TECH TALK

A journal of bus architecture tips & techniques

Are VMEbus & VME64X Really Compatible? (Part 2 of 4)

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In the first article of this series, I compared differences between VMEbus and VME64X. With this knowledge under our belts, we can discuss how to combine the two architectures.

In general, VMEbus modules are forward compatible to VME64X systems, which means VMEbus boards can plug into VME64X systems. Many system designers think that, correspondingly, a VME64X board will easily plug into a VMEbus system. This is not the case. VME64X boards are only backward compatible with modifications to the board, chassis, or both. Thus, plugging a VME64X board into a VMEbus system is not a straight forward task. It requires forethought and some upfront design considerations. However, it can be accomplished.

Plugging a VMEbus board into a VME64X System
A VME64X system is designed to accept a VMEbus board. Thus, a VMEbus board should plug into a VME64X system without problems. You should note a couple of mechanical differences in a VME64X chassis compared to a VMEbus one. It has a rail designed to accept updated injector / ejector handles and card guides to accept an ESD pin and coding key. Older VMEbus face plates have no shielding. Despite these differences, an older VMEbus board will slide into the card cage and latch and screw into the rail just fine.

You may need increased force to push the board into the 160-pin connector. Not only are you pushing 96 pins into sockets, but the two outer rows of the 5 row connector create resistance on the sides of the 96-pin DIN connector. The older VMEbus handle has an ejector, but no injector. Carefully use some muscle to properly seat and lock in the card.

Plugging a VME64X board into a VMEbus Chassis
Now consider plugging a VME64X board into an older VMEbus enclosure. There is good news: the 5 row, 160-pin connector is designed to fit over the older 96-pin connecter. There is bad news: a number of VME64X features are incompatible with VMEbus. The incompatible features are:

- Power. Remember that 3.3V isn't available in a VMEbus chassis. If your VME64X board requires 3.3V input - and many do these days - it won't operate.
- Handles. Next you'll find that the VME64X injector / ejector handles won't fit the VMEbus rails. If you attempt to latch a VME64X handle (IEEE 1101.10) onto the older VMEbus system, the deflection force of the injector can bend the rail. This has happened. I have seen engineers force a VME64X board into a VMEbus system resulting in a very bad day.
- J0 Interference. If your VME64X board has J0, it may have to be removed. Poke your head inside your VMEbus enclosure, and you'll likely see a support bar running across the backplane between J1 and J2. This bar is difficult to remove and probably should be left alone. If there is no bar, you may be able to leave J0 on your board. Of course, J0 won't be of any use at this point.
- Rear I/O. There likely won't be a rear I/O card cage, per IEEE 1101.11, in a VMEbus enclosure. Does your VME64X board require a transition module? If so, will it fit into the rear of the VMEbus chassis? If you can manage to plug in the module, it will be confined to the VMEbus user-defined pins on the 96-pin connector.

What modifications are best and most practical? Do you upgrade your VMEbus chassis or do you downgrade the VME64X board? I'll list options and discuss tradeoffs in the next issue.

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