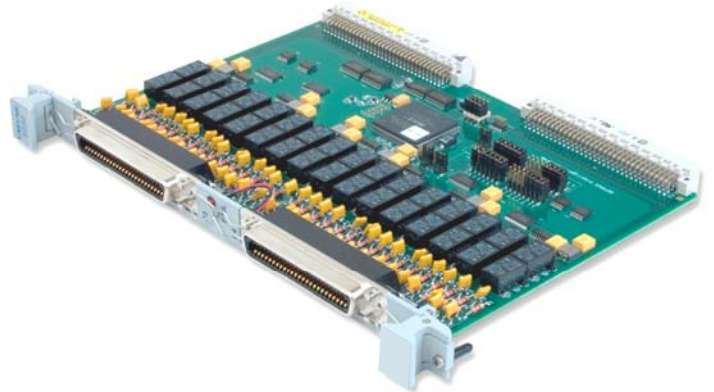


# VME-2232A\*

## Specifications



### 32-Channel Relay Output Board with Built-in-Test (BIT)

#### Features:

- 32 relay output channels (one form C relay per channel)
- Contact ratings
  - 60 W, 50 VA maximum switching power
  - 220 VDC, 250 VAC maximum switching voltage
  - 2A maximum switching current
  - 3A maximum carry current
- Optional contact protection electronics for DC operation
- 8-, 16-, or 32-bit data transfers
- Built-in-Test (all active components are tested)
- Front panel with fail LED
- Compatible with the Intelligent I/O Controllers
- VxWorks® driver available
- Software compatible with the VMIVME-2532\* and the VMIVME-2533\*

Ordering Options						
Sept. 15, 2010 800-102232-000 B	A	B	C	D	E	F
VME-2232A	-		0	0	0	

**A = Data Polarity**

- 0 = Negative True ("0" Energizes Relay)
- 1 = Positive True ("1" Energizes Relay)\*\*

**B = Contact Protection\***

- 0 = No Protection\*\*\*
- 1 = Contact Protection for 1A Switched Current at **50 VDC** Maximum\*\*\*\*  
(R = 5.6 Ω and C = 1.0μF)
- 2 = Contact Protection for 1A Switched Current at **200 VDC** Maximum  
(R = 22 Ω and C = 0.1μF)\*\*\*\*

**CDE = 0 (Options reserved for future use)**

**F = Conformal Coating**

- 0 = Standard VME front panel without conformal coating
- 1 = Reserved
- 2 = Standard VME front panel with conformal coating

**Connector Data**

Compatible Connector (SCSI type)	AMPHENOL No. 157-32500 or 850-57F-30500-20 or AMP 554085-1
PC Board Connector	AMP 554901

- \* Contact the factory for other contact protection options.
- \*\* Required for operation with GE's family of IIOCs (VMIVME-901x, 906x, 908x).
- \*\*\* B=0 No contact protection. Can be used in DC and AC circuits
- \*\*\*\* Contact protection is provided only for DC circuits

For Ordering Information, Call:  
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859  
Email: [info.embeddedsystems.ip@ge.com](mailto:info.embeddedsystems.ip@ge.com)  
Web Address: [www.ge-ip.com](http://www.ge-ip.com)

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## Functional Characteristics

**Output Connector Type:** Dual 50-pin compatible connector (SCSI)

**Output Organization:** Four ports 8 bits wide.

**Compatibility:** VMEbus specification-compatible double height form factor

**Built-in-Test Features:** This board is designed with internal logic that contains the state of each relay coil. This data can be read by the host during on-line or off-line operations to monitor the condition of the board. The data read back by the host will depend upon the board's mode of operation.

During off-line operations, the test mode is active. The board enters test mode under software control, onboard power up, or after a system reset. In test mode, the relay drivers are disabled, as a safety precaution, to prevent the relays from coming up activated. Special test data can be written to the board, and read back, as a health test for the data path to the relay drivers. The written data is read back from the output registers used to control the relay drivers. Unlike the on-line test described below, the data read back is true, not inverted.

When not in Test Mode, the relays on positive true boards are ACTIVATED (the normally open contacts are closed) if the data bit corresponding to the relay is set to a logic one in its Data Register. When not in Test Mode, the relays on negative true boards are ACTIVATED if the data bit corresponding to the relay is set to a logic zero in its Data Register. The VME-2232A, upon power up and reset, is configured in the Test Mode and all Data Registers in a logic zero state. Thus when ordering the negative true option, note the board powers up with data in the logic zero state and applied to the output of the data buffers, ready to activate the corresponding relays upon removal of the test mode condition. Therefore, this data must be initialized BEFORE removing the Test Mode condition, or else all of the relays will activate.

During on-line operations, the relay drivers are active and the read-back feature of the output registers is disabled. In this condition, when data is read back from the board, it is inverted. For example, when a logic one is written to a positive true board, the data read back will be a logic zero because the driver inverts its input data. The logic levels are reversed for negative true boards. Here a zero is written to activate a relay and a logic one will be read back.

**Addressing Scheme:** Four ports addressable on 8-, 16-, or 32-bit boundaries in the short I/O addressing. These ports are accessed as 8-, 16-, or 32-bit words.

**Address Modifiers Codes:** Jumper-selectable for short supervisory and/or short nonprivileged I/O access. Factory configured for short supervisory I/O accesses.

**Control and Status Register (CSR):** A Control and Status Register (CSR) is provided to control the front panel Fail LED, internal Built-in-Test features, and to enable/disable the relays.

**Board Address:** Address selection jumpers are provided to select board addresses within the short I/O memory map.

**Fail LED:** A front panel Fail LED is provided. The LED is illuminated at power up and extinguished under program control.

