



Enterprises, Inc.

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

XScale-Mini
PXA270, 520 MHz



- 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 Computer

The **New XScale-Mini** 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 Controller, Touch Screen Controller, 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, file drag and drop, and Ethernet are fully supported. 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
- Compact, Small Footprint
- Color LCD Display Port
- 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

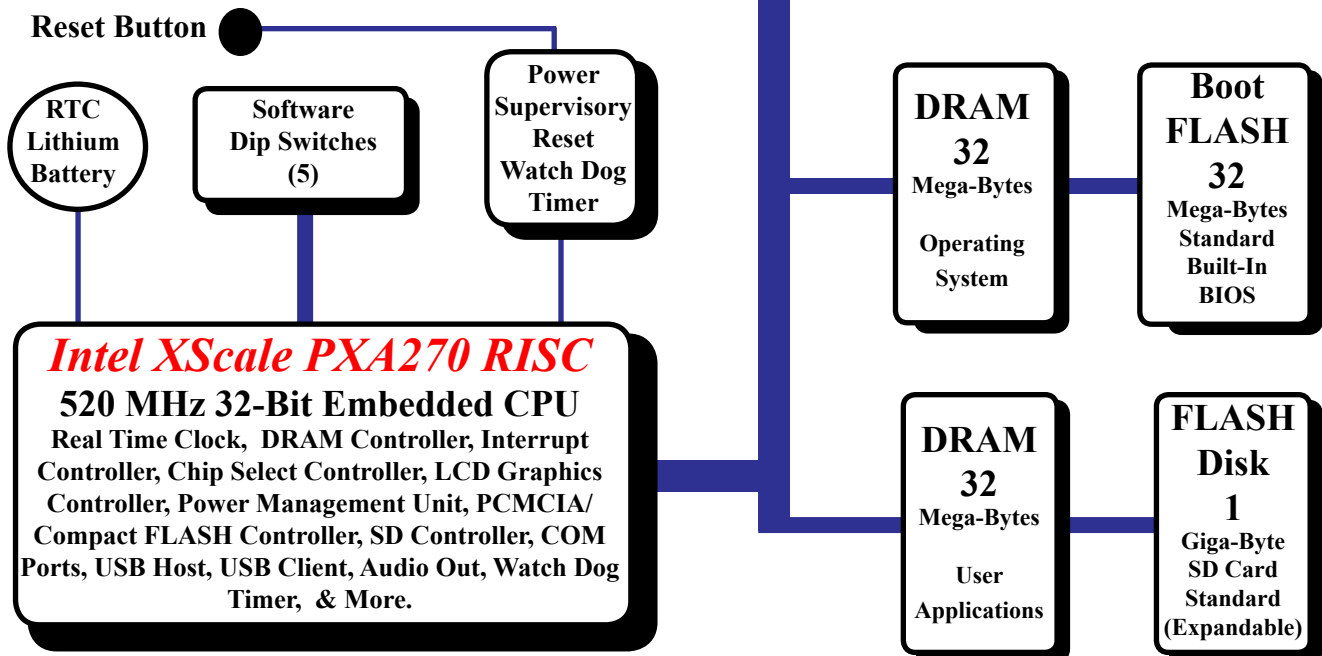
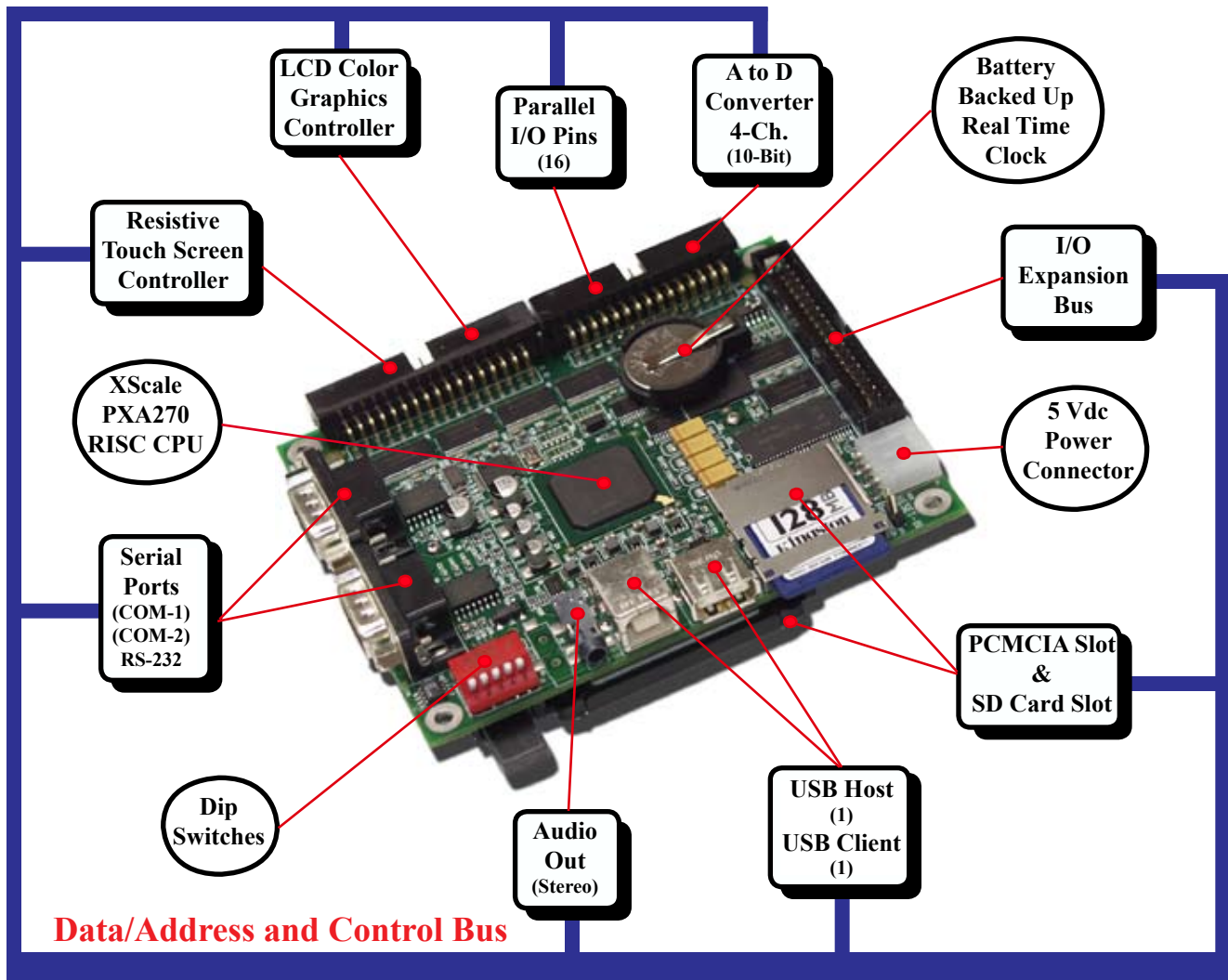
- Windows CE 6.0 Pre-Loaded
- Microsoft Compact Framework 3.5
- Visual Studio 2005/2008 Supported
- Visual Basic Supported
- Visual C# Supported
- Visual C++ Supported
- Remote Debug Supported
- Remote Display Supported
- Demo Programs With Source Code

