



# Embedded Control

## Serial-to-Ethernet Application Kit Getting Started

### Application Kit Contents

- *Dynamic C* CD-ROM, with complete product documentation on disk.
- CD-ROM with sample program and information related to Application Kit.
- RCM3010 module.
- Prototyping Board, with a bag of accessory parts for use on the Prototyping Board.
- LCD/keypad module.
- AC adapter, 9 V DC, 1 A (included only with Development Kits sold for the North American market). A header plug leading to bare leads is provided to allow overseas users to connect their own power supply with a DC output of 7.5–30 V.)
- 10-pin header to DE9 programming cable with integrated level-matching circuitry.
- Cable kits to access RS-485 and analog input connectors on Prototyping Board.
- DB9 null modem cable.
- DB9 to 10-pin adapter cable.
- Ethernet crossover cable.
- *RCM3000 Getting Started Manual*.
- *Getting Started* instructions and Application Note.
- *Rabbit 3000 Processor Easy Reference* poster.
- Registration card.

### Installing Dynamic C

If you haven't yet installed Dynamic C, insert the Dynamic C CD from the Application Kit in your PC's CD-ROM drive. If the installation program does not auto-start, then run the **setup.exe** program in the root directory of the Dynamic C CD.

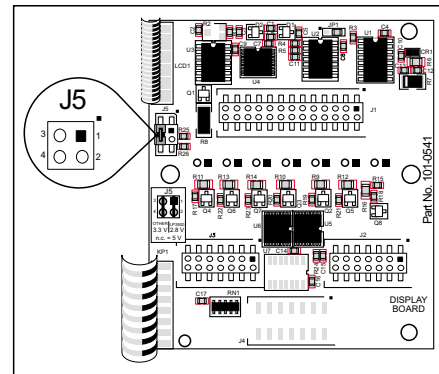
## Hardware Connections

### 1. Set Up LCD/Keypad Module for 5 V

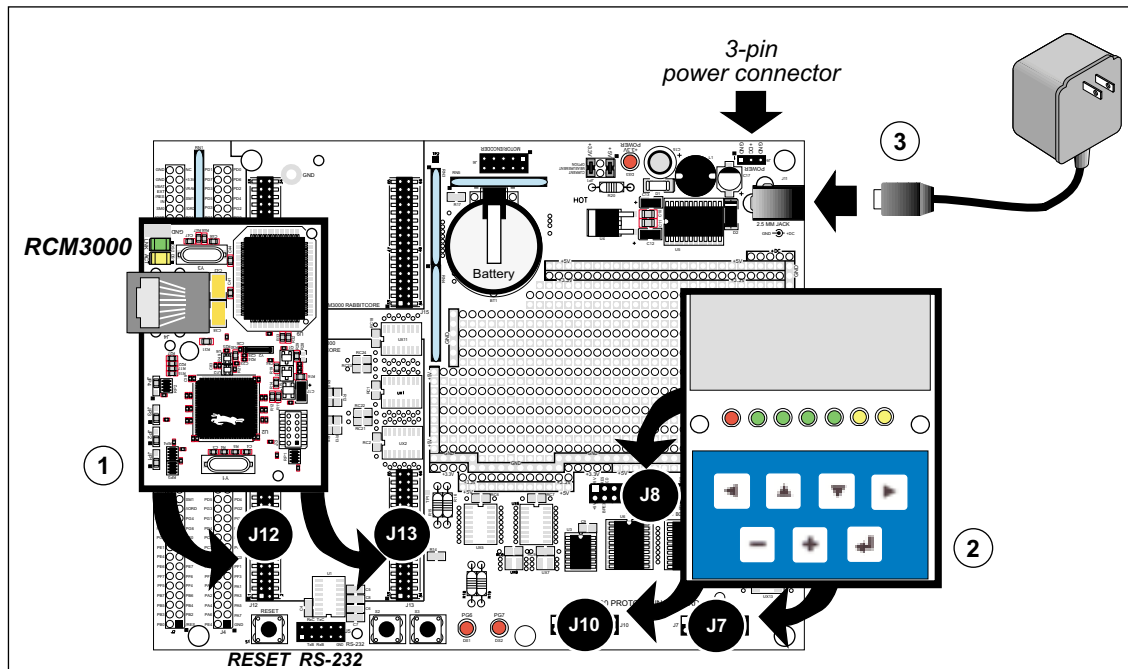
Remove the jumper on header J5 on the back of the LCD/keypad module to configure the LCD/keypad module to operate at 5 V.

