Intel386™ EX Processor Embedded PC

The EXPLR1 can be used:

- As an Intel386™ EX Processor Evaluation Board Running x86 Code
- As an Intel386 EX Processor Prototype Board For Quick, Proof-of-Concept Development
- As a Stand Alone Target Embedded PC Platform For DOS Based Applications

EXPLR1 Features:

- 25 MHz Intel386 EX Processor Running Pipelined, Zeros ws, Page Mode
- 4 Mbit Boot Block Flash Memory (Intel 28F400BXT) Configured as 256Kb x 16
- 1 MB of DRAM SIMM Expandable to 16 MB
- A Single Slot Type II PCMCIA Controller
- LCD/VGA Graphics Controller
- IDE Controller
- PS/2 Style Mouse and Keyboard
- 2 Asynchronous Serial Ports (COM1 and COM2)
- Real Time Clock (RTC) With Battery Backed CMOS RAM
- System Bus Access Via Two Expansion Headers
- Embedded BIOS in FLASH
- ROMed DOS in FLASH
- Compact Board Design - 6" x 6"

As part of the new Exploration Series from Intel, the EXPLR1 demonstrates embedded PC capabilities using the Intel386 EX Processor as its primary processor engine. The platform can be used as a traditional processor evaluation board providing an environment for code execution, debug and hardware development. However, the platform is best used within an embedded PC environment where embedded applications are written on top of a PC-like BIOS and a ROMable DOS Operating System. Further, the embedded PC evaluation platform is expandable allowing for additional functionality to be incorporated within a customer specific prototype or development environment.
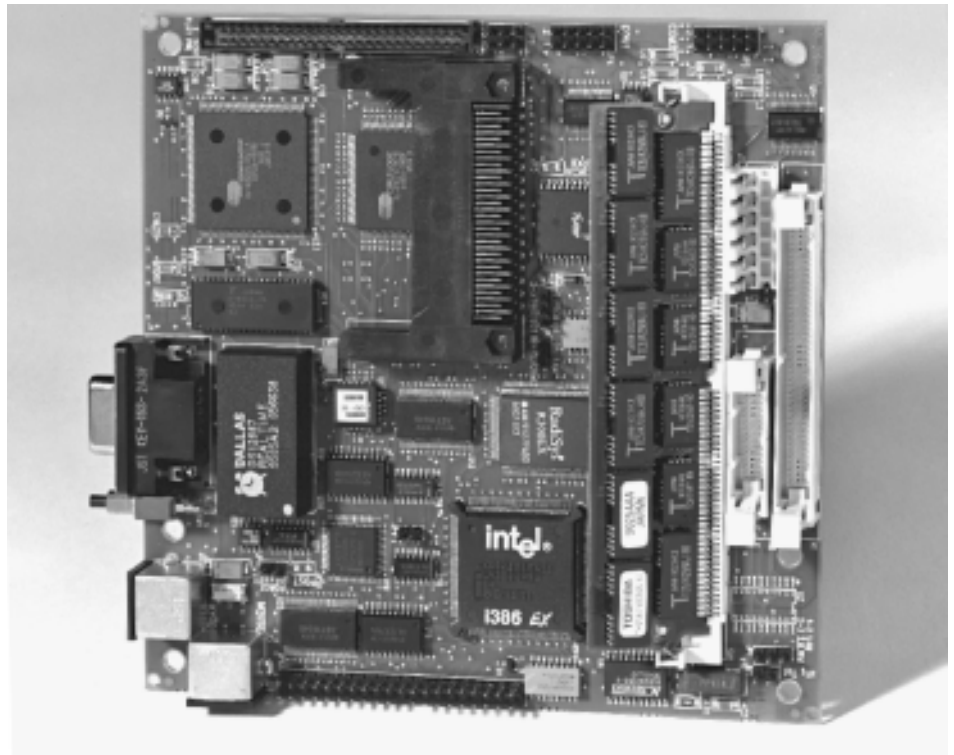
The EXPLR1 evaluation platform differs considerably from other Intel embedded evaluation boards. The EXPLR1 enables new embedded design to get to market quicker by taking advantage of the PC infrastructure for both hardware and software development. The platform comes equipped with a BIOS and a ROMable OS so there is no need to build an embedded application from scratch. It has keyboard and mouse interfaces, an IDE drive interface, and LCD/VGA display capabilities. Intel fully expects that embedded designers will re-use some portion (if not all!) of this base design within their specific application. The challenge of this platform was to be able to provide all the ingredients necessary for our customers to build a custom embedded PC system for their specific target market segment or application. The hardware design itself is modular, allowing for portions of the embedded PC design to be cut and pasted easily if desired.

