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What is IEEE 1101.10?

IEEE 1101.10 is a mechanical standard adopted by CompactPCI and VME64X. It's an enhancement of the earlier IEEE 1101.1 specification. Some of its features include EMC shielding, an insertion / extractor handle, ESD protection, an alignment pin, front panel keying, an improved card guide, and a new mounting rail.

Are VMEbus & VME64X Really Compatible?

By Kelvin Aist

VMEbus, a bus that has been around since Pac-Man, remains a dominant embedded architecture. The creation of VME64X breathed in new life, and soon, VITA 41 and 46 will further extend this legacy. What happens when you want to upgrade your legacy VMEbus system? Can you add a higher performing VME64X board or must you scrap the system and start over with VME64X? If you build a VME64X system, can you insert VMEbus cards into it?

Here's the problem: plugging a VME64X board into a VMEbus system isn't straight forward. In a series of four articles (at www.sierrasales.com/tech_talk.html), I will tell you how to do so.

VME64X was adopted in 1997 to address some shortcomings of VMEbus, namely performance, I/O, and power. It utilized IEEE 1101.10, a mechanical standard that is also used by CompactPCI. VME64X was designed to be compatible with older VMEbus boards. In other words, VMEbus boards can plug into VME64X systems. However, VME64X boards won't plug into older VMEbus systems without some forethought and design considerations. To blend these two specifications, you need to understand how VME64X enhanced the connector, power provisions, mechanicals specified by IEEE 1101.10, and rear transition area.

Connectors
An obvious addition to VME64X was a move from the three row 96-pin connector to a five row 160-pin connector for J1 / P1 and J2 / P2. An optional 95-pin J0 connector also is specified between J1 and J2. VME64X has 141 more user defined pins (46 pins on J2 and 95 pins on J0) plus additional pins for extra power and ground. J0 / P0 is frequently used to route I/O from the board to a rear transition module. In some systems, J0 is bussed. VME64X backplanes may be ordered with or without J0.

Power
VME64X requires +3.3V in addition to the VMEbus voltage inputs of +5V, +12V, and -12V. You'll find the +3.3V power

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Choosing CompactPCI Power Supplies: Review of Plug-In

By Kelvin Aist

Four main types of power supplies are common in CompactPCI systems: ATX, plug-in, open frame, and modular. This article will discuss a power supply favorite: plug-in supplies.

Plug-in power supplies are popular because they can be easily removed, providing a simple means of service from the front panel. These supplies mount into the front of the enclosure and connect directly to the backplane. You don't have to deal with a wiring harness. These features are critical for high availability systems requiring hot swapping of dual or N+1 redundant power supplies. They are a great choice when a rear I/O card cage prevents a supply from being mounted in the back of the chassis.

Plug-in power supplies are easily

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VMEbus & VME64x Compatibility (continued)

pins on Row d of J2. Thus, a VME64X AC to DC power supply has four voltage outputs. In general, VME64X boards will consume more power than VMEbus boards so VME64X power supplies need to supply more watts for the same number of slots. VME64X provides additional +5V power on pins labeled VPC (Voltage Pre-Charge).

Mechanicals (IEEE 1101.10)
VME64X, as well as CompactPCI, adopted the IEEE 1101.10 standard. It offers several mechanical enhancements over the earlier IEEE 1101.1 specification. The most visible improvement is the handle that includes an injector and ejector. The older VMEbus handle had only an ejector. Other noticeable improvements include EMC shielding, ESD protection, an alignment pin, front panel keying, an improved card guide, and a new mounting rail.

Rear Transition Area (IEEE 1101.11)
Since VME64X specified a large number of user defined pins, it made sense to create a standard for plugging in rear transition boards. IEEE 1101.11 specifies a 6U x 80mm rear card cage, card guides, and rails. VME64X, as well as CompactPCI, adopted this specification. A rear transition module (essentially 6U x 80mm of more real estate per slot) mates to the backside of the backplane and allows a VME64X card to route I/O signals to it. Most processor boards take advantage of this module to mount the keyboard, mouse, video, storage, and other interface connectors.

Now that you know some major differences and similarities of the two architectures, how do you actually combine VMEbus and VME64X hardware? That's easy. Read the next article at www.sierrasales.com/tech_talk.html. ■

Tech Specs

What is VXS?

VXS is a switched serial backplane fabric for VMEbus defined by VITA specification 41, www.vita.com. VXS payloads are standard VME64X boards with a new P0 connector which handles two 4X, full-duplex switched serial ports. A VXS switch card connects payload cards and manages the crossbar switching.

"Where a calculator on the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have only 1,000 vacuum tubes and perhaps weigh 1.5 tons."

Popular Mechanics, March 1949

Review of Plug-In (continued)

integrated into standard Eurocard (CompactPCI or VMEbus) enclosures. They use common dimensions: 3U or 6U high by 160 mm deep by one (4 HP) or two (8 HP) slots wide. They range from 125W to 600W and accept both AC and DC inputs.

CompactPCI plug-in power supplies conform to several electrical and mechanical specifications:
•PICMG CompactPCI 2.0 R 3.0. Defines voltage distribution, tolerance, ripple, and capacitance.
•PICMG CompactPCI 2.11 R 1.0. Defines electrical and mechanical interfaces and connector pins.
•IEEE 1101.10. Defines front panel, EMI gasket, alignment pin, injector / extractor handle, and front panel keying.

Backplane connection
Plug-in power supplies connect to a standard 47-pin Positronics hot-pluggable power supply connector. This connector usually is mounted vertically on the right side of the backplane or on a Power Interface Board (PIB). Two Positronics connectors are provided for high outputs, redundancy, and N + 1 supplies.

The PIB is a separate board containing power circuitry for a backplane and Positronics power connector. It is used to connect a plug-in supply to a standard backplane built with regular power taps. PIBs are 3U or 6U in height and wide enough for single or dual power supply configurations. They mount securely next to the backplane. The AC or DC input is wired directly to the PIB, which provides a physical connection to the backplane for 3.3V, +5V, -12V, and +12V.

Cooling
Plug-in power supplies rely on the chassis manufacturer for cooling. Their design allows air to be moved through them. Since they can slide into the card cage to mount beside CompactPCI boards, they take advantage of the existing fan tray for cooling. For horizontal chassis, plug-in supplies may mount to the left or right of the card cage. In this setup, air is pushed through the boards and then, through the power supply.

Cost
Plug-in supplies cost significantly more than their ATX counterparts. Be prepared to pay at least 100% more than an equivalent ATX supply. This cost will be reflected in your chassis price. Lower volume, a PIB (when necessary), and compliance to IEEE 1101.10 and other specifications contribute to the higher price.

Besides plug-in and ATX power supplies, two other power supply types can be specified in CompactPCI systems: open frame and modular. Look for articles at www.sierrasales.com/tech_talk.html. ■

Tech Talk is available online. To check more topics and read continuing articles in a series, or to sign up for our e-journal, go to:

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