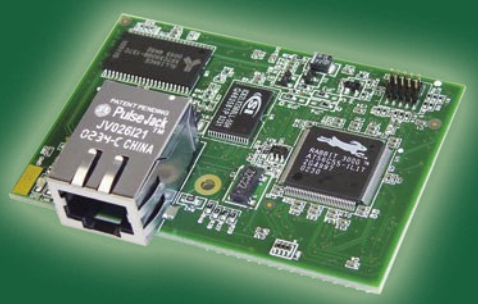
RabbitCore™
Microprocessor Core Modules
RCM2000 & RCM3000 Series



Key Features

- Powerful Rabbit microprocessors
- Interchangeable pin-compatible models with or without Ethernet
- Built-in Ethernet port with RJ-45 jack for simplified connectivity
- Up to 512K Flash program memory
- Up to 512K SRAM for data
- Interchangeable models with different onboard memory capacities

Design Advantages

- 3.3 V and 5 V platforms
- Well-integrated hardware & software design
- Support for TCP/IP, IrDA, SDLC/HDLC, Async, SPI, I^2C
- Low-EMI for passing CE and RF tests
- Migration path from core module to chip
- Glueless memory interface
- 1MB direct code/data space

Cost Benefits

- ✓ Royalty-free TCP/IP stack with source code
- ✓ Technical support for hardware & software
- ✓ On-chip peripherals to reduce chip count
- ✓ Low-cost development kits
- ✓ Faster time-to-market with our industry-proven RabbitCore technology

RABBIT® Semiconductor

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—many customers have successfully designed their product in 60-90 days using our low-cost RabbitCore solution. Be up and running within the first hour of opening one of our many low-cost development kits. Extensive libraries and sample programs are provided for quick application development.

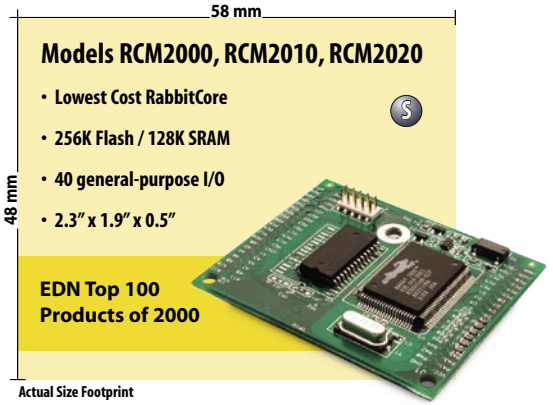
Ethernet/Internet Control & Monitoring

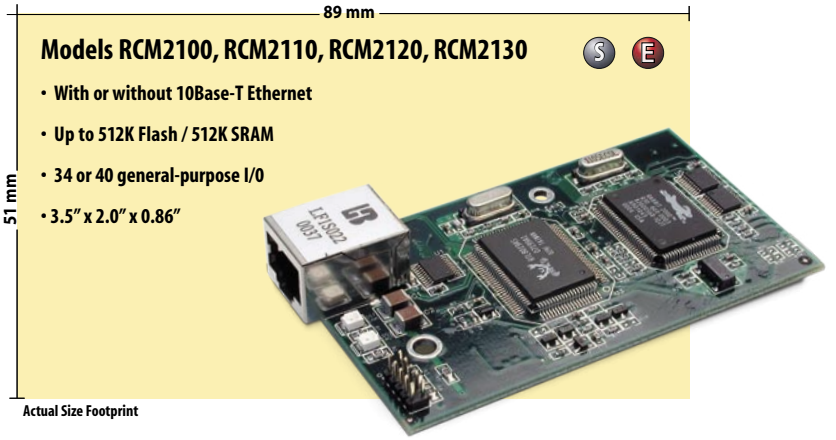
Interchangeable models with or without Ethernet and with various amounts of memory provide the flexibility designers need to offer product options to their customers. The 10Base-T and 10/100Base-T interfaces on Ethernet-enabled RabbitCores allow easy connection to local networks or the Internet.

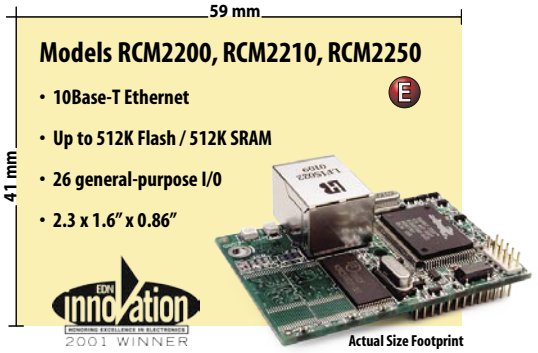
Powerful software allows communication via TCP/IP including sending e-mail and serving web pages. Users can program and debug over Ethernet/Internet using accessory hardware and/or application software.

