

Using VME Devices with  
NI-VXI or NI-VISA



Your application may call for installing VME devices in a VME mainframe or installing VME devices in a VXI mainframe. If using National Instruments' VXI or VME controllers, this note should help you proceed with your application.

Note: The term **mainframe** and **chassis** is used interchangeably throughout this note.

### **Installing VME devices in a VXI mainframe**

You can install a VME device directly in a B-size VXI chassis since they are generally the same size. However, you **MUST** take precautions to prevent damage. The pins on the outer rows of the P2 connector are strictly defined in the VXI specification while these pins are not defined in the VME specification and may be used by your VME device in a manner inconsistent with the VXI specification. To prevent damage to devices in your system, you must ensure that these pins on your VME device will not cause contention.

To fit VME devices into a C-size VXI mainframe, you should use a VME adapter. VME adapters are available from several suppliers (National Instruments isn't one of them). These adapters serve two purposes:

1. They allow the front panel of the VME device to be flush with the front of the VXI chassis.
2. They prevent contention on the pins on the outer rows of the P2 connector between VXI devices and your VME device.

Be forewarned that some VME adapters do not allow VME bus masters to operate correctly.

### **How do the VXIpc-600 series controllers, VME-MXI-2 and VME-MXI controllers use the outer two rows of pins on the P2 connector?**

Normally, these devices do not use the outer rows of the P2 connector. However, you can configure two or more VME-MXI-2s or VME-MXIs to operate in the same chassis. If you configure the jumpers on the VME-MXI or VME-MXI-2, then they will use a pin on the outer rows of the P2 connector for some local communication between each other and you should ensure that your other VME devices do not use the same pin. For this configuration, the position of the jumper determines which pin is used on the outer rows of the P2 connector.

### **Why do I need to configure VME devices?**

All VXI devices contain configuration registers in the upper 16kB of the A16 address space which are used to configure VXI devices. The Resource Manager utility, `resman`, can allocate resources and configure VXI devices using these configuration registers. However, this is not implemented by the VME specification. If you want to use a VME device with NI-VXI or NI-VISA, you must tell NI-VXI which resources your VME device needs. VME devices are configured with the Non-VXI device editor or with the T&M Explorer utility. If you don't configure your VME devices with either of these utilities, you could potentially cause a conflict of resources.

## Using the T&M Explorer

If your system does not have the T&M Explorer, please skip to the section **Where is the Non-VXI Device Editor?** Currently, T&M Explorer comes with MITE-based VXI or VME controllers for Windows 95, Windows 98, and Windows NT only.

