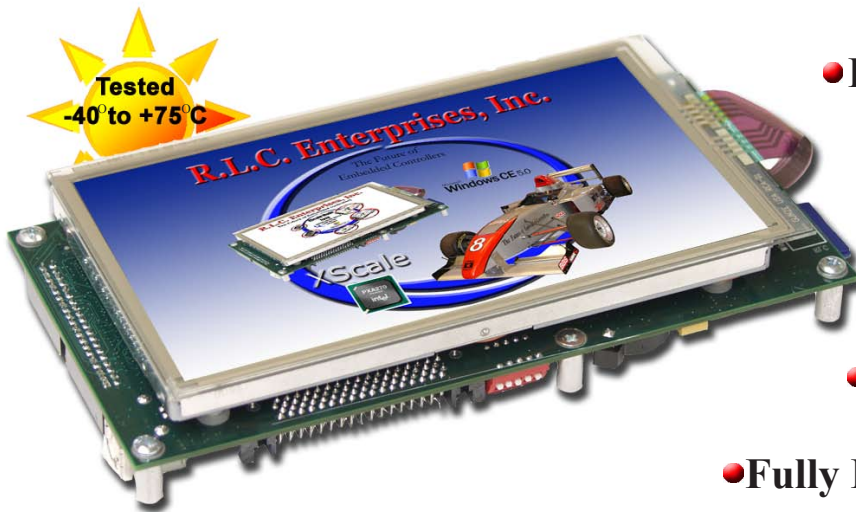


# Enterprises, Inc.

2985 Theatre Drive, Paso Robles, CA 93446  
Phone (805) 239-9737 Web Site: [www.rlc.com](http://www.rlc.com)

## **XScale-Extreme** (Extended Temperature)



- Windows CE 6.0 OS Pre-Installed
- Platform Builder Not Required
- Expandable On-Board I/O
- Visual Studio Ready
- Application Ready
- Over 40 Demos Provided
- Fully Integrated And Complete

## Embedded Touch Screen Computer

The **New XScale-Extreme** (Extended Temperature) 32-Bit Embedded Single Board Computers feature a complete Windows CE 6.0 operating system pre-installed and can easily run your applications written in Microsoft Visual Basic, Visual C#, or Visual C++. Key hardware features include an Intel XScale RISC Processor, DRAM and FLASH Memory, Solid State Disk, Real Time Clock, Serial Ports (2), LCD Color Graphics Display, Touch Screen, PCMCIA Card Slot, SD Card Slot, USB Host Port (1), USB Client Port (1), Analog Inputs (4), Digital I/O (16), Audio Out, Pulse Width Modulation (2), Expandable I/O Bus, and much more. Remote debug, drag and drop, and software development via USB is fully supported.

### Hardware Features

- Intel XScale PXA270 RISC Processor
- 520 MHz Clock Speed
- 1 Giga-byte FLASH Memory
- 64 Mega-bytes On-Board DRAM
- 6.5 in. Sunlight Readable, Extended Temperature Color LCD Display
- Touch Screen (Resistive)
- PCMCIA Card Interface
- SD Card Interface
- RS-232 Serial COM Ports (2)
- USB Host Port (1)
- USB Client Port (1)
- Real Time Clock (Battery Backed)
- Pulse Width Modulation (2)
- User I/O Expansion Bus
- Audio Output (Stereo)
- Analog Inputs (4)
- Digital I/O (16)

