THE LEADER IN

SINGLE-BOARD COMPUTERS

FOR EMBEDDED CONTROL

- Single-Board Computers
- Operator Interface SBCs
- Core Modules
- Embedded Software




20 YEARS STRONG • 20 YEARS STRONG • 20 YEARS STRONG • 20 YEARS STRONG

2003-2004 Z·World Product Catalog

Z·World Single-Board Computers for

Embedded Control · Communications · Ethernet Connectivity

Legend

- Display meets NEMA 4 water-resistance standards (see user manuals)
- Serial Only/Non-Ethernet
- Ethernet and Serial Communication
- Low-Power

CE Mark Certification

Z·World submits many products for CE mark testing and certification. Please visit our website for product CE testing information and the most current CE test status.

Quality Technical Support

If you have technical questions and need expert answers, Z·World provides technical support for both hardware and software issues. Our highly trained Technical Support Team is ready to assist you from 8:00 a.m.–5:00 p.m., Pacific Time. Visit our website's Technical Support Center for complete product documentation, frequently asked questions, customer bulletin board, technical notes, white papers, and our Tech Support E-mail Request Form.

Visit www.zworld.com/support

Founded in 1983, Z·World is a pioneer in the embedded controls market, serving OEM customers in all industries. We offer a comprehensive line of low-cost single-board computers (SBCs), as well as operator interfaces, core modules, expansion boards, and Ethernet/Internet connectivity products—everything needed to develop a complete embedded system application.

In 1989, Z·World introduced Dynamic C®, the first integrated software development system specifically designed for embedded systems. Z·World's integration of hardware and software greatly reduces OEM development time and costs. Z·World maintains its leadership position in the embedded controls market by continually adding innovative functions to Dynamic C, as well as by implementing powerful features—such as Ethernet connectivity—to its product line.

To further serve the embedded controls market and our customers, in November 1999 we introduced a Z·World sister division, Rabbit Semiconductor. This fabless semiconductor company specializes in microprocessors and development tools. You will find high-performance Rabbit microprocessors—characterized by their low EMI, fast number-crunching ability and numerous on-chip peripherals—in most Z·World products. Additionally, if your product volume reaches a level warranting a custom single-board computer, you can design Dynamic C-programmable boards around Rabbit microprocessor-based core modules.

Flexible, Powerful Embedded Control Products

Z·World single-board computer products are easy to use, come in a variety of form factors, and interface easily with other devices. Every programmable product executes multitasking programs in real time, providing superior performance at very low cost. Easy to run out of the box, Z·World products have corresponding tool kits (peripheral hardware and software) or development kits (product, peripheral hardware, and software) that include everything needed to start design and development.

Software That Makes a Difference

Our strategy is simple: Provide customers with a competitive design advantage. That's why we pioneered the Dynamic C development system, which is specifically designed for embedded control applications. Dynamic C is an integrated compiler, editor, and debugger that permits software development right in the memory of a target Z·World system, saving time and speeding development.

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Ordering Information

Z•World is represented worldwide through our direct sales department and a network of international distributors. International orders in countries with Z•World distributors (see back cover) should be placed with the distributor. Customers in all other countries, including the U.S. and Canada, should contact the Z•World Sales Department directly.

Customers from any country may order online anytime. We fill and ship such orders through any authorized distributor or through Z•World direct.

ORDER ONLINE ANYTIME @ www.zworld.com

Taxes

Unless otherwise indicated, all prices and charges exclude excise, sales, value added, use, property, or like taxes that may be imposed by any taxing authority upon the manufacture, sale, or delivery of items sold by Z•World.

Payment

Z•World accepts check, money order, C.O.D., wire transfer, VISA, MasterCard, and American Express. Credit accounts may be opened after first purchase, upon credit approval. Credit accounts are net 30 days from the date of invoice with approved credit.

Shipping and Delivery

Z•World's preferred carrier is UPS, though FedEx is also available. Standard delivery will be made F.O.B. (Free on Board, Origin). Z•World makes every effort to fulfill its delivery commitments; Z•World has no liability for any delays in delivery.

30-Day Money-Back Guarantee

Z•World products are backed by a 30-day, unconditional, money-back guarantee (excluding all low-cost development kits). Products may be returned for credit, exchange, or refund. A Return Material Authorization (RMA) number is required before returning any products to ensure their safe return. Products returned under this guarantee must be unmodified and in their original packaging. We reserve the right to refuse credit for any products that are damaged or not in original form. Volume orders are subject to restocking fees.

All orders are subject to Z•World's standard terms and conditions of sale. A copy of our Standard Terms and Conditions is available on our website or by request.

Contents

Speed Time-to-Market with Industry-Proven

Dynamic C® Development Software

Key Features

- **Full-feature programming editor**
- **Full-feature source and/or Assembly level debugger, no in-circuit emulator required.**
- **Royalty-free TCP/IP stack with source code and most common protocols.**
- **Hundreds of functions in source code libraries and sample programs**
- **Exceptionally fast support for floating-point arithmetic and transcendental functions**
- **RS-232 and RS-485 serial communications**
- **Analog and digital I/O drivers**
- **I²C, SPI, GPS, Encryption, File System**
- **LCD display and keypad drivers**
- **Powerful language extensions for cooperative or preemptive multi-tasking**
- **Loader utility program to load binary images into Z-World targets in the absence of Dynamic C**
- **Create your own source code libraries and augment on-line help by creating "function description" block comments using a special format for library functions**

Royalty-Free TCP/IP

Full TCP/IP stack with source code is provided royalty free in Dynamic C.

Dynamic C® is an integrated C compiler, editor, loader, and debugger designed specifically for Rabbit microprocessor-based products. The Dynamic C integrated development environment provides a platform for developing applications quickly for fast time to market. Since 1990, Z-World's effective integration of hardware and software has helped design engineers develop thousands of successful OEM products.

Dynamic C enhances standard C to facilitate real-time programming for powerful embedded systems. Language extensions include constructs for cooperative and preemptive multi-tasking and protecting writes to variables during power failures. Libraries for standard C functions, board-specific peripheral drivers, chip peripherals, and other features are included in source code format. Assembly language programming is fully supported, and Assembly code is easily mixed with C code for time-critical applications.

Developing software with Dynamic C is simple. Users can write, compile, and test C and Assembly code without leaving the Dynamic C development environment. Debugging occurs while the application runs on the target. Alternatively, users can compile the program to an image file for later loading. Dynamic C runs on PCs under Windows 95, 98, 2000, NT, ME, and XP. Programs are downloaded at baud rates of up to 460,800 bps (dependent on hardware) while the program compiles.

Standard Debugging Features

- **Breakpoints —** Set breakpoints that can optionally disable interrupts.
- **Single-stepping —** Step into or over functions at a source or machine code level.
- **Code disassembly —** The disassembly window displays addresses, opcodes, mnemonics, and machine cycle times. Switch between debugging at machine code level and source code level by simply opening or closing the disassembly window.
- **Watch expressions —** Watch expressions are compiled when defined, so complex expressions including function calls may be placed into watch expressions. Watch expressions can be updated with or without stopping program execution.
- **Register window —** All processor registers and flags are displayed. The contents of general registers may be modified in the window by the user.
- **Stack window —** Shows the contents of the top of the stack.
- **Hex memory dump —** Displays the contents of memory at any address.
- **STDIO window —** `printf` outputs to this window, and keyboard input on the host PC can be detected for debugging purposes.

Dynamic C Modules

Dynamic C includes extensive libraries and sample programs that serve as application templates for fast program development. Dynamic C is included in all tool kits and development kits. Select from a wide range of add-on library modules to customize your unique programming needs. These low-cost modules are sold separately, allowing you to buy only the software capability your application requires, at an optimum cost-savings.

A one-year subscription for telephone tech support is available with or without the most recent upgrade of Dynamic C (e-mail/web-based tech support is free of charge). Additional user licenses, site licenses, and educational licenses are also available.

TCP/IP Libraries and Sample Programs (included in Dynamic C)

HTTP – *Hypertext Transfer Protocol.* The protocol used by web browsers and servers to transfer files, such as text and graphics. Contains facilities for Server Side Includes (SSI) and CGI routines.

POP3 – *Post Office Protocol.* A standard protocol to retrieve e-mail.

TFTP – *Trivial File Transfer Protocol.* Simplified version of FTP that allows files to be transferred from one computer to another over a network. Client and server available.

FTP – *File Transfer Protocol.* Application protocol in TCP/IP stack for transferring files between network nodes. Server with password support for file transfers between network nodes.

SMTP – *Simple Mail Transfer Protocol.* Internet protocol providing e-mail services.

DHCP – *Dynamic Host Configuration Protocol.* A method for a device to assign its network configuration information from a central server.

Socket-Level UDP – *User Datagram Protocol.* Simple protocol that exchanges datagrams without acknowledgements or guaranteed delivery.

Socket-Level TCP – *Transmission Control Protocol.* For reliable full-duplex data transmission.

PING – Network protocol to verify connecting to another host.

