



Despite being old enough to qualify for the technology 'old folk's home', the VMEbus continues to survive and remains the backplane technology of choice in some applications.

In order to keep the technology as up to date as possible, the standard has been revised a number of times over the last few years. The great – and continuing – attraction of VME is that, almost without exception, those revisions to the standard have maintained backwards compatibility. This means that something produced for the early stages of VME could still be used today.

The standard is developing under the watchful eye of VITA, the VMEbus International Trade Association. One of the projects which is making its way from the committee room to the 'real world' is VITA 46, also known as VPX. Basically, VITA 46 is a break away from previous incarnations of the VMEbus in favour of the latest connector and bus technologies. The aim, says VITA, is to ensure a long technology cycle for the approach.

VITA 46 is currently in the 30 day balloting phase required before a suggested specification becomes an industry standard. Jing Kwok is principal engineer with Curtiss Wright Controls Embedded Computing (CWC) as well as chairman

Military and aerospace are early adopters of VPX, but will the technology find broader application?

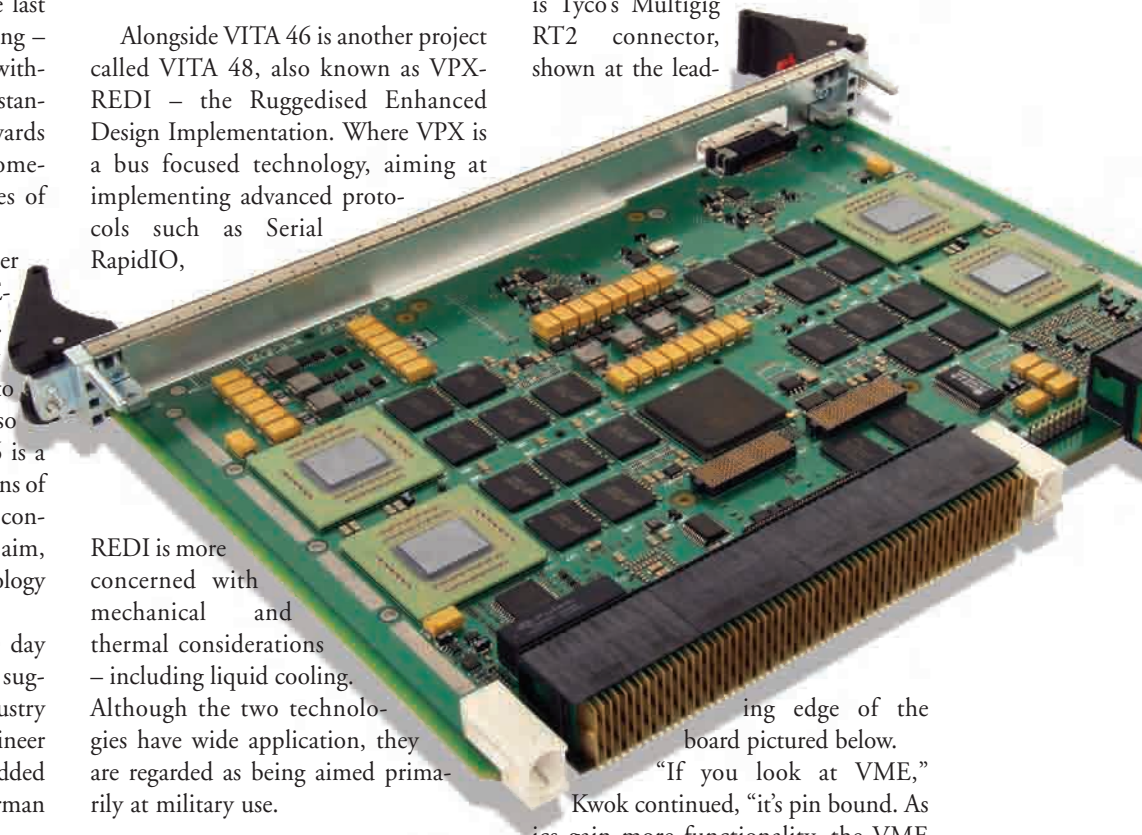
By **Graham Pitcher**.

Alongside VITA 46 is another project called VITA 48, also known as VPX-REDI – the Ruggedised Enhanced Design Implementation. Where VPX is a bus focused technology, aiming at implementing advanced protocols such as Serial RapidIO,

REDI is more concerned with mechanical and thermal considerations – including liquid cooling. Although the two technologies have wide application, they are regarded as being aimed primarily at military use.

structure has needed to change.”

But this 'quantum leap' has meant a break with the past. “Users have been broadly comfortable with the VME form factor,” Kwok claimed, “but the connector isn't up to the job.” This has required the specification of a new connector to handle the serial data rates. That device is Tyco's Multigig RT2 connector, shown at the lead-



REDI for VPX?

of the VITA 46 working group within VITA. He says that, along with the base standard (46.0), there's a bunch of other proposals, known as 'dot specs'. “The base spec is done and is now in the process of being approved as an ANSI standard. It's now out for public review, which gives people the chance to look at the spec.” Kwok says the group wants to meet the 13 July deadline so comments can be addressed and resolved.

