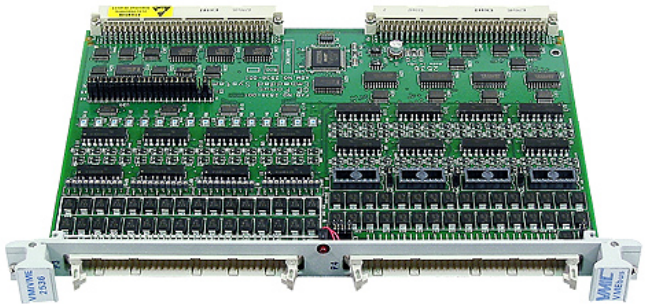
GE Fanuc Automation

VMIVME-2536 Specifications



32-Channel Optically Coupled Digital I/O Board with Built-in-Test

Features:

- 32 optically coupled outputs
- 32 optically coupled inputs
- High isolation potential
  - 1kV sustained
  - 35kV pulsed
- 8-, 16-, 32-bit data transfers
- Standard data or short I/O addressing A16 or A24
- Voltage sensing or contact sensing inputs
- Input ranges of 5 to 125VDC
- 300mA current sinking outputs
- 50V maximum output voltage
- Supports Built-in-Test for both inputs and outputs

FANUC

Embedded Systems

Ordering Options							
June 12, 2007 800-002536-000 F		A	B	C	D	E	F
VMIVME-2536	–		0		0	0	0

A = Input Voltage Range
0 = 5V
1 = 12V
2 = 24 to 28V
3 = 48V
4 = 125V (Voltage Sensing Only)
5 = Reserved
B = 0 (Option reserved for future use)
C = CE Compliant
0 = Non-CE Compliant
1 = CE Compliant
DEF = 0 (Options reserved for future use)

Connector Data	
Compatible Cable Connector	Panduit No. 120-964-435
Strain Relief	Panduit No. 100-000-072
PC Board Header Connector	Panduit No. 120-964-033A

Note

Panduit is also known as ITW/Pancon.

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

Functional Characteristics

Board Function: This board has 32 optically coupled inputs and 32 optically coupled outputs. Both the outputs and inputs have Built-in-Test capability and provide a sustained 1kV of system isolation to the VME backplane.

Compliance: This board complies with the VMEbus specification ANSI/IEEE STD 1014-1987 IEC 821 and 297 with the following mnemonics:

A24/A16, D32/D16/D08(EO)
Slave with the following Address Modifiers:
3D,39/2D,29.

Built–in-Test: The VMIVME-2536 supports both online and offline Built-in-Test (BIT).

Inputs are put into the test mode by setting a bit in the Control and Status Register (CSR). While in the test mode, data placed in onboard test registers are read through the input ports instead of field data. The test registers are at the same address as the input data ports, allowing testing to be achieved by simply writing to and reading from the input data ports. This feature is used for both online and offline testing.

The contents of the Output Data Registers may be read at anytime, thereby supporting online testing. The outputs may be put into offline test mode by setting a bit in the CSR. In the offline test mode, the open-collector outputs are all disabled. Data patterns may then be written to and read from the Output Registers for test purposes without affecting the outputs.

On powerup or reset, the board is placed in the test mode. Output Data Registers should be initialized prior to being put online to avoid undetermined states.

Addressing Scheme: The board is organized in 8-bit ports. Four input ports and four output ports, stacked one longword boundary above Board ID and CS Registers. A total of 16 bytes of address space is occupied.

Address Map:

Relative Address	Register Name
$00	BD ID (Board ID)
$02	Control and Status (CSR)
$04	Input Data Register 0
$05	Input Data Register 1
$06	Input Data Register 2
$07	Input Data Register 3
$08	Output Data Register 0
$09	Output Data Register 1
$0A	Output Data Register 2
$0B	Output Data Register 3
$0C	Reserved
$0D	Reserved
$0E	Reserved
$0F	Reserved

Input Characteristics

Input Configuration: The inputs can be voltage sensing or contact sensing. Voltage sensing or contact sensing may be set on byte boundaries. For contact sensing, a user-supplied SIP resistor must be installed. External voltage or internal VME +5V may be jumper-selected on byte boundaries to supply power for contact sensing mode. Note the VME +5V is useful only with the 5V input option.

Input Voltage Options: The input voltage range is a manufacturing option. The available ranges are 5, 12, 24, 28, 48, and 125V. See Tables 1 through 5 for more detailed information and please refer to the Ordering Options.

Input Isolation: 10MΩ, minimum

Isolation Voltage(1): 1,000V sustained;
3,500V for one second field to VME.
500V sustained channel-to-channel maximum.

Contact Debounce: User-programmable debounce is available. Debounce times are 0, .256, .512, 1.024, 2.048, 4.096, 8.192, and 16.384ms. Debounce defaults to 0 on reset.

Output Characteristics

Output Configuration: The outputs are optically isolated with open collector. The user may install a pull-up resistor on byte boundaries. External voltage or internal VME +5V may be jumper-selected on byte boundaries to supply power for pull-up resistors.

Output Leakage Current: 500µA maximum at VCE = 50V and TA = 60°C

Output Voltage: 50V maximum

Switching Time: See Table 6

Output Isolation: 10MΩ, minimum

Isolation Voltage: 1,000V sustained
3,500V for one second field to VME
500V sustained channel-to-channel maximum

Note: User-supplied resistors may limit isolation.

Physical/Environmental Specifications

Dimensions: 6U (4HP) single slot Eurocard form factor

Height	9.2 in. (233.4mm)
Depth	6.3 in. (160mm)
Thickness	0.8 in. (20.3mm)

User Connectors: Two 64-pin DIN connectors (one for the inputs and one for the outputs).

Temperature:
Operating: 0 to +60° C
Storage: -55 to +85° C

Humidity: 20% to 80%, noncondensing

Power Requirements: +5VDC at 2.65A

MTBF: 463,909 hours

Regulatory: The VMIVME-2536 has been tested to and found to meet the requirements of the following standards.

European Union (CE Mark)
EN55024
EN55022 Radiated Emissions Class A
EN61000-4-2 (ESD)
EN61000-4-3 (Radiated Immunity)
EN61000-4-4 (EFT)
EN61000-4-5 (Surge)
EN61000-4-6 (Conducted RF)