***MicroC/OS-II: The Real-Time Kernel* by Jean J. Labrosse -** This new edition of the best-selling book *MicroC/OS, The Real-Time Kernel*, contains over 200 pages of new examples and explanations of the popular real-time kernel. Jean Labrosse shows how the kernel was designed and built and teaches the fundamentals of a multitasking real-time system. Learn about kernel structure, task and time management, intertask communications and synchronization, and dynamic memory allocation. (Included with Micro C/OS-II software module.) 040-0001

Remotely Program and Debug Over Ethernet/Internet

Use our RabbitLink card to remotely program and debug over most networks or the Internet. RabbitLink provides a connection between an Ethernet-based network and the programming connector on any Rabbit microprocessor-based board. (See page 16)

Software Modules (sold separately)

SNMP Source Code – *Simple Network Management Protocol.* A network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security. 101-0642

PPP Source Code – *Point-to-Point Protocol.* A common serial protocol for communicating between computers. Supports transmission of IP packets across a PPP link. 101-0643

RFU Source Code – *Rabbit Field Utility.* Allows customers to modify RFU source code and embed their own proprietary software for distribution to their OEM customers for programming their devices without Dynamic C. 101-0645

AES Source Code – *Advanced Encryption Standard.* Library and sample programs for implementing encryption to a device's communications. 101-0646

Encryption Utility – Executable utility program provides OEM developers the ability to encrypt specific Dynamic C user libraries for distribution to an end user. Provides developer the ability to determine which aspects of source code to protect from modification or viewing by the developer's end user. 101-0647

Single-Board Computers

Key Applications

- Building / Home Automation
- Data Acquisition Terminals
- Elevator Control
- Environmental Monitoring
- Fleet Management / GPS Systems
- Ethernet / Internet Interfacing
- Medical Devices
- Wireless Systems
- Food Service Equipment
- Industrial Automation
- Point-of-Sale / Barcode Scanners
- Packaging Equipment
- Consumer Wastewater Systems
- Conveyer Systems
- Military / Transportation Systems
- Remote Monitoring / Control
- Robotics Control
- Test Equipment
- Marine Systems
- Semiconductor Manufacturing Equipment
- Service Processor / Device Monitoring
- Railway Monitoring Systems
- Electric, Gas & Oil Monitoring

Tool Kits and Development Kits

Easy to run out-of-the-box, Z-World SBCs have corresponding tool kits (peripheral hardware and software) or development kits (tool kit plus selected product model) that include demonstration board, Dynamic C development software and documentation on CD-ROM, User's Manual with schematics, serial cable for programming and debugging, and AC adapter (US/Canada only). Kits may also contain products unique for each SBC model.

Z•World single-board computers (SBCs) are the low-cost control and monitoring solution for robust OEM products and systems. Design engineers worldwide use these compact boards that are rich with digital and analog I/O for controlling a broad array of industrial and product applications. Z•World SBCs are easy to use, come in a variety of form factors, and interface easily with other devices. All of our products are capable of multitasking in real-time while providing superior performance.

Ethernet/Internet Control and Monitoring

Systems with built-in Ethernet can be directly controlled and monitored across networks or the Internet and can also open sockets to remote devices, serve web pages, or send e-mail. Ethernet models are ideal for remotely monitoring and supervising another programmable system, or web-enabling new or existing products. All models can be programmed and debugged over Ethernet/Internet using appropriate accessory hardware and/or application software. The Ethernet interface is fully supported by software to enable network and Internet connectivity.

Z•World SBCs support a broad variety of serial communication ports. All RS-232 and RS-485 are rated at 15 kV for ESD protection. The CMOS-compatible programming port can be used in the user's application after programming is completed. Most SBCs support synchronous serial communications, including SPI, SDLC/HDLC, and I^2C.

Programming Z•World Products

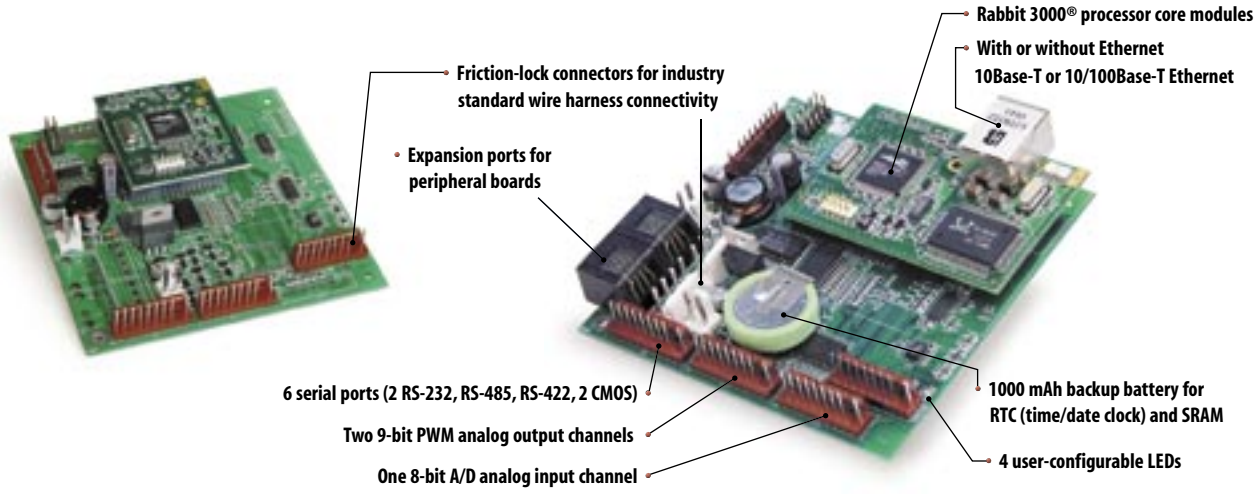
Each SBC is designed for programming with Dynamic C®, the first integrated software development system specifically designed for embedded single-board computers. Z•World's proven integration of hardware and software substantially reduces OEM development time and cost. An extensive library of drivers and sample programs is provided, along with our royalty-free TCP/IP stack with source code.

Z•World SBCs feature Rabbit microprocessors, specifically designed for embedded applications. Z•World SBCs, Rabbit processors, and Dynamic C software were designed in a complementary fashion for maximum performance and ease of use in embedded systems. The following table lists the features of Rabbit-based SBCs.

Shared Features of Z•World SBCs

Feature	Rabbit 2000	Rabbit 3000®
Serial Rate	Max. asynchronous burst rate = CLK/32 Max. sustained rate = burst/2	Max. asynchronous burst rate = CLK/8
Real-Time Clock *(battery backable)*	Yes	
Watchdog	Yes	
Timers	Five 8-bit timers *(5 cascadable)* and one 10-bit timer with 2 match registers	Ten 8-bit timers *(7 cascadable from the first)* and one 10-bit timer with 2 match registers
Operating Temperature	–40° to +70°C	
Humidity	5 – 95%, non-condensing	
Keypad/Display	See our "OP" products for serial display options	

Coyote Models BL2500, BL2510, OEM2500, OEM2510



The BL2500 Coyote gives OEM designers an extremely low-cost embedded control solution. Two standard models—one with Ethernet, one without—feature the Rabbit 3000® microprocessor at 29.4 MHz, with 256K Flash and 128K SRAM (standard).

The Coyote's compact board size is easily mountable in standard 100 mm DIN rail trays. External connections via polarized industry-standard friction-lock connectors enable rapid assembly and I/O connectivity with wire harnesses. A new line of expansion boards (including A/D, D/A, digital I/O, and keypad/display) will interface via the two serial expansion ports.

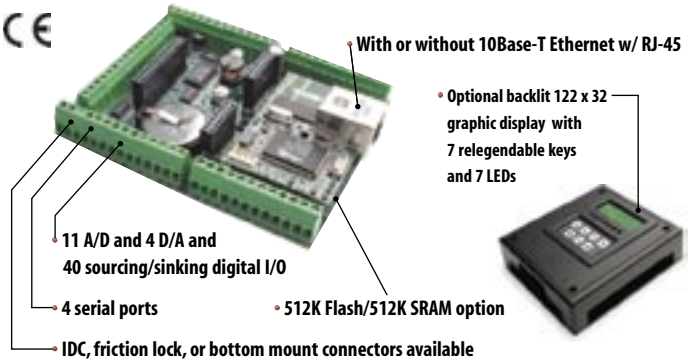
Customized BL2500 models (OEM2500 versions) can be manufactured to user-selected configurations in volumes ≥ 500. Customization helps OEMs realize an extremely low cost, yet maintain a reliable and rugged industrial solution. Our pin-compatible RabbitCore modules provide multiple configurations on the Coyote, including Ethernet, or non-Ethernet versions, and memory upgrades. The optional Ethernet interface (10 Mbps or 10/100 Mbps) allows easy connection to local networks or the Internet. Powerful software allows TCP/IP communication including sending e-mail and serving web pages.

Six serial ports support external communications. Two ports are connected to standard full-duplex RS-232 circuitry. One port allows connection to industry standard multi-drop RS-485 networks. One port, designed to allow serial expansion, is multiplexed through two very high-speed (>1Mbit/ps capability) SPI ports with each line going through RS-422 differential pair signaling. The SPI ports connect to RJ-45 connectors (accepting standard category 5 cabling) for ease of connectivity. One serial port is a 3.3 V CMOS-level port that can either be asynchronous or clocked. The last port is for programming.

