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Common Questions about AT-MXI

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This document answers frequently asked questions about the AT-MXI to VXI/VME-MXI interface. Please contact National Instruments if you have further questions or suggestions regarding the AT-MXI to VXI/VME-MXI interface.

List of Questions (Independent of Operating System)

1. Can the AT-MXI card be inserted into a XTbus (8-bit) slot?
2. Can the AT-MXI card be inserted into a EISAbus (32-bit) slot?
3. Are there any jumpers or switches on the AT-MXI card?
4. How much I/O address space does the AT-MXI occupy? What is the default base I/O address of the AT-MXI?
5. Why is the Master DMA channel parameter in the VXI Resource Editor, vxiedit/vxitedit, permanently set to NONE if the Master DMA channel hardware jumper on the AT-MXI is set to 6?
6. What is the difference between the AT-MXI's Board Interrupt Level and its MXIbus Interrupt Level?
7. When will the MXI LED on the VXI/VME-MXI become lit?
8. When will the VXI or VME LED on the VXI/VME-MXI become lit?
9. Does the AT-MXI and NI-VXI software support dual-ported memory on the PC? Can a VXI/VME bus master/processor access memory on the PC through the MXIbus?
10. By default, which device is the MXIbus System Controller, the AT-MXI or the VXI/VME-MXI? Can this be changed?
11. If I have a Type M1 MXIbus cable (single-ended connector on both ends), does it matter which end of the cable is connected to the AT-MXI (assuming it is the MXIbus System Controller)?
12. If I have a MXIbus cable that is Type M2, M3, M4, or M5 (single-ended connector on one end and daisy-chain connector on other end), does it matter which end of the cable is connected to the AT-MXI (assuming it is the MXIbus System Controller)?

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13. If I have three MXIbus devices connected together (device A connected to device B with a cable, device B connected to device C with a cable), on which device should I pull the MXIbus termination resistors?
14. On the VXI/VME-MXI, how should I set the MXIbus Controller Bus Timeout jumper setting?
15. On the VXI/VME-MXI, how should I set the VMEbus Controller Bus Timeout jumper setting?
16. Should I change the logical address of the VXI/VME-MXI from its default value of 1?
17. If I have a two mainframe system in which each mainframe possesses a VXI/VME-MXI, what logical addresses should I assign to the VXI/VME-MXIs? Are there any restrictions on the logical addresses that I can assign to the devices in each mainframe?
18. How do I install the VXI-MXI in a slot other than Slot 0?
19. Can the VXI-MXI, which is a C-size module, be inserted into a B-size mainframe?
20. Can the VXI-MXI, which is a C-size module, be inserted into a D-size mainframe?
21. Which NI-VXI utility program must I use to configure the AT-MXI and the NI-VXI driver?
22. Which NI-VXI utility program must I use to initialize the AT-MXI hardware?
23. Which NI-VXI utility program must I use to perform startup Resource Manager operations?

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Questions and Answers

Install #1: **Can the AT-MXI card be inserted into an XTbus (8-bit) slot?**

No, the AT-MXI is a 16-bit card. The AT-MXI must be inserted into an ATbus slot or an EISAbus slot.

Install #2: **Can the AT-MXI card be inserted into a EISAbus (32-bit) slot?**

Yes, the AT-MXI, which is a 16-bit card, can be inserted into an EISAbus slot. The AT-MXI will only use the lower 16 data lines of the EISAbus.

Install #3: **Are there any jumpers or switches on the AT-MXI card?**

The AT-MXI card has one bank of switches and two sets of jumpers. The bank of switches configures the base I/O address of the AT-MXI card in the PC's I/O space. One set of jumpers configures the AT-MXI's Board Interrupt Level and its MXIbus Interrupt Level (if applicable). The other set of jumpers configures the AT-MXI's Master and Slave DMA channels. The Master DMA channel is not used by the NI-VXI software. The Slave DMA channel is only used if a VXI/VME bus master accesses the RAM on your PC through the MXIbus. All of these hardware settings must match the parameters that you set in the Configuration Editor in the VXI Resource Editor program, vxiedit or vxitedit.

