XPI SINGLE BOARD COMPUTER

DDR200/266 Memory Up to 4GB — Xeon™ Processor (Socket 603) — +12V Connector (From ATX12V) — Dual Ultra ATA/100 EIDE Interfaces — Dual USB Ports (Rev 1.1) — Serial Ports — Enhanced Bi-Directional Parallel Interface — Floppy Drive Interface — PS/2 Mouse and Keyboard Interface — Speaker Header — SXGA Interface — Dual Full-Speed PCI 10/100/1000 Base-T Ethernet Interfaces — Memory Controller Hub — PICMG® Connector — I/O Controller Hub — I/O Expansion — ISA Bus — AMI Flash BIOS
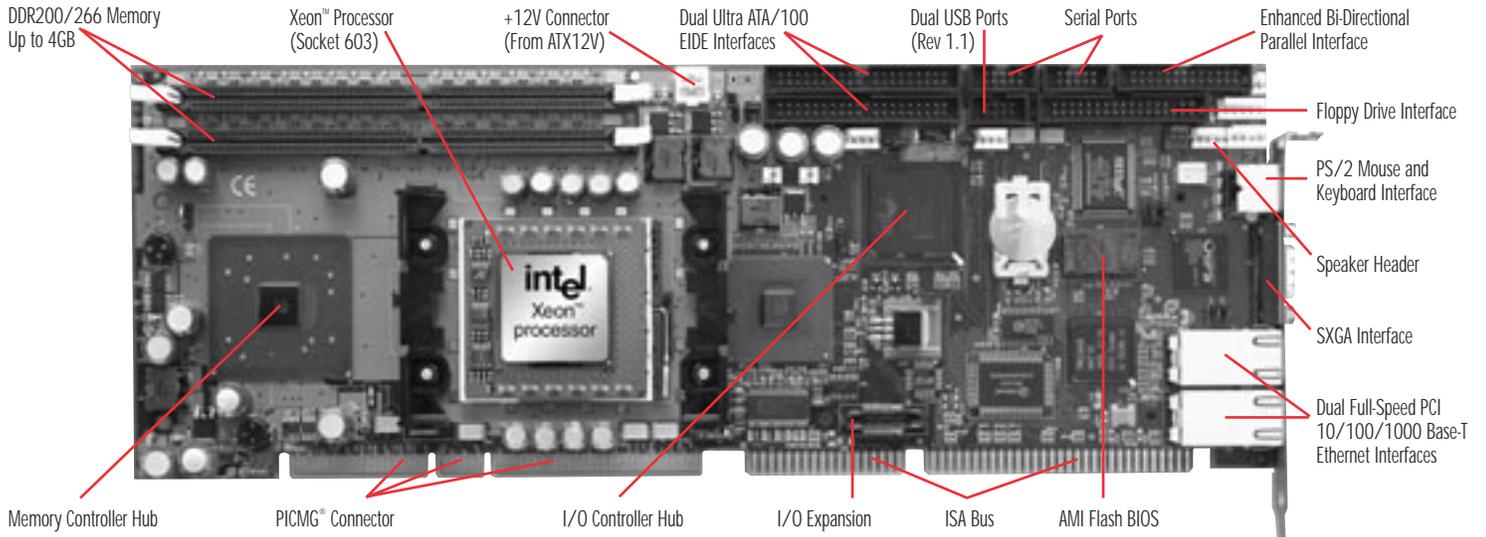
The XPI single board computer merges Chassis Plans' innovative engineering and quick delivery manufacturing capability with the features of the Intel® Xeon™ processor and E7500 chip set. The result is a robust PCI/ISA SBC designed for a wide variety of high-speed data-intensive applications such as medical diagnostic imaging, data convergence, telecommunications and industrial automation.