(In CE test at press time)

FEATURE	BL2500	BL2510	OEM2500	OEM2510
Microprocessor	Rabbit 3000 @ 29.4 MHz			
Ethernet Port	10Base-T, RJ-45 *(standard)*	None	10Base-T, RJ-45 *(standard)*	None
Flash Memory	256K *(standard)*			
SRAM	128K *(standard)*			
Backup Battery	3 V lithium coin-type, 1000 mA•h, supports RTC & SRAM		Optional	
LEDs	4, user-programmable			
Digital Inputs	16: 15 protected to ±36 V DC, 1 protected to +5/–36V; threshold is 1.5 V nominal.		8 protected to ±36 V DC, threshold is 1.5 V nominal.	
Digital Outputs	8, sink up to 200 mA each, 36 V DC max. standoff voltage			
Analog Inputs	One 10-bit resolution, 8-bit accuracy, input range 0.1–3.1 V, 10 samples/s			
Analog Outputs	Two 9-bit PWM, 0.1–3.1 V DC, 17ms settling time			
Serial Ports	6 serial ports: • 1 RS-485 • 2 RS-232 or one RS-232 *(with RTS/CTS)* • 1 CMOS level asynchronous or clocked SPI • 1 port multiplexed to 2 RS-422 clocked SPI ports • 1 CMOS compatible serial port *(programming)*		5 serial ports: • 1 RS-485 • 2 RS-232 or one RS-232 *(with RTS/CTS)* • 1 CMOS level asynchronous or clocked SPI • 1 CMOS compatible serial port *(programming)*	
Expansion Ports	Yes, 2 I/O Expansion Ports		Optional	
Connectors	5 polarized 9-pin 0.1" pitch friction lock, two 4-pin 0.156" pitch friction lock, two 0.156" pitch 2-pin friction lock, one 0.1" pitch 2x5 IDC, one 2 mm pitch 2x5 IDC		4 polarized 9-pin 0.1" pitch friction lock, two 0.156" pitch 2-pin friction lock, one .1" pitch 2x5 IDC, one 2 mm pitch 2x5 IDC *(programming)*	
Power	8 – 40 V DC, 1 W typical w/ no load	8 – 40 V DC, 0.8 W typical w/ no load	8 – 40 V DC, 1 W typical w/ no load	8 – 40 V DC, 0.8 W typical w/ no load
Board Size	3.95" × 3.95" × 1.16" *(100 × 100 × 29 mm)*	3.95" × 3.95" × 0.80" *(100 × 100 × 20 mm)*	3.95" × 3.95" × 1.16" *(100 × 100 × 29 mm)*	3.95" × 3.95" × 0.80" *(100 × 100 × 20 mm)*
Part Number	101-0575	101-0576	101-0605	101-0606
User-Selected Options	N/A		Contact Local Distributor	
Development Kit Part Number	U.S. 101-0577 • Int'l 101-0578			

Smartcat Models BL2100, BL2110, BL2120, BL2130



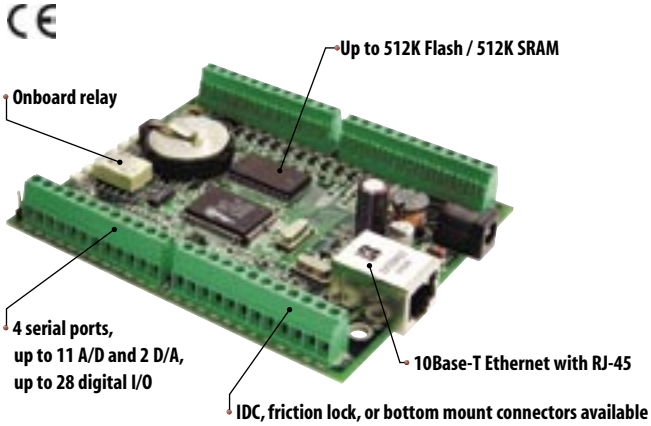
Feature	BL2100	BL2110	BL2120	BL2130
Microprocessor	Rabbit 2000 @ 22.1 MHz			
Ethernet Port	10Base-T, RJ-45, link and activity LEDs		None	
Flash Memory	256K *(standard)*		256K	
SRAM	128K *(standard)*		128K	
Backup Battery	Socketed 3 V lithium coin-type, 265 mA·h, supports RTC and SRAM			
Digital Inputs	24: protected to ± 36 V DC			
Digital Outputs	16: source/sink 200 mA each, 36 V DC max.			
Analog Inputs	11 at 1 MΩ, 12-bit, ±10 V DC, up to 4,100 samples/sec.	None	11 at 1 MΩ, 12-bit, ±10 V DC, up to 4,100 samples/sec.	None
Analog Outputs	Four 12-bit resolution, 0–10 V DC, update rate 12 kHz	None	Four 12-bit resolution, 0–10 V DC, update rate 12 kHz	None
Serial Ports	4 total: two 3-wire *(or one 5-wire)* RS-232, 1 RS-485, and one 5 V CMOS-compatible *(programming)*			
Connectors	Screw terminals support max. 14 AWG/1.5 mm² *(standard)*			
Power*	9–36 V DC, 1.5 W max. (without display), 3 W max. *(with display)*			
Board Size	4.14" x 3.41" x 0.93" *(105 x 87 x 24 mm)*			
Part Number	101-0461	101-0462	101-0463	101-0464
Tool Kit Part Number	U.S. 101-0482 • Int'l 101-0483			

* 13 V DC minimum required for full 0-10 V DC analog output range.

The Smartcat offers optional Ethernet and keypad/displays, plus plenty of sinking/sourcing digital I/O with A/D and D/A. Available in four flexible configurations—two with Ethernet, two without—all Smartcat models feature 40 digital I/O, and 3 RS-232/485 serial ports (plus a programming port) and 512K Flash/512K SRAM. For the most demanding applications, the BL2100 and BL2120 include 11 channels of 12-bit resolution A/D input and 4 channels of 12-bit D/A output. The Smartcat's 16 digital push/pull outputs allow per-point sinking or sourcing, addressing the needs of both the domestic and international markets.

A 7-key, 122 x 32 graphic display module is available as a cost-effective user interface (a panel-mount, water-resistant NEMA 4 version is also available). Keypad legends are easily modified by customizing printed paper inserts. The Smartcat is available as an unenclosed printed circuit board, mounted on a plastic baseplate, in a plastic enclosure with a display, or with a panel-mounted display connected via a flat cable.

Wildcat Models BL2000, BL2010, BL2020, BL2030



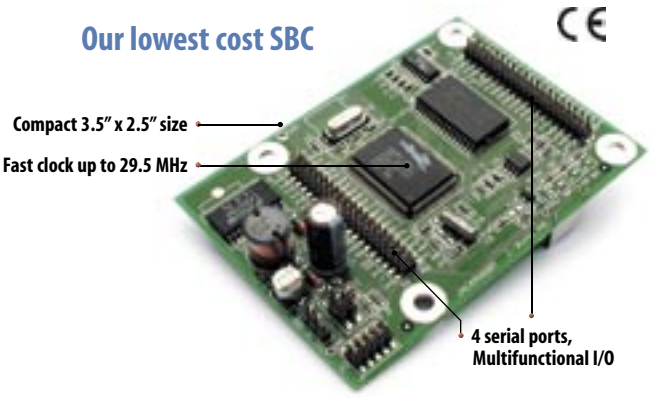
FEATURE	BL2000	BL2010	BL2020	BL2030
Microprocessor	Rabbit 2000 @ 22.1 MHz			
Ethernet Port	10Base-T, RJ-45, link and activity LEDs		None	
Flash Memory	256K *(standard)*			
SRAM	128K *(standard)*			
Backup Battery	Socketed 3 V lithium coin-type, 255 mA·h, supports RTC and SRAM			
LEDs	8: Power On, Processor Error, 4 output status, Ethernet Link, Ethernet Activity,		6: Power On, Processor Error, 4 output status	
Digital Inputs	11, protected to ±36 V DC			
Digital Outputs	10 : 8 sink 200 mA, 2 sink 750 mA, 40 V DC max.			
Analog Inputs	Four 12-bit	Four 10-bit	Four 12-bit	Four 10-bit
	1 MΩ, ±10 V DC, up to 4,000 samples/sec.			
Analog Outputs	Two 12-bit, 0–4 V DC, update rate 12 kHz	None	Two 12-bit, 0–4 V DC, update rate 12 kHz	None
Dual-Purpose Analog or Digital Inputs	5 at 12 kΩ, 12-bit res., 0–48 V DC	7 at 12 kΩ, 10-bit res., 0–48 V DC	5 at 12 kΩ, 12-bit res., 0–48 V DC	7 at 12 kΩ, 10-bit res., 0–48 V DC
Relay Output	SPDT, 1 A @ 30 V DC, 0.3 A @ 120 V AC Uses 1 digital output			
Serial Ports	4 total: two 3-wire *(or one 5-wire)* RS-232, 1 RS-485, and one 5 V CMOS-compatible *(programming)*			
Connectors	Screw terminals support max. 14 AWG/1.5 mm² *(standard)*			
Power	9–40 V DC or 24 V AC ±10%, 1.5 W max., power jack			
Board Size	3.41" x 4.14" x 0.82" *(87 x 105 x 21 mm)*			
Enclosure Size	4.9" x 5.6" x 1.1" *(124 x 142 x 28 mm)*			
Part Number	101-0430	101-0455	101-0456	101-0457
Tool Kit Part Number	U.S. 101-0472 • Int'l 101-0476			

The Wildcat gives OEM designers optional Ethernet connectivity in a low-cost, high-performance single-board computer. Available in four configurations—two with Ethernet, two without—the Wildcat features up to 28 digital I/O, onboard SPDT relay, LEDs, and optional 512K Flash and/or 512K SRAM.

For the most demanding applications, the BL2000 and BL2020 models include 4 channels of 12-bit resolution A/D input, 5 channels of dual-purpose input, and 2 channels of 12-bit D/A output. For applications not requiring high-resolution analog I/O, the BL2010 and BL2030 offer 4 channels of 10-bit resolution A/D input and 7 channels of dual-purpose input. The dual-purpose inputs are software configurable as analog inputs or programmable-threshold digital inputs.

Jackrabbit Models BL1800, BL1810, BL1820

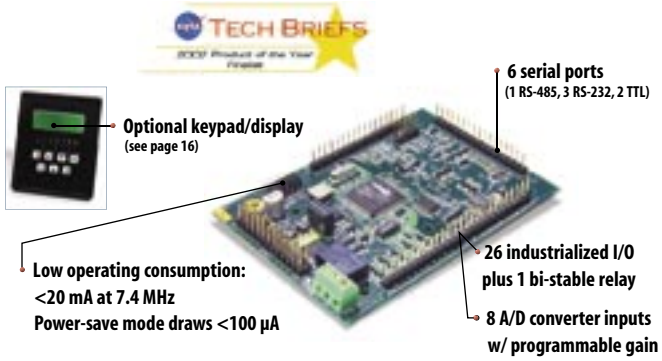
Feature	BL1800	BL1810	BL1820
Microprocessor	Rabbit 2000 @ 29.5 MHz	Rabbit 2000 @ 14.7 MHz	
Flash Memory	256K	128K	
SRAM	128K *(standard)*		
Backup Battery	3 V lithium coin-type, 1000 mA•h, supports RTC and SRAM		None
Digital Inputs	6 CMOS-compatible		7 CMOS-compatible
Digital Outputs	8: 4 CMOS, 3 @ 1 amp sink, 1 @ 0.5 amps, 30 V DC max.	8: 4 CMOS, 3 @ 200 mA sink, 1 @ 100 mA, 30 V DC max.	9: 5 CMOS, 3 @ 200 mA sink, 1 @ 100 mA, 30 V DC max.
Configurable I/O	14 total CMOS-compatible: 8 bytewide and 6 by bit		15 total: 8 bytewide and 7 by bit
Analog Inputs	One 9-bit, 8-bit accuracy, 0.1–2.8 V, 10 samples/sec.		
Analog Outputs	Two 9-bit PWM, one 0.1–2.8 V DC, one 0.7–3.5 V DC, update rate 50 Hz		
Serial Ports	4: two 3-wire *(or one 5-wire)* RS-232, one RS-485, and one 5 V CMOS-compatible. *(programming)* 2 configurable as sync.		4: two 3-wire *(or one 5-wire)* RS-232 and two 5 V CMOS-compatible *(programming)*
Connectors	2 x 20, 2 mm IDC headers		
Power	8–40 V DC, 1.2 W max.	7.5–25 V DC, 100 mA	
Board Size	3.50" x 2.50" x 0.94" *(89 mm x 64 mm x 24 mm)*		
Part Number	101-0356	101-0357	101-0358
Development Kit Part Number	U.S. 101-0363 • Int'l 101-0364		



The Jackrabbbit is Z•World's most compact and lowest cost single-board computer. The Jackrabbit provides 24 CMOS-compatible I/O, 3 analog channels, and 4 high-power outputs. Three of the high-power outputs can sink up to 1 amp each and are protected for direct driving of inductive loads. The BL1800 features a switching regulator that provides a wide range of input voltages (8–40 V DC), reducing power consumption while minimizing heat. A linear regulator is featured on the BL1810 and BL1820 versions.

The BL1800 provides direct access to most of the Rabbit microprocessor I/O pins allowing maximum design flexibility.

Low-Power Fox Models LP3500, LP3510

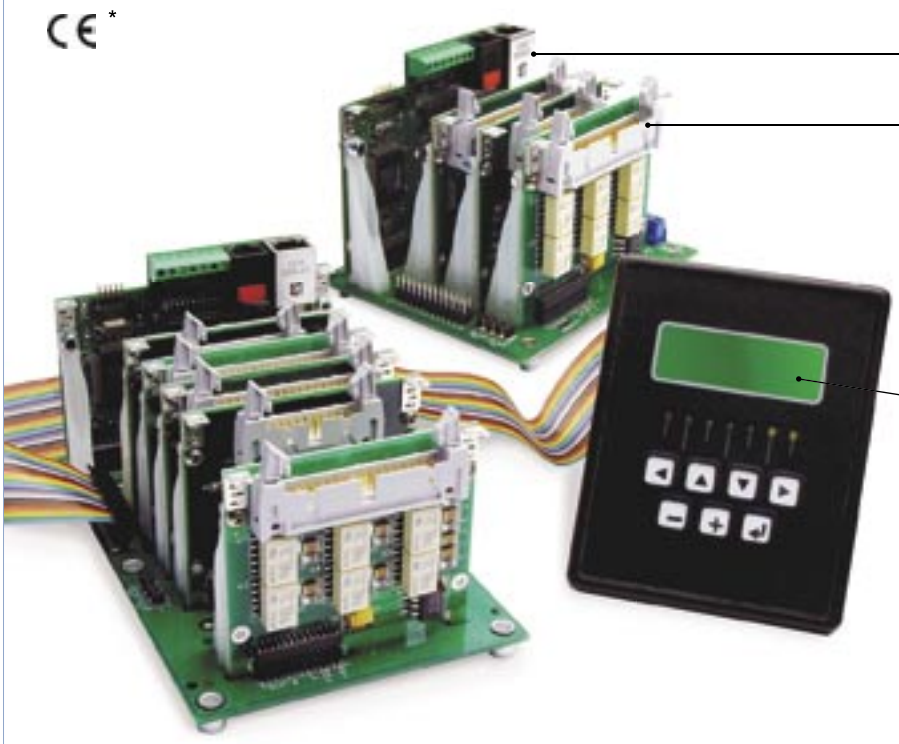


The LP3500 Fox is a low-power single-board computer designed to operate reliably where power is limited, such as in portable, hand-held, battery-powered, and remote monitoring systems. The board is equipped with 0.1" connectors, for user supplied cables. The LP3500 can be mounted to a panel or plastic mounting base or it can be inverted and directly mounted to mating connectors on a customer-designed motherboard.

Normally powered by an external battery or power supply (3–30 V DC), the LP3500 can be awakened from the power-save mode by an internal timer, an RS-232 signal, or via polling of an external input. A socketed coin-type battery facilitates long-term data storage (SRAM) and RTC operation. 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. Analog inputs allow multiple software-controlled programmable gain voltage ranges from 0–1 V to 0–20 V. Four channels can be set individually for 4–20 mA with plug-in jumpers and 1 channel has a software-selectable power voltage-monitoring option. *(In CE test at press time.)*

FEATURE	LP3500	LP3510
Microprocessor	Rabbit 3000 @ up to 7.4 MHz	
Flash Memory	512K *(2 x 256K)*	256K
SRAM	512K	128K
Backup Battery	Socketed 3 V lithium coin-type, 255 mA·h, supports RTC and SRAM	
Digital Inputs	16 protected to ±36 V DC	
Digital Outputs	10 total: 8 sink and 2 source 200 mA each, 36 V DC max.	
Relay	1 SPDT, 1 A, 30 V DC, bi-stable	None
Analog Inputs	8: Configurable in combinations of 11-bit single-ended or four 12-bit differential, 1MΩ input, 200 samples/sec.	None
Analog Outputs	3 unfiltered PWM, 1 kΩ output	
Serial Ports	6 total: • 1 RS-485 • 3 RS-232 *(three 3-wire OR one 5-wire and one 3-wire)* • 1 logic-level serial interface for optional add-ons • 1 3 V CMOS-compatible *(programming)*	
Connectors	Two 1 × 17, and one 1 x 25 0.1" pitch headers	
Main Power	3–30 V DC, 20 mA max. @ 7.4 MHz, 100 µA max. @ 2 kHz	
Backup Power	2.7–3.3V @ 100µA max	
Board Size	3.65" × 2.60" × 0.45" *(93 × 66 × 11 mm)*	
Part Number	101-0525	101-0526
Tool Kit Part Number	U.S. 101-0529 • Int'l. 101-0530	

Smart Star SR9000 Modular Control System



- Ethernet connectivity—CPU with or without Ethernet
- Flexible functionality—modular configuration allows interchanging or replacement of individual I/O cards
- Multiple I/O card options—digital I/O, A/D, D/A, relay
- Expandable—up to 168 I/O
- Cost-effective—low cost per I/O
- Optional keypad/display—backlit 122 x 32 pixel graphic LCD with 7 user-relegendable keys, 7 LEDs NEMA 4

The Smart Star is a modular, expandable embedded control system designed for demanding real-time control and data acquisition applications. Multiple I/O card options—including digital, A/D, D/A, and relays—allow users to closely match their specific I/O needs. The Smart Star CPU card comes in both Ethernet and non-Ethernet versions, and a cost-effective keypad/display is also available. To make integration easy, the Smart Star has been designed from the ground up, with careful consideration given to configuration, implementation, and maintenance requirements. Modular expansion allows you to use the same Smart Star architecture in both small or large applications and where cost and physical size are critical. Unprecedented I/O density is provided with up to 168 I/O supported in a panel size less than 27.3 square inches.

** Except SR94xx*

The basic Smart Star system consists of a rugged backplane with power supply, a CPU card, and one or more I/O cards of your choice. The Smart Star backplane is available in two models, the 8-slot SR9010 and the 4-slot SR9050. With one slot on the backplane reserved for the CPU, remaining slots can be utilized for any combination of I/O cards, giving designers a customizable platform for their applications. Connections to I/O cards are via pre-assembled flat ribbon-cable assembly or optional field wiring terminals (FWTs). Ribbon-cables provide the lowest cost connection for high-volume applications with no variation in wiring from unit to unit. FWTs provide pluggable or screw-type terminals for discrete, customized connections and easy field maintenance.

Panel Mounted Display

SR9050 backplane supports back-to-back display mounting

Field Wiring Terminals

Screw type and pluggable connectors available. Supports AWG #16 wire

Backplane Chassis

Feature	SR9010	SR9050
Backplane	8 slots: 1 for CPU, 7 for I/O expansion cards	4 slots: 1 for CPU, 3 for I/O expansion cards
Number of I/O Card Slots	7	3
Reset	All I/O cards are reset simultaneously	
Slot Select	Each slot has a predefined, dedicated set of addresses	
Keypad/Display	See keypad/display option *(below)* and our "OP" products *(for serial display options)*	
Voltage Regulator	Sources 5 V at 1 A, switching regulator	
Power	9–30 V DC, Current dependent on type and number of installed I/O cards	
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*	
Board Size	6.50"' x 4.20" x 0.56" *(165 x 107 x 14 mm)*	4.40" x 3.75" x 0.75" *(112 x 95 x 19 mm)*
Part Number	101-0512	101-0487
Tool Kit Part Number	101-0427	

CPU Card

Feature	SR9150	SR9160
Microprocessor	Rabbit 2000® @ 22.1 MHz	
Ethernet Port	10Base-T, RJ-45, link and activity LEDs	None
Flash Memory	512K *(2 x 256K)*	
SRAM	128K *(standard)*	
Backup Battery	Socketed 3 V lithium coin-type, 255 mA·h, supports RTC and SRAM	
Serial Ports	3 total: one 5 V CMOS-compatible *(programming)* and either two 3-wire RS-232, one 3-wire RS-232 and one RS-485, or one 5-wire RS-232	
Serial Rate	Max. burst rate = CLK/32, Max. sustained rate = burst/2	
Connectors	Screw terminals support max. 16 AWG *(1.5 mm²)*	
Real-Time Clock	Yes	
Timers	Five 8-bit timers *(four cascadable from the first)* and one 10-bit timer with 2 match registers	
Watchdog	Yes	
Power	5 V DC, 190 mA typical, from backplane power supply	
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*	
Board Size	4.00" x 3.12" x 1.00" *(102 x 79 x 25 mm)*	
Part Number	101-0486	101-0506

Keypad/Display Module

Feature	Specification
LCD Panel	122 x 32 graphic LCD *(with programmable backlight)*, relegendable keypad with 7-key/7-LED interface
LEDs	7 user-programmable: 1 red, 4 green, 2 yellow
Environmental	0–50°C, 5–95% *(non-condensing)*
Board Size	3.00" x 2.6" x 0.75" *(76 x 66 x 19 mm)*
Panel Size	5.60" x 4.875" x 1.5" *(142 x 124 x 38 mm)*
Part Number	101-0502

I/O Expansion Cards

Digital I/O Card

Feature	SR9200	SR9205	SR9210	SR9220
Digital I/O	16 inputs and 8 outputs, sinking	16 inputs and 8 outputs, sourcing	8 inputs and 16 outputs, sinking	8 inputs and 8 outputs, sinking
Digital Inputs	Protected to ±48 V DC			
Digital Outputs	200 mA, 40 V DC max.			
Connectors	Standard latch/eject ribbon-cable header. Optional FWT27 pluggable or screw-type connectors are available *(one output is inaccessible if FWT27 is used)*.			
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*			
Power	5 V DC, 65 mA typical, from backplane power supply			
Board Size	3.00" x 2.75" x 0.44" *(76 x 70 x 11 mm)*			
Part Number	101-0389	101-0437	101-0390	101-0391

A/D Card

Feature	SR9300	SR9310	SR9320
Analog Input	Eleven 12-bit @ 100 kΩ, 0–10 V DC, up to 10,000 samples/sec.	Eleven 12-bit @ 100 kΩ, ±10 V DC, up to 10,000 samples/sec.	Eleven 12-bit @ 249 Ω, 4–20 mA, up to 10,000 samples/sec.
Connectors	Standard latch/eject ribbon-cable header. Optional FWT18 pluggable or screw-type connectors are available.		
Power	5 V DC, 40 mA typical, from backplane power supply	+V_USER, 9–30 V DC, 35 mA typical	
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*		
Board Size	3.00" x 2.75" x 0.44" *(76 x 70 x 11 mm)*		
Part Number	101-0392	101-0423	101-0444

D/A Card

Feature	SR9400	SR9410	SR9420
Analog Output	Eight 12-bit, 0–10 V DC, update rate 16 kHz	Eight 12-bit, ±10 V DC V, update rate 16 kHz	Eight 12-bit, 4–20 mA, update rate 16 kHz
Connectors	Standard latch/eject ribbon-cable header. Optional FWT18 pluggable or screw-type connectors.		
Power	5 V DC, 40 mA typical, from backplane power supply +V_USER, 9–30 V DC, 35 mA typical		
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*		
Board Size	3.00" x 2.75" x 0.44" *(76 x 70 x 11 mm)*		
Part Number	101-0393	101-0394	101-0445

Relay Card

Feature	SR9500	SR9510
Relay	6 total: 1 SPDT, 5 SPST *(including snubbers)*	8 SPDT *(no onboard snubbers)*
I/O Type	6 relays, 30 V DC at 1 A and 48 V AC at 0.5 A *(resistive)*	8 relays, 30 V DC at 1 A and 48 V AC at 0.5 A *(resistive)*
Connectors	Standard latch/eject ribbon-cable header. Optional FWT18R pluggable or screw-type connectors.	Standard latch/eject ribbon-cable header. Optional FWT27 pluggable or screw-type connectors.
Power	5 V DC, 10 mA typical, from backplane power supply +V_USER, 12–30 V DC, 75 mA typical	
Environmental	–40°C to +70°C, 5–95% *(non-condensing)*	
Board Size	3.00" x 2.75" x 0.44" *(76 x 70 x 11 mm)*	
Part Number	101-0395	101-0440

Operator Interface SBCs

Key Applications

- **Data Acquisition Terminals**
- **Environmental Monitoring**
- **Fleet Management / GPS Systems**
- **Food Service Equipment**
- **Industrial Automation**
- **Point-of-Sale Systems**
- **Medical Devices**
- **Packaging Equipment**
- **Retail Kiosk Displays**
- **Remote Monitoring / Control**
- **Ethernet/Internet Interfacing**
- **Manufacturing Equipment**
- **Utility, Electric, Gas & Oil Monitoring**
- **Time/Attendance Clocking Systems**
- **Rail & Transportation Systems**

Tool Kits

Tool Kits contain all the software and hardware tools needed to begin design, including Dynamic C development software and documentation on CD-ROM, user manual with schematics, a demonstration board, serial cable for programming and debugging, and AC adapter (U.S./Canada only).

Z•World operator interface single-board computers provide the data acquisition and display functionality required for almost any embedded application, such as remote terminals, automated machinery, and control systems. Within our line, some products are designed for space-constrained applications while others offer a large graphic interface. Ethernet models facilitate remote diagnostics, control, and communication, including sending and receiving e-mails and alerts.

Input power requirements (9–36 V DC) allow operator interfaces to be used in a wide variety of fixed and mobile applications. Provision is made for external battery backup to maintain real-time clock values and data stored in SRAM. Input points are designed to interface with logic levels or a switch closure to ground outputs are designed to drive up to 100 mA loads.

Ethernet/Internet Control and Monitoring

Systems with built-in Ethernet can be directly controlled and monitored across networks or the Internet and can also open sockets to remote devices, serve web pages, or send e-mail. Ethernet models are ideal for remotely monitoring and supervising another programmable system, or web-enabling new or existing products. All models can be programmed and debugged over Ethernet/Internet using appropriate accessory hardware and/or application software. The Ethernet interface is fully supported by software to enable network and Internet connectivity.

Programming Operator Interface SBCs

Programs are developed using Z•World's industry-proven Dynamic C® software development system. An extensive library of drivers and demo programs is provided, along with royalty-free TCP/IP stack with source. Our small graphic display features a quick-start menu system utilizing a scroll-up-and-down highlight-bar for menu option selection. It is also designed to easily add/delete options to the menu structure. The quick-start menu also provides page-up and page-down control for large menus, as well as sub-menu nesting capability, designed to pop-up to the original calling menu option.

Operator Interface Graphics Engine

For graphic-enabled displays, a powerful and easy-to-program graphics engine allows easy downloading of pre-drawn bitmaps and use of pre-defined and user-defined macros. The graphics engine also provides complete remote control of display functionality via a serial interface. Demo programs include pop-up menuing, onscreen keypads, data transmission and reception over TCP/IP and serial connections, analog volt meter display, and many more.

eDisplay Models OP7200, OP7210

Features	OP7200	OP7210
Microprocessor	Rabbit 2000 @ 22.1 MHz	
Ethernet Port	10Base-T, RJ-45	
Flash Memory	256K *(standard)*	
SRAM	128K *(standard)*	
Backup Battery	Socketed 3 V lithium coin-type, 255 mA·h, supports RTC and SRAM	
Keypad/Display	¼ VGA *(320 × 240 pixels)* with programmable on/off white LED backlight, 9-key tactile feedback keypad	
	4096 × 4096 analog touchscreen	No touchscreen
LEDs	4: Power On, Microprocessor Error, Ethernet Link Alive, Ethernet Activity	
Digital Inputs	19 protected to ±36 V DC	16 protected to ±36 V DC
Digital Outputs	8: individually configurable in software; sink up to 350 mA, source up to 250 mA, or tri-state; 40 V DC max.	
Analog Inputs	8: Configurable in combinations of 11-bit single-ended or four 12-bit differential, 200 kΩ, 2.5 ksamples/sec.	None
Serial Ports	1 RS-485 *(or I/O expansion port)*, 2 RS-232 *(one 5-wire or two 3-wire)*, one 5 V CMOS-compatible *(programming)*	
Serial Rate	Max. burst rate = CLK/32, Max. sustained rate = CLK/64	
Real-Time Clock	Yes	
Timers	Five 8-bit timers and one 10-bit timer with 2 match registers	
Watchdog	Yes	
Power	9–40 V DC or 24 V AC, 4 W max.	
Environmental	–10° to +65°C, 20–70%, humidity *(noncondensing)*	
Connectors	Screw terminals support max. 14 AWG/1.5 mm² *(standard)*	
Product Size	5.67″ × 4.41″ × 1.70″ *(144 × 112 × 43 mm)*	
Viewing Area	3.0″ x 2.3″ *(77 x 58 mm)*	
Part Number	101-0535	101-0536
Tool Kit Part Number	U.S. 101-0543 • Int'l. 101-0544	

- **4096 x 4096 analog touchscreen (optional)**
- **1/4 VGA display (320 x 240 pixels)**
- **3.0″ x 2.2″ (76 x 56 mm) viewing area**
- **24-27 industrialized digital I/O**
- **10Base-T Ethernet with RJ-45**
- **8 A/D inputs**
- **4 serial ports**
- **LED backlight**

The OP7200 eDisplay is an ideal data acquisition operator interface SBC that offers rugged I/O, built-in Ethernet connectivity, and optional A/D and touchscreen capabilities. It is ideal for data acquisition, display, and control. Two eDisplay models incorporate 24–27 digital I/O plus an I/O expansion port and 4 serial ports. When front-panel mounted, the unit meets NEMA 4 water-resistance standards, making it suitable for use in harsh environments.