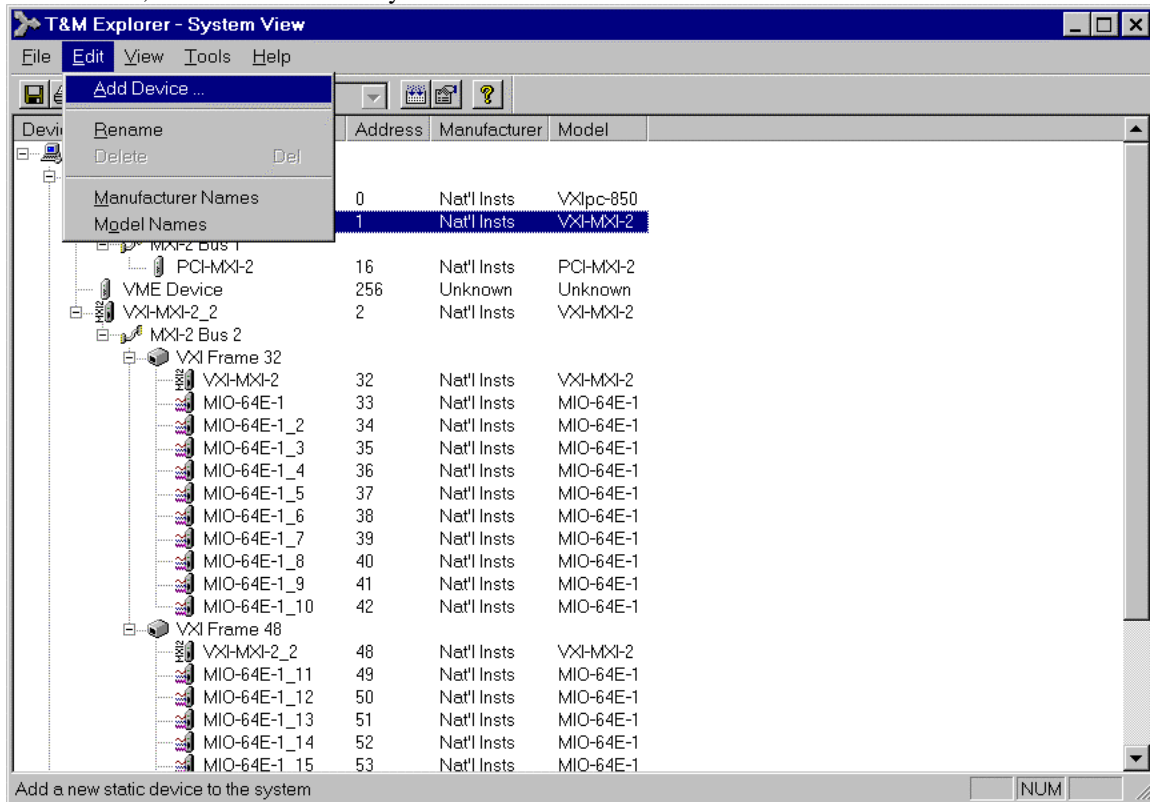
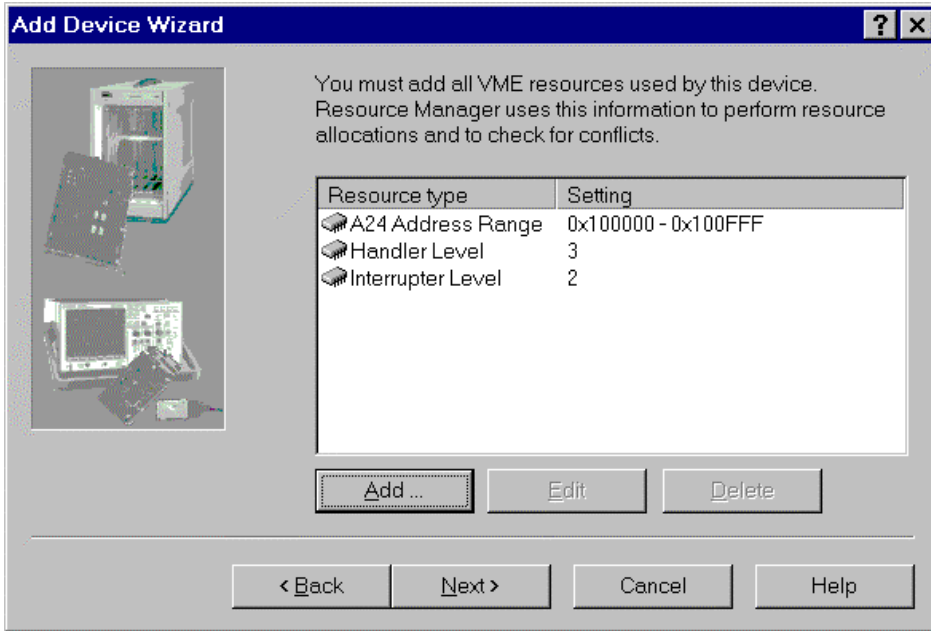


Figure A

### How to add a new VME device:

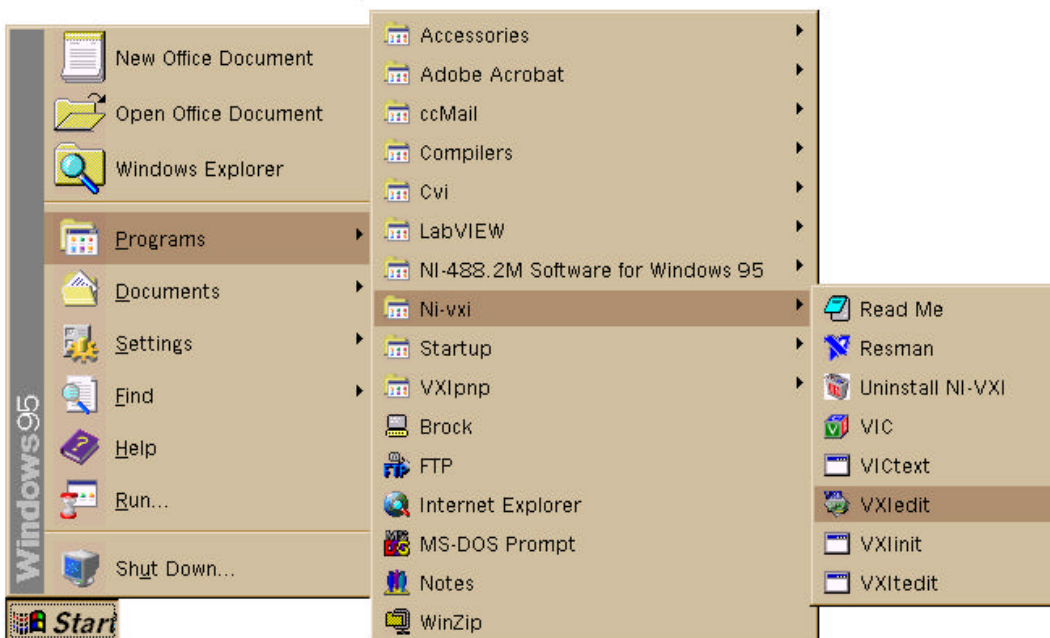
1. Go to the Add Device wizard under the Edit menu of T&M Explorer as shown in Figure A.
2. In the wizard, you may optionally enter the Slot, Manufacturer, Model, and a Device Name for your device.
3. In the wizard, add the resources that your device will use. This is shown below in Figure B.
4. After you finish with the wizard, run Resman to configure your system.

Figure B



### Where is the Non-VXI Device Editor?

The Non-VXI Device Editor is found in the VXIEdit or VXIedit configuration utility. The following discussion refers to VXIEdit, but VXIedit is similar.



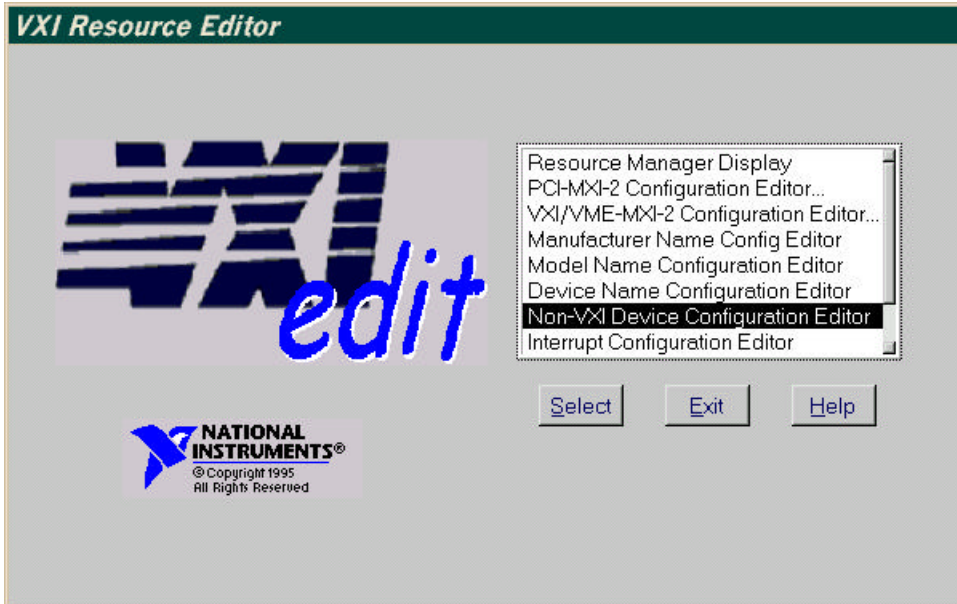


Figure C

**How do I use the Non-VXI Device Editor?**

Once you selected the non-VXI Device Editor as shown above, you will see the screen in figure D.

