

CB912 – VideoPaC™

PowerPC with Video & Graphics VPX SBC



Embedded Computing
without Compromise



Aitech's VideoPaC™ brings high-performance processing and graphics capabilities to 3U VPX systems, in a single-slot reduced SWaP-C (size, weight, power, and cost) package.

With NXP's T4 series SoC and AMD's Radeon E8860 GPU, the qualified, fully integrated, and tested VideoPaC™ provides an ideal, improved heat dissipation solution for graphics-intensive display computing, glass cockpit displays & Mission Computers, situational awareness, C4ISR, EW systems, and many other harsh environment applications.

- Rugged 3U VPX Single-Slot SBC + Video/Graphics XMC combination
- NXP QorIQ Multicore SoC
 - ▶ 12/8/4 e6500 Dual Thread Cores (T4240/T4160/T4080)
 - ▶ AltiVec Unit
 - ▶ Secure Boot and Trust Architecture 2.0
- AMD Radeon E8860 (Adelaar) GPU
 - ▶ 6 Independent Graphic Heads
 - ▶ 2 GB GDDR5
 - ▶ 640 Shader Processing Units
- PCIe and 10G (XAUI) Fabric Options
- 4 GB DDR3L with ECC
- 128 MB NOR Flash Memory
- 16 GB SATA Flash Drive
- 512 kB NVRAM (MRAM)
- Versatile I/O
 - ▶ USB
 - ▶ SATA
 - ▶ Video Outputs
 - DVI/HDMI
 - S-Video
 - RGBHV
 - STANAG 3350
 - Composite
 - ▶ Serial
 - ▶ GbE
 - ▶ Discrete
 - ▶ Video Inputs
 - SDI (SD/HD)
 - STANAG 3350
 - Composite
 - S-Video
- WWDT, IPMI, ETR, RTC, Temp. Sensors
- VxWorks®, INTEGRITY® Support
- OpenVPX Compliant
- 2LM Option per VITA 48.2
- Conduction and Air-Cooled Versions
- Vibration and Shock Resistant



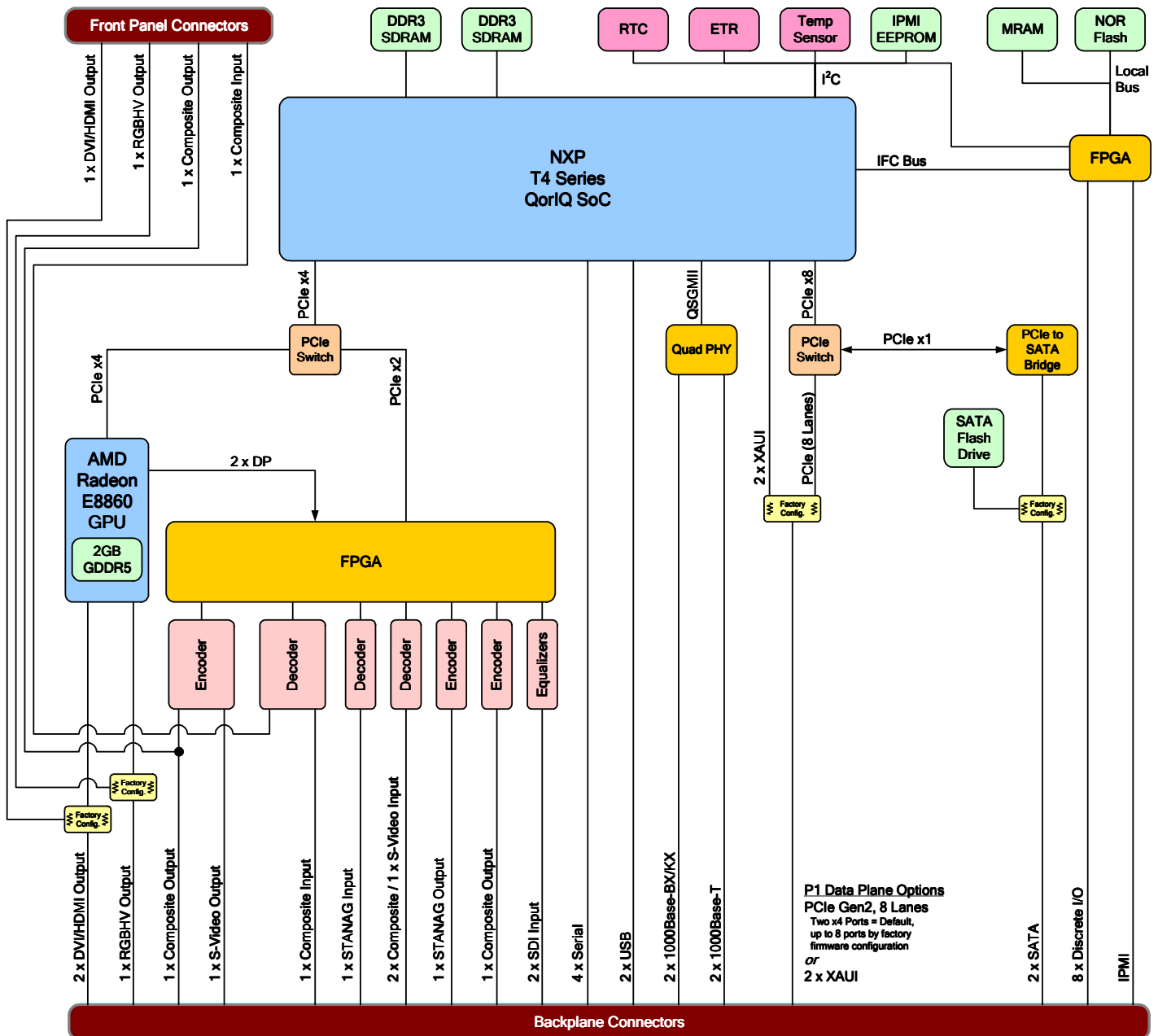
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Board Architecture