Both models come equipped with a 1/4 VGA display (320 × 240 pixels) with a 9-key keypad and programmable on/off white LED backlight. One model includes a 4096 × 4096 analog touchscreen and A/D. Both versions provide easy-to-use menu-building software and have a programmable audible alarm for prompt notification and keypad/display feedback. The eDisplay supports English and foreign language fonts, as well as graphic and bitmap images. A font converter program is supplied, and different fonts, languages, and sizes can be used simultaneously in combination with graphic images.

Smart Screen Model OP7100

- **1/4 VGA display (320 x 240 pixels) CCFL**
- **Touchscreen matrix**
- **Wide viewing angle**
- **16 digital I/O**
- **4.53″ x 3.40″ (115 x 86 mm) viewing area**

The OP7100 touchscreen display features a blue-on-white graphic LCD (320 x 240 pixels). A total of 16 digital I/O are available—8 each CMOS/TTL-level inputs and outputs. Vertical or horizontal orientations are user selectable in software. Software also controls the screen contrast and CCFL backlighting to enhance visibility and provide visual feedback. Software included with the Smart Screen provides three font sizes. Additional fonts, symbols and icons can be defined in any language as well. Up to 50 images can be stored in Flash memory for immediate recall.

Software can divide up the display into 8x8 independent regions, each of which can scroll or remain stationary. Reverse, outlined, or blinking attributes can be applied to each region, with mixed graphics and text.

Features	OP7100
Microprocessor	Z180 at 18.432 MHz
Flash Memory	512K *(2 x 256K)* + 32K VRAM
SRAM	128K *(standard)*
Backup Battery	Socketed 3 V lithium coin-type, 255 mA·h, supports RTC and SRAM
Keypad/Display	8 x 8 touchscreen, 320 x 240 pixels, blue-on-white background, adjustable contrast with automatic temperature compensation, CCFL backlight with software control
Digital Inputs	8 CMOS/TTL-level, –2.0 V DC to +7.0 V DC
Digital Outputs	8 CMOS/TTL-level, 6 mA max.
Serial Ports	Two 3-wire or one 5-wire RS-232, *or* one 3-wire RS-232 and one RS-485
Serial Rate	57,600 bps max.
Real-Time Clock	Yes
Watchdog	Yes
Power	10–30 V DC, 4.5 W with backlight on, 1.5 W with backlight off
Environmental	0–50°C, 25–65% humidity *(non-condensing)*
Connectors	DB9, 34-pin header, 5-terminal screw block
Product Size	8.0″ x 5.4″ x 1.6″ *(203 x 137 x 41 mm)*
Viewing Area	4.53″ x 3.40″ *(115 x 86 mm)*
Part Number	101-0303
Tool Kit Part Number	101-0306

MiniCom Models OP6800, OP6810

- **122 x 32 graphic display/keypad**
- **24 industrialized digital I/O**
- **Optional 10Base-T Ethernet**
- **Quick-start menu program**
- **Meets NEMA 4 water resistance**
- **4 serial ports**

The MiniCom is a small footprint, low-cost operator interface that offers plenty of industrialized I/O, a graphic LCD, and keypad. Both the Ethernet-enabled OP6800 and the non-Ethernet OP6810 feature 24 rugged digital I/O, an international-character 122 x 32 pixel LCD, user-relegendable keypad with 7-key / 7-LED interface, and 4 serial ports. When front-panel mounted, both MiniCom models meet NEMA 4 water-resistance compliance standards, making them suitable for use in harsh environments.

The MiniCom's digital I/O includes 13 filtered inputs and 11 sinking outputs—7 standard outputs also have indicator LEDs, and 4 heavy-duty outputs offer transient protection to drive inductive loads. The 122 x 32 pixel graphic display supports English and foreign language fonts, as well as simple graphic and bitmap images. A font converter program is supplied, and different fonts, languages, and sizes can be used simultaneously. The MiniCom also makes an ideal display option for use with other Z•World single-board computers.

(In CE test at press time.)

Feature	OP6800	OP6810
Microprocessor	Rabbit 2000 @ 22.1 MHz	
Ethernet Port	10Base-T, RJ-45	None
Flash Memory	256K *(standard)*	256K
SRAM	128K *(standard)*	128K
Backup Battery	Connection for user-supplied battery *(to support RTC and SRAM)*	
Keypad/Display	122 × 32 pixel graphic LCD *(back light on/off programmable)*, user-relegendable keypad with 7-key/7-LED interface	
LEDs	7 hardware- or software-driven: 1 red, 4 green, 2 yellow	
Digital Inputs	13 total: 8 protected to ±36 V DC, 5 protected to ±25 V DC	
Digital Outputs	11 total: sink 200 mA, 40 V DC max., 4 with built-in inductive load-protection diode	
Serial Ports	4 total: two 3-wire or one 5-wire RS-232, 1 RS-485, and one 5 V CMOS-compatible *(programming)*	
Serial Rate	Max. burst rate = CLK/32, Max. sustained rate = burst/2	
Real-Time Clock	Yes	
Timers	Five 8-bit timers *(four cascadable from the first)* and one 10-bit timer with 2 match registers	
Watchdog	Yes	
Power	9–36 V DC, 1.5 W max.	
Environment	0–50°C, 5–95% humidity *(non-condensing)*	
Connectors	2 × 20, 0.1" pitch ribbon-cable header	
Product Size	4.5" × 3.6" × 1.33" *(112 × 91 × 33 mm)*	
Viewing Area	2.2" x 0.75" *(54.8 x 19.0 mm)*	
Part Number	101-0492	101-0497
Tool Kit Part Number	U.S. 101-0500 • Int'l 101-0501	

Intellicom Models OP6700, OP6600

- **10Base-T Ethernet with RJ-45**
- **High-visibility backlit, supertwist 4 x 20 LCD**
- **12-key, user-relegendable keypad**
- **8 industrialized I/O**
- **Scratch-resistant, self-healing lens**
- **Vacuum fluorescent display (VFD) option**
- **3.0" x 1.0" viewing area**

The Intellicom is a 12-key graphic display with optional Ethernet for network connectivity and a VFD option for applications requiring high visibility. To accommodate users' installation preferences, the versatile Intellicom can be either wall or panel mounted. The OP6700 offers direct connection to 10Base-T Ethernet and communicates with serial devices via RS-232 and/or RS-485, providing multiple solutions for communications applications. Eight general-purpose I/O provide control functionality.

A high-visibility 4 x 20 character display with backlighting provides excellent character legibility, and a tactile feedback 2 x 6 keypad offers a legend that can be user customized. The Intellicom is easily mounted and comes with bezel and impact-resistant plastic enclosure.

Feature	OP6700	OP6600
Microprocessor	Rabbit 2000 @ 18.43 MHz	
Ethernet Port	10Base-T, RJ-45	None
Flash Memory	512K *(2 x 256K)*	256K
SRAM	128K *(standard)*	
Backup Battery	Socketed board with 3 V lithium coin-type, 1000 mA·h, supports RTC and SRAM	
Keypad/Display	2 x 6 domed tactile keypad with customizable legend, supertwist 4 x 20 LCD with backlighting	
Digital Inputs	4 protected to ±36 V DC	
Digital Outputs	4 sink 200 mA, 40 V DC max.	
Speaker Outputs	Software-adjustable frequency and volume	
Serial Ports	3 total: one 5 V CMOS-compatible *(programming)* and either two 3-wire RS-232, one 3-wire RS-232 and one RS-485, or one 5-wire RS-232	
Serial Rate	Max. burst rate = CLK/32, Max. sustained rate = burst/2	
Real-Time Clock	Yes	
Timers	Five 8-bit timers *(four cascadable from the first)* and one 10-bit timer with 2 match registers	
Watchdog	Yes	
Power	9–40 V DC, 2.4 W *(backlighting on)*	
Environmental	0–50°C, 5–95% humidity *(non-condensing)*	
Connectors	Screw terminals	
Product Size	6.7" x 5.7" x 2.0" *(170 x 145 x 51 mm)*	
Viewing Size	3.0" x 1.0" *(76.0 x 25.2 mm)*	
Part Number	101-0411	101-0412
Tool Kit Part Number	U.S. 101-0414 • Int'l 101-0415	

RabbitCore Modules

The RabbitCore family of microprocessor core modules is designed to facilitate rapid development and implementation of embedded systems. RabbitCores are powered by high-performance Rabbit microprocessors with extensive integrated features and a C-friendly instruction set designed for use with the Dynamic C® development system. The RabbitCore mounts on a user-designed motherboard and acts as the controlling microprocessor for the user's system. Small in size but packed with powerful features, these core modules give designers a complete package for control and communication. RabbitCores can also offer massive reductions in development time—60-90 day time-to-market for some OEM products and applications.

Ethernet/Internet Control and Monitoring

Interchangeable models with or without Ethernet and various amounts of memory provide the flexibility OEMs need to offer a number of options to their customers. The optional Ethernet interface (10 Mbps or 10/100 Mbps) allows easy connection to local networks or the Internet. Powerful software allows TCP/IP communication including sending e-mail and serving web pages. Users can program/debug over Ethernet/Internet using appropriate accessory hardware and/or application software.