### Software Features

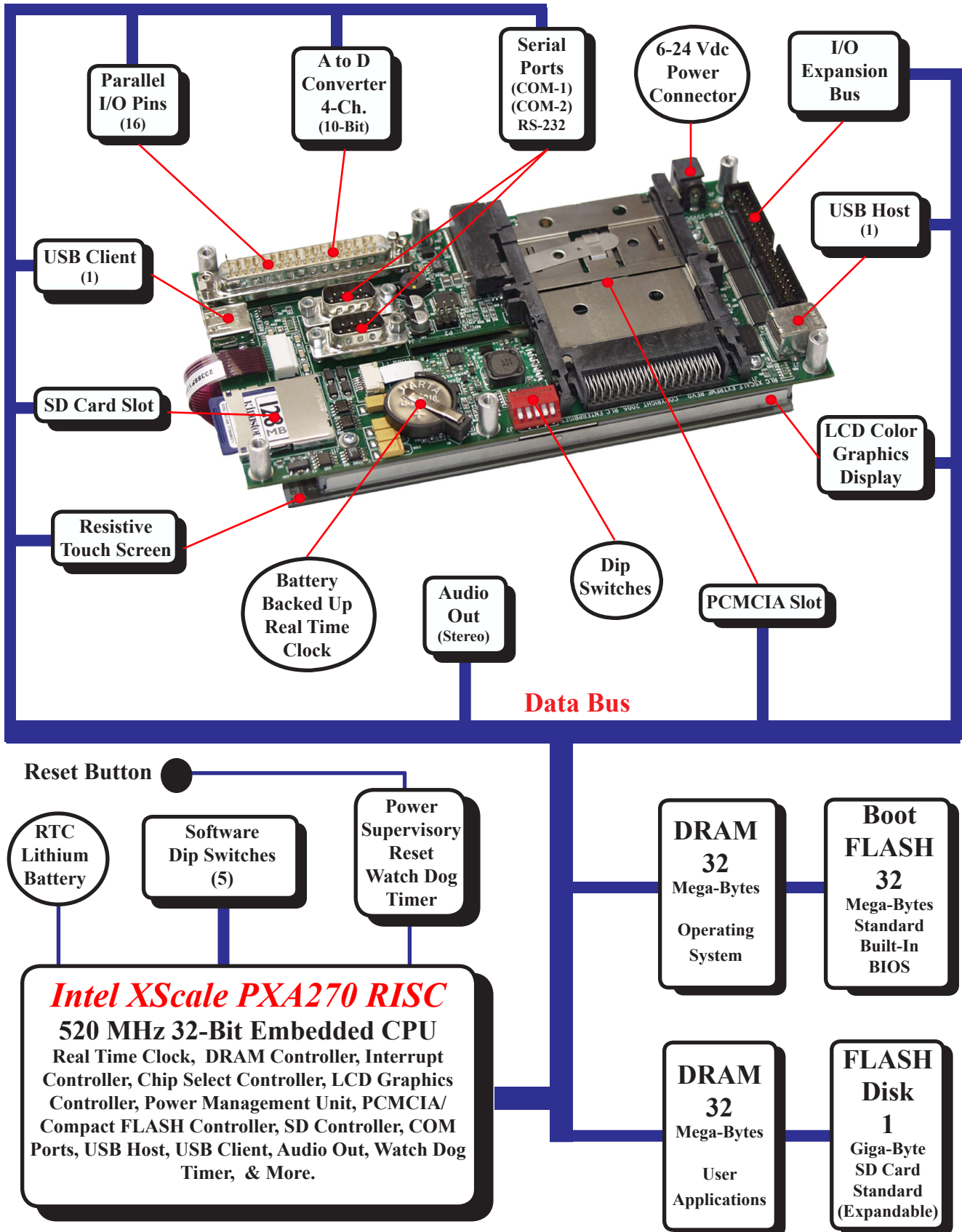
- Windows CE 6.0 Pre-Loaded
- Microsoft Compact Framework 3.5
- Visual Studio 2005/2008 Supported
- Visual Basic Supported
- Visual C# Supported
- Visual C++ Supported
- Remote Debug Supported
- Remote Display Supported
- Demo Programs With Source Code

*The Future of Embedded Controllers™*

Copyright 2008, R.L.C. Enterprises, Inc. All Rights Reserved. Specifications may change without notice.  
XScale is a Trademark of Intel Corp. Windows is a trademark of Microsoft Corp.

# XScale-Extreme

## On-Board I/O and Functionality Block Diagram



# XScale-Extreme Description

## Intel XScale RISC CPU

The **XScale-Extreme** features the Intel XScale PXA270 RISC processor chip. The chip provides a 520 Mhz, low-power CPU and a complete set of Windows CE compatible peripherals suitable for embedded applications. The extended temperature range (-40°/+75°C) gives the unit an edge in rugged environments. Fully integrated compatible peripherals include an LCD graphics controller, DRAM controller, PCMCIA/Compact FLASH controller, SD Controller, Real Time Clock, Watch-Dog-Timer, two serial ports, one USB host port, one USB client port, audio output, and more. The Intel XScale RISC CPU is targeted for low power embedded applications that require high performance. The XScale-Extreme is fully supported by the Microsoft Visual Studio 2005/2008 and the Microsoft Embedded Visual Tools for application development using Visual Basic, C#, and Visual C++.

