



RABBIT eNews

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Qualstar's new Rabbit-powered Q-Link is giving computer network administrators unprecedented remote control of their automated tape storage libraries.

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Rabbit 3000/Dynamic C Training Seminar

September 26-27
Cleveland, Ohio

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Live Links!

Rabbit eNews features live links that take you exactly where you want to go. Just click on the headlines or any graphic or web address to jump directly to the relevant page or online resource.



www.rabbitsemiconductor.com

Product Spotlight

Three New RabbitCores!

Rabbits have been multiplying faster than ever this summer! Three new RabbitCore microprocessor core modules are hopping off the production line.

Like their successful predecessors, the RCM3000, RCM3100, and soon-to-be-released RCM3200 are ready-made solutions for rapid development of OEM designs and embedded systems. All of the new RabbitCores are powered by our new Rabbit 3000™ microprocessor. The powerful RCM3000, which comes in two models, is feature packed and Ethernet enabled. The low-cost, non-Ethernet RCM3100 has a small footprint and also comes in two configurations. And the groundbreaking RCM3200 boasts 10/100Base-T Ethernet and a fast 44 MHz clock. The new RCMs are pin compatible with each other to permit hassle-free parallel development.



	RCM30xx SHIPPING NOW	RCM31xx SHIPPING NOW	RCM3200 AVAILABLE 9/30
Clock speed	29.4 MHz	29.4 MHz	44.2 MHz
Ethernet	10Base-T	None	10/100Base-T
Flash	256K-512K	256K-512K	512K
SRAM	128K-512K	128K-512K	512K + 256K (data)
Digital I/O	52	54	52
Size	2.73" x 1.85" x 0.86" (69 x 47 x 22 mm)	1.85" x 1.65" x 0.48" (47 x 42 x 12 mm)	2.73" x 1.85" x 0.86" (69 x 47 x 22 mm)
Price (qty. 1000)	\$44	\$29	\$63

Designing with RabbitCores

The RabbitCore family of core modules features 8-bit 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.

The integrated Ethernet port frees designers from the limitations of serial-port communications and control and permits instant local or worldwide connectivity using low-cost networking hardware. Embedded systems using Ethernet-equipped RabbitCores can be controlled and monitored (as well as programmed and debugged, when using appropriate accessory hardware) across any network or the Internet.

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For more information, call 530.757.8400 or visit www.rabbitsemiconductor.com

Programming RabbitCores

Programs are developed using our industry-proven Dynamic C SE software development system (included in low-cost development kits). An extensive library of drivers and sample programs is provided, along with royalty-free TCP/IP stack with source (Ethernet kits only).

Low-Cost Development Kits

Jumpstart your evaluation and design efforts with a complete RabbitCore Development Kit, which includes selected core module (with Rabbit 3000 microprocessor, Flash, SRAM, serial ports, and I/O), a prototyping board, Dynamic C SE development software with documentation on CD-ROM (not a trial version), AC adapter (U.S. only), serial cable for programming and debugging, and Getting Started manual. ■

Customer Success Story

Q-Link Provides Library Privileges

Rabbit-Powered Web Server Facilitates Remote Management of Tape Backup Libraries

For nearly two decades, Qualstar Corporation® has been providing computer network administrators around the globe with reliable tape storage solutions for backup, archive, data protection, and storage management applications. From high-profile projects like Boeing's Space Shuttle mission to less glamorous undertakings such as corporate enterprise systems, Qualstar's tape products are designed to be compatible with virtually any operating system and platform.

Qualstar's latest innovation, Q-Link™, is a remote library management tool powered by the popular Rabbit 2000™ microprocessor. Q-Link allows customers to manage their tape libraries from any number of offsite locations via an easy-to-use web browser-based interface.

"The people that are running these libraries—controlling and configuring them—aren't always in the same building as the libraries," says Richard Nelson, Qualstar's vice president of engineering. "They may be across campus, across the state, or across the country. So working over the Internet or an intranet is the ideal way for them to perform all the tasks associated with managing their libraries, whether it's checking tape drives or updating firmware."

The Rabbit 2000 provided a low-cost, fully integrated hardware and software solution for Qualstar's design team. "Our main reason for going with the Rabbit was that it simply yielded a greater cost-benefit," says project engineer Tom Barker. "It's a nice processor with excellent speed, and it's a great bundled product. You get an integrated TCP/IP stack royalty-free, you don't need any third-party tools, and it comes packaged as one unit. So right away you're up and

running and ready to do programming. You don't have any other startup requirements."