Programming RabbitCores

Each RabbitCore is designed for programming with Z•World's industry-proven Dynamic C® software, the first integrated software development system specifically designed for embedded control. This proven integration of hardware and software substantially reduces OEM development time and cost. An extensive library of drivers and sample programs is provided, along with our royalty-free TCP/IP stack with source code. All RabbitCores are programmed via a serial interface.

CE Mark Information

RabbitCore modules are components for OEM products and systems, because EMC testing of the final product would be completed by the integrator. Our RabbitCores feature low-EMI Rabbit processors to help OEMs pass CE and regulatory RF emissions testing.

Shared Features of RabbitCores

Feature	RCM2XXX	RCM3XXX
EMI Reduction	Spectrum spreader for reduced EMI *(radiated emissions)*	
Serial Rate	Max. asynchronous burst rate = CLK/32	Max. asynchronous burst rate = CLK/8
Backup Battery	Connection for user-supplied battery *(to support RTC and SRAM)*	
Slave Interface	Permits use as master or intelligent peripheral with Rabbit-based or other master controller	
Real-Time Clock	Yes, battery backable	
Timers	Five 8-bit timers *(four cascadable from the first)* and one 10-bit timer with 2 match registers	Ten 8-bit timers *(six cascadable from the first)* and one 10-bit timer with 2 match registers
Watchdog	Yes	
Humidity	5–95%, non-condensing	
Pulse-Width Modulation	N/A	8-bit free running counter and four 10-bit pulse-width registers
Input Capture	N/A	2-channel input capture can be used to time input signals from various port pins.
Quadrature Decoder	N/A	2-channel quadrature decoder accepts inputs from external incremental encoder modules.

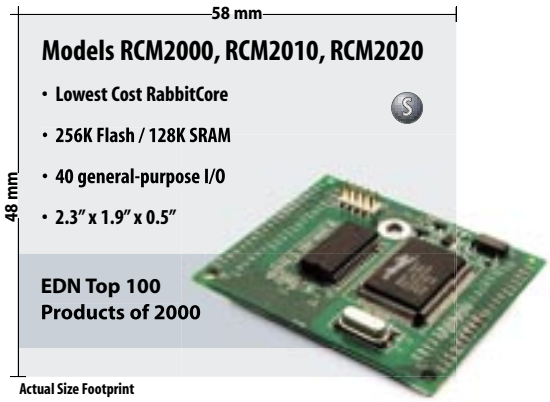
Key Applications

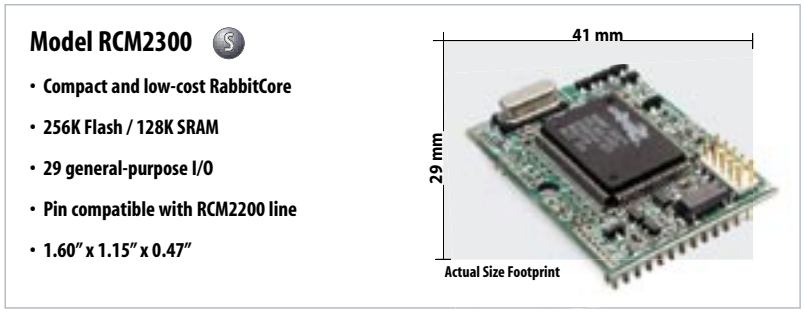
- **Building / Home Automation**
- **Handheld Devices**
- **Industrial Automation**
- **Point-of-Sale / Barcode Scanners**
- **Telecom Systems**
- **Wireless Devices**
- **Security Access / Biometric Systems**
- **GPS Systems**
- **Food Service Equipment**
- **Medical Devices**
- **Packaging Equipment**
- **Utility Metering Devices**
- **Ethernet / Internet Interfacing**
- **Point-of-Sale / Barcode Scanners**
- **Robotics Control**
- **Military / Transportation Systems**
- **Semiconductor Manufacturing Equipment**
- **Service Processor / Device Monitors**
- **Marine Systems**
- **Test Equipment**
- **Remote Monitoring Systems**

Development Kits

Jump-start your evaluation and design efforts with one of our many development kits, which include a RabbitCore module, prototyping board, AC adapter (U.S./Canada only), Dynamic C development software and complete documentation on CD-ROM, serial cable for programming and debugging, and Getting Started manual.

N4 NEMA 4 compliant S Serial Only/Non-Ethernet E Ethernet and Serial Communication LP Low-Power





Rabbit 2000-based Core Modules

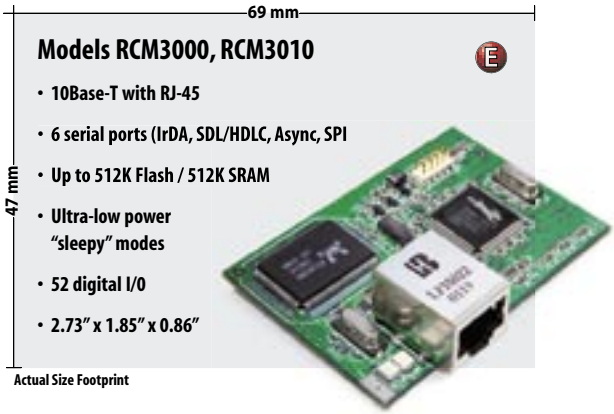
Feature	RCM2000	RCM2010	RCM2020	RCM2100	RCM2110	RCM2120	RCM2130	RCM2200	RCM2210	RCM2250	RCM2300
CPU Speed	25.8 MHz		18.4 MHz	22.1 MHz							
Ethernet Port	None			10Base-T RJ-45, 2 LEDs		None		10Base-T RJ-45, 2 LEDs	10Base-T raw signals	10Base-T RJ-45, 2 LEDs	None
Flash Memory	256K			512K	256K	512K	256K	256K		512K	256K
SRAM	512K	128K		512K	128K	512K	128K	128K		512K	128K
Analog Inputs	None										
General Purpose I/O*	40 parallel I/O • 26 configurable I/O • 8 fixed inputs • 6 fixed outputs			34 parallel I/O • 20 configurable I/O • 8 fixed inputs • 6 fixed outputs		40 parallel I/O • 26 configurable I/O • 8 fixed inputs • 6 fixed outputs		26 parallel I/O • 16 configurable I/O • 7 fixed inputs • 3 fixed outputs			29 parallel I/O • 17 config. I/O • 8 fixed inputs • 4 fixed outputs
Add'l Inputs	2 Startup Mode, Reset										
Add'l Outputs	Watchdog, Reset			Status, Clock, Watchdog, Reset				Status, Reset			
External I/O	13 address, 8 data, I/O Read-Write, Buffer Enable			13 buffered address lines, 8 buffered data lines, plus I/O Read-Write, and Buffer Enable				4 address, 8 data, plus I/O Read-Write			
Serial Ports	Four 5 V CMOS-compatible • 4 configurable as asynchronous • 2 configurable as clocked serial *(SPI)*							Four 5 V CMOS-compatible • 4 configurable as asynchronous • 2 configurable as clocked serial *(SPI)***			
Power	4.75–5.25 V DC, 130 mA		4.75–5.25 V DC, 98 mA	4.75–5.25 V DC, 140 mA				4.75–5.25 V DC, 134 mA			4.75–5.25 V DC, 108 mA
Operating Temp.	–40°C to +85°C			–40°C to +70°C		–40°C to +80°C		–40°C to +70°C			–40°C to +85°C
Board Size	2.3″ x 1.9″ x 0.5″ *(58 x 48 x 13 mm)*			3.5″ x 2.0″ x 0.86″ *(89 x 51 x 22 mm)*		3.5″ x 2.0″ x 0.5″ *(89 x 51 x 13 mm)*		2.3″ x 1.6″ x 0.86″ *(59 x 41 x 22 mm)*			1.60″ x 1.15″ x 0.47″ *(41 x 29 x 12 mm)*
Connectors	2 x 20, 2 mm IDC headers							2 x 13, 2 mm IDC headers			
Part Number	101-0404	101-0405	101-0383	101-0434	101-0435	101-0436	101-0446	101-0454	101-0488	101-0494	101-0453
Development Kit Part Number	U.S. 101-0398 Int'l 101-0399			U.S.101-0451 Int'l 101-0452				U.S.101-0475 Int'l 101-0478			U.S.101-0480 Int'l 101-0481

* Grouped in 8-bit ports and shared with serial ports

** 1 clocked line available only on programming header

Models RCM3000, RCM3010

- 10Base-T with RJ-45
- 6 serial ports (IrDA, SDL/HDLC, Async, SPI
- Up to 512K Flash / 512K SRAM
- Ultra-low power "sleepy" modes
- 52 digital I/O
- 2.73" x 1.85" x 0.86"

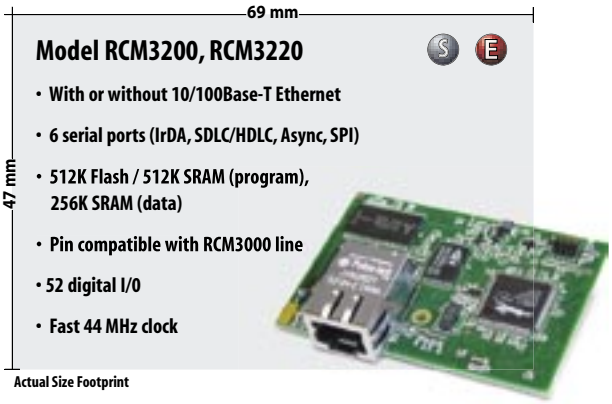


Models RCM3100, RCM3110

- Up to 512K Flash / 512K SRAM
- 6 serial ports (IrDA, SDLC/HDLC, Async, SPI)
- Pin compatible with RCM3000 line
- Ultra-low poser "sleepy" mode
- 54 digital I/O
- 1.85" x 1.65" x 0.48"

