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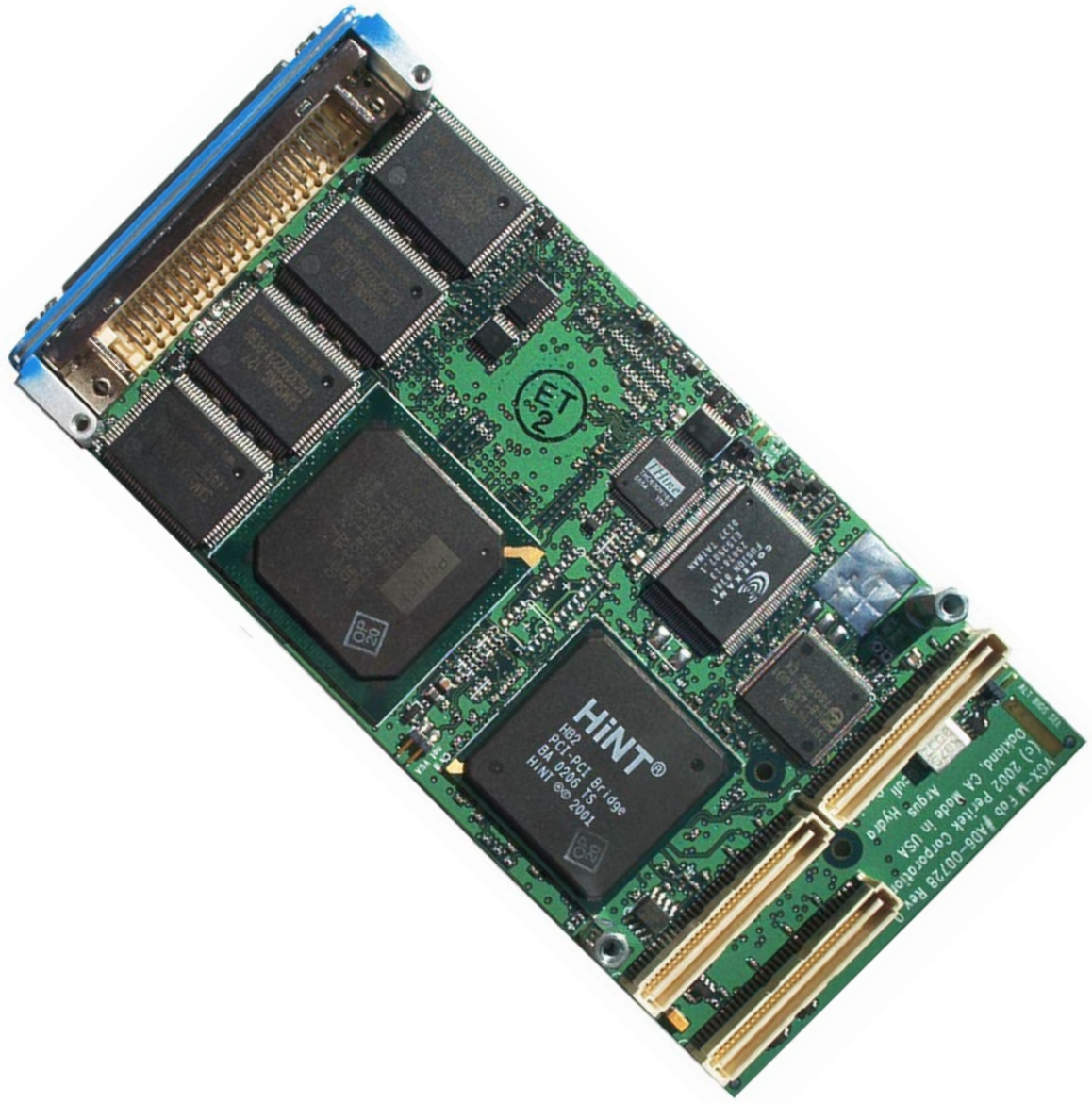
Peritek

A Curtiss-Wright Company

Argus/PMC

Dual Channel Super High Resolution VGA Graphics plus Video Digitizers and USB 2.0

Solaris ▪ Windows ▪ Linux
Real-Time Operating Systems



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The Argus/PMC

Peritek's Argus/PMC fulfills high performance requirements for dual channel graphics and video acquisition common to embedded computing processing environments, including Solaris, Linux, Windows, and leading real-time operating systems such as VxWorks.

Using two of Peritek's 128-bit Borealis graphics accelerators, the Argus/PMC supports independent 2D/3D/OpenGL/DirectX compatible displays with screen resolutions up to 1920 x 1200 with up to 16.7 million colors (32 bpp). Monitor support includes analog VGA and Sync-On-Green (SOG) plus digital PanelLink/DVI. A quad-image VGA/FCode BIOS enables the Argus/PMC to operate in virtually any x86 or SPARC system using VGA, SOG, or DVI displays.