Overview	The CB912 VideoPaC™ is a combination of Aitech's C912 SBC (NXP T4 series SoC) and M596 video/graphics XMC (AMD E8860 Radeon GPU). The two boards are interconnected via a high speed PCIe x4 Gen2 link.
CPU	NXP T4 Series QorIQ SoC: 12 (T4240), 8 (T4160), or 4 (T4080) dual-threaded e6500 cores with integrated memory, bus, and I/O controllers. Includes on-chip 32k/32k L1 per core, and 2 MB shared L2 caches per cluster (cluster = 4 cores).
GPU	AMD Radeon E8860 (Adelaar) @ up to 625 MHz, 6 Independent Graphic Heads, 2 GB GDDR5 @ up to 1125 MHz, 640 Shader Processing Units, Full 2D/3D Processing Capabilities, Video Overlay Support.
Video FPGA	Video and graphics capabilities can be enhanced by the optional video FPGA, which provides video input interfaces and additional output interfaces that are not natively supported by the GPU (see the I/O section below).
Board Resources	<ul style="list-style-type: none">• Watchdog Timers (Windowed + Standard)• Secure Boot and Trust Architecture 2.0• Intelligent Platform Management Interface (IPMI)• Real Time Clock• Elapsed Time Recorder• Temperature Sensors• 8 Counters/Timers
OpenVPX (VITA 65) Slot Profiles	<ul style="list-style-type: none">• SLT3-PAY-2F2U (supported by standard configurations of the CB912) Payload board, Two Fat Pipes (Factory Configured as PCIe or 10G XAU), Two Ultra-Thin Pipes (1000Base-BX/KX)• SLT3-PAY-2F2T (available as a special order option, contact your Aitech representative for more information) Payload board, Two Fat Pipes (Factory Configured as PCIe or 10G XAU), Two Thin Pipes (1000Base-T) Backplane PCIe interfaces are configured as two x4 ports by default. Additional port configurations (up to 8 ports) are available by factory configuration of the PCIe switch firmware, contact your Aitech representative for more information.

Memory Resources

RAM	4 GB of DDR3L SDRAM with ECC operates at 1600 MT/s, configured in dual channels
Flash Disk	Optional 16 GB SATA Flash Disk, using SLC (Single-Level Cell) Flash memory
Boot Flash	128 MB NOR Flash – 64 MB allocated for Boot; 64 MB available to user
NVRAM	512 kB high speed MRAM with unlimited writes & long term data retention

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		I/O Variant ⁽¹⁾	
		Variant #1 General Purpose (with video FPGA)	Variant #2 Basic Video Outputs (without video FPGA)
I/O			
USB 2.0		2	2
SATA 2.0		2 ⁽²⁾ or 1 ⁽³⁾	2 ⁽²⁾ or 1 ⁽³⁾
Gigabit Ethernet: 10/100/1000Base-T + 1000Base-BX/KX		2+2 ⁽⁴⁾	2+2 ⁽⁴⁾
Serial Ports Asynchronous UARTs. Software configurable as RS-232/422.		3	4
Discrete I/O Lines Individually software configurable as input (with optional interrupts) or output, and as SE (1 line per channel) or Diff RS-422 (2 lines per channel)		8	8
Video Outputs	DVI (single-link) / HDMI	2 ⁽⁵⁾	2 ⁽⁵⁾
	RGBHV	1 ⁽⁶⁾	1 ⁽⁶⁾
	Composite (RS-170A [NTSC]/PAL)	2 ^{(7) (8) (9)}	N/A
	S-Video (NTSC/PAL)	1 ⁽⁷⁾	N/A
	STANAG 3350 Class B and C	1 ⁽⁸⁾	N/A
Video Inputs	SDI (SD/HD)	2	N/A
	Composite (RS-170A [NTSC]/PAL)	3 ^{(10) (11)}	N/A
	S-Video (NTSC/PAL)	1 ⁽¹¹⁾	N/A
	STANAG 3350 Class B and C	1	N/A