Model RCM3200, RCM3220

- With or without 10/100Base-T Ethernet
- 6 serial ports (IrDA, SDLC/HDLC, Async, SPI)
- 512K Flash / 512K SRAM (program), 256K SRAM (data)
- Pin compatible with RCM3000 line
- 52 digital I/O
- Fast 44 MHz clock



Models RCM3400, RCM3410

- Reference design for 10/100Base-T
- Up to 512K Flash / 512K SRAM
- 5 serial ports (IrDA, SDLC/HDLC, Async, SPI)
- 47 digital I/O, alternate I/O bus
- 8 channel 12-bit A/D with programmable gain
- 1.38" x 1.16" x 0.31"

Rabbit 3000-based Core Modules

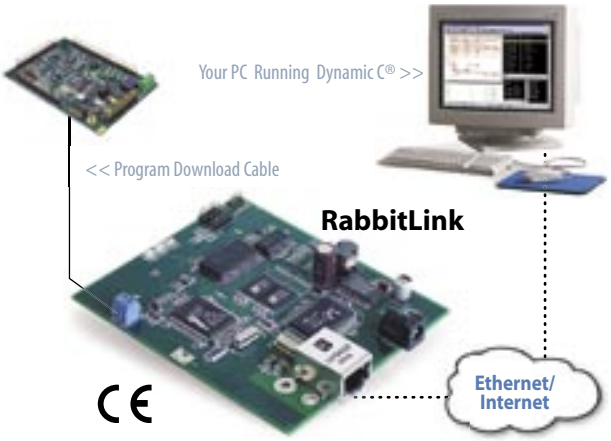
Feature	RCM3000	RCM3010	RCM3100	RCM3110	RCM3200	RCM3220	RCM3400	RCM3410
CPU Speed	29.4 MHz				44.2 MHz		29.4 MHz	
Ethernet Port	10Base-T, RJ-45, 2 LEDs		None		10/100Base-T, RJ-45, 3 LEDs	None	Reference Design for 10/100Base-T Mac ID installed	
Flash Memory	512K *(2 x 256K)*	256K	512K *(2 x 256K)*	256K	512K		512K	256K
SRAM	512K	128K	512K	128K	512K program + 256K data		512K	256K
Analog Inputs	None						8 channels single-ended *(11-bit)* or 4 channels differ. *(12-bit)*, Prog. gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V.	
General Purpose I/O*	52 digital I/O • 44 configurable I/O • 4 fixed inputs • 4 fixed outputs		54 digital I/O • 46 configurable I/O • 4 fixed inputs • 4 fixed outputs		52 digital I/O • 44 configurable I/O • 4 fixed inputs • 4 fixed outputs		47 digital I/O • 41 configurable I/O • 3 fixed inputs • 3 fixed outputs	
Add't Inputs	2 Startup Mode, Reset						2 Startup Mode, Reset In, CONVERT	
Add't Outputs	Status, Reset						Status, Reset Out, BVREF	
External I/O	6 address (*shared with I/O*), 8 data, plus I/O Read-Write							
Serial Ports	Six 3.3 V CMOS-compatible: • 6 configurable as asynchronous *(with IrDA)* • 4 configurable as clocked serial *(SPI)* • 2 configurable as SDLC/HDLC						Five 3.3 V CMOS-compatible: • 4 configurable as asynchronous *(with IrDA)*, 3 as clocked serial *(SPI)*, 2 as SDLC/HDLC *(with IrDA)* • 1 asynchronous serial port *(programming)* • Support for MIR/SIR IrDA transceiver	
Power	3.15–3.45 V DC • 150 mA		3.15–3.45 V DC • 75 mA		3.15–3.45 V DC • 255 mA		3.0–3.45 V DC • 97 mA @ 29.4 MHz/ 2.8–3.45 V DC • 57 mA @ 14.7 MHz	
Operating Temp.	–40°C to +70°C		–40°C to +85°C		–40°C to +70°C		–40°C to +85°C	
Board Size	2.73" × 1.85" × 0.86" *(69 × 47 × 22 mm)*		1.85" × 1.65" × 0.48" *(47 × 42 × 12 mm)*		2.73" × 1.85" × 0.86" *(69 × 47 × 22 mm)*		1.38" × 1.16 " × 0.31" *(35 × 29 × 7.4 mm)*	
Connectors	2 x 17, 2 mm IDC headers						2 x 17, 1.27 mm IDC Headers	
Part Number	101-0507	101-0508	101-0517	101-0518	101-0520	101-0522	101-0561	101-0562
Development Kit Part Number	U.S.101-0523 Int'l 101-0524		U.S.101-0533 Int'l 101-0534		U.S.101-0552 Int'l 101-0553		U.S.101-0587 Int'l 101-0588	

* Grouped in 8-bit ports and shared with serial ports

Peripheral Products

RabbitLink™ Card, Model EG2110

- **Quickly download programs and debug any Rabbit-based board via Ethernet/Internet**
- **Customize programs with supplied source code**
- **Easily set network address parameters**



The RabbitLink facilitates high-speed remote or local programming and debugging of any Rabbit microprocessor-based system over most networks or the Internet through the standard programming connector on any Rabbit-based board. Static IP addresses can be set manually via the programming cable, or IP addresses can be assigned over Ethernet using DHCP.

When added to a Rabbit-based system in the field, the RabbitLink provides an easy-to-use Ethernet interface for updating, programming, and debugging Dynamic C programs over a local area network or the Internet. This allows the user to compile, run, and debug programs at a remote site from any Internet-connected PC running Dynamic C. All of the standard features of Dynamic C are available via the remote interface.

101-0580

Universal Relay Board, Model SE1100

- **4 mechanical relays rated 6.3 A at 250 V AC or 24 V DC**
- **Opto-isolation between host SBC signals and SE1100 relays**
- **Relay status LED indicators**
- **Operates remotely at up to 50 feet (15 m)**
- **Interface voltage range from 5–24 V DC**

The SE1100 expansion board provides 4 SPDT relays that connect to the digital outputs of any SBC. With 4 relays combined into one integrated interface, the SE1100 saves time by eliminating the need to wire together individual relays. Each relay has normally closed (NC), normally open (NO), and common (COM) terminals. With an operating range of up to 50 feet (15 m), the SE1100 can be located near the load rather than near the single-board computer. The relays are optically isolated and have fuses and filters to protect against noise and transients. Each relay has an LED indicator to aid in system maintenance.

101-0282

NEMA 4-Compliant Panel-Mount Keypad/Display Module

For BL2100 Smartcat, LP3500 Fox, and SR9000 Smart Star

A NEMA 4-compliant, 122 x 32 graphic display with seven relegendable keys and user-programmable LEDs provides quick-status feedback. Displays international characters, bitmap images, and graphic constructs such as circles, lines, and squares. A 20" cable is also available (sold separately).

With Nema 4 Panel Mount	101-0541
Without Panel Mount	101-0601

Serial Flash Expansion Boards, Models SF1004, SF1008, SF1016

- **Board can be easily removed**
- **Simple serial peripheral interface (SPI)**
- **Data easily retrieved and downloaded to another system**
- **Can plug into programming port**

The SF1000 significantly increases the data-storage capabilities of any embedded control system. Offering up to 16 MB of memory, these cards are ideal for applications that require temporary storage of large amounts of data collected from a system's controlling device. Data stored on an SF1000 board can be retrieved and downloaded to another user system via TCP/IP or serial communications (on supported board-level products), or the card itself can be easily removed to facilitate data transfer at another location.

SF1016 - 16 MB	101-0641
SF1008 - 8 MB	101-0467
SF1004 - 4 MB	101-0468

Options and Accessories

Connector Adapter Boards

For RCM2xxx, RCM3xxx, BL18xx

Connector Adapter Boards connect RabbitCore modules and the BL1800 Jackrabbit to a prototyping/development board that has a prototyping area with a 0.1" pitch. One model is designed for Rabbit 2000-based RabbitCores with 2 mm headers and the other Adapter Board is designed for Rabbit 3000-based RabbitCores with either 2 mm or 1.27 pitch headers. The Adapter Boards are sold individually with connectors or in panels with connectors sold separately.

3000 Series (panel of 5)	175-0254	*3000 Series Board & Connectors*	151-0114
2000 Series (panel of 5)	175-0230	*2000 Series Board & Connectors*	151-0113

TCP/IP 10Base-T Accessory Kit

For all 10Base-T Ethernet products

This kit is intended to help in application development by providing the accessories needed to interface to a 10Base-T network. Includes an Ethernet hub, two Ethernet straight-thru cables, and one Ethernet crossover cable.

101-0403

Rabbit Cloning Board

For all Rabbit-based products

Ideal for copying compiled software programs from one Rabbit-based board to another, and especially in a production environment (3-5 V). Connects via four 2 x 5 ribbon cable connectors (2 x 2 mm, 2 x 1.27 mm pitch)

101-0589

Connector Header Options for BL21xx and BL20xx SBCs

Screw Terminals

Support maximum 14 AWG (American Wire Gauge) 1.5 mm^2 (standard)

IDC Headers

Dual row 2 x 20 or 2 x 17, 0.1" pitch

Bottom Mount Socket

BL2xxx mounts directly on 0.1" pitch pins on custom motherboard

OEM Polarized Friction Lock

0.1"pitch

Call for details.

Unibox Enclosure (with baseplate)

For BL20xx Wildcat, EG2110 RabbitLink

Black plastic enclosure with cover, baseplate, and mounting screws.

101-0431

Baseplate

For BL21xx Smartcat, BL20xx Wildcat, LP35xx Fox, and EG2110 RabbitLink

Black plastic baseplate and mounting screws.

101-0495

Visit our website for our complete option and accessory offerings.

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