## On-Board FLASH/DRAM Memory

The **XScale-Extreme** provides 64 MB of high speed DRAM, 32MB available for the user, 32 MB of on-board BOOT FLASH memory, and 1 GB of FLASH Memory via SD Card which is user expandable. Additional FLASH memory may also be added using ATA FLASH cards via the USB, PCMCIA or SD Card interface. All necessary drivers are built into the operating system. A BIOS with built-in loader and flash programmer is contained in a protected region of the on-board BOOTFLASH memory. The Windows CE file system is compatible to a standard Windows desktop platform, therefore, program transfers into FLASH DISK memory space using standard drag and drop and your desktop Windows Explorer are fully supported.

## COM / Serial Ports (1-6)

The **XScale-Extreme** provides two (2) standard serial ports (COM-1, COM-2). Each serial port provides RS-232 receivers and drivers for Tx, Rx, RTS, and CTS signals on a standard DB-9 connector. The number of COM ports can be expanded to a total of six (6) using off-the-shelf I/O modules from RLC. Drivers for six (6) COM ports are provided in the RLC Windows CE operating system that comes pre-installed on the XScale-Extreme.

## Color Display & Touch Screen

The **XScale-Extreme** features a built-in color LCD graphics display controller and a resistive touch screen controller. This driver is used to drive the attached 6.5 in. sunlight readable, extended temperature display. The display features 400x240 graphics, 64,000 colors and a software controllable CCFL back light system.

## Standard I/O Interfaces

The **XScale-Extreme** provides (2) RS-232 Serial Ports, (1) USB Host Port, (1) USB Client Port, Audio Out (stereo), (4) channels of 10-Bit A to D conversion, (16) Parallel I/O lines, User I/O Interface, and more. These standard I/O interfaces and features are made available on standard connectors on the back side of the main CPU board. Software drivers and demonstration programs with source code are provided for each of these I/O functions.

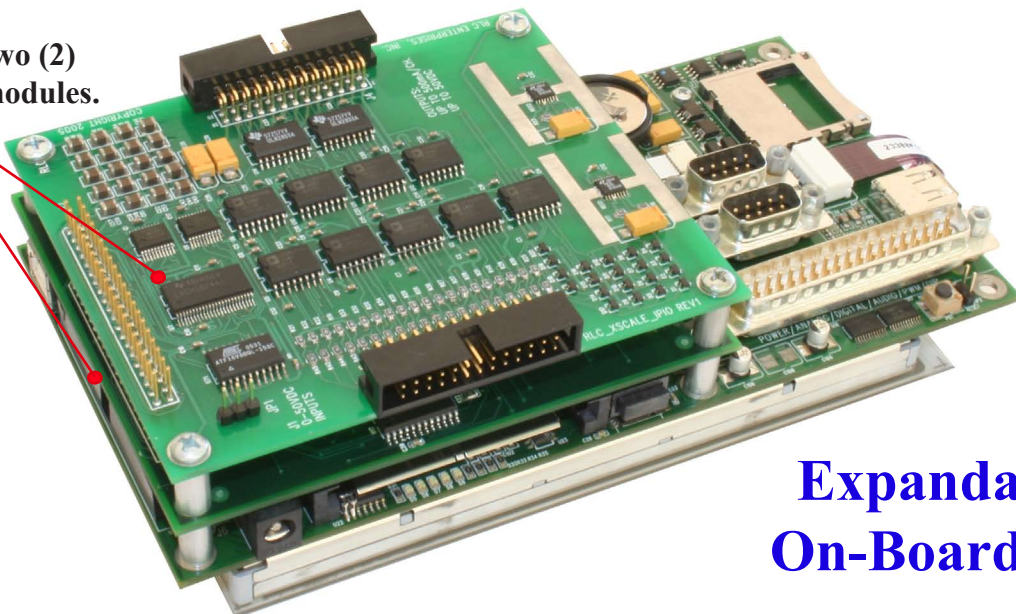
## PCMCIA/CF/SD Card Slots

One (1) full size PCMCIA and one (1) SD card slot is provided. Full size PCMCIA cards are accepted. Compact FLASH cards are also accepted when used with an adapter. Ethernet, Wireless Ethernet, Modem, SD FLASH and Micro hard drives are supported.

## User I/O Expansion BUS

The **XScale-Extreme** provides an interface connector with access to the CPU address lines, data lines, chip selects, interrupts, and control signals. You can use this interface to add your own custom I/O designs or to add any of our off-the-shelf I/O expansion modules. Software demos and drivers are provided for interfacing to the I/O and Interrupts. Schematics are also available for engineers to help create their own custom I/O designs when off-the-shelf I/O cannot be used.

