64-bit Optically Coupled Digital Input Board

Features:
- 64 optically coupled digital inputs
- 5V to 48VDC input range
- High isolation, 1,000V sustained, 7,500V pulsed
- Filtered input options
- Dual I/O connectors
- Contact closure sensing
- Voltage sourcing or current sinking input options
- Positive or negative true input options
- Double Eurocard form factor with front panel
- 8- or 16-bit data transfers
- Nonprivileged or supervisory I/O access
- High reliability DIN-compatible input connectors
Functional Characteristics

**Board Function:** This 64-bit optically coupled, digital input board, was designed and optimized specifically for the VME. Featuring high isolation, the VMIVME-1150 provides a flexible, low-cost 8-byte digital input port with high noise immunity. The Functional Block Diagram is shown in Figure 1.

**Compatibility:** The VMIVME-1150 is a standard, double height printed circuit board that is electrically and mechanically compatible with the VME.

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

**Addressing Scheme:** Each 8-bit port, individually addressable on 8- or 16-bit boundaries anywhere within the short supervisory or short nonprivileged I/O space.

**Board Address:** The board address is selected by onboard DIP switches. Operation is supported in any available slot on the VME backplane, except slot 1.

**VME Access:** Address modifier bits are decoded to support either short supervisory or nonprivileged short I/O access. A single jumper is provided to support this option. This board is factory configured for short supervisory I/O access.

**VME Reply:** A DTACK reply is generated in response to a data strobe (DS0 or DS1) and a decoded board address.

**Data Transfer Type:** D8, D16

**Access Time:** 250ns maximum

**Data Polarity:** Order as positive or negative true. This is based upon the assertion of the inputs to this board. To assert an input, current must flow through the LED in the optocoupler. For a positive true board, this current will present a logical one to the VME. If the board is ordered with negative true logic, then the board will present a logical zero to the VME when the LED has current flowing through it.

**Input Characteristics

**Signal Conditioning:** Inputs can be either voltage sourcing or current sinking, with voltages accepted in the range from 5 to 48V.

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

**Input Configurations:**
- Voltage source
- Voltage-source contact sense
- Logic-level input

**Filter Options:** Input filtering for all 64 inputs is available, with standard time constants of 2μs, 10μs, or 5ms.

**Isolation:** 10MΩ, minimum

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

**Physical/Environmental Specifications

**Dimensions:** Standard VME double height Eurocard (160 x 233.5mm)

**Power Requirements:** +5VDC at 1.1A (typical), 2.2A (maximum)

**Temperature:**
- 0 to +55° C, operating
- -40 to +85° C, storage

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

**Input Connectors:** Two 64-pin DIN connectors

**MTBF:** Contact Factory

**Related Products and Applications**

GE Fanuc Embedded Systems offers a broad range of digital I/O products for VME systems, and supports these products with comprehensive applications information. Contact the factory for a description of current products and a list of application guides.
Specifying Input Configurations

To accommodate the variety of digital input requirements encountered in VME applications, the VMIVME-1150 inputs can be configured for specific signal sources and time delays.

Trademarks

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Figure 1. VMIVME-1150 Functional Block Diagram
Figure 2. User Input Connection Circuit
a. TYPICAL CONTACT SENSE OPTO INPUT

b. TYPICAL VOLTAGE SOURCE OPTO INPUT

Figure 3. Typical VMIVME-1150 OPTO Input Configurations (5 to 50V Inputs)
Table 1. 5V Option

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITION</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>—</td>
<td>3.6</td>
<td>2.6</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$V_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>—</td>
<td>2.6</td>
<td>1.8</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>VIN = 5 VDC</td>
<td>—</td>
<td>—</td>
<td>3.1</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>VIN = $V_{\text{INL}}$ (MIN)</td>
<td>—</td>
<td>—</td>
<td>0.7</td>
<td>mA</td>
</tr>
</tbody>
</table>

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

Table 2. 12V Option

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITION</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>—</td>
<td>9.2</td>
<td>5.9</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$V_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>—</td>
<td>2.6</td>
<td>3.4</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>VIN = 12 VDC</td>
<td>—</td>
<td>—</td>
<td>3.4</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>VIN = $V_{\text{INL}}$ (MIN)</td>
<td>—</td>
<td>—</td>
<td>0.7</td>
<td>mA</td>
</tr>
</tbody>
</table>

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

Table 3. 24V Option

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITION</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>—</td>
<td>21.3</td>
<td>12.9</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$V_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>—</td>
<td>—</td>
<td>12.9</td>
<td>6.9</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>VIN = 24 VDC</td>
<td>—</td>
<td>—</td>
<td>2.9</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>VIN = $V_{\text{INL}}$ (MIN)</td>
<td>—</td>
<td>—</td>
<td>0.7</td>
<td>mA</td>
</tr>
</tbody>
</table>

Typical turn-on current is 1.43 mA at VIN = 12.9 V.
Absolute maximum input voltage is 34 VDC.
### Table 4. 48V Option

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITION</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>——</td>
<td>43.2</td>
<td>27.0</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$V_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>——</td>
<td>—</td>
<td>27.0</td>
<td>13.9</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>VIN = 12 VDC</td>
<td>—</td>
<td>—</td>
<td>2.7</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>VIN = V INL (MIN)</td>
<td>—</td>
<td>—</td>
<td>0.7</td>
<td>mA</td>
</tr>
</tbody>
</table>

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

### Table 5. Logic Input Option

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CONDITION</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>——</td>
<td>1.7</td>
<td>1.5</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>$V_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>——</td>
<td>—</td>
<td>1.5</td>
<td>1.3</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{INH}}$ -HIGH THRESHOLD VOLTAGE</td>
<td>VIN = 5 VDC</td>
<td>—</td>
<td>—</td>
<td>19.0</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{\text{INL}}$ -LOW THRESHOLD VOLTAGE</td>
<td>VIN = V INL (MIN)</td>
<td>—</td>
<td>—</td>
<td>0.7</td>
<td>mA</td>
</tr>
</tbody>
</table>

Typical turn-on current is 1.43 mA at VIN = 1.5 V. Absolute maximum input is 6 VDC.

GE Fanuc Embedded Systems Information Centers

**Americas:**
- Huntsville, AL 1-800-322-3616
- 1-(256) 880-0444
- Camarillo, CA 1-(805) 987-9300
- Greenville, SC 1-(864) 627-8800
- Richardson, TX 1-(972) 671-1972

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- 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