United States
FCC Part 15, Class A

Canada
ICES-003, Class A

Trademarks

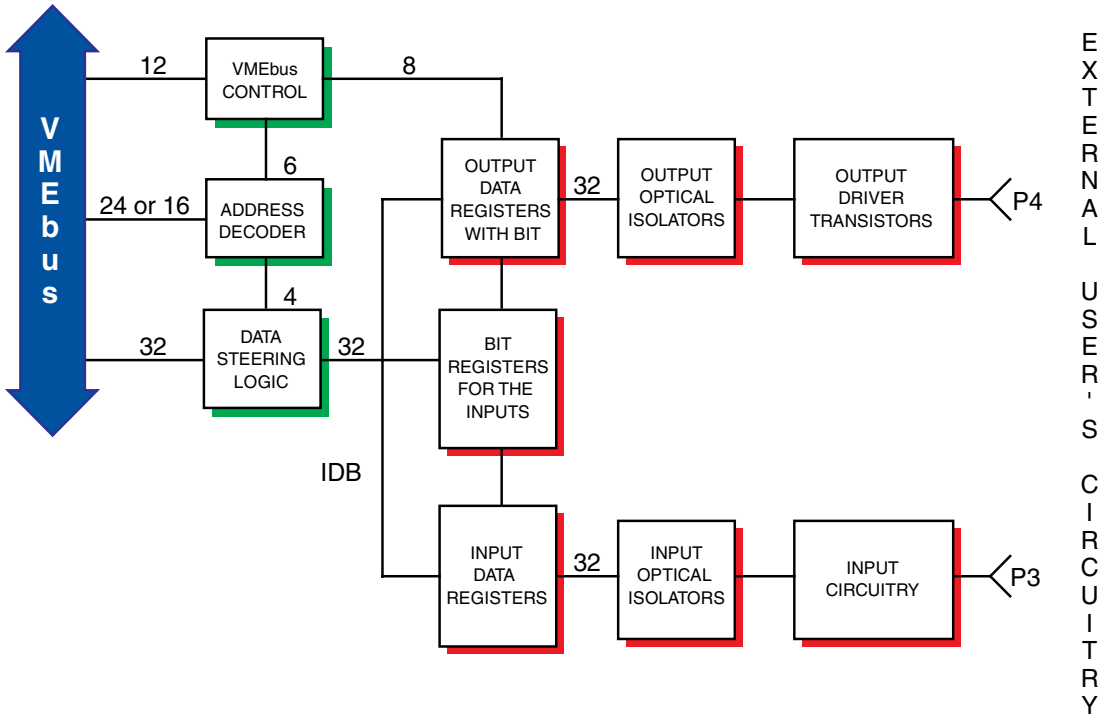


Figure 1. VMIVME-2536 Functional Block Diagram

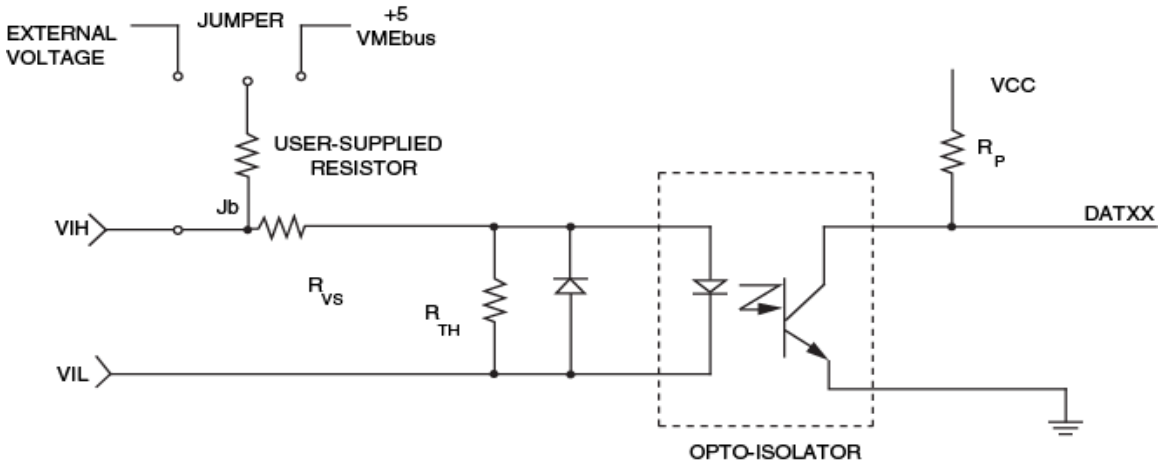
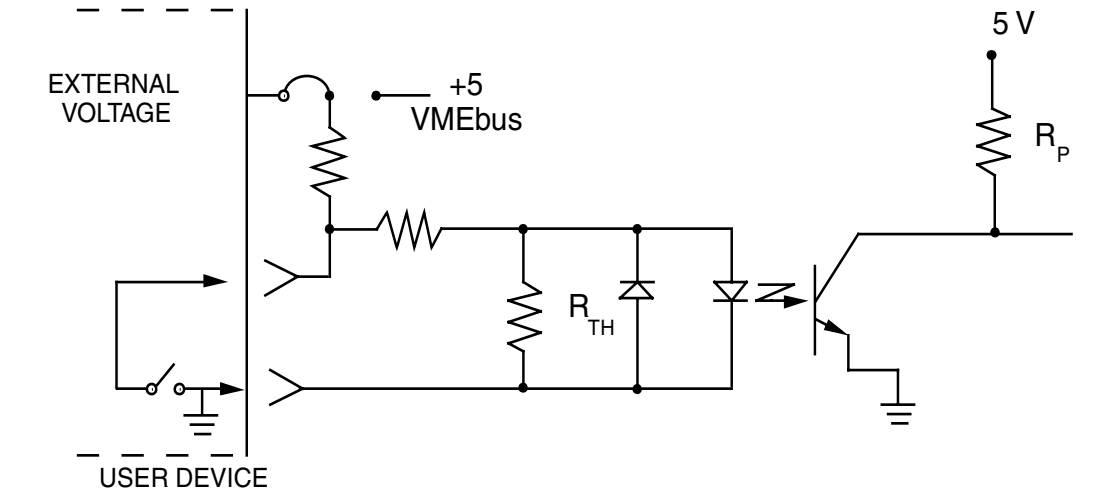
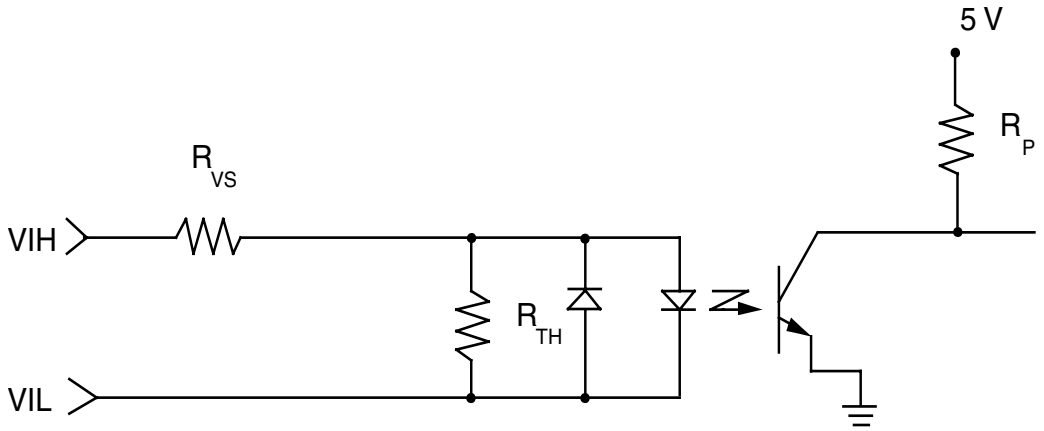


Figure 2. User Input Connection Circuit



a. TYPICAL CONTACT SENSE (CURRENT SINKING) OPTO INPUT

* CANNOT SUPPORT CONTACT SENSE ON 125 V OPTION.



b. TYPICAL VOLTAGE SENSE OPTO INPUT

Figure 3. Typical VMIVME-2536 OPTO Input Configurations (5 to 125V Inputs)