Remote Control

Q-Link cost-effectively web-enables a whole host of Qualstar's new and existing tape products, giving network managers an unparalleled degree of control over their libraries. (Qualstar libraries range in capacity from 10 to 600 tapes, with up to 12 drives. The largest library has a compressed capacity of 156 terabytes and a combined compressed backup rate of 1.3 terabytes per hour.)

Choosing the right chip for Qualstar's new web server was easier than expected. Nelson and Barker came across Rabbit Semiconductor while researching processor options for Q-Link. "We had looked at many different platforms, but we saw that the Rabbit board had a TCP/IP stack with it," says Barker.

After purchasing a RabbitCore microprocessor core module development kit to evaluate the Rabbit's capabilities, both engineers were suitably impressed. "From the start, it was very easy to work with. It was really nice to be able to take something out of the box, download a program to it, and watch it run," says Barker.

Nelson and Barker quickly designed their own customized boards around the Rabbit 2000, using the RabbitCore schematic as a guide. "After we developed the framework for the web server, we drew the PCB for our proprietary board," said Barker. "We went from schematic in the Rabbit manual to a production release without a hitch."

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Powered by the Rabbit 2000, the Q-Link cost-effectively web-enables many of Qualstar's new and existing tape backup products (above), giving network managers an unparalleled degree of control over their libraries



Qualstar's Q-Link™

Ahead of the Curve

Rabbit's integrated hardware/software approach helped give Qualstar a head start in development, leading to quick time to market. "The fact that the hardware is bundled with the Dynamic C software—that it comes to you in an integrated package—that was a few learning curves that were out of our way in the development cycle," says Barker.

With customer demand for the web server growing fast, getting ahead of the curve was especially important. "From schematic to the working boards took only about six weeks," says Nelson. "The same interface circuitry is now on four different boards that go into many of our different product models—and there will be more coming."

"The Rabbit 2000 and Dynamic C have afforded us everything we want to present to the user," adds Barker. "Simply being able to give the user all the real estate that's available with the browser is a huge plus—there are essentially no restrictions."

Special Features

Utilizing the proven RabbitCore design as a foundation, the Qualstar team simply added a few special features to their own board designs to accommodate customers' specific needs. "What's on our board is essentially what's on the schematic for the RabbitCore. We have a single half-meg of Flash, a single half-meg of RAM, the processor, clocks, and Ethernet connection," says Barker. "We also have a few other components related to fiber channel connections on a particular board."

Qualstar uses Dynamic C's SMTP mail server protocol to equip Q-Link with the ability to notify users when important events occur. "When specific events happen with the library, we're able to E-mail out to multiple recipients exactly what's going on," says Barker. "That way, they know about it on a timely basis and can correct it."

Qualstar also takes advantage of Dynamic C's support for a wide range of protocols. "We use a lot of HTML, and we make extensive use of CGIs and a few applets for names and

passwords, for example," says Barker. "There's a lot of interaction going on. We use DHCP and static IP addresses, and eventually we will be using SNMP [*ed. note: upcoming releases of Dynamic C will feature SNMP*]. We view that as a huge plus as far as the development environment goes."

The Bottom Line

The bottom line for Qualstar's customers is that Q-Link allows them to do their jobs more efficiently. Q-Link's design and interactive inventory display extends the capabilities of the library's menu system, giving network managers the ability to check the status of all cartridge storage locations, move tapes, and even clean tape drives remotely.

"Q-Link provides a full-blown picture of the library, with folders and a menuing system that looks much like Windows Explorer," says Barker. "Everything that you want to see in the library is laid out before you."

Q-Link also simplifies library monitoring and configuration.

Whereas before, supervising or changing parameters required an operator to be physically present at the library site, now the process is reduced to a simple point-and-click task executable from a web-enabled PC.

Customers can retrieve information more easily, as well. "Say you have 600 tapes and you need to know where a particular bar code is," says Barker. "You simply type in a few numbers of

the code and it will find it immediately. If you didn't have that interface, you'd have to go onsite to use the library's LCD, and who knows how many key presses it would take to find out where that tape is located."