### 2. Install Modules on Prototyping Board

Turn the RCM3010 module so that the Ethernet connector end of the module extends off the left side of the Prototyping Board as shown in Figure 2 below. Align the module headers J1 and J2 into sockets J12 and J13 on the Prototyping Board. Install the LCD/keypad module on header sockets J7, J8, and J10 of the Prototyping Board as shown in Figure 2. Press both module's pins firmly into the Prototyping Board headers.



**Figure 1. Remove Jumper from Header J5 on LCD/Keypad Module**



**Figure 2. Install the Modules on the Prototyping Board**

**NOTE:** It is important that you line up the pins on the modules exactly with the corresponding pins of the sockets on the Prototyping Board. The header pins may become bent or damaged if the pin alignment is offset, and the modules will not work. Permanent electrical damage to the modules may also result if a misaligned module is powered up.

Connect the wall transformer to jack J11 on the Prototyping Board as shown in Figure 2 above. The LED above the **RESET** button on the Prototyping Board should light up.

**NOTE:** The **RESET** button is provided on the Prototyping Board to allow a hardware reset without disconnecting power.

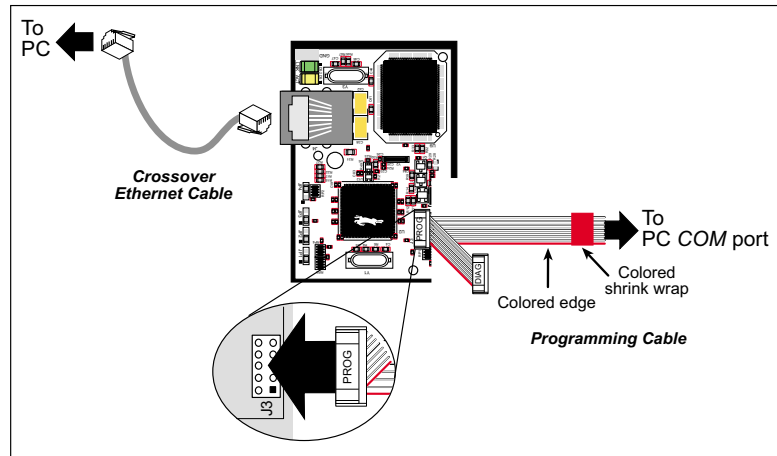
## Overseas Development Kits

Development kits sold outside North America include a header connector that may be connected to 3-pin header J9 on the Prototyping Board. The connector may be attached either way as long as it is not offset to one side. The red and black wires from the connector can then be connected to the positive and negative connections on your power supply. The power supply should deliver 7.5 V–30 V DC at 500 mA.

### 3. Attach Cables

Connect the 10-pin connector of the programming cable labeled **PROG** to header J3 on the RCM3010 as shown in Figure 3. Be sure to orient the marked (usually red) edge of the cable towards pin 1 of the connector. (Do not use the **DIAG** connector, which is used for a normal serial connection.)

**NOTE:** Be sure to use the programming cable supplied with this Application Kit—the programming cable has red shrink wrap around the RS-232 converter section located in the middle of the cable. Programming cables from other Z-World or Rabbit Semiconductor kits were not designed to work with RCM3000 modules.



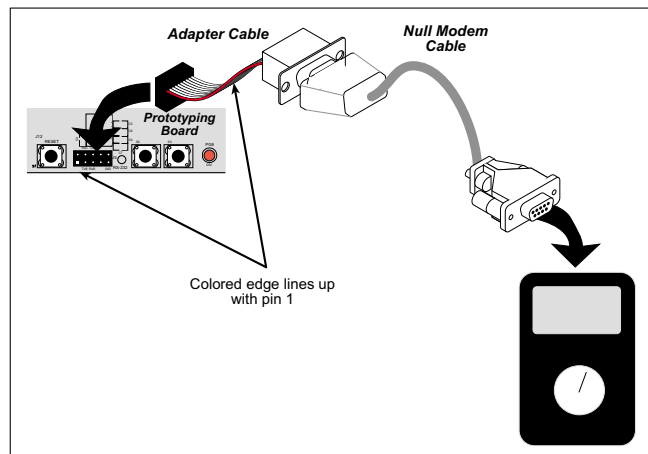
**Figure 3. Connect Programming and Ethernet Cables to PC**

Connect the other end of the programming cable to a COM port on your PC. Use the Ethernet crossover cable to connect the RJ-45 jack on the RCM3010 to the RJ-45 jack on your PC.

Use the null modem cