
-20 to +85 °C, storage

Humidity: 20 to 80 percent, noncondensing

Cooling: Convection, forced air

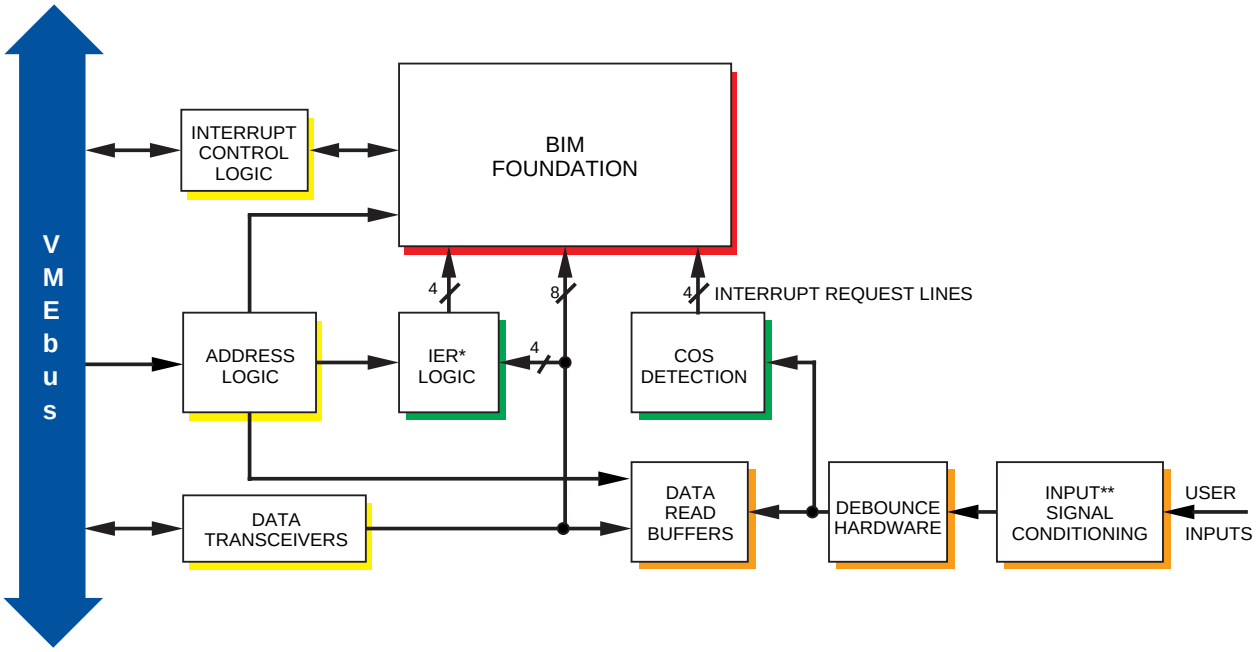
Power Requirements: +5 VDC at 1.1 A (typical), 2.1 A (maximum)

TRADEMARKS

* Refer to definition on page 1.

APPLICATION AND CONFIGURATION GUIDE — 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 products.

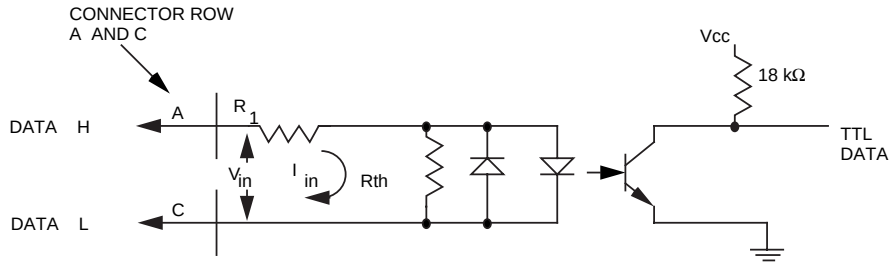
Title	Document No.
Digital Input Board Application Guide	825-000000-000
Change-of-State Board Application Guide	825-000000-002
Digital I/O (with Built-in-Test) Product Line Description	825-000000-003
Connector and I/O Cable Application Guide	825-000000-006



