PENTXM2 Server Class Manageable VME Blade



Powerful

- Low-Power Dual-Core Intel[®] Xeon[®]
 Processor 1.67 GHz
- Up to 4 GB DDR2-400 SDRAM

Versatile

- > x8 PCI-Express XMC Mezzanine Slot
- > x4 PCI-Express Expansion Port
- Dual PMC 64-bit/66 MHz Slots
- PMC Carrier available

Scalable

- > IPMI VITA 38 System Management
- > VITA 31.1 Backplane Networking

Application Enabling

- > 4 GB Solid State Flash Disk
- > EFI Open Standard Firmware
- Air-cooled and Rugged Conduction-Cooled Variants
- Linux 2.6, VxWorks, LynxOS, Windows and QNX Neutrino



Product Overview

The Kontron PENTXM2 family of singleboard computers (SBCs) uses the latest Low Power Dual-Core Intel Xeon processor and E7520 chipset and offers high speed, server-class performance for advanced embedded applications. The single slot PENTXM2 SBC is ideal for thermally constrained environments and includes all

the up to date I/O standard interfaces required in a server blade PC. Furthermore, the PENTXM2 product supports the Intelligent Platform Management Interface (IPMI) specification for easy integration in complex systems. The Kontron PENTXM2 is therefore ideal for bandwidth intensive applications both in a standalone or in a complex cluster configuration.

The PENTXM2 is a 6U VME SBC which features a 1.67 GHz Dual-Core Intel Xeon processor (Codenamed Sossaman) combined with the Intel E7520 server class Memory Controller Hub (MCH). It handles server-like data throughput and provides next generation PCI-Express I/O bandwidth capabilities.

Greater Performance/Watt

The Dual-Core Intel Xeon Low Voltage processor is a member of Intel's growing product line of multicore processors. The dual-core technology allows approximately twice the performance at similar power consumption as previous single core products.

The user application will also benefit from the use of high bandwidth data interfaces:

- ► 667 MHz Front Side Bus (FSB)
- 6.4 GB/s peak memory access to DDR2-400 SDRAM
- PCI-Express interfaces to network, mezzanine and external devices

Unique Versatility

The PENTXM2 supports all the up-to-date standard interfaces required for a modern communicant server:

> Dual Gigabit ports, configurable either on front or on rear PO in order to support VITA 31.1 backplane networking

► High speed serial storage and data I/O interfaces: SATA-150 and USB 2.0

➤ x8 PCI-Express mezzanine interface to tailor the supported features with high performance COTS ANSI/ VITA 42 XMC such as Dual Head 3D-graphics or multiports Gigabit Ethernet cards. ➤ x4 PCI-Express interface on the enhanced performance P0 connector to expand I/O capabilities via the use of a PMC carrier or any other PCI Express device. The PENTXM2 features an onboard legacy EIDE interface to plug-on a 2″5 disk or compact-flash kit.

A rich set of LEDs at the frontpanel report disk activity on EIDE and SATA buses.

Longterm Availability

The Dual-Core Intel Xeon processor and Intel E7520 chipset are members of the Embedded Intel Applications products range which feature extended life cycle.

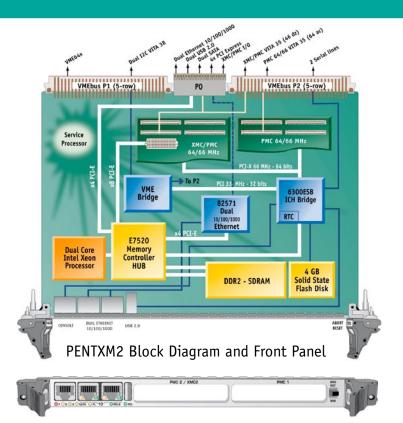
Associated with Kontron's experienced long term support offering (LTS Protect), customer's investment is protected from frequent re-design and maintenance costs.

Warranty and Services

> All of Kontron's hardware products are covered by a two-year return-to-factory warranty.

> Several service programs are available, including hardware and software update services, product repair and exchange services, and either on-site or remote technical assistance. In addition to its standard support services, Kontron offers customized consultation to system integrators.

➤ ISO 9001: Kontron's ISO 9001 certification is just another way for us to back our commitment to quality products and customer service.