Meanwhile, Q-Link helps Qualstar provide better customer service. "If someone has a problem, our people can now directly access activity logs recorded inside the library," says Nelson.

High Interest Rates

So far, Q-Link is garnering a lot of customer interest. The response from those already using the new technology has been overwhelmingly positive. "One of our customers, a large university, has about ten servers in the computer science department that they monitor from a single point," says Barker. "It just made no sense for them to have to run upstairs every time they wanted to do something with the library. With this web server, they no longer have to—they can now see what's going on in the library along with everything else that's in their facility. They're able to be that much more efficient in doing their job, and they just love it." ■

“Our main reason for going with the Rabbit was that it simply yielded a greater cost-benefit.”
—Tom Barker, project engineer



For more information,
call 805.583.7744
or visit www.qualstar.com

Rabbit 3000™/Dynamic C® Training Seminar

September 26-27, 2002, Hyatt Regency Cleveland

Rabbit Semiconductor and Z-World are pleased to offer a jointly sponsored Rabbit 3000 / Dynamic C Training Seminar. This seminar will provide attendees with the knowledge needed to design and develop high-performance embedded systems using low-cost Rabbit products. Training is tailored to hardware/software design engineers of OEM products.

Day One

Morning session: Basics of the Rabbit 3000 Microprocessor, I/O Registers, Timers, and other Rabbit 2000/3000 features, as well as the basics of Dynamic C development software.

Afternoon session: Advanced Rabbit 3000 features, the range of Dynamic C's capabilities, and tips for developing a custom application.

Day Two (optional)

Morning session: TCP/IP concepts (theory)

Afternoon session: Using TCP/IP (hands-on)

One-on-one Q&A and technical assistance will round out both days' sessions.

Dates & Locations

Cleveland, Ohio

Thursday/Friday

September 26–27

8:00 a.m. to 4:30 p.m.

Cleveland Hyatt

420 Superior Ave.

Registration Fee

\$399 2-day seminar with TCP/IP

\$349 Day One only without TCP/IP seminar

Last day to register is September 20.

Fee includes:

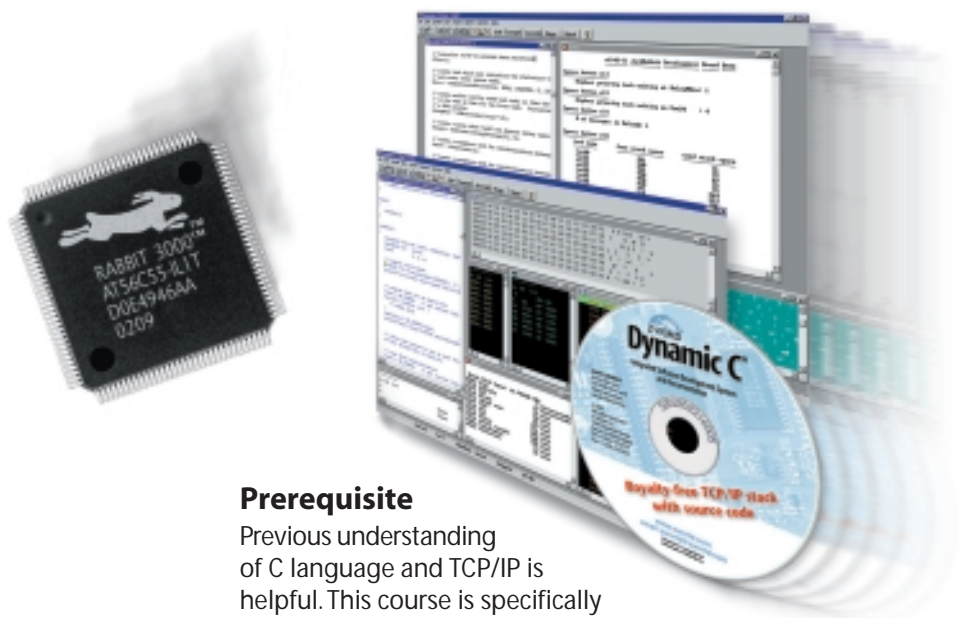
- One day training on Rabbit 3000/Dynamic C
- One day training on TCP/IP (theory and hands-on)
- Rabbit 3000/RCM3000 Development Kit
- Ethernet cross-over cable
- Training materials
- Continental breakfast and lunch

How to Register

Phone: Call **530.757.8400** and ask to register for the Rabbit 3000/Dynamic C Training Seminar.

Fax: Download the registration form in Acrobat PDF format at www.rabbitsemiconductor.com/registration.pdf and fax the completed form to **530.757.8402**.

Note: Registration is nonrefundable. However, registration and included development kit are transferable to a colleague if you are unable to attend, or we will ship the development kit to you after the seminar.



Prerequisite

Previous understanding of C language and TCP/IP is helpful. This course is specifically tailored for design engineers new to the Rabbit 3000 processor and Dynamic C software development system.

Tools

Please bring a Windows laptop with working RS-232 port, working Ethernet adaptor, and your drivers disk (to assist with Dynamic C installation.) If you cannot bring a laptop, handouts of the presentation with room for notes are provided to begin development after the class.

Accommodations

Attendees of either training seminar wishing to stay overnight at the Hyatt will receive a special rate. To reserve a room, call the Cleveland Hyatt directly at 216.575.1234 and reference "Rabbit Training Seminar."

**Seating is limited.
Last day to register is September 20.**

Dynamic C[®] 7.30 Highlights (Early October Release)

In our continuous quest to provide the best software solutions for embedded control, we have added new features and made functional improvements to Dynamic C:

NEW FEATURES

Separate Instruction and Data Space. The compiler can now take advantage of an MMU feature on all Rabbit 3000 chips as well as Rabbit 2000 chips (except those labeled with an IQ2T manufacturing code). This effectively doubles the available Root memory space.

Simple Network Management Protocol (SNMP).

Implements SNMP v1 basic protocol (using UDP as transport mechanism) plus a database for the MIB tree.

TCP/IP Multicasting Support. For IGMPv1 and IGMPv2.

Allows Internet-enabled Rabbit products to send packets with multiple destinations.

Ethernet Packet Driver Support. Added for SMSC LAN91C113 10/100 and ASIX AX88796 10/100.

New Download Manager Sample Programs. One added for single 256K byte Flash boards, and one for using FTP instead of RS-232.

TCP/IP Multiple Interface Support. Allows simultaneous use of multiple Ethernet ports or Ethernet and PPP.

Other new features:

- Samples, libraries, and documentation for new RCM3200 core module added.
- More extended memory data handling functions added.

OTHER IMPROVEMENTS

General TCP/IP Improvements include:

- Congestion avoidance improvements
- Significantly faster transmission
- ARP now handles ICMP redirect messages

Significant Speed-Ups to compiling and downloading

For more information about Dynamic C 7.30 features:

www.rabbitsemiconductor.com/products/dc/newFeatures.html

Dynamic C[®]

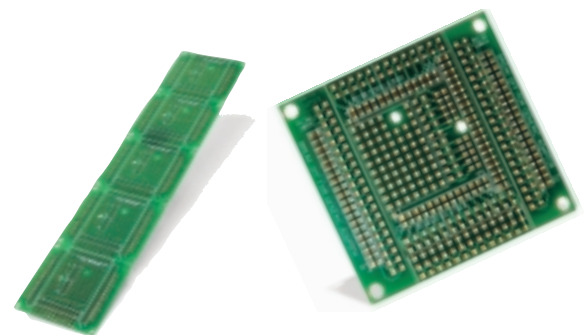
Integrated Software Development System

New Connector Adapter Board

Rabbit Semiconductor now offers a Connector Adapter Board that allows customers to use RCM2xxx and RCM3xxx RabbitCore modules and the BL1800 Jackrabbit with 2-mm pitch headers on a prototyping or development board with 0.1" pitch.

The Adapter Board is sold individually for prototyping and in scored panels of five for production. Headers and sockets are sold separately in packets of 10 pieces. Simply choose the sockets and headers you need for your particular application.

A convenient small prototyping area will usually be left on the Adapter Board once your single-board computer or RabbitCore module is in place on the Adapter Board.



To order online, please visit:

www.rabbitsemiconductor.com/products/adapter_board/

Contact Information



www.rabbitsemiconductor.com

2932 Spafford Street • Davis, CA 95616

T: 530.757.8400

F: 530.757.8402

eNews: press@rabbitsemiconductor.com

Sales: sales@rabbitsemiconductor.com