Other features of the Argus/PMC include dual Conexant Fusion 878A video digitizers and a Philips ISP1561 USB 2.0 host controller. A unique asynchronous PCI bridge design supports all PMC interfaces from 32-bit, 33 MHz to 64-bit, 66 MHz, while enabling the Borealis graphics accelerators to always operate at 32-bit, 66 MHz. The 33 MHz PCI digitizers and USB 2.0 are decoupled from the graphics PCI bus by a secondary bridge.

The Borealis graphics accelerator is manufactured exclusively for Peritek, which enables its comprehensive selection of Borealis-based PMC, CompactPCI and PCI display solutions to satisfy the extended product life-cycle requirements expected by the embedded computing market.

The Argus/PMC adds substantial 3D/OpenGL functionality, dramatically improved 2D performance, and four times the display memory over the chip used on its predecessor, the VFG-M.

Display-only PMC boards for single, dual, and quad monitor applications are also available. Please contact Peritek for more information or consult our web page at *http://www.peritek.com*.



Side 1 shown - some components are actually located on Side 2.

Argus/PMC features

- Dual Borealis 128-bit 2D/3D graphics controllers
- 33/66 MHz, 32/64-bit PCI interface
- Each display programmable for 8, 16, or 32 bits/pixel
- Each controller has 16 MB SGRAM
- Analog (RGB) resolution up to 1920 x 1200
- Digital (PanelLink/DVI) up to 1280 x 1024
- OpenGL 1.1 in Hardware
- Hardware scroll, pan, and cursor
- VGA and FCode BIOS support on Channel A
- USB 2.0 host controller
- Dual Multi-input Video Digitizers
- Thermal sensor allows monitoring of board temperature
- USB, Digitizers, and Bridges have Vital Product Data EEPROM
- Companion Single and Dual Display-only versions
- PCI and CompactPCI carriers

Argus/PMC Technical Overview

Introduction

The Peritek Argus/PMC is a PMC (PCI Mezzanine Card) multifunction display controller for VMEbus, CompactPCI, and PCI computers. When used with a Peritek PMC adapter board, the Argus/PMC can be used in standard CompactPCI and PCI slots.

Argus System Overview

Referring to the block diagram, the Argus/PMC is composed of five functional blocks: PMC interface bridge, secondary PCI bridge, Borealis graphics controllers, USB 2.0 controller, and Fusion878A video digitizers.

Dual PCI Bridge Architecture

The HiNT HB2 Asynchronous PCI Bridge supports all PMC interfaces, from 32-bit, 33 MHz to 64-bit, 66 MHz, while enabling the local side to always operate at 32 bit, 66 MHz, which is the native interface for the graphics controllers and secondary bridge. This capability is due to the HB2's use of large internal FIFOs to unlock the timing of the primary and secondary PCI buses from each other.

A second bridge, a HiNT HB4, is used to minimize the impact of the slower (33 MHz PCI) digitizer and USB devices by decoupling them from the primary 66 MHz local bus

Video Inputs

The Argus/PMC provides two ***Conexant Fusion 878A Video Quad-input Digitizers***. The Fusion 878A is a single-chip solution for NTSC and PAL composite video or S-Video capture on the PCI bus. It performs on-the-fly image scaling and clipping. Its RISC-based high throughput DMA engine transfers or CPU memory via the PCI bus.

128-Bit Graphics Accelerator

Each Argus/PMC display channel is powered by a ***Borealis*** graphics accelerator. With its 128-bit wide memory bus, the Borealis can draw up to sixteen 256-color pixels each memory cycle for a raw drawing speed of 2 GB/s. It can generate many hundreds of thousands of shaded triangles per second. The drawing engine's blazing performance is further enhanced by its display list capabililty, which enables it to execute lists of instructions from the CPU, rather than just one at a time. The Borealis and the host CPU can process data independently, thus breaking the lockstep which often reduces system throughput.

The display memory has 16 MB of high speed SGRAM, which provides ample local storage for the graphics image and off-screen data such as texture maps, Z-buffer, and backing store.

The Borealis does not use the RAMDAC to provide YUV to RGB color space conversion. Instead, it uses a programmable Look Up Table (LUT) as part of its Drawing Engine. When video data is copied from off-screen memory as part of the video image double-buffering operation, pixels can be converted on the fly to the current display pixel format. This allows for efficient use of offscreen memory and the ability to dynamically accommodate a variety of image formats.

The Borealis can smoothly X/Y scale small RGB or YUV video clips up to full screen at any resolution and any color depth, and maintain a rate greater than 30 frames per second.

