

Features

- ◆ Compact size high-performance EIA-709 network node
- ◆ ARM7 CPU @ 60 MHz (LC3020A-240)
- ◆ 8 Mbytes FLASH memory
- ◆ 16 Mbytes SDRAM memory
- ◆ L-Chip™ based EIA-709 network interface
- ◆ 10/100 Mbit/s Ethernet interface
- ◆ 2x UART
- ◆ CSI (SPI) interface, master and slave mode
- ◆ Watchdog timer, 2x 16-bit hardware timer
- ◆ Clock and reset generation on-board
- ◆ Up to 72 user programmable I/Os
- ◆ I/O, address and data bus available on connector for user expansion
- ◆ JTAG interface for software debugging
- ◆ Supports various transceivers: FT-10/LPT-10, TP-1250, RS-485, PLT-22
- ◆ Bit-rates between 300 bps and 2.5 Mbps
- ◆ RTEMS real-time multitasking operating system (incl. TCP/IP stack and web server)
- ◆ ORION protocol stack for high-speed EIA-709 connectivity
- ◆ Optional CNIP library for EIA-852 communication
- ◆ Optional BACnet library from Cimetrics
- ◆ L-Core support library (high-level API for on-board Flash filesystem, watchdog timer, etc.)
- ◆ Powerful Eclipse development environment for Windows
- ◆ GNU tool-chain
- ◆ No additional license fees¹
- ◆ SO-DIMM (68 x 38 mm) form factor
- ◆ 200 position SO-DIMM connector
- ◆ 3.3 V DC supply voltage @ 400 mA

Overview

The L-Core™ suite is LOYTEC's contribution to the emerging embedded market having a need for high-performance embedded nodes in control networks. LC3020 controller based platforms offer a high grade of flexibility and power without a bottle-neck between the application and the network, making it an ideal basis for the development of next generation devices like high-speed gateways or sophisticated controller applications.



The L-Core XP philosophy is to provide a solution for building high-performance EIA-709 nodes at a very affordable cost. This can be achieved by either using the L-CORE XP module, a core module (SO-DIMM form factor!) that comes with a powerful ARM7 CPU LC3020, 8 Mbytes Flash memory, 16 Mbytes SDRAM, clock and reset circuitry, or by designing the L-Core components directly onto the target hardware.

The L-Core XP helps developers to concentrate on the application when building new EIA-709 nodes. LOYTEC provides a complete Open Source Real-Time Multitasking Operating System (RTEMS - see also www.rtems.com) as well as a library including LOYTEC's high performance ORION protocol stack for L-Core XP. And the best of all - when using the L-CORE module it is royalty free.

The development kit uses the popular GNU-Tools integrated into the powerful Eclipse development environment. These tools can either be installed on a native Linux host PC or on a Windows® platform.

Architecture

An L-Core-based node consists of the L-Core XP module and a motherboard. The L-Core XP module is a low-cost, high performance EIA-709 network node. Its small SO-DIMM style form-factor measures only 68 x 38 mm and it is only 6.6 mm thin. A powerful 60 MIPs ARM7 CPU executes the RTEMS real-time operating system, the ORION protocol stack, and leaves enough horse power for computing intensive user applications. 8 Mbytes of on-board FLASH and 16 Mbytes on-board SDRAM allow room for the most demanding user programs.

¹When using the L-CORE XP module

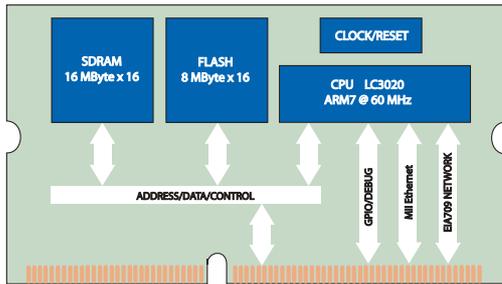


Figure 1: L-CORE-MOD block diagram.

The motherboard has a 200 position SO-DIMM connector to plug in the L-Core XP module, an ANSI/EIA-709 transceiver, sensors/actuators and, if required, other peripherals. A high-performance EIA-709-to-IP gateway can be built by connecting an external Ethernet PHY to the core module. A TCP/IP protocol stack already comes with the RTEMS real-time operating system, so does a web server from goahead.

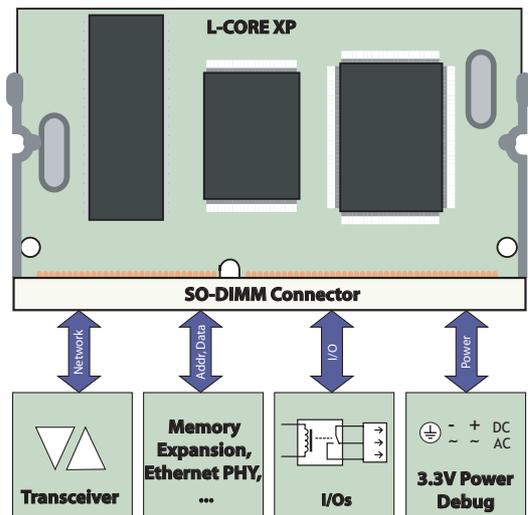


Figure 2: Block diagram of a typical network node using the L-CORE XP core module

Development

Standard GNU tools like C-compiler and source-level debugger can be used to develop and debug the application code that will be linked to the pre-compiled RTEMS real-time operating system and ORION EIA-709 protocol stack. To get started with L-Core XP we recommend ordering the L-CORE-KIT (Design Kit for ORION Embedded Controller Core Module), which includes:

- ◆ RTEMS 4.0 operating system including BSP (Source Code and Binary)
- ◆ GNU development environment for Linux and Windows® (Source Code and Binary)
- ◆ Eclipse Integrated Development Environment
- ◆ Full featured ORION protocol stack library
- ◆ L-Core XP Hardware Support Library (high-level functions to use on-board flash memory, CPU watchdog timer, etc.)
- ◆ L-CORE XP core module
- ◆ L-CONTROL XP development board
- ◆ Complete documentation
- ◆ LC3020 reference design schematics
- ◆ Application notes

For a quick start LOYTEC offers a two days training course on all the L-Core XP essentials. Designing a high-performance EIA-709 network node has never been easier or faster. Within just a few hours developers can put new network nodes in operation.

Licensing

When using the L-CORE XP modules there are no additional fees - everything is already included in the module price. When designing the L-CORE XP circuitry onto a custom board design a small royalty applies in order to use the ORIONStack™ library.

Order Information

Order Number	Description
L-COREXP-F8R8B16	L-Core XP module, SO-DIMM form factor, ARM7 CPU@60MHz LC3020B-240, 16 Mbytes SDRAM, 8 Mbytes FLASH memory, 16-bit databus width.
L-CORE-KIT	The package for the developer: ORION protocol stack library, RTEMS and GNU source code, Eclipse IDE, complete user documentation, development board, application notes, 12 month free updates and new releases.
LTRAIN-LCORE	Two days training course on L-Core XP essentials.

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