Shown with two (2)  
stackable I/O modules.



**Expandable  
On-Board I/O**

# Software Application Development

Our custom Windows CE 6.0 platform is pre-installed onto all of the **XScale-Extreme** Embedded Single Board Computers. It is so complete that you can start writing your application the same day you receive your development kit! Platform Builder is not needed with our units. We save you months of unnecessary work, get a jump start on your project with one of our units!

R.L.C. development systems provide all the necessary hardware and software needed to develop software applications using Microsoft Visual Studio 2005/2008. Demonstration programs are pre-installed, ready to run, and are also provided on a separate CD with source/project files included for your own use. Software remote debugging and file/program transfers are fully supported using a simple USB cable.

**Visual Studio  
2005/2008**

Microsoft  
**Windows CE 6.0**



**Visual Basic, Visual C++ and VisualC#**

## I/O And User Interfaces Specifications

### Serial Ports:

Two (2) serial ports COM-1 and COM-2, provide DTE style (Rx, Tx, RTC, CTS) RS-232 signals. DB-9F locking connectors are provided on the back of the main CPU board. A null-modem is not required to connect directly to a PC.

### Parallel / Digital I/O Ports:

Sixteen (16) Bits of parallel I/O are provided. They are arranged in groups of 8-bits. Each 8-bit port can be used as Input or Output. The lines are TTL compatible with up to 50 mA of source and sink ability per channel. A maximum of 300 mA for all 16 channels.

### Analog Inputs:

Four (4) channels of A to D conversion, 10- Bit resolution. Input voltage range 0 to 7 Vdc +-1% accuracy.

### Audio Out & Media Player:

Audio output is provided for playing stereo type audio signals, .WAV and MP3 files can be played. A media player is provided and supports AVI and MPG files. An amplifier may be necessary to drive speakers direct.

### PCMCIA, CF, & SD Card Interface:

One (1) PCMCIA and one (1) SD card slots are supplied to support Ethernet, Modem or FLASH memory cards. Software drivers are included in the pre-installed Windows CE operating system. Compact FLASH cards, with an adapter, can be used in the full size PCMCIA card slot.

### Ethernet:

XScale-Ethernet add-on I/O module or wired Ethernet Compact FLASH card using an adapter in the PCMCIA socket.

### USB Ports (2):

One USB host and one USB client ports are provided, version 1.1. The pre-installed operating system includes drivers for Active Synch, Remote Display, keyboard, mouse, and USB FLASH sticks.

### User I/O Expansion BUS Interface:

An I/O interface to the on-board Intel XScale RISC CPU is provided. (16) Data Lines, (8) Address Lines, (4) Interrupt Lines, Chip Selects, I/O Read, I/O Write, RESET, \*RESET, 5Vdc, GND. Example schematics and software drivers are provided.

## General Specifications

### Power Requirements:

Single unregulated 6-24 Vdc power source.  
Full power mode: 5700 mW (with display)  
Suspend mode: 480 mW (with display)

### CPU Clock Speed:

Intel 32-Bit Intel XScale PXA270 RISC processor running at 520 Mhz.

### Boot Time:

Unit will boot in 6-8 seconds.

### On-Board Memory:

64MB of DRAM, 32MB available for user. 32MB of BOOT FLASH, 1GB of FLASH Memory via SD Card (expandable).

### Environmental Testing:

Each unit is tested in an environmental chamber and certified to meet specifications.  
Operating temperature: -40° to +75° C  
Storage Temperature: -30° to +85° C

## Display And Touch Screen Option

### LCD Sunlight Readable, Extended Temperature Display:

The XScale-Extreme comes with a 6.5 in. sunlight readable, transfective, extended temperature color TFT (400x240, 64,000 Colors) VGA LCD Display. With no extra configurations or integration, the display mounts directly to the XScale-Extreme. The display includes integrated power supply, backlight inverter, backlight controls and an optional integrated resistive touch screen.

## Operating System

The XScale-Extreme comes with a pre-installed Windows CE 6.0 operating system which allows for fast and easy application development. The operating system is stored in a permanent section of FLASH that you or your customer can not alter or erase. You can either boot to the familiar Windows desktop or directly to your application. The operating system includes such features as internet browser, media player, file server, and web server. Many device drivers are built-in including USB FLASH storage, keyboard and mouse support, headless remote display, wireless Ethernet, and more. Please visit our website, [www.rlc.com](http://www.rlc.com), for more details.