Install #4: **How much I/O address space does the AT-MXI occupy? What is the default base I/O address of the AT-MXI?**

The AT-MXI uses 32 bytes (0x20) of I/O address space. The default base I/O address of the AT-MXI is 0x340. The AT-MXI's base I/O address can be changed to an address from 0x100 to 0x3E0 in 0x20 increments. If you change the AT-MXI's base I/O address, be sure to change the Base I/O Address parameter in the Configuration Editor in the VXI Resource Editor program, vxiedit or vxitedit.

Install #5: **Why is the Master DMA channel parameter in the VXI Resource Editor program, vxiedit or vxitedit, permanently set to NONE if the Master DMA channel hardware jumper on the AT-MXI is set to 6?**

The Master DMA channel parameter in the VXI Resource Editor program, vxiedit or vxitedit, is permanently set to NONE because the computer's processor is able to transfer data at faster rates than the DMA controller. DMA transfers offer superior performance only in asynchronous function calls. The only NI-VXI function call which could take advantage of DMA transfers is the VXImove function, which is synchronous. Therefore, the Master DMA channel parameter in the VXI Resource Editor program is permanently set to NONE. The hardware jumper is only provided for backward compatibility.

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Install #6: **What is the difference between the AT-MXI's Board Interrupt Level and its MXIbus Interrupt Level?**

The AT-MXI's Board Interrupt Level is used to convey board status and error information. The Board Interrupt Level is set to a default value of 12. By default, the MXIbus interrupt signal IRQ* causes the AT-MXI to assert its Board Interrupt Level. But if you want the MXIbus IRQ* signal to use a different interrupt level or priority, you can set the AT-MXI's MXIbus Interrupt Level hardware jumper (by default, set to 10) and the MXIbus Interrupt Level parameter in the VXI Resource Editor program, vxiedit or vxitedit, to a unique interrupt level. All other AT-MXI status and error interrupts will still use the Board Interrupt Level.

Install #7: **When will the MXI LED on the VXI/VME-MXI become lit?**

The MXI LED on the VXI/VME-MXI becomes lit whenever another MXIbus device tries to access a VXI/VME address that the VXI/VME-MXI passes into its mainframe. For example, if the AT-MXI accesses any device in a particular mainframe, that mainframe's VXI/VME-MXI will illuminate its MXI LED.

Install #8: **When will the VXI or VME LED on the VXI/VME-MXI become lit?**

The VXI or VME LED on the VXI/VME-MXI becomes lit whenever a VXI/VME device in its mainframe tries to access a VXI/VME address that the VXI/VME-MXI passes out of its mainframe.

Install #9: **Does the AT-MXI and NI-VXI software support dual-ported memory on the PC? Can a VXI/VME bus master/processor access memory on the PC through the MXIbus?**

Yes. Yes. The AT-MXI hardware does support transfers from the VXI/VME bus into PC memory. You must use the VXI Resource Editor, vxiedit or vxitedit, to configure the segment of your PC's memory that will be accessible to the VXI/VME devices in your system. In your application program, you can use the VXImemAlloc, VXImemCopy, and VXImemFree functions to allocate, access, and free the dual-ported (shared) memory on your PC. For more information about the VXI Resource Editor, refer to the Getting Started manual, the NI-VXI Text Utilities Manual, or the NI-VXI DOS Utilities Manual. For more information about the shared memory NI-VXI functions, refer to the NI-VXI Software Reference Manual for C.

Install #10: **By default, which device is the MXIbus System Controller, the AT-MXI or the VXI/VME-MXI? Can this be changed?**

By default, the AT-MXI is configured to be the MXIbus System Controller, and the VXI/VME-MXI is not configured to be the MXIbus System Controller. This configuration can be changed. To change the AT-MXI to not be the MXIbus System Controller, go into the VXI Resource Editor, vxitedit or vxiedit, enter the Configuration Editor, enter the Bus Configuration Editor, and change the 'MXIbus System Controller' parameter to '0'.

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To change the VXI/VME-MXI to be the MXIbus System Controller, change the MXIbus System Controller slide switch on the card. Also, be aware that the MXIbus Controller Bus Timeout jumper setting, which determines the length of the MXIbus timeout period, now applies because the VXI/VME-MXI is the MXIbus System Controller. Refer to the Getting Started manual for more information.