PROCESSOR:

Intel® Xeon™ processor at 2.0GHz to 3.0GHz*
Processor Package: INT-mPGA(603-pin)

Higher speeds as available

The Xeon processor supports a 400MHz system bus as well as Intel's NetBurst™ micro-architecture. Both features combine to provide robust performance and fast program execution in a PCI/ISA single board computer. Some of the processor features that enable such performance enhancements are:

- Hyper-Pipelined technology
- Streaming SIMD Extensions 2 (SSE2)
- Advanced Dynamic Execution
- 512K Advanced Transfer Cache (L2)
- 12K trace and data cache (L1)

Intel's Hyper-Threading technology allows a single Xeon processor to act as two logical processors resulting in simultaneous instruction processing. Two logical processors executing program instructions at the same time enable high performance XPI operation in exacting PCI/ISA single board computing applications.

E7500 CHIPSET:

The chipset supports a 400MHz system bus, DDR200/266 memory with ECC and high-speed Hub Link 2.0 I/O expansion.

DUAL ETHERNET INTERFACES — 10/100/1000BASE-T:

The XPI's internal PCI-X bus, with a bus speed of 133MHz, connects to Intel's 82546EB Ethernet Controller chip. This feature provides high-speed dual Gigabit Ethernet on LAN ports 1 and 2. The XPI also supports existing 10Mb/s or 100Mb/s Ethernet networks over the same internal PCI-X bus. RJ-45 connectors located on the I/O bracket provide the mechanical interface to the Ethernet networks.

I/O EXPANSION VIA THE MICTOR CONNECTOR:

Optional I/O expansion mezzanine cards connect directly to the XPI's Memory Controller Hub (MCH) via Intel's Hub Link 2.0 interface. This feature provides fast (1GB/s) I/O connectivity for mezzanine expansion cards such as Trenton's H2S2 Dual Ultra160 SCSI interface. Consult Sales for additional I/O expansion card availability.

DDR200/266 MEMORY:

Double Data Rata (DDR) memory represents the next generation of memory technology. The increased speed performance of DDR200/266 memory, sometimes referred to as PC1600 or PC2100 memory, will prove useful in demanding computing applications. The DDR200/266 interface on the XPI single board computer consists of two DDR memory channels. These channels come off the MCH and terminate in separate memory module sockets. The sockets must contain the same size, registered DDR memory modules with ECC. The bandwidth of the DDR200/266 memory interface is 1600MB/s per channel.

EIDE ULTRA ATA/100 INTERFACES (DUAL):

Dual high-performance PCI EIDE interfaces are capable of supporting up to two IDE disk drives each in a master/slave configuration. The interfaces support Ultra ATA/100 with synchronous ATA mode transfers up to 100MB per second.

BUS SPEEDS:

ISA	- 16-bit/8MHz
PCI	- 32-bit/33MHz, 32-bit/66MHz
	- 64-bit/33MHz, 64-bit/66MHz
PCI-X (on-board only)	- 64-bit/133MHz
Hub Link 2.0	- 1GB/s
System or FSB	- 400MHz

BIOS (FLASH):