Technical Information ≻

Dual-Core Intel Xeon	Dual Real Time Clock (RTC)
Low voltage (ULV) dual-core processor	► RTC#1
One thread per core	The 6300ESB ICH provides a RTC. This includes a PC-AT clock, calendar, and
Upwardly code-compatible with x86 family microprocessors.	242 bytes of CMOS RAM for BIOS configuration functions. The clock and
Integrated 2 MB L2 cache	configuration RAM functions are maintained from a temporary power fail
1.67 GHz max. processor frequency	
Software control of the operating frequency	ure of up to 10 hours using a super cap.
► 667 MHz Front Side Bus (FSB)	> RTC#2
Memory Controller Hub	The PENTXM2 also features an industrial grade RTC with -40°C to +85°C
► Intel E7520 Server Class MCH	Lithium battery. This battery provides more than ten years of power
Two channel DDR2 SDRAM memory	backup under normal operation.
Support of ECC memory	Optional Mass storage
Peak bandwidth of each DDR2 branch channel is 3.2 GB/s with DDR2 400	Onboard 44-pin header EIDE interface for use by the optional Hard Disk or
Independent high-speed links to I/O Controller Hub (ICH), dual gigabit	CompactFlash Mass Storage Kits in place of one PMC
Ethernet controller, XMC mezzanine port and enhanced performance PO	Holes in the board allow for secure a 2"5 disk drive mounting
connector	Up to two EIDE peripherals may be connected to this interface
DDR2 SDRAM Memory	A LED indicates disk activity
► 1, 2 or 4 GB of DDR2 SDRAM clocked at 400 MHz with ECC	I/O Expansion Ports
User Flash Disk	Two PMC sites: 64-bit/66MHz, 3.3V signalling only PCI bus interface. The
► 4 GB of User NAND-Flash on secondary EIDE interface as build option	Pn4 I/O of the PMC#1 and PMC#2 are routed respectively onto P2 (VITA 35-
 A LED indicates disk activity 	64ac) and P2 (VITA 35-32dz) and P0 (P0 PICMG 2.17)
I/O Controller Hub	> XMC site: x8 PCI-Express link usable as dual x4 links in concurrence of PCI
► Intel 6300ESB ICH	bus interface of PMC#2
 3* "8254-type" timer/counters which have fixed uses and are clocked 	> x4 PCI-Express on PO: a x4 PCIExpress link is available on the 5Gbps
by a 14.31818 MHz source	enhanced performance PO connector of the PENTXM2 for interfacing any
 Watchdog timer facility 	PCI-Express device or the V2PMC2 dual PMC 64-bit/66 MHz carrier board
Serial ATA interfaces	PENTXM2 + V2PMC2 Carrier: 4 PMC 64-bit/66 MHz in only two slots. PCI
 Two independent serial ATA (SATA-150) interfaces are provided, both of 	The V2PMC2 uses a transparent PCIe-PCI bridge and is able to host one 5V
which route to the P0 connector	signaling mezzanine.
	System Management
Each interface is supported by its own DMA Controller	The PENTXM2 is the first VME Blade computer which features a baseboar to
A LED indicates disk activity	Management Controller (BMC) as outlined in the VITA 38/PICMG 2.9
USB Ports	recommendation. The enabling or disabling of the BMC is an hardware
Three USB 2.0 interfaces are provided on this board by the 6300ESB	build option. The BMC, which draws less than a Watt, complies with the
One channel is available on the front panel connector	Intelligent Platform Management Interface (IPMI) rev. 1.5. This allows
Two channels are connected to the P0 connector	control the PENTXM2 while the main processor is off-line.
All channels can operate at 1.5 Mb/s, 12 Mb/s or 480 Mb/s	EFI BIOS/Firmware
Dual Gigabit Ethernet Ports	The PENTXM2 supports a BIOS/Firmware which complies with Extensible
Intel 82571EB Gigabit Ethernet Controller	Firmware Interface (EFI) specification. The EFI specification defines a new
x4 PCI-Express Gigabit Ethernet Controller-MCH interface	model for the interface between operating systems and platform firmware.
> 10/100/1000 operation	The interface consists of data tables that contain platform-related information,
> Every port is software configurable either on front panel (RJ-45) or rear PO	plus boot and runtime service calls that are available to the operating system
The PO Ethernet routing supports VITA 31.1 backplane networking	and its loader. Together, these provide a standard environment for booting an
Serial Lines	operating system and running pre-boot applications. Written in C, the EFI
2* "16550-style" serial communications ports, SP0/COM1 and SP1/COM2	firmware can easily be tailored to fit customers' application.
Supplied by the 6300ESB ICH	Please, contact Kontron.
SPO/COM1 available either via the front or via the VMEbus P2 connector	Built in Test Option
SP1/COM2 available via the VMEbus P2 connector	Kontron diagnostics tools for Intel-based SBCs provide a comprehensive set of
Each serial port may be configured as EIA-232, EIA-422 or EIA-485	Built-In Test (BIT) routines to verify the integrity of the underlying hardware.
VMEbus	Designed for use with mission-critical software with hard real-time constraints,
Tundra® Universe II - PCI to VME bridge	they simplify integration with applications running COTS software. Three test
The board can act as system controller when in the first VMEbus slot	set definitions are available in Flash: cold start, warm start, and forced start.
Geographical addressing and Autoslot ID are both supported	These definitions can be tailored to achieve the appropriate test coverage,
System Synchronization Timer	starting run time ratio. The Kontron Power-on BIT (PBIT) routines run automa-
The Software Synchronization Timer is a 32-bit timer clocked by the VMEbus	tically at power-on, and the test results are stored in onboard Flash memory
SYSCLK signal. It allows high accuracy software synchronization for multi-	for later use by the operating system or application.
processor-based systems.	Board Support Packages
processor bused systems.	BSPs are available for Linux 2.6, VxWorks, LynxOS, Windows and QNX Neutrino.