What has pushed the development of VPX? Kwok said: “If you look at the electronics industry, everything is getting faster and it's the same for communications. This used to be parallel, but there are a lot of issues in boosting speed. For instance, they can't be clocked any faster so industry is moving to serial buses. Serial data rates of up to 1GHz mean an order of magnitude jump and that's meant the current infra-

ing edge of the board pictured below.

“If you look at VME,” Kwok continued, “it's pin bound. As chips gain more functionality, the VME format doesn't give you all the pins you need. VPX overcomes this, with more pins and more bandwidth.”

One other introduction in VPX is a 3U form factor, previously unavailable in VME. Kwok noted: “3U is becoming more interesting because users want to be able to pull cards and the development of VITA 48 helps in this respect.”

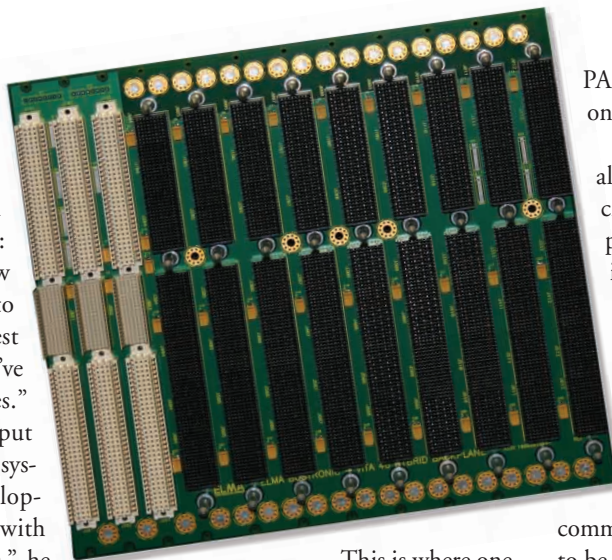
VITA 48 – or VPX-REDI – brings in a number of mechanical specifications, in particular esd protection at the connector. “This standard addresses the needs of military users,” Kwok continued, “for what is called two level maintenance. At the moment, users can't remove a failed board in the field, so sub systems are replaced. Now, with VPX, boards can be swapped out.” However,



VPX doesn't support so called 'hot swap', unlike other possible solutions.

CWC's Mike Slonoski, product manager for PowerPC based single board computers, noted: "Our core product lines are now migrating to the VPX format to support this. One of the latest moves was an fpga board, but we've also migrated dsp engines." Slonoski noted that CWC has put together 'quick start' kits to help system builders get product development moving. "We're working with Hybricon's 5 and 11 slot chassis," he added.

Whilst VPX is a 'different animal' to VME, there will be ways in which the



This is where one of the 'dot specs' comes in. The spec in question is VITA46.1, which address mapping VMEbus signals to the VPX world. "On CWC's VPX6-185 sbc, for example, you can interface to VME and to other serial fabrics," said Slonoski.

And there are chassis available which offer a VPX/VME hybrid. "These allow the use of legacy cards in a system and bring the benefit of VPX' higher performance," he continued.

CWC is also extending its PowerPC based lines into the VPX world. Slonoski noted: "Freescale's 8641, for example, allows us to mix Serial RapidIO and PCI-Express on one device. We're also planning a product line based on Intel's Core Duo processor family and we're looking at Power Architecture based processors from other vendors, such as

PA Semi, and we'll be delivering these on the 3U format."

Mercury Computer Systems has already selected PA Semi's PWRficient processor for next generation products in its PowerStream range, including 3U and 6U VPX-REDI formats.

All in favour?


Initially, VPX is going to be of interest to the military and aerospace markets. But Kwok contends that the VITA 46 committee's intent is for the specification to be applicable in all relevant markets.

"There's a lot of signal processing applications out there, for example, where users want more bandwidth and need to support serial switched fabrics. But what VPX does it to allow military users to build computer systems, something which was not previously possible."

Dave Martin, sales manager with Elma Electronic UK, takes a similar view. "Normally, the military sector approaches new technology with a degree of caution. But with VPX, they are leaping in feet first. It's all to do with the extra processing power, speed and I/O."

Elma UK managing director Martin Blake noted: "We support all architectures and don't have an axe to grind, but the people we're talking to are more interested in VPX with legacy VME support."

Although Elma lists VPX compatible backplanes and system platforms on its website, Martin doesn't see any other applications for the technology than mil/aero. "I can't see why anyone else would need it. Telecoms, for example, will be more aligned to ATCA and MicroTCA."

In the end, whether VPX finds application in the broader world may well be a matter of 'horses for courses'. Where it does bring benefits is in squeezing large amounts of computing power and bandwidth into small volumes. If users aren't constrained by space, then other technologies – equally powerful, equally fast and, importantly, cheaper – may better suit their purposes. 

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Jing Kwok, **Curtiss Wright Embedded Controls**

two domains can interact. "It's not backwards compatible," Kwok admitted, "because it uses a different backplane connector. So that means you can't put a VPX card into, for example, a VME64 type application."