Install #11: **If I have a Type M1 MXIbus cable (single-ended connector on both ends), does it matter which end of the cable is connected to the AT-MXI (assuming it is the MXIbus System Controller)?**

It does not matter which end of the Type M1 MXIbus cable is attached to the AT-MXI. Note that if you are using a Type M1 MXIbus cable that was purchased before 1993, it is possible that the cable was manufactured incorrectly. If this is the case, one end of the cable might have to be connected to the MXIbus device that is closer to the MXIbus System Controller, while the other end of the cable might have to be connected to the MXIbus device that is farther from the MXIbus System Controller. In other words, one end of the cable is different from the other end of the cable.

Install #12: **If I have a MXIbus cable that is Type M2, M3, M4, or M5 (single-ended connector on one end and daisy-chain connector on other end), does it matter which end of the cable is connected to the AT-MXI (assuming it is the MXIbus System Controller)?**

Yes, it does matter which end of the cable is connected to the AT-MXI. The single-ended connector must always be connected to the MXIbus device that is closer to the MXIbus System Controller. The daisy-chain connector must always be connected to the MXIbus device that is farther from the MXIbus System Controller. Therefore, in this situation, the single-ended connector would be connected to the AT-MXI (MXIbus System Controller) and the daisy-chain connector would be connected to the VXI/VME-MXI.

Install #13: **If I have three MXIbus devices connected together (device A connected to device B with a cable, device B connected to device C with a cable), on which device should I pull the MXIbus termination resistors?**

I should pull the MXIbus termination resistors on device B, which is not one of the MXIbus devices at the end of the MXIbus chain. All devices which do not reside at the end of a MXIbus chain must have their MXIbus termination resistors pulled. This method of connecting devices together is similar to that used by the SCSI bus.

Install #14: **On the VXI/VME-MXI, how should I set the MXIbus Controller Bus Timeout jumper setting?**

If the VXI/VME-MXI is not the MXIbus System Controller (default setting), the MXIbus Controller Bus Timeout jumper setting is irrelevant. If the VXI/VME-MXI is the MXIbus System Controller, you can change the jumper setting to select a MXIbus timeout period of 100, 200, or 400 microseconds.

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Install #15: **On the VXI/VME-MXI, how should I set the VMEbus Controller Bus Timeout jumper setting?**

If possible, you should always assign the VXI/VME-MXI to be the device that monitors the VMEbus timeout period. You can use the VMEbus Controller Bus Timeout jumper setting to select a VMEbus timeout period of 100, 200, or 400 microseconds. The default VMEbus timeout period is 100 microseconds. If another VXI/VME device must monitor the VMEbus timeout period, set the VXI/VME-MXI's VMEbus Controller Bus Timeout jumper setting to DISABLE.

Install #16: **Should I change the logical address of the VXI/VME-MXI from its default value of 1?**

If your system consists of multiple mainframes, you should not set the VXI/VME-MXI to a logical address of 1. The Resource Manager only allows a specific range of logical addresses into a mainframe. The method that the Resource Manager uses to assign this range requires that you set each VXI/VME-MXI's logical address to a power of 2 that is 16 or greater (i.e. 16, 32, 64, or 128).

If your system consists of only a single mainframe, you should keep the VXI/VME-MXI's logical address set to 1.

Install #17: **If I have a two mainframe system in which each mainframe possesses a VXI/VME-MXI, what logical addresses should I assign to the VXI/VME-MXIs? Are there any restrictions on the logical addresses that I can assign to the devices in each mainframe?**

Remember that the Resource Manager only allows a specific range of logical addresses into each mainframe. The method that the Resource Manager uses to assign this range requires that you set each VXI/VME-MXI's logical address to a power of 2 that is 16 or greater (i.e. 16, 32, 64, or 128). For example, you could assign the first VXI/VME-MXI a logical address of 16 and assign the second VXI/VME-MXI a logical address of 32. In general, in a multiple mainframe system, the logical addresses of the devices in a particular mainframe should all be within a range starting with the logical address of the VXI/VME-MXI + 1 and ending with the logical address of the VXI/VME-MXI +15 (inclusive). In the example given above, you could insert devices with logical addresses from 17 to 31 into the first mainframe and insert devices with logical addresses from 32 to 47 into the second mainframe.

Install #18: **How do I install the VXI-MXI in a slot other than Slot 0?**

a. Move switch S1 (upper right-hand area) to the upper position [Non-Slot 0 setting].
b. Move switch S8 (lower right-hand area, on the side) to the right position [Non-Slot 0 setting].
c. Move the CLK10 Source jumpers at W9 and W10 (right-hand area) from the 1st row to the 3rd row [Receive CLK 10, Non-Slot 0 setting].
d. Move one of the three VMEbus Timeout Chain Position jumpers in the block of pins at W7. Move the jumper in the upper left-hand corner to a vertical position in the lower left-hand corner [VMEbus Timeout Chain Position setting].
e. Install the board in a slot other than Slot 0.

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Optional Changes:

1. If you need to change the logical address of the VXI-MXI from its default value of 1, set the dip switches (upper-middle area) to the new logical address. The dip switches represent bits 7 to 0 in forming the VXI-MXI's logical address. Dip switch 1 represents bit 7 (decimal value of 128), dip switch 2 represents bit 6 (decimal value of 64), etc.. Push down on the 'OFF' side to set the bit.

Example: If dip switches 3, 2, 1, and 0 are pushed down on the 'OFF' side, the VXI-MXI is set to logical address 15 (8 + 4 + 2 +1 = 15).

2. If VXI-MXI needs to be the MXIbus System Controller, move switch S4 (upper-middle area) to the upper position [MXIbus System Controller enabled].

Note: If the VXI-MXI is the MXIbus System Controller, then it sets the MXIbus System Controller Timeout value. You can change the timeout by moving the jumper at W8 from the default value of 100us.

Install #19: **Can the VXI-MXI, which is a C-size module, be inserted into a B-size mainframe?**

Yes, the VXI-MXI can be inserted into a B-size VXI mainframe, but the front panel of the VXI-MXI will protrude out of the mainframe. The front panel of the VXI-MXI will not be flush with the mainframe front panel.

Note that if you are attempting to insert the VXI-MXI into a B-size VME mainframe, you will have the same problem. But you must also be sure that no VME devices are driving any signals on the outer two rows of the P2 connector because the VXI-MXI will drive various VXI signals onto those rows. If you insert a VME device, which does drive the outer two rows of the P2 connector, into the mainframe, you could damage the VXI-MXI, the VME device, and/or the entire VME backplane on the mainframe.

Install #20: **Can the VXI-MXI, which is a C-size module, be inserted into a D-size mainframe?**

Yes, the VXI-MXI can be inserted into a D-size mainframe, but the VXI-MXI only connects to the P1 and P2 connectors. The VXI-MXI will not be able to supply or respond to the P3 connector signals. To physically secure the VXI-MXI in its mainframe slot, you should insert a support that is specifically designed for installing C-size cards in D-size mainframes.

Install #21: **Which NI-VXI utility program must I use to configure the AT-MXI and the NI-VXI driver?**

You can use the text-based VXI Resource Editor program, vxitedit, to configure the AT-MXI and the NI-VXI driver. It is found in the NIVXI directory. If you are running DOS, you can use the graphical version of the VXI Resource Editor, vxiedit. More information about the vxitedit program, the vxiedit program, and their editors can be found in Chapter 3 of the Getting Started manual, in the NI-VXI Text Utilities Manual, and in the NI-VXI DOS Utilities Manual.

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Install #22: **Which NI-VXI utility program must I use to initialize the AT-MXI hardware?**

You must use the hardware initialization program, vxiinit, to initialize the AT-MXI. It is found in the NIVXI directory. The NI-VXI utility program, vxiinit, uses the settings in the Configuration Editor of the VXI Resource Editor.

Install #23: **Which NI-VXI utility program must I use to perform startup Resource Manager operations?**

You must use the program, resman, to perform startup Resource Manager operations. It is found in the NIVXI directory. The NI-VXI utility program, resman, uses the settings in the Configuration Editor of the VXI Resource Editor. It initalizes your VXI/VMEbus system and stores the information that it collects to a file, `resman.tbl`, in the TBL subdirectory of the NIVXI directory.

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