- Notes:
- (1) I/O Variants offer different quantities/types of I/O via factory configuration; additional I/O options may be available per customer request, contact an Aitech representative for more information
 - (2) In boards without on-board SATA Flash drive
 - (3) In boards equipped with the on-board SATA Flash drive
 - (4) These Ethernet port quantities are relevant to the default slot profile configuration (SLT3-PAY-2F2U). The SLT3-PAY-2F2T configuration (available as a special order option) provides two 1000Base-T ports and no 1000Base-BX/KX ports.
 - (5) In air-cooled boards one of these channels is available only at the front panel (not at the backplane). Backplane DVI ports support single-link operation in standard versions of the board, front panel ports also support dual-link operation (dual-link backplane ports are available by factory configuration as a special order option, contact your Aitech representative for more information).
 - (6) In air-cooled boards the RGBHV output is available only at the front panel (not at the backplane).
 - (7) Composite Output 0 and the S-Video Output are clones that are generated by the same video encoder.
 - (8) Composite Output 1 and the STANAG Output originate in the same GPU port, the two channels cannot simultaneously output independent video.
 - (9) A clone of backplane Composite Output 0 is routed to the front panel of air-cooled boards, the channel cannot be used simultaneously at both locations.
 - (10) One additional Composite input is available at the front panel of air-cooled boards
 - (11) Because ports are routed to shared pins, each S-Video input is available at the expense of two Composite inputs. Due to shared decoders, a maximum of two Composite/S-Video inputs can be used simultaneously.

Software

Operating Systems	Wind River VxWorks® and Green Hills INTEGRITY® are supported
Drivers	Operating system specific device drivers for board resources are available. Video and graphics capabilities are supported by the CoreAVI OpenGL driver package. Safety Critical BSP & drivers also available (contact your Aitech representative for more information).
BIT	Built-In Tests are available

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Mechanical

	Form Factor & Dimensions	Pitch	Weight
Air-Cooled	3U VPX REDI per ANSI/VITA 48.1	1"	< 1000 g (2.21 lbs.)
Conduction-Cooled	3U VPX REDI per ANSI/VITA 48.2	0.8"	< 1100 g (2.43 lbs.)
Conduction-Cooled 2LM	3U VPX REDI 2LM (Two Level Maintenance) per ANSI/VITA 48.2	0.85"	< 1200 g (2.65 lbs.)

Power

35 to 65W (depends on configuration options)

Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	Rugged	Military	Rugged	Military
Operating Temp.	AC1 (0 to +55°C) ⁽²⁾	AC3 (-40 to +70°C) ⁽²⁾	AC4 (-40 to +85°C) ^(1,2)	CC3 (-40 to +70°C) ⁽³⁾	CC4 (-40 to +85°C) ^(1,3)
Non-Operating Temp.	C1 (-40 to +85°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)
Vibration	V1	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS1	OS2	OS2
Altitude	15,000 ft.	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity ⁽⁴⁾	0 - 90%	0 - 95% with Acrylic (Standard),			
Conformal Coating	N/A	0 - 100% with Urethane (Optional)			

Notes: (1) -55°C available, contact an Aitech representative for more information
(2) Operating ambient air temperature (with sufficient airflow)

(3) Operating card edge temperature
(4) Non-condensing

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Ordering Information

Processor

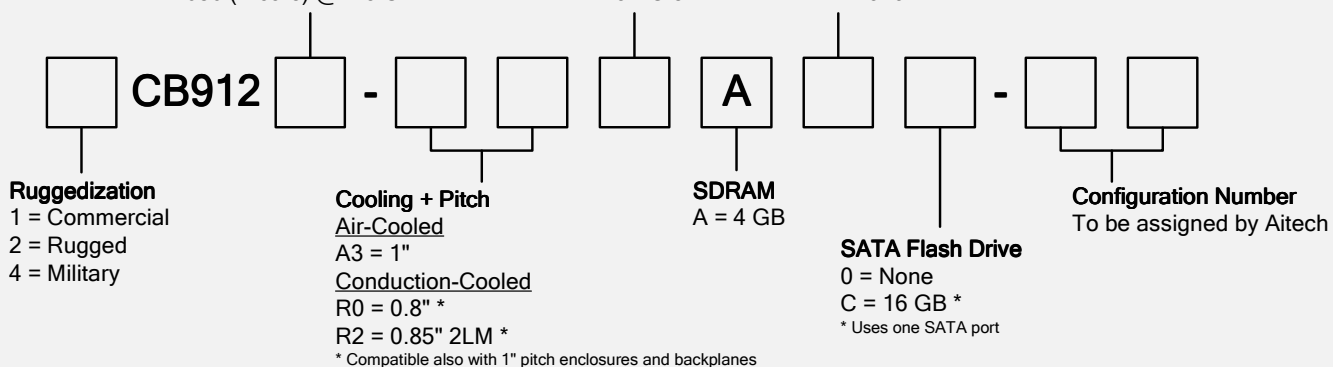
L = T4240 (12-core) @ 1.5 GHz
U = T4160 (8-core) @ 1.5 GHz
V = T4080 (4-core) @ 1.5 GHz

Data Plane Fabric

1 = Two XAU1
2 = Two PCIe x4

I/O Variant (see I/O section above)

1 = Variant 1
2 = Variant 2



Example: 4CB912U-R22A1C-00

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the CB912 VideoPaC™ and additional software support.

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