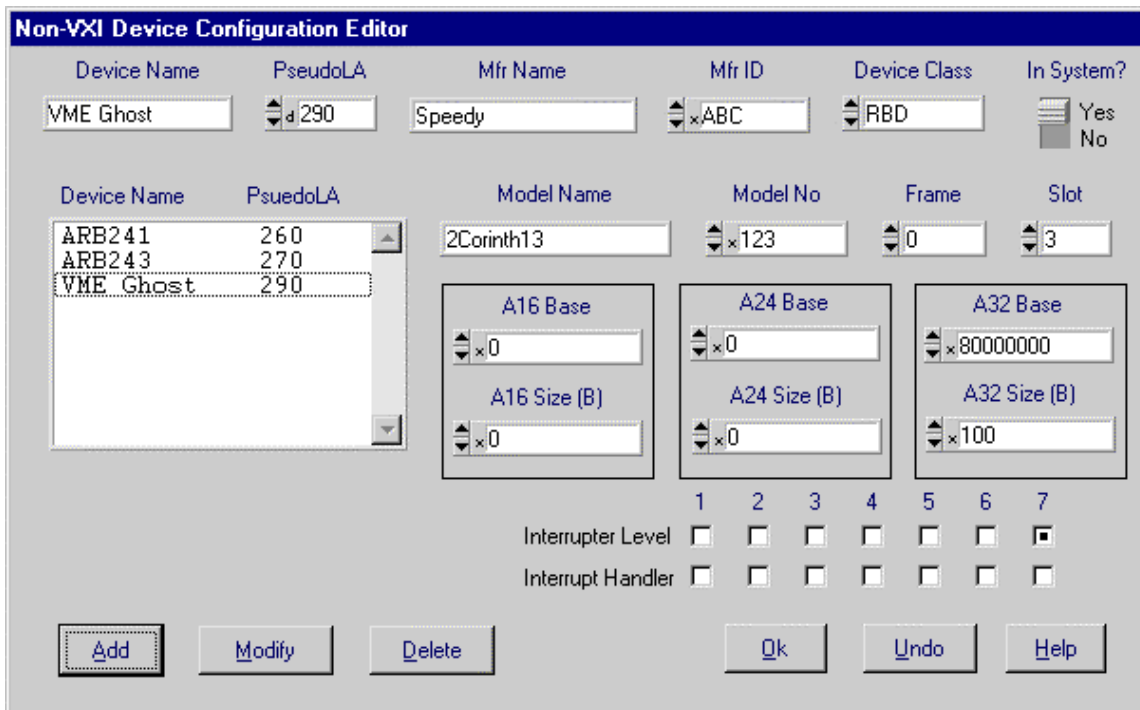


Figure D

**Description of Parameters: (\* means it is necessary)**

Device Name: The device's name. 12 character ASCII

\*Pseudo LA: A logical address. between 256 - 511

Mfr Name: Manufacturer name. 12 character ASCII

Mfr ID: Manufacturer ID. *0x000 - 0xFFF*

\*Device Class: Select from memory, extender, message-based, register-based. If using DOS or Windows, select from 0 = memory, 1 = extender, 2 = message-based, 3 = register based.

\*In System?: Whether the device is currently installed.

Model Name: *12-character ASCII* name.

Model Number: *0x000 - 0xFFF*.

\*Frame: Logical address of the daughter-side controller of the chassis where the VME device is located. Typically, this is the VXI or VME controller in the chassis.

\*Slot: *0 - 12*.

\*A16 Base: Base of A16 memory. *0x0000 - 0xFFFF*

\*A16 Size (B): Size of A16 memory in bytes. *0x0 - 0x8000*

\*A24 Base: Base of A24 memory. *0x000000 - 0xFFFFFFF*

\*A24 Size (B): Size of A24 memory in bytes. *0x0 - 0x800000*

\*A32 Base: Base of A32 memory. *0x0 - 0xFFFFFFFF*

\*A32 Size (B): Size of A32 memory in bytes. *0x0 - 0x80000000*

\*Interrupt Level: What interrupts the VME device will use.

\*Interrupt Handler: What interrupts the VME device will be able to acknowledge if it supports such a function.

#### **How to add a new VME device:**

1. Enter all the fields that are necessary.
2. Ensure that the Frame parameter is set correctly to ensure communication with your VME device.
3. Hit the "Add" button.
4. Run Resman to configure your system.

#### **How to modify an existing VME device:**

1. Double-click on the device in the list that you want to modify.
2. Make the necessary changes.
3. Click on "Modify."
4. Click "Ok."
5. Say "Yes" to save changes.
6. Run Resman to configure your system.

Here is a sample of Resman before adding the new VME device (same settings used as figure B).

