

# RCM4000 RabbitCore™

MODELS | RCM4000 | RCM4010 |

*Microprocessor Core Module*

## Key Features

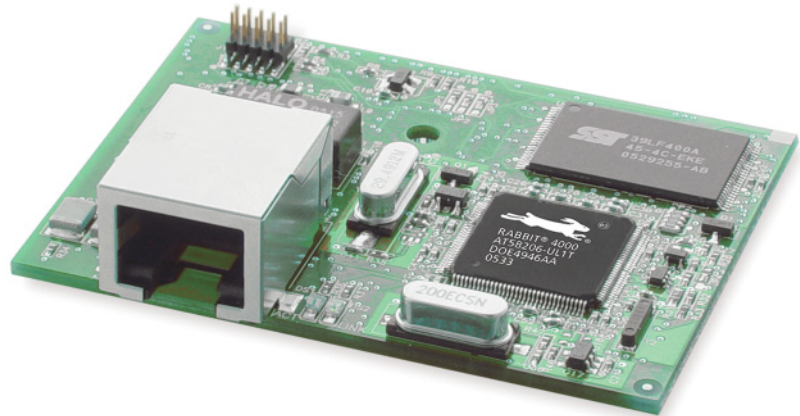
- Rabbit® 4000 microprocessor with integrated Ethernet
- Clock speed at 58.98 MHz with 16-bit memory
- 32 MB NAND flash for data
- 512K Flash / 512K SRAM
- 8-channel, 12-bit A/D converter
- Up to 25 GPIO with multi-layer alternate pin functions
- Up to 5 CMOS-compatible serial ports
- Low-power modes and speeds as low as 2 kHz
- Low-EMI
- Optimized for use with Dynamic C® v. 10 – a powerful integrated development environment

## Design Advantages:

- Designed for embedded networking with intelligence and I/O control
- Serves web pages, controls remote devices, links equipment to the Internet
- Security-key feature with “tamper detect” and encryption capabilities adds peace of mind for OEMs and systems integrators
- Complete microprocessor, on-board memory, development software with royalty-free TCP/IP stack, and hundreds of sample programs reduce time-to-market

## Applications

- Serial-to-Ethernet applications
- Remote monitoring and communications
- Web-enabling devices
- Device/data management and control



## RCM4000 RabbitCores – Embedded Networking & Control

The RCM4000 microprocessor core module is a powerful embedded Ethernet control device that has the intelligence and internet connectivity that allows your devices to be remotely monitored and controlled from anywhere in the world.

The RCM4000 is the first RabbitCore module to take advantage of the integrated Ethernet on the new Rabbit 4000 microprocessor. Running at 58.98 MHz, equipped with 16-bit memory, on-chip DMA channels and 500+ new code instructions, the RCM4000 can handle both communications and intelligence of your embedded device. The microprocessor also features GPIO lines shared with up to five serial ports, four levels of alternate pin functions that include variable phase PWM, quadrature decoder, and input capture.

The RCM4000 series feature a small

footprint of 1.84" × 2.41" × 0.77" (47 mm × 61 mm × 20 mm), complete with the Rabbit 4000 microprocessor, 512K Flash, 512K SRAM, 10Base-T Ethernet, and 32MB NAND flash and eight channels of 12-bit A/D on the RCM4000 model. The RCM4000 core module is ready for network connectivity and I/O control for true device internet communication and control.

RabbitCores mount directly onto a user-designed motherboard, and can interface with CMOS-compatible digital devices via the user's motherboard. Programs are developed with our industry-proven

Dynamic C development system that includes an editor, compiler, and in-circuit debugger.

Programming is easy with hundreds of samples and libraries that are pre-developed, for a user to be up and running in no time. No in-circuit emulator is required, no third party tools needed. Dynamic C enhanced compiler generates smaller code, support for far pointers and far data for easy access to external memory devices, improvements to AES encryption libraries, and a new I/O configuration utility that helps assign pin functions and guides those selections so that conflicts can be avoided.

## Dynamic C Add-on Modules

Dynamic C Add-on modules provide added functionality and customization to your embedded applications. Software is available via download or CD-ROM.



### Secure Socket Layer

Industry standard web security for embedded applications



### RabbitWeb

Easily create web interfaces to monitor and control embedded applications



### Fat File System

Popular, network-accessible file system for flash memories



### Advanced Encryption Standard

128-bit encryption for transfer of sensitive data



### Point-to-Point Protocol

TCP/IP functionality for serial and PPPoE connections



### Library Encryption Executable

Program to encrypt Dynamic C library source files

| RCM4000 RabbitCore Specifications          |                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                              |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Features                                   | RCM4000                                                                                                                                                                                                                                                                                                                                                                        | RCM4010                                                                                                                      |
| Microprocessor                             | Rabbit 4000 @ 58.98 MHz                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                              |
| EMI Reduction                              | Spectrum spreader for reduced EMI (radiated emissions)                                                                                                                                                                                                                                                                                                                         |                                                                                                                              |
| Ethernet Port                              | 10Base-T, RJ-45, 2 LEDs                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                              |
| Flash                                      | 512K (16-bit)                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                              |
| SRAM                                       | 512K (16-bit)                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                              |
| NAND Flash                                 | 32 MB                                                                                                                                                                                                                                                                                                                                                                          | —                                                                                                                            |
| General-Purpose I/O                        | 19 digital I/O lines, configurable with up to four layers of alternate functions                                                                                                                                                                                                                                                                                               | 25 digital I/O lines, configurable with up to four layers of alternate functions                                             |
| Analog Inputs                              | 8 channels single-ended (11-bit resolution) or 4 channels differential (12-bit resolution)                                                                                                                                                                                                                                                                                     | —                                                                                                                            |
| Additional Inputs                          | 2 Startup Mode, Reset In, CONVERT                                                                                                                                                                                                                                                                                                                                              | 2 Startup Mode, Reset In                                                                                                     |
| Additional Outputs                         | Status, Reset Out, Analog VREF                                                                                                                                                                                                                                                                                                                                                 | Status, Reset Out                                                                                                            |
| Auxiliary I/O Bus                          | 8 data and up to 6 address (shared with I/O), plus I/O read/write                                                                                                                                                                                                                                                                                                              |                                                                                                                              |
| Pulse-Width Modulators                     | —                                                                                                                                                                                                                                                                                                                                                                              | Two channels synchronized PWM with 10-bit counter<br><br>Two channels variable-phase or synchronized PWM with 16-bit counter |
| Serial Ports                               | Five shared high-speed, CMOS-compatible ports <ul style="list-style-type: none"><li>• All 5 are configurable as asynchronous (with IrDA)</li><li>• 4 configurable as clocked serial (SPI)</li><li>• 1 configurable as SDLC/HDLC</li><li>• 1 clocked serial port dedicated for A/D converter (RCM4000)</li><li>• 1 asynchronous serial port dedicated for programming</li></ul> |                                                                                                                              |
| Serial Rate                                | Max. asynchronous baud rate = CLK/8                                                                                                                                                                                                                                                                                                                                            |                                                                                                                              |
| Backup-Battery                             | Connection for user-supplied battery (to support RTC and data SRAM)                                                                                                                                                                                                                                                                                                            |                                                                                                                              |
| Slave Interface                            | Slave port permits use as master or intelligent peripheral with master controller                                                                                                                                                                                                                                                                                              |                                                                                                                              |
| Real-Time Clock                            | Yes                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                              |
| Timers                                     | Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers                                                                                                                                                                                                                         |                                                                                                                              |
| Watchdog/Supervisor                        | Yes                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                              |
| Input Capture                              | —                                                                                                                                                                                                                                                                                                                                                                              | 2-channel input capture can be used to time input signals from various port pins                                             |
| Quadrature Decoder                         | —                                                                                                                                                                                                                                                                                                                                                                              | 2-channel quadrature decoder accepts inputs from external incremental encoder modules                                        |
| Power                                      | 3.0 – 3.6 V DC, 90 mA @ 3.3 V (preliminary, pins unloaded)                                                                                                                                                                                                                                                                                                                     |                                                                                                                              |
| Operating Temp.                            | 0°C to +70°C                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                              |
| Humidity                                   | 5–95%, non-condensing                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                              |
| Connectors - Headers                       | One 2 x 25, 1.27 mm pitch IDC signal header. One 2 x 5, 1.27 mm IDC programming header                                                                                                                                                                                                                                                                                         |                                                                                                                              |
| Board Size                                 | 1.84" x 2.41" x 0.77" (47 mm x 61 mm x 20 mm)                                                                                                                                                                                                                                                                                                                                  |                                                                                                                              |
| Pricing                                    |                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                              |
| Pricing (qty. 1/100)<br>Part Number (RoHs) | \$89/\$72<br>20-101-1094                                                                                                                                                                                                                                                                                                                                                       | \$69/\$56<br>20-101-1112                                                                                                     |
| Development Kit<br>Part Number             | \$249<br>U.S. 101-1145      Int'l 101-1146                                                                                                                                                                                                                                                                                                                                     | \$239<br>U.S. 101-1114      Int'l 101-1115                                                                                   |

## RCM4000 and RCM4010 Development Kits come complete with:

- RCM4000 or RCM4010 RabbitCore Module
- Prototyping Board
- Serial cable for programming and debugging
- Dynamic C® integrated development software
- Getting Started Instructions
- Complete product documentation on CD including the Rabbit 4000 reference manual
- AC adapter (U.S. only)
- Rabbit 4000 pin specifications poster
- Connectors and accessories