For basic startup support on any system expecting a VGA device on power up, the Argus/PMC graphics Channel A includes a quad image BIOS that supports VGA and FCode, with or without SOG. Once the operating system is running, full function drivers can be loaded, allowing the Borealis's extended instruction set to be utilized.

The Borealis programmable video timing ranges from 30 to 150 Hz vertical and 15.7 to 100 kHz horizontal refresh rates, with a pixel clock up to 250 MHz, giving display formats up to 1920 x 1280 x 32 bpp.

The display output is directed through an internal RAMDAC which includes a graphics cursor with a 64 x 64 x 2 bit map. It integrates the graphics and cursor pixels into 24-bit color values (8 bits each of RGB). The analog signals from the RAMDAC are connected to a standard RGBHV (VGA) or SOG monitor. Display Data Channel lines enable the host computer to control the monitor.

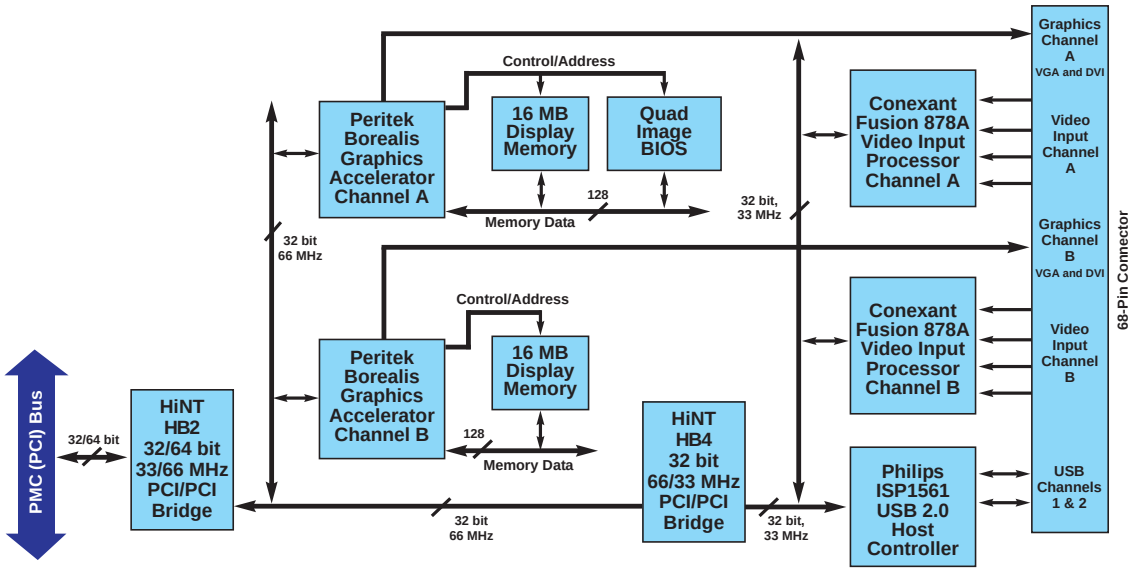
A separate data path from the Borealis supports digital output using a PanelLink (DVI) converter. It provides clock and encoded 24-bit graphics data on four matched-length differential pairs.

USB 2.0 Ports

USB 2.0 supports data rates in excess of 400 Mbit/s, making it viable for video input and other applications. USB is also useful for mouse, trackball, keyboard, and scanner. The Argus/PMC uses the Philips ISP1561 which is USB 2.0 and 1.1 compatible. It supports four channels, implemented internally as dual primary/secondary channel USB 2.0 engines. The standard build version of the Argus PMC utilizes both primary channels. A four channel version is available by special order which deletes Graphics Channel B DVI support. Output is differential data/clock and switched 5V.

I/O Connections

All connections are made through the Argus/PMC's front panel 68-pin high density(HD) ribbon connector and a breakout cable (purchased separately). The breakout cable splits the functions into dual DVI-I (for both DVI and VGA), dual USB 2.0, and BNC connectors for each digitizer's 3 input channels.