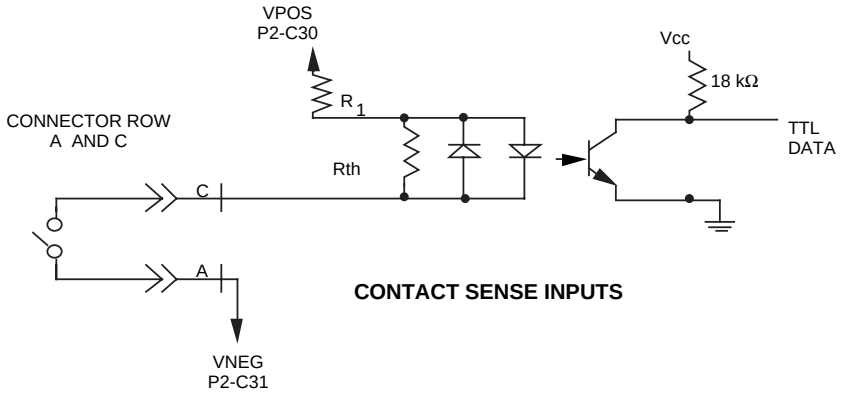
*Interrupt enable register.
**Board dependent.

Figure 1. VMIVME-1160A Functional Block Diagram

CONFIGURATION OF VOLTAGE SOURCE AND CURRENT SINK OPTIONS



VOLTAGE SOURCE INPUTS



CONTACT SENSE INPUTS

Figure 2. Typical Voltage Source and Contact Sense Signal Conditioning

Table 1. 5 V Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
V_{IH} - HIGH THRESHOLD VOLTAGE	————	3.6	2.6	——	V
V_{IL} - LOW THRESHOLD VOLTAGE	————	——	2.6	1.8	V
I_{IH} - HIGH VOLTAGE CURRENT	VIN = 5 VDC	——	——	3.1	mA
I_{IL} - LOW VOLTAGE CURRENT	VIN = $V_{IL(MIN)}$	——	——	0.7	mA

Typical turn-on current is 1.43 mA at VIN = 2.6 V.
Absolute maximum input voltage is ± 12 VDC.

Table 2. 12 V Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
V_{IH} - HIGH THRESHOLD VOLTAGE	————	9.2	5.9	——	V
V_{IL} - LOW THRESHOLD VOLTAGE	————	——	5.9	3.4	V
I_{IH} - HIGH VOLTAGE CURRENT	VIN = 12 VDC	——	——	3.4	mA
I_{IL} - LOW VOLTAGE CURRENT	VIN = $V_{INL(MIN)}$	——	——	0.7	mA

Typical turn-on current is 1.43 mA at VIN = 5.9 V.
Absolute maximum input voltage is ± 22 VDC.

Table 3. 24 V Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
V_{IH} - HIGH THRESHOLD VOLTAGE	————	21.3	12.9	——	V
V_{IL} - LOW THRESHOLD VOLTAGE	————	——	12.9	6.9	V
I_{IH} - HIGH VOLTAGE CURRENT	VIN =24 VDC	——	——	2.9	mA
I_{IL} - LOW VOLTAGE CURRENT	VIN = $V_{INL(MIN)}$	——	——	0.7	mA

Typical turn-on current is 1.43 mA at VIN =12.9 V.
Absolute maximum input voltage is ± 34 VDC.

Table 4. 48 V Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
V_{IH} - HIGH THRESHOLD VOLTAGE	————	43.2	27.0	——	V
V_{IL} - LOW THRESHOLD VOLTAGE	————	——	27.0	13.9	V
I_{IH} - HIGH VOLTAGE CURRENT	VIN = 48 VDC	——	——	2.7	mA
I_{IL} - LOW VOLTAGE CURRENT	VIN = $V_{INL(MIN)}$	——	——	0.7	mA

Typical turn-on current is 1.43 mA at VIN = 27.0 V.
Absolute maximum input is ± 50 VDC.