The XPI uses the AMIBIOS8. The flash BIOS resides in the 82802 Firmware Hub (FWH). AMIBIOS8 contains useful features such as:
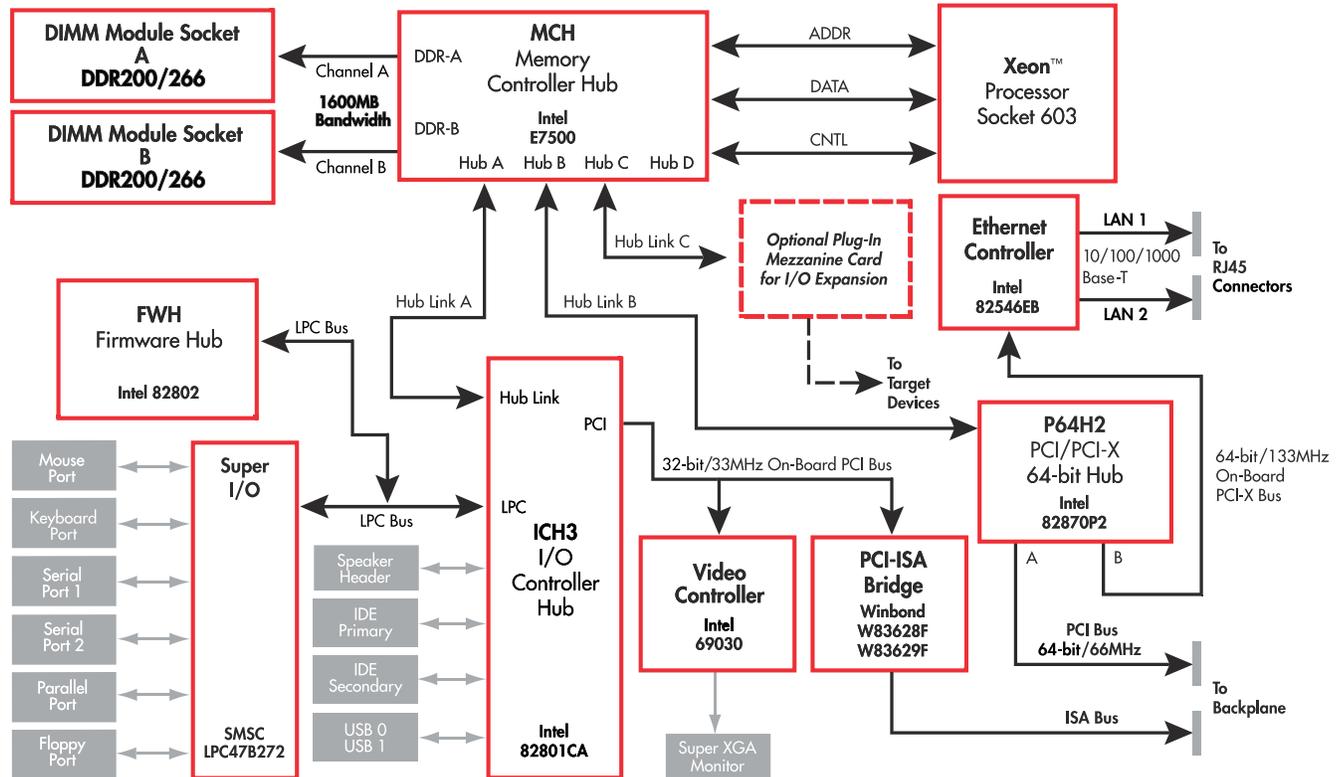
- CMOS setup for system parameters
- Peripheral management for configuring on-board peripherals
- PCI-to-PCI bridge support and PCI interrupt steering
- Support for flash devices for BIOS upgrading via floppy interface

Some of the new AMIBIOS8 features supported on the XPI include:

- Integrated support for USB mass storage devices such as USB CD-ROM, CD-RW, etc.
- Faster POST execution
- Improved BIOS code modularity streamlines the BIOS customization process while offering a higher degree of BIOS customization

CHASSIS PLANS

Your Custom Industrial Computer Solution

Block diagram showing:

DIMM Module Socket A DDR200/266 — Channel A — 1600MB Bandwidth — **DIMM Module Socket B DDR200/266** — Channel B

MCH Memory Controller Hub (DDR-A, DDR-B, Intel E7500, Hub A, Hub B, Hub C, Hub D) — ADDR / DATA / CNTL — **Xeon™ Processor Socket 603**

FWH Firmware Hub (Intel 82802) — LPC Bus

Hub Link A, Hub Link B, Hub Link C

Optional Plug-In Mezzanine Card for I/O Expansion — To Target Devices

Ethernet Controller (Intel 82546EB) — LAN 1 / 10/100/1000 Base-T / LAN 2 — To RJ45 Connectors