Product Specifications

Graphics Controllers	Peritek Borealis, 32-bit/66 MHz PCI
Maximum Dot Clock	250 MHz
Horizontal Scan Rates	31.5 to 115 kHz
Display memory	16 MB SGRAM per channel
Display Colors	16.7 Million @ 24-bits, 256 @ 8-bits
USB 2.0 Controller	Philips ISP1561, 32-bit/33 MHz PCI
Primary PCI-PCI Bridge	HiNT HB2: 32/64-bit, 33/66 MHz (PMC side) 32-bit, 66 MHz (Borealis side)
Secondary PCI-PCI Bridge	HiNT HB4: 32-bit, 66 MHz (Borealis side) 32-bit, 33 MHz (USB/Digitizer side)
Video Digitizers	Conexant Fusion 878A, 32-bit/66 MHz PCI
VPD Serial EEPROMs	2 Kb each for USB, Bridges, and Digitizers
Environment	
Temperature	0°C to +55°C, operating, -55°C to +85°C, storage
Humidity	10% - 90% non-condensing
Power Requirements	+3.3V ±5%, 2 A (est), +5V ±5%, .3 A (est)
Compatibility	IEEE 1386-2001, 64-bit, PCI 2.2 compliant Universal PCI Bus signaling (5V and 3.3V)
PCI Device IDs and Interrupts	HB2 Primary Bridge: IDSEL = PMC IDSEL HB4 Secondary Bridge: IDSEL = HB2_AD16 Borealis Channel A: IDSEL = HB2_AD17, INTA Borealis Channel B: IDSEL = HB2_AD18, INTB Fusion 878 Channel A IDSEL = HB4_AD16, INTC Fusion 878 Channel B IDSEL = HB4_AD17, INTD USB: IDSEL = HB4_AD20, INTA LM75 INTB
PCI Subsystem Vendor ID	0x10F0 (Peritek Vendor Code)
PCI Subsystem Device ID	0x00C5 (Argus/PMC Identifier)
Dimensions	149 mm x 74 mm
I/O Connector	68-pin 3M N10268-52E2VC Mini-D ribbon
Breakout cable	Graphics: 2 x *DVI-I* (VGA and PanelLink/DVI) USB: 2 x *USB Type A* Video Input: 2 x BNC for 1-of-3 composite or S-Video and one composite.
Analog Monitor Support	VGA or Sync-On-Green up to 1920 x 1200 x 32 bpp
Composite Video Signal	1 Volt peak to peak, consisting of: 660 mV Reference White 54 mV Reference Black 286 mV Sync
Digital Monitor Support	PanelLink/DVI up to 1280 x 1024 x 32 bpp
Software Support	Standard Drawing Library (SDL) for Linux and VxWorks Windows 2K/XP drivers Linux/XFree86 and Solaris SunX DDX Third-party drivers are also available; contact the factory for more information
BIOS Support	Quad-image VGA and FCode BIOS supports analog (VGA or Sync-On-Green), and PanelLink (DVI). Channel A functions as system console.
Display Support	Supports multiple monitors
Maintenance Features	DDC-2B control enables system software to inter-rogate monitor for type and capabilities; RAM-DAC 1-bit ADC sense function can detect monitor connections; LM75 thermal sensor can report board temp; RAMDAC's integral CRC capability allows any 24 video data lines to be tested.
Power-management capabilities	Depending on underlying operating system support, most devices can be at least partially powered down.

Display Resolutions

Resolution	Vertical Scan Rate			
	Windows and RTOS		Solaris	
	Format	Maximum	Index	Frequency
640 x 480	VGA	150+ Hz	8 9	60 Hz 75 Hz
800 x 600	SVGA	150+ Hz	6 7	60 Hz 75 Hz
1024 x 768	UVGA	142 Hz	0 1	60 Hz 75 Hz
1152 x 864	Sun	126 Hz	2 [default] 3	60 Hz 75 Hz
1280 x 1024	SXGA	107 Hz	4 5	60 Hz 75 Hz
1600 x 1200	UXGA	91 Hz	C	60 Hz
1920 x 1080	HDTV	83 Hz	n/a	n/a
1920 x 1200	WUXGA	77 Hz	D	60 Hz

Ordering Information

Standard Configuration:

Argus/PMC
Two Peritek Borealis Graphics Accelerators, 16 MB SGRAM per channel, hardware pan, scroll, and zoom, cursor, analog (VGA and SOG) and digital (PanelLink/DVI), two Conexant Fusion 878A video digitizers, and Philips ISP1561 USB 2.0 host controller. Quad image BIOS supports analog and digital FCode and VGA .

Breakout Cable:

VGX-6/1 ArgusPMC to a set of USB, DVI-I, and triple BNC video-in per channel:1 ft.(30 cm)

VGX-6/6 ArgusPMC to a set of USB, DVI-I, and triple BNC video-in per channel: 6 ft.(183 cm)

Software:

SDL
Standard Drawing Library (SDL): C-callable graphics library for use with VxWorks for PowerPC and Linux for x86.

Windows Drivers
Drivers for Windows 2000 and Windows XP. Downloadable from Peritek website (www.peritek.com).

. **DDX/SO**
2D W-Windows DDX drivers for Solaris 2.6, 7, 8 and 9.
Install with Solaris "pkgadd".

GL/SO
High Performance Direct Rendering Infrastructure (DRI) based hardware accelerated 3D/OpenGL DDX driver for Solaris 2.6, 7, 8 and 9.
Install with Solaris "pkgadd".

Note: Version numbers are subject to change as enhancements and improvements occur. Please check Peritek website for latest software versions.

www.peritek.com

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