**Contacts:**

- Maximum Switching Power: 60W, 50 VA
- Maximum Switching Voltage: 220VDC, 250VAC
- Maximum Switching Current: 2ADC or AC
- Maximum Carry Current: 3ADC or AC
- UL/CSA Rating: 0.6A at 110VDC  
0.6A at 125VAC  
2.0A at 30VDC

**Contact Life (Minimum Operation):**

- Mechanical (at 180 CPM): 10<sup>8</sup>
- Electrical: 5 x 10<sup>5</sup> at 2A 30VDC  
2 x 10<sup>6</sup> at 1A 30VDC

## Physical/Environmental Specifications

**Power Requirements:** 3.9A at +5V

**Airflow:** Forced air cooling required: 350 LFM minimum, measured at the top (outlet) of the unit

**Temperature:**

Operating: 0° to +55°C

Storage: -40° to +85°C

**Altitude:**

Operating: 0 – 10,000 ft (3,000m)

Storage: 0 – 40,000 ft (12,000m)

**Humidity:**

Operating: relative humidity 20% to 80%, noncondensing

Storage: relative humidity 20% to 80%, noncondensing

**Cooling:** Forced air convection

**MTBF:** Contact Factory

**Positive/Negative True Ordering Information:** This board may be ordered with positive or negative true relay drivers. With positive true drivers, a relay is energized when a VMEbus logic one is written to the corresponding relay driver. Also, when using negative true drivers, a relay is energized when a VMEbus logic zero is written to the corresponding relay driver.

## Trademarks

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VME-2232A 32-Channel Relay Output Board with Built-in-Test (BIT)

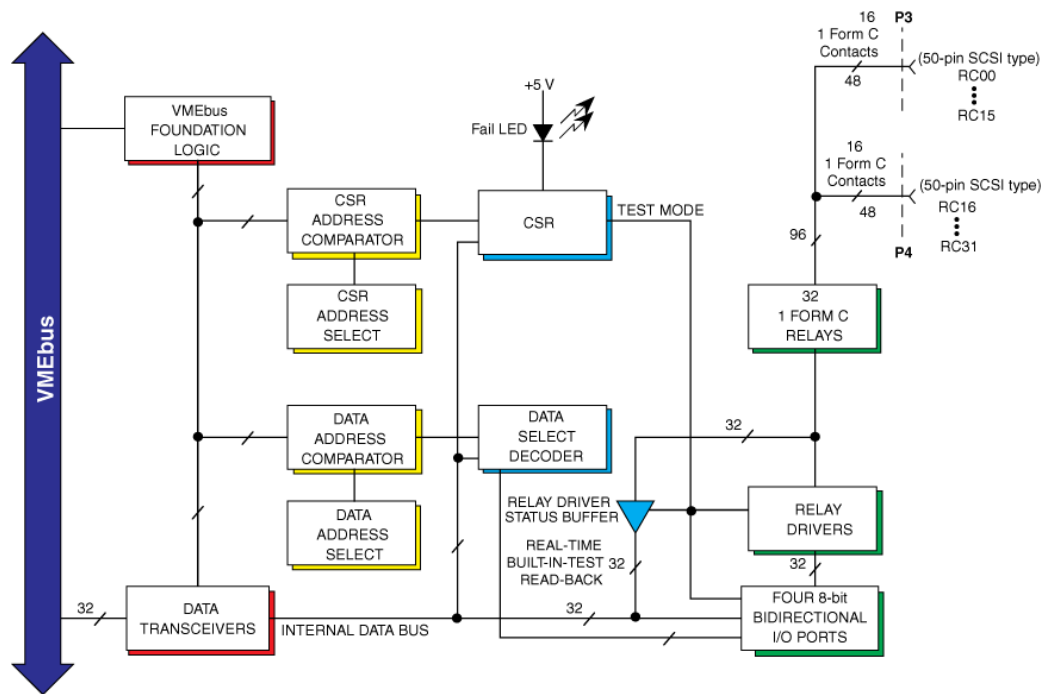
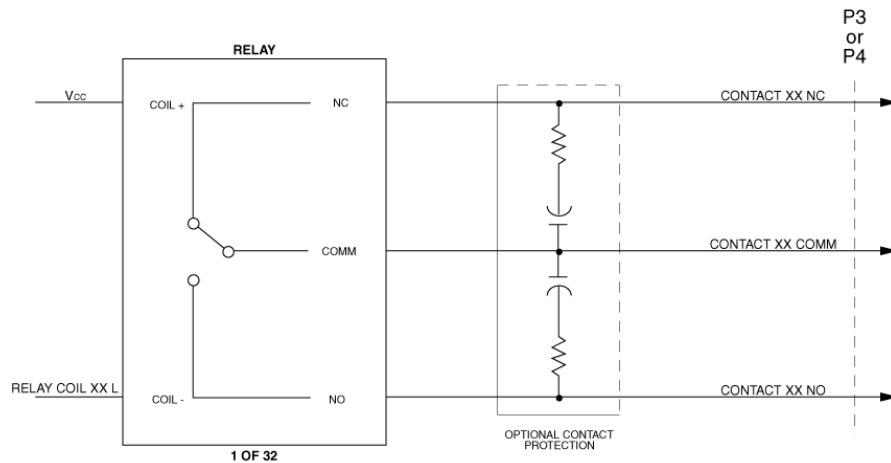


Figure 1. VME-2232A Functional Block Diagram



COMM = COMMON  
 NO = NORMALLY OPEN  
 NC = NORMALLY CLOSED

Figure 2. Typical Relay



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Additional Resources

For more information, please visit the  
 GE Intelligent Platforms Embedded Systems  
 web site at:

[www.ge-ip.com](http://www.ge-ip.com)