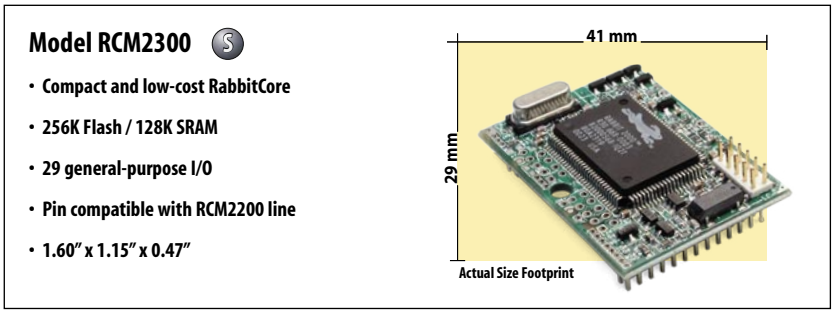
Shared Features of RabbitCores

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%, noncondensing	
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









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	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			
Pricing *(qty. 1/100)* Part Number	**$69/55** 101-0404	**$49/39** 101-0405	**$39/31** 101-0383	**$89/69** 101-0434	**$59/49** 101-0435	**$69/55** 101-0436	**$49/39** 101-0446	**$55/44** 101-0454	**$49/39** 101-0488	**$79/62** 101-0494	**$42/33** 101-0453
Development Kit Part Number	**$169** U.S.101-0398 Int'l 101-0399			**$279** U.S. 101-0451 Int'l 101-0452				**$239** U.S. 101-0475 Int'l 101-0478			**$199** U.S. 101-0480 Int'l 101-0481

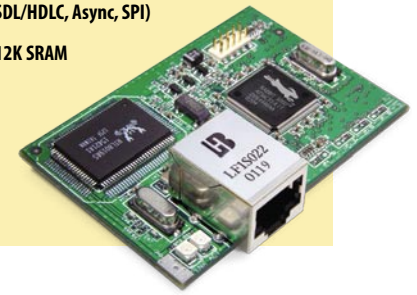
* Grouped in 8-bit ports and shared with serial ports

** 1 clocked line available only on programming header

69 mm

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"



47 mm

Actual Size Footprint

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"

47 mm

42 mm

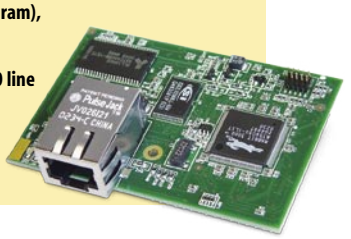
Actual Size Footprint

69 mm

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

47 mm



Actual Size Footprint

29 mm

35 mm

Actual Size Footprint

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	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	
Pricing *(qty. 1/100)* Part Number	**$79/64** 101-0507	**$59/49** 101-0508	**$65/50** 101-0517	**$45/35** 101-0518	**$89/72** 101-0520	**$79/65** 101-0522	**$79/59** 101-0561	**$59/49** 101-0562
Development Kit Part Number	**$299** U.S. 101-0523 Int'l 101-0524		**$239** U.S. 101-0533 Int'l 101-0534		**$349** U.S. 101-0552 Int'l 101-0553		**$399** U.S. 101-0587 Int'l 101-0588	

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

S Serial Only/Non-Ethernet E Ethernet and Serial Communication

Key Applications

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

Low-Cost Development Kits

Jumpstart 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. Kits start at only $169.

Dynamic C® Software

Integrated Development Environment

RabbitCores are ready for immediate software development. User programs are created using Dynamic C, a software development environment that includes a compiler, editor, loader and debugger. Programs are compiled and executed using Dynamic C and a serial programming cable—no in-circuit emulator is needed. Key features include:

- **Fast compiler with compiling, linking, and downloading to target**
- **Full-feature source and/or Assembly-level debugger**
- **Hundreds of functions in source-code libraries and sample programs**
- **Powerful language extensions for cooperative or preemptive multi-tasking**

Ethernet-enabled RabbitCore kits include TCP/IP stack in source form royalty free, saving OEMs significant costs over the life of their application. Users can write directly to TCP or UDP sockets to develop custom applications. Design engineers will appreciate the advanced starting point for development, with extensive demo programs illustrating each of the following supported TCP/IP capabilities:

HTTP – *Hypertext Transfer Protocol*. Protocol for 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*. 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*. Protocol exchanging datagrams without acknowledgements or guaranteed delivery.

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

ICMP – *Internet Control Message Protocol*. Network protocol to verify connection to another host (PING).

Customize your unique programming needs by selecting from a wide range of add-on software library modules, including source code and sample programs for:

- **SNMP source code and sample programs**
- **PPP source code and sample programs**
- **AES source code and sample programs**
- **MicroC/OS-II source code and sample programs**
- **Library encryption executable**
- **And more…**

RABBIT Semiconductor

ORDER ONLINE OR FIND A LOCAL DISTRIBUTOR @

www.rabbitsemiconductor.com

2932 Spafford Street • Davis, CA 95616
T: 530.757.8400 • F: 530.757.8402 • E: rabbit@rabbitsemiconductor.com