**Resource Manager (Ver 2.8.1)**  
**(c) 1996, National Instruments**

>>>>>>>>> **Resource Manager Operations Begun** <<<<<<<<<<

**Resource Manager is a Nat'l Insts "DEVICE\_0" at Logical Address (LA) 0.**

**IDENTIFYING VXI/VME/MXibus DEVICES:**

**Waiting (0 sec's) for SYSFAIL\* to be removed from the backplane...done.**

**Configuring Mainframe 0:**

**The Slot 0 device is LA 0.**

**Cards seen in Slots: 0.**

**SC Message Based device "DEVICE\_0" found at LA 0 in slot 0.**

**No DC devices found.**

**Verifying Self Tests:**

**DEVICE\_0 (LA 0) Passed Self-Test.**

---

**CONFIGURING ADDRESS MAP:**

**A24 Address Map:**

**DEVICE\_0 (LA 0) requests no memory.**

**A32 Address Map:**

**DEVICE\_0 (LA 0) requests no memory.**

---

**CONFIGURING COMMANDER/SERVANT HIERARCHY:**

**Finding 'Commander' Message Based Devices:**

**Initial Commander/Servant Hierarchy is as follows:**

**Resource Manager DEVICE\_0 (LA 0) is highest commander.**

**Known Servant Lists are as follows:**

**DEVICE\_0 (LA 0) has servants: none.**

---

**ALLOCATING VXI/VME IRQ LINES:**

**Finding out protocols supported by Message Based Servants:**

**No Immediate Message Based Servants that have PASSED self-tests.**

**Mainframe 0:**

**Assigning Interrupt lines to Static Non-VXI (VME) Handlers:**

**Assigning Interrupt lines to Programmable VXI Handlers:**

**DEVICE\_0 (LA 0), PH #1, allocated interrupt line 7.**

**DEVICE\_0 (LA 0), PH #2, allocated interrupt line 6.**

**DEVICE\_0 (LA 0), PH #3, allocated interrupt line 5.**

**DEVICE\_0 (LA 0), PH #4, allocated interrupt line 4.**

**DEVICE\_0 (LA 0), PH #5, allocated interrupt line 3.**

**DEVICE\_0 (LA 0), PH #6, allocated interrupt line 2.**

**DEVICE\_0 (LA 0), PH #7, allocated interrupt line 1.**

**Assigning Interrupt lines to Static Non-VXI (VME) Interrupters:**

**Assigning Interrupt lines to Programmable VXI Interrupters:**

**No Programmable VXI Interrupters found.**

---

**INITIATING NORMAL OPERATION:**

**Done.**

---

**>>>>>> Resource Manager Operations Completed <<<<<<**

Here is a sample of Resman after adding the new VME device (same settings used as figure B).

**Resource Manager (Ver 2.8.1)**  
**(c) 1996, National Instruments**

**>>>>>>>> Resource Manager Operations Begun <<<<<<<<<**

**Resource Manager is a Nat'l Insts "DEVICE\_0" at Logical Address (LA) 0.**

**IDENTIFYING VXI/VME/MXibus DEVICES:**

**Waiting (0 sec's) for SYSFAIL\* to be removed from the backplane...done.**

**Configuring Mainframe 0:**

**The Slot 0 device is LA 0.**

**Cards seen in Slots: 0.**

**SC Message Based device "DEVICE\_0" found at LA 0 in slot 0.**

**No DC devices found.**

**Non-VXI (VME) device "VME Ghost" found at Pseudo-LA 290 in slot 3.**

**Verifying Self Tests:**

**DEVICE\_0 (LA 0) Passed Self-Test.**

---

**CONFIGURING ADDRESS MAP:**

**A16 Address Map for Non-VXI (VME) devices:**

**VME Ghost (Pseudo-LA 290) requests no memory.**

**A24 Address Map:**

**VME Ghost (Pseudo-LA 290) requests no memory.**

**DEVICE\_0 (LA 0) requests no memory.**

**A32 Address Map:**

**VME Ghost (Pseudo-LA 290) requests 0x100 bytes at 0x80000000.**

**DEVICE\_0 (LA 0) requests no memory.**

---

**CONFIGURING COMMANDER/SERVANT HIERARCHY:**

**Finding 'Commander' Message Based Devices:**

**Initial Commander/Servant Hierarchy is as follows:**

**Resource Manager DEVICE\_0 (LA 0) is highest commander.**

**Known Servant Lists are as follows:**

**DEVICE\_0 (LA 0) has servants: none.**

---

**ALLOCATING VXI/VME IRQ LINES:**

**Finding out protocols supported by Message Based Servants:**

**No Immediate Message Based Servants that have PASSED self-tests.**

**Mainframe 0:**

**Assigning Interrupt lines to Static Non-VXI (VME) Handlers:**

**VME Ghost (Pseudo-LA 290), assigned interrupt handlers : none.**

**Assigning Interrupt lines to Programmable VXI Handlers:**

**DEVICE\_0 (LA 0), PH #1, allocated interrupt line 7.**

**DEVICE\_0 (LA 0), PH #2, allocated interrupt line 6.**

**DEVICE\_0 (LA 0), PH #3, allocated interrupt line 5.**

**DEVICE\_0 (LA 0), PH #4, allocated interrupt line 4.**

**DEVICE\_0 (LA 0), PH #5, allocated interrupt line 3.**

**DEVICE\_0 (LA 0), PH #6, allocated interrupt line 2.**

**DEVICE\_0 (LA 0), PH #7, allocated interrupt line 1.**

**Assigning Interrupt lines to Static Non-VXI (VME) Interrupters:  
VME Ghost (Pseudo-LA 290), assigned interrupt lines : 7.  
Assigning Interrupt lines to Programmable VXI Interrupters:  
No Programmable VXI Interrupters found.**

---

**INITIATING NORMAL OPERATION:  
Done.**

---

**>>>>>> Resource Manager Operations Completed <<<<<<<**