CPU			I/0
	Processor	Dual-Core Intel Xeon Low Voltage	Dual E
	Clock Frequency	1.67 GHz	Dual S
	Front Side Bus	667 MHz	Triple
Memory			Dual E
	SDRAM	1, 2 or 4 GB soldered	Power Requirer
		Double bank 400 MHz	5V - 3
		DDR2-400 - ECC support	Miscellaneous
	Flash	4 GB NAND-Flash	► Boa
	Optional	EIDE port, 2"5 slot	> Con
VME Int	terface		
	Tundra Universe II		sing
	5-row connector		> Elec
	Enhanced Performance	NF I	
PMC#1			NF I
	64-bit/66 MHz PCIBus	> All	
	x8 PCI-Express		Real Time Cloc
XMC/PM	1C#2		RTC#1
í	64-bit/66 MHz PCIBus		
	x8 PCI-Express		RTC#2
	Configurable in dual x4	links	

Dual Ethe	Dual Ethernet 10/100/1000 ports (Front/PO)						
Dual SATA	-150 ports on PO						
Triple US	3 2.0 ports						
Dual EIA-	232/422/485 serial lines						
Power Requiremer	its						
5V - 3A /	3.3V - 7A under BIOS activity						
Miscellaneous							
Board size: 6U: 233.3 mm x 160 mm							
> Conduc	Conduction-cooled version is IEEE 1101.2-1992 compliant and is a						
single	single VME slot solution.						
Electromagnetic compatibility							
NF EN 55022 Class B							
NF EN 50082-2							
All Kontron boards are EC-compliant							
Real Time Clocks							
RTC#1:	6300ESB integrated PC-AT clock with calendar						
	10-hour ride-through capacitor						
RTC#2:	Industrial grade RTC with integrated battery						
	10-year lifetime typical						

Environmental Specifications SA RC Standard Commercial Rugged Conduction-Cooled Conformal Coating Optional Standard Airflow 1.2 m/s without throttling at 40°C NA Temperature VITA 47-Class AC1 VITA 47-Class CC4 Cooling Method Conduction Convection Operating 0° to +55°C -40° to +85°C -45° to +85°C -45° to +100°C Storage Vibration Sine (Operating) 20/500 Hz: 2g 22/2,000 Hz: 5g VITA 47-Class V1 VITA 47-Class V3 Random 20q/11 ms Half Sine 40q/20 ms Half Sine Shock (Operating) Altitude (Operating) -1,640 to 50,000 ft -1,640 to 15,000 ft Relative Humidity 90% without condensation 95% without condensation

Ordering Information

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		SA	RC	1	1	1	-	\uparrow	\uparrow			\square
Environnement Class	Standard Air- Cooled	Х		SA								
	Rugged Conduction-Cooled		Х	RC								
Processor	1.67 GHz Dual-Core- Processor				3							
DDR2-400-SDRAM	1 GB	Х	X			4						A
	2 GB	Х	X			6						for SA only
	4 GB	Х	Contact Kontron			8						for S
VITA 38 IPMI Board Management	Disabled	Х	Х					0				le V 1
	Enabled	Х	Х					1				Add Code V
User Flash Disk	4 GB	Х	X						0			Adc
	No Flash	Х	X						N			
Reserved										0		
Manufacturing	Leaded	Х	X								0	
	RoHS	Con	itact Kontron								U	
Coating		Х	Default									V

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