EXPLR1 Kit Includes:

The EXPLR1 kit includes the Intel386 EX CPU based embedded PC evaluation platform board and a flash utility for downloading and reprogramming the on-board flash memory. The flash utilities allow a user to install an operating system or debug monitor of choice. By using the flash utilities, users can easily download and run application programs from flash memory whether in a DOS or proprietary environment.
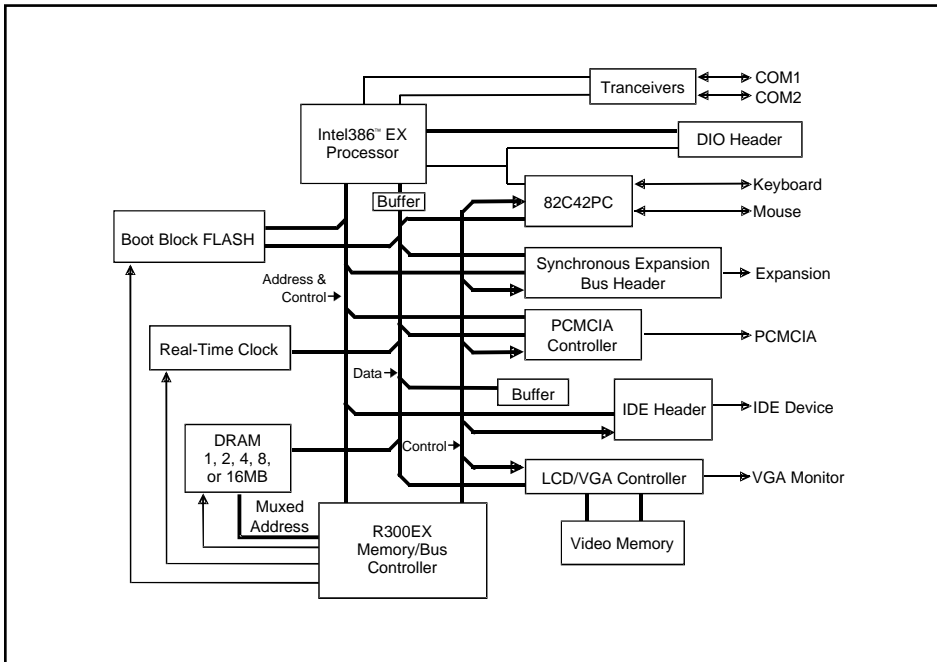
Embedded PC Functionality
R300EX Controller
The R300EX memory/bus controller is a low cost semi-custom device developed

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Intel386™ EX Processor Block Diagram

by Radisys Corp. that reduces board space by combining a number of basic system control functions for the EXPLR1 within a single controller. The R300EX has two primary functions. First, it provides DRAM control taking advantage of pipelining for maximum access speeds. Second, it provides critical system bus signals to enable expansion capabilities to the platform. In addition, the R300EX provides Flash memory control, data bus transceiver control, reset synchronization, ready generation and NMI generation logic.

Embedded Bios and Dos
The EXPLR1 comes with a custom BIOS developed by Phoenix Technologies supporting the Intel386 EX processor and device drivers for all hardware supported devices. In addition, a ROM version of MS DOS supported by Annabooks comes installed on the EXPLR1 board. As other BIOS's and DOS's become available they will be supported on the Intel applications BBS.

LCD/VGA Controller
Local bus graphic support is provided by a Cirrus Logic CL-GD6245 LCD/VGA controller. The 6245 supports 640 x 480 dual or single-scan color or monochrome STN LCDs and color or monochrome TFT LCDs. CRTs are supported with resolutions up to 1024 x 768 with 16 colors or 800 x 600 with 256 colors. The 6245 also provides simultaneous CRT and LCD operations. VGA uses a standard DB15 connector. LCDs can be attached using a 50 pin high density header.

PCMCIA and IDE Control
The EXPLR1 provides a number of methods for accesses and executing applications. The on-board single slot Type II PCMCIA controller provides access to PCMCIA modules as well as a means to support large file transfers using portable media. A 40 pin header enables the more conventional method of booting your embedded design via an IDE controlled hard drive.

Flash Installation Utility
The flash installation utility establishes communication between the serial port and the flash support utility. A hardware switch allows the install software to download an embedded application into ROM (flash). The utility also allows for downloading other software such as another operating system or debug monitor. The flash utility accepts Intel OMF-386 bootloadable format, Intel hex format, or absolute memory image. The flash utility allows displaying the directory of programs stored in flash memory on the EXPLR1.

System Requirements
The EXPLR1 is an embedded PC evaluation platform that does not require any additional hardware to run DOS based applications. The board includes both the BIOS and OS in ROM. Just attach any VGA CRT, a PS/2 keyboard and mouse, and power supply to begin.

Ordering Information
To order the Reference Design Kit associated with the board call 1 (800) 548-4725 and request order number 272768; to order the EXPLR1 board contact your local Intel distributor, request Product Code: EX386EXPLR1.