

FAQ - PowerRACE Family

What PCI signal voltage does the PowerRACE use?

All members of the PowerRACE family use 5V signal levels for both of the PMC slots. The primary PMC slot is required to use 5V signal levels because the Ethernet and VME interfaces are 5V only devices. The secondary PMC slot is normally configured for 5V signal levels but can be configured for 3.3V as a factory option.

What PCI clock does the PowerRACE use?

The PowerRACE-2A and PowerRACE-2 use a 33 MHz PCI clock. 66 MHz is not supported.

What PCI bus width does the PowerRACE support?

The PowerRACE-2 and PowerRACE-2A support both 32 and 64 bit PMC modules with sustained throughput to RACE++ of 240 MB/s using 64 bit PMC modules.

Do the PowerRACE cards provide 3.3V to the PMC slots?

All PowerRACE modules provide 3.3V DC power, in addition to the required 5V, +12V and -12V power, to the PMC slots. 3.3V DC power is provided whether the PMC interface is configured for 3.3V or 5V signalling levels. The PowerRACE card has 12 Amperes of 3.3V power available; after budgeting for other onboard components, approximately 6 Amperes is available to be shared between the two PMC slots.

Which of the four standardized PMC connectors (Pn1 through Pn4) does the PowerRACE provide?

The PMC/CMC spec, IEEE 1386, defines four connectors (Pn1 through Pn4). Basic 32-bit PCI uses two connectors (Pn1 and Pn2), the 64-bit extension to PCI uses Pn3 and user I/O uses Pn4.

All PMC carriers and PMC cards are required to support Pn1 and Pn2. 64-bit carriers must provide Pn3 to support 64-bit PMC modules; likewise 64-bit PMC modules must use Pn3. PowerRACE has Pn1, Pn2 and Pn3

All of TEK's 32-bit PMC modules use Pn1, Pn2 and Pn4, because they provide some limited I/O signals for systems that have P2 I/O options, but the Pn4 does not connect to the PowerRACE carrier. TEK's newer 64-bit PMC modules use Pn1, Pn2 and Pn3; we dropped the I/O capability but added 64-bit PCI. Fibre Channel and Gigabit Ethernet PMCs typically use Pn1, Pn2 and Pn3 because they are 64-bit devices.

Do the PowerRACE cards use 5-row or 3-row VME connectors?

All PowerRACE cards use 5-row VME64x connectors and are compatible with both "classic" 3-row VME backplanes and VME64x 5-row VME backplanes.

The PowerRACE cards use the additional ground pins if they are present on the 5-row backplane, but do not otherwise make use of the VME64x extensions. Specifically, 3.3V power is always generated using onboard converters from 5V power, and all PowerRACE cards are within the VME specification for maximum current using 3-row connectors.

The ANSI/VITA 5 RACEway standard defines a single port using the P2 rows A and C user defined pins. The ANSI/VITA 5.1 extension defines an additional RACEway port using P2 rows D and Z. The PowerRACE card supports the following combinations of hardware:

1. When installed in a 3-row VME backplane, ILK and ILK-P RACEway Interlink modules or RTA-S 2-slot test adapters may be used to implement one RACEway port per card slot. The second RACEway port is automatically held in an idle state.

2. When installed in a 5-row VME backplane with a single port RACEway Interlink (ILK, ILK-P, or RTA-S), the PowerRACE operates as described above.

3. When installed in a 5-row VME backplane with a dual-port capable RACEway Interlink (DLK-P or RTA-D), the PowerRACE automatically enables the second RACEway port.

In all cases described above, PowerRACE-1 cards support RACEway 1.0 hardware at 40 MHz, and PowerRACE-2 and -2A cards support both RACEway 1.0 hardware at 40 MHz and also RACE++ hardware at either 40 or 66 MHz.

Do the PowerRACE cards support the VME64x Geographic Address feature?

The PowerRACE-2A can read the Geographic Address from the backplane through a BSP-provided function. The PowerRACE-2 does not have support for reading the Geographic Address.

Can the PowerRACE controllers provide all of the necessary Slot 1 controller functions (SYSCLK, bus arbiter, etc.)?

Yes, the PowerRACE can act as a slot 1 controller. The VMEbus interface uses the Universe II from Tundra, which includes slot 1 functionality. The PowerRACE startup code uses the Universe II automatic slot 1 sense to select whether to be a slot 1 controller or not (this can be overridden through a FLASH parameter if need be).

What VxWorks software is included with the card?

The card includes VxWorks targets and firmware support for all of TEK's PMC modules and some supported 3rd party modules. Our policy is to include firmware updates at no cost as new PMC modules are released/supported.

Our VxWorks license with Wind River allows us to distribute the card with VxWorks as an embedded I/O controller provided that there is no target software development capability. If your application can make use of our VxWorks or MC/OS API without target software development, then you do not need to acquire a VxWorks development license.

How much power does a PowerRACE card typically draw?

The typical power consumption for the PowerRACE-2 is 37W. The power consumption analysis was based on typical power consumption figures for each of the components on the PowerRACE card. For cases where data sheets did not indicate typical power consumption, the maximum power consumption was used. In all cases, power consumption was estimated assuming that components were running at full speed; this is a relatively conservative number. All of the analysis was without PMC cards installed.

We have measured actual power consumption measurement on PowerRACE-2 to be 21W (4.1A at 5V), again without PMC cards installed. This is consistent with the conservative nature of the analysis that generated the 37W number.