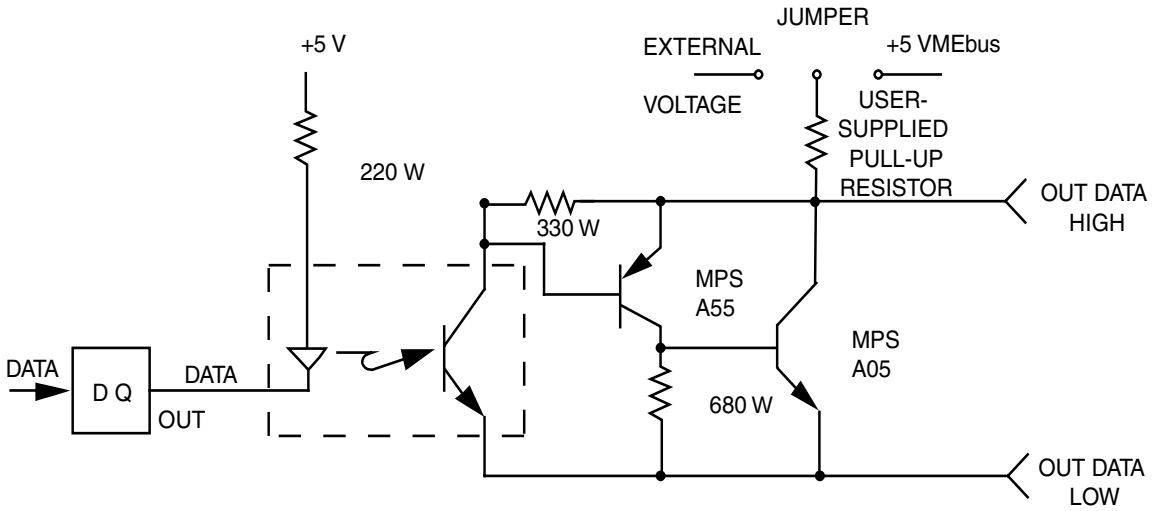


Figure 4. Typical Output Configuration

Table 1. 5V Input Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{INH} – High Threshold Voltage		3.6	2.6		V
V_{INH} – Low Threshold Voltage			2.6	1.8	V
I_{INL} – High Threshold Current	V_{IN} = 5VDC			3.5	mA
I_{INL} – Low Threshold Current	V_{IN} = V $INL^{(MIN)}$			0.7	mA

Table 2. 12V Input Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{INH} – High Threshold Voltage		9.2	5.9		V
V_{INH} – Low Threshold Voltage			5.9	3.4	V
I_{INL} – High Threshold Current	V_{IN} = 12VDC			2.8	mA
I_{INL} – Low Threshold Current	V_{IN} = V $INL^{(MIN)}$			0.7	mA

Table 3. 24 to 28V Input Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{INH} – High Threshold Voltage		21.3	12.9		V
V_{INH} – Low Threshold Voltage			12.9	6.9	V
I_{INL} – High Threshold Current	V_{IN} = 24VDC			2.8	mA
I_{INL} – Low Threshold Current	V_{IN} = V $INL^{(MIN)}$			0.7	mA

Table 4. 48V Input Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{INH} – High Threshold Voltage		43.2	27.0		V
V_{INH} – Low Threshold Voltage			27.0	13.9	V
I_{INL} – High Threshold Current	V_{IN} = 48VDC			2.2	mA
I_{INL} – Low Threshold Current	V_{IN} = V $INL^{(MIN)}$			0.7	mA

Table 5. 125 Input Option

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{INH} – High Threshold Voltage		105.1	75.2		V
V_{INH} – Low Threshold Voltage			75.2	48.2	V
I_{INL} – High Threshold Current	V_{IN} = 125VDC			2.2	mA
I_{INL} – Low Threshold Current	V_{IN} = V INL (MIN)			0.7	mA

Table 6. Output Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
V_{CE}				50	V
V_{CE}(SAT)	I_{CE}=300mA			1.2	V
I_{CE}	V_{IN} = 48VDC			300	mA
I_{CEO}	V_{CE}= 50V T_A=60°C			500	µA
T_DON			7.0		µs
T_DOFF				35	µs

GE Fanuc Embedded Systems Information Centers

Americas:
Huntsville, AL 1 800 322-3616
1 (256) 880-0444
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Greenville, SC 1 (864) 627-8800
Richardson, TX 1 (972) 671-1972

Europe, Middle East and Africa:
Edinburgh, UK 44 (131) 561-3520
Paris, France 33 (1) 4324 6007

Additional Resources

For more information, please visit the GE Fanuc Embedded Systems web site at:
www.gefanucembedded.com