LP3500

MODELS | LP3500 | LP3510 |

Low-Power Single-Board Computer

Key Features

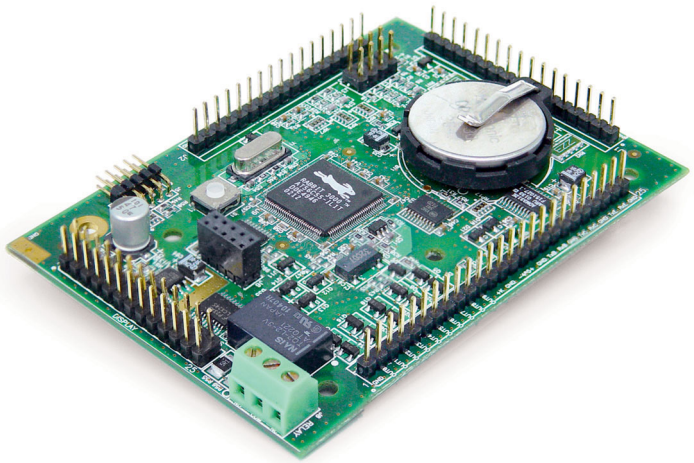
- Low-EMI Rabbit® 3000 microprocessor
- Socketed 3 V lithium battery
- 8 A/D converter inputs with programmable gain
- 6 serial ports (1 RS-485, 3 RS-232, 2 TTL)
- Optional keypad/display, serial Flash, peripherals

Design Advantages

- Power-save mode draws <100 µA
- Low operating consumption: <20 mA at 7.4 MHz

Applications

- Remote telemetry units (RTUs)
- Pipeline monitoring
- GPS/asset tracking
- Handheld wireless devices
- Remote data acquisition
- Electrical transmission line monitoring
- Other applications that require low-power control



The LP3500 is a low-power single-board computer designed to operate reliably in any place it is deployed, especially where power is limited, such as in portable, hand-held, battery-powered, remote monitoring systems. The LP3500 features built-in analog and digital I/O, while consuming less than 20 mA when fully operational and less than 100 µA in power-save mode.

The LP3500 incorporates the low-EMI Rabbit 3000 microprocessor, up to 512K each of Flash and SRAM, 26 industrialized digital I/O, A/D converter inputs and PWM outputs, 6 serial ports, one relay, and two dedicated function ports for easy connection to serial Flash, keypad/display, and other devices. The LP3500 runs at up to 7.4 MHz at a variety of power levels under software control, thereby accommodating a wide range of operating conditions. The board is equipped with 0.1" connectors, and users can supply their own cables or plug the SBC directly into sockets on their motherboard. The LP3510 is a lower-cost model without A/D or relay features.

A socketed coin-type battery facilitates long-term data storage (SRAM) and real time clock (RTC) operation. When powered by an external battery or power supply (3-30 V DC), the unit can be awakened from the power-save mode by an internal timer, an RS-232 signal, or via polling of an

external input. The LP3500 can be switched from power-save mode to full operation and back again via software control. In addition, various sections of circuitry (e.g., RS-232 ports) can be switched off via software control to further conserve power when not in use.

The LP3500 can be mounted to a panel or plastic mounting base that allows I/O connections via traditional connectors with 0.1-inch spacing, or it can be inverted and directly mounted to mating connectors on a customer-designed motherboard. The first approach is appropriate where I/O connections go directly to devices and switches, while the second method is suitable where additional circuitry is incorporated on the motherboard.

Programming the LP3500

Programs are developed and debugged with Rabbit's industry-proven Dynamic C® software. The programming device is connected via a serial cable, or a USB cable. Comprehensive debugging support includes break points, watch expressions and many other extensive features oriented toward real-time embedded systems programming. An extensive library of drivers and sample programs is provided, including a royalty-free TCP/IP stack for network and Internet communications as well as full source code for most library routines.

Development Kit

The LP3500 Development Kit contains software and hardware tools needed to begin design including a demo board, Dynamic C software and documentation on CD-ROM, User's Manual with schematics, serial cable for programming and debugging, AC adapter (US/Canada only), wiring assembly, and friction-lock crimp pins and housings (standard crimping tool sold separately).

LP3500 Specifications			
Feature		LP3500	LP3510
Microprocessor		Rabbit® 3000 at up to 7.4 MHz	
EMI Reduction		Spectrum spreader for ultra-low EMI (radiated emissions)	
Flash Memory		512K (2 × 256K)	256K
SRAM		512K	128K
Backup Battery		Socketed 3 V lithium coin Panasonic® CR2330, 265 mA·h, supports RTC and SRAM, connection for user-supplied external battery	
Keypad/Display		Supports optional LCD/keypad module with 7 keys and 122 × 32 graphic display	
Digital Inputs		16: fully protected 0–36 V DC, can handle short spikes ±40 V	
Digital Outputs		10: 8 sink up to 200 mA each, 36 V DC max.; 2 source up to 200 mA each, 36 V DC max.	
Relay Output		1 C-form, 1 A, 30 V DC	None
Analog Inputs	General	• Eight single-ended or four differential inputs • 1MΩ input impedance • Sampling rate up to 200 samples/s • Eight software-controlled ranges from 0–1 V to 0–20 V DC	None
	Single-Ended	• Resolution: 11 bits (8-bit accuracy) • 4 channels can be set individually for 4-20 mA • 1 channel has software-selectable voltage-monitoring option	
	Differential	Resolution: 12 bits (9-bit accuracy)	
Analog Outputs		3 unfiltered pulse-width modulated, 1 kΩ output impedance	None
Serial Ports		6 shared high-speed, CMOS-compatible ports: • 1 RS-485 • 3 RS-232 (one 5-wire plus one 3-wire or three 3-wire) • 1 logic-level serial interface for optional add-ons • 1 asynchronous clocked serial port dedicated for programming	
Serial Rate		Max. asynchronous baud rate = CLK/8	
Real-Time Clock		Yes	
Timers		Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers	
Watchdog/Supervisor		Yes	
Pulse-Width Modulators		10-bit free-running counter and 4 pulse-width registers	
Power		3 V to 30 V DC 20 mA (max.) @ 7.4 MHz, 100 µA max. @ 2 kHz (with linear regulator turned off)	
Operating Temperature		–40° C to +70° C	
Humidity		5% to 95%, non-condensing	

Connectors		• 0.1″ headers
		  • I/O and misc. signals: one 1 × 25, two 1 × 17 headers
		  • Display: one 2 × 13 header
		• 2 mm headers
		  • Programming port: one 2 × 5 header
		  • Serial interface: one 2 × 4 socket
		• Screw-terminal headers
		  • Relay: one 3- position screw-terminal header	

Board Size		2.60″ × 3.65″ × 0.45″ (66 mm × 93 mm × 11 mm)	
Pricing			
Price (qty 1/25) Part Number		$199/$175 20-101-0525	$149/$131 20-101-0526
Development Kit Part Number		$399 U.S. 101-0525/101-0529 Int'l 101-0525 / 01-0530	$349 U.S. 101-0526/101-0529 Int'l 101-0526/101-0530

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