Mouse Port, Keyboard Port, Serial Port 1, Serial Port 2, Parallel Port, Floppy Port — **Super I/O** (SMSC LPC47B272) — LPC Bus

ICH3 I/O Controller Hub (Hub Link, PCI, LPC, Intel 82801CA) — Speaker Header, IDE Primary, IDE Secondary, USB 0 USB 1

32-bit/33MHz On-Board PCI Bus

Video Controller (Intel 69030) — Super XGA Monitor

PCI-ISA Bridge (Winbond W83628F W83629F)

P64H2 PCI/PCI-X 64-bit Hub (Intel 82870P2) — A — B — 64-bit/133MHz On-Board PCI-X Bus — PCI Bus 64-bit/66MHz — To Backplane — ISA Bus

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SUPER XGA INTERFACE:

The Intel 69030 video controller has 4MB of on-chip video memory and supports up to 1280 x 1024 pixel resolution. Software drivers are available for most popular operating systems.

ADDITIONAL XPI FEATURES:

System Hardware Monitor
- The Winbond W83783S chip supports hardware monitoring. The functions monitored are:
  - Voltage: 3.3V, +/-12V, 5.0V and VCORE
  - Fan speed
  - Temperature
- The XPI hardware monitor driver allows the user to program the monitor limits to provide a trigger point for the application software. The user's application program can monitor these trigger points in order to send system alert messages or perform corrective actions.

Watchdog Timer
- The programmable watchdog timer provides a system reset with a total range of 1ms to 60 seconds. The programmable increments of the watchdog are 1ms, 10s and 60s.

I/O Features
- Two high-speed serial ports
- Enhanced bi-directional parallel interface
- Dual Universal Serial Bus (USB, Rev 1.1)
- PS/2 mouse interface
- Keyboard interface
- Floppy drive interface

XPI APPLICATION CONSIDERATIONS:

Power Requirements:
Typical Values

CPU	+5V*	+12V**	+3.3V*
3.0GHz	4.05A	6.25A	3.08A
2.8GHz	3.85A	4.54A	3.05A
2.4GHz	3.84A	4.13A	3.02A
2.0GHz	3.80A	3.64A	3.02A

-12V* @ <100mA

* From Backplane via PICMG® Connector
** From ATX12V power supply or equivalent via P4 connector

The Xeon processor's power requirements created the need for an additional on-board 4-pin power connector (P4). This connector requires +12V from an external power supply that conforms to the ATX12V power specification. This external power supply should have a minimum wattage rating of at least 250W. The XPI also requires that 3.3V be applied to the backplane from the power supply.

Temperature/Environment:
- Operating Temperature: 0˚ to 45˚ C
- Storage Temperature: -40˚ to 70˚ C
- Humidity: 5% to 90% non-condensing
- A Xeon processor can consume as much as 70Watts of power on the XPI single board computer. The XPI's cooling system uses a high-reliability fan mounted to the SBC.

Mechanical:
Chassis Plans' engineers have devised a low-profile (2.05″ height) active cooling system. The XPI's cooling system may cover up additional slots in a typical PCI/ISA passive backplane system. Overall dimensions for the XPI, including the active cooling system, are 13.3" L (338mm) x 4.8" H (121.9mm) x 2.05″ W (52.1mm).

STANDARDS:
- IEEE P996, Personal Computer Bus Standard
- PCI Local Bus Specification 2.1
- PICMG 1.0 Specification

AGENCY APPROVALS:
- Designed for UL1950, CAN/CSA C22.22 No. 950-95, EN55024: 1998; EN55022: 1998 Class B; EN61000-3-2: 2000; EN61000-3-3: 1995

ORDERING INFORMATION:

Model Name: XPI

Model #	CPU Speed
S6022-008-xM	3.0GHz
S6022-007-xM	2.8GHz
S6022-004-xM	2.4GHz
S6022-002-xM	2.0GHz

(xM = Memory)

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