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-Mini

On-Board I/O and Functionality Block Diagram



XScale-Mini Description

Intel XScale RISC CPU

The **XScale-Mini** 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. Fully integrated compatible peripherals include an LCD graphics controller, DRAM controller, PCMCIA/Compact FLASH controller, SD Controller, Real Time Clock, Watch-Dog-Timer, two RS-232 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 which require high performance. The XScale-Mini is fully supported by the Microsoft Visual Studio 2005/2008 and the Microsoft Embedded Visual Tools for application development using Visual Basic, Visual C#, and Visual C++.

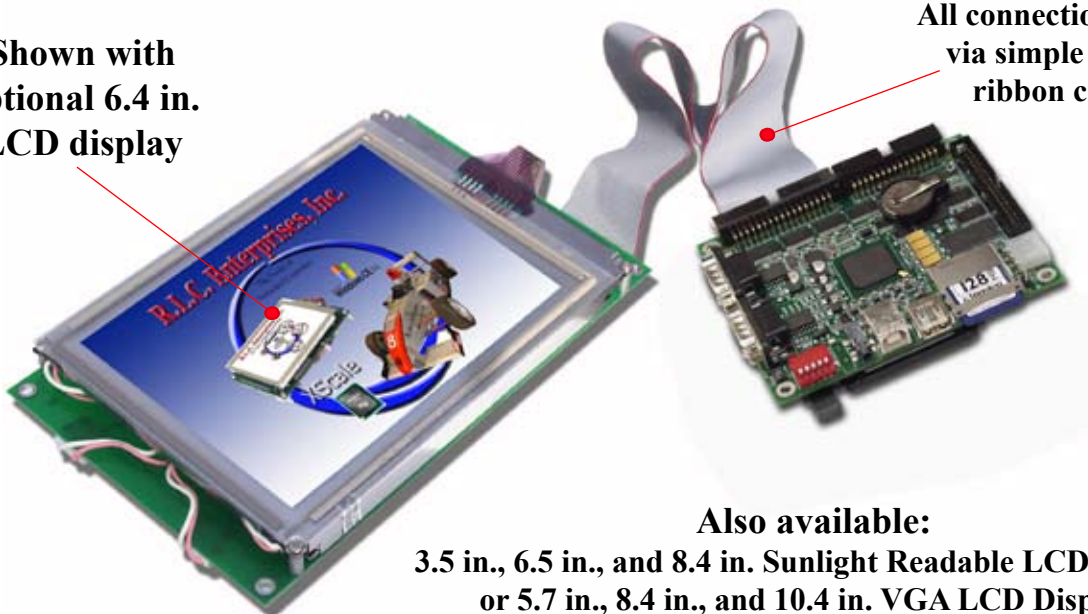
On-Board FLASH/DRAM Memory

The **XScale-Mini** provides 64 MB of high speed DRAM, 32 MB available for the user, 32 MB of on-board BOOTFLASH 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

COM / Serial Ports (1-6)

The **XScale-Mini** 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 serial 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 5.0 operating system that comes pre-installed on the XScale-Mini.

Shown with
optional 6.4 in.
LCD display



Color Display & Touch Screen

The **XScale-Mini** features a built-in color LCD graphics display controller and a resistive touch screen controller. You can use this interface to add a variety of LCD displays and touch screens. This interface is through a 34-pin ribbon cable connection. The Windows CE operating system that is provided on the XScale-Mini has many display drivers built into the operating system.

Standard I/O Interfaces

The **XScale-Mini** 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 pins, 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 used with an adapter can also be used. Ethernet, Wireless Ethernet, SD FLASH and Micro hard drives are supported.

User I/O Expansion BUS

The **XScale-Mini** 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.

All connections made
via simple 34-pin
ribbon cable.

Also available:

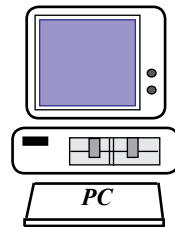
3.5 in., 6.5 in., and 8.4 in. Sunlight Readable LCD Displays
or 5.7 in., 8.4 in., and 10.4 in. VGA LCD Displays

Software Application Development

Our custom Windows CE 6.0 platform is pre-installed onto all of the **XScale-Mini** 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**



USB



Visual Basic, Visual C++ and Visual C#

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 slot is supplied to support Ethernet, Modem or FLASH memory cards. Software drivers are included in the pre-installed Windows CE operating system. Compact FLASH, used with an adapter, cards 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 (1) USB host and one (1) 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

On-Board Memory:

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

Boot Time:

Unit will boot in 6-8 seconds.

Environmental Testing:

-10 to +60 C with air flow and no condensation.

CPU Clock Speed:

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

Power Requirements:

Regulated 5 Vdc or unregulated 6-24 Vdc with optional power supply module.

Full power mode: 1248 mW (without display)

Suspend mode: 168 mW (without display)

Extended Temperature Option

The XScale-Mini is also available in an extended temperature version, the XScale-Mini-ET. It has all of the same functionality as the regular XScale-Mini computer boards, just modified with special extended temperature parts to meet the extreme temperature specifications. Each unit is tested in an environmental chamber to make sure that the unit will boot and run at temperatures between -40 to +85 C. Each unit comes with a certificate that guarantees it has met the temperature specifications.

Display And Touch Screen Options

LCD Display Options: (Off-The Shelf)

RLC offers a 5.7 in., 6.4 in., 8.4 in., or a 10.4 in. color TFT (640x480, 64,000 Colors) VGA LCD Display. RLC also offers a 3.5 in., 6.5 in., and 8.4 in. sunlight readable, extended temperature color LCD display. With no extra configurations or integration, these displays can plug directly into the XScale-Mini. These displays include integrated power supply, backlight generator, backlight controls and an integrated resistive touch screen.

*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.*