- **1-Slot, C-size**
- **Allows addition of functionality in small blocks**
- **Supports up to six independent M-Modules simultaneously**
- **Separate logical address for each M-Module**
- **Fully programmable interrupts for each M-Module**
- **VXI*plug&play* Win 95/NT and HP-UX Frameworks supported**
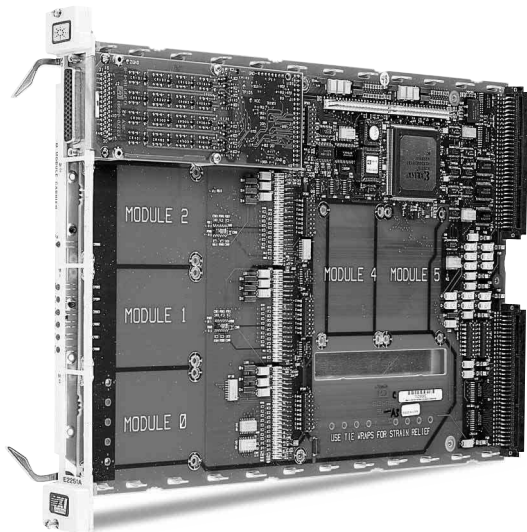
**Agilent E2251A**

## Description

The Agilent E2251A **C-size, 1-slot, M-Module Carrier** allows a VXI user the ability to cost effectively add small blocks of functionality. It provides backplane access to as many as six different M-Modules, each with independent addresses, plus, the function and point count that exactly matches the customer's system requirements. You can use up to 31 M-Modules with the Agilent E1406A Command Module, or use 255 M-Modules with embedded controllers, the Agilent E8491B, and MXIbus solutions.

The carrier provides the electrical and mechanical interface between the VXIbus system backplane and the M-Modules. It also provides VXI register configuration, access to I/O space and memory, and interrupt handling. Additionally, it is in full compliance with VXI Specification Revision 1.4.

With each M-Module having its own address within the E2251A M-Module carrier, you have the flexibility to use the M-Modules in many combinations. This flexibility allows you to get the amount of functionality you need in smaller blocks, lowering your overall system costs. You can install up to six

M-Modules on one E2251A carrier. However, for cabling access, it is recommended that only five M-Modules be placed in one E2251A.

Refer to the Agilent Technologies Website for instrument driver availability and downloading instructions, as well as for recent product updates, if applicable.

## Compact Packaging with Agilent M-Modules

In addition to the carrier, Agilent has a wide selection of switching, digital I/O, interface and development modules. These modules are:

- E2259A Double-wide Breadboard M-Module
- E2261A Quad RS-232 Interface M-Module
- E2270A 16-Channel Form A Switch M-Module
- E2271A 4x4 Matrix Switch M-Module
- E2272A Dual 8x1 Relay Multiplexer M-Module
- E2273A 8-Channel Form C Switch M-Module
- E2274A 4-Channel Form C Power Relay M-Module
- E2290A 16-Bit Digital I/O M-Module
- E2291A 16-Channel Isolated Digital Output M-Module

## Agilent Technologies

## M-Module Summary

For detailed specifications before ordering, see each individual M-Module Technical Specifications.

**All modules**
- 44 pin D-Sub (female) connector
- ANSI/VITA 12-1996

## E2259A Double-wide Breadboard M-Module

- 16-Bit bi-directional user interface
- + 5 V and ± 12 V access
- Can use 1 or 2 M-Module slots

## E2261A Quad RS-232 Interface M-Module

- Four independent RS-232 channels
- 75 to 38.4K baud rates
- RTS/CTS hardware handshake
- XON/XOFF software handshake
- 2KB input and output buffers for each channel
- Dense in nature, may not fit in non-Agilent carriers

## E2270A 16-Channel Form A Switch M-Module

- 16 SPST latching relays
- 200 Vdc/ac-peak*
- 2 Adc/ac-peak
- <2 Ω channel resistance end of life
- 50 W per channel
- 200 W per module

## E2271A 4x4 Matrix Switch M-Module

- 16 DPST latching relays (2-wire)
- 200 Vdc/ac-peak*
- 2 Adc/ac-peak
- <2 Ω channel resistance end of life
- 50 W per channel
- 200 W per module

## E2272A Dual 8x1 Relay Multiplexer M-Module

- 16 DPST latching relays (2 wire)
- 200 Vdc/ac-peak*
- 2 Adc/ac-peak
- <2 Ω channel resistance end of life
- 50 W per channel
- Dual 8x1 or single, 16x1 multiplexing

## E2273A 8-Channel Form C Switch M-Module

- 8 SPDT armature relays
- 200 Vdc/ac-peak*
- 1 Adc/ac-peak
- <2 Ω channel resistance end of life
- 40 W per channel
- 100 W per module

## E2274A 4-Channel Form C Power Relay M-Module

- 4 SPDT armature relays
- 125 Vdc/200 Vac-peak*
- 5 Adc/ac-peak
- <1 Ω channel resistance end of life
- 100 W per channel
- 300 W per module

## E2290A 16-bit Digital I/O M-Module

- 16 digital inputs or outputs
- + 30 Vdc max. open collector voltage
- 200 mA max. sink
- 20 mA max. source
- TTL compatible inputs with debounce
- Interrupts on pattern match

## E2291A 16-Channel Isolated Digital Output M-Module

- 16 outputs for digital or relay drive
- + 36 Vdc max. open collector voltage
- 0.2 Adc max. sink current at <0.5 Vdc output
- 30 V-rms/42 V-peak/60 Vdc isolation
- 16-Bit universal timer (0.031 to 2089 ms.)

*Note*: *These limits apply only if the products is installed in a humidity controlled (<60% RH) environment where airborne contaminants and transients are controlled, and no relay connection is made to power mains. If these conditions cannot be maintained, the 60 Vdc, 48 Vac rms or 68 Vac-peak voltage limit applies.*

## Product Specifications

### M-Module Characteristics
**Note:** *slot5 not useable for voltage rating >30 Vac rms, 42 Vac peak, 60 Vdc*

| | |
|---|---|
| **Output connector type:** | n/a |
| **Standard compliance:** | A08, A16, D08, D16, INTA, INTB, INTC |
| **Accessory:** | n/a |

## General Specifications

### VXI Characteristics

| | |
|---|---|
| **VXI device type:** | Register based |
| **Data transfer bus:** | n/a |
| **Size:** | C |
| **Slots:** | 1 |
| **Connectors:** | P1/2 |
| **Shared memory:** | None |
| **VXI busses:** | n/a |
| **C-size compatibility:** | n/a |

### Module Current
**Note:** *Need to add all M-Module currents.*

| | $I_{PM}$ (A) | $I_{DM}$ (A) |
|---|---|---|
| **+5 V:** | 0.3 A | 0.01 A |
| **+12 V:** | 0 | 0 |
| **–12 V:** | 0 | 0 |
| **+24 V:** | 0 | 0 |
| **–24 V:** | 0 | 0 |
| **–5.2 V:** | 0 | 0 |
| **–2 V:** | 0 | 0 |

### Cooling/Slot

| | |
|---|---|
| **Watts/slot:** | 50 W |
| **$\Delta$P mm H$_2$0:** | 0.2 |
| **Air flow liter/s:** | 4.0 |

## Ordering Information

| Description | Product No. |
|---|---|
| C-Size M-Module Carrier | E2251A |
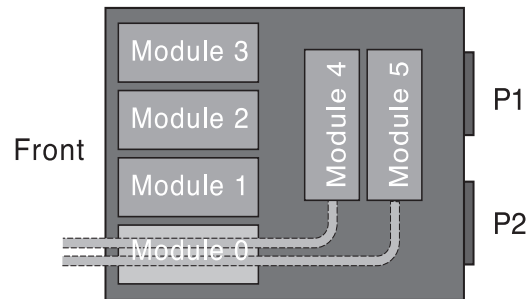


NOTE: May need Module 0 location for
cable access to Modules 4 and 5

NOTE: Module 5 location is a low voltage location
V <30 V-rms
<42 Vac-peak
<60 Vdc

**Figure 1: Agilent E2251A C-Size, 1-Slot,
M-Module Carrier Layout**

## Related Literature

*2000 Test System and VXI Catalog CD-ROM,*
Agilent Pub. No. 5980-0308E (detailed specifications for VXI products)

*2000 Test System and VXI Catalog,*
Agilent Pub. No. 5980-0307E (overview of VXI products )

*1998 Test System and VXI Products Data Book,*
Agilent Pub. No. 5966-2812E

## Online

Internet access for Agilent product information, services and support
 *www.agilent.com/find/tmdir*

VXI product information
 *www.agilent.com/find/vxi*

Defense Electronics Applications
 www.agilent.com/find/defense_ATE

Agilent Technologies VXI Channel Partners
 *www.agilent.com/find/vxichanpart*

Agilent Technologies' HP VEE Application Website
 *www.agilent.com/find/vee*

Agilent Technologies Data Acquisition and Control Website
 *www.agilent.com/find/data_acq*

Agilent Technologies Instrument Driver Downloads
 *www.agilent.com/find/inst_drivers*

Agilent Technologies Electronics Manufacturing Test Solutions
 *www.agilent.com/go/manufacturing*

**Get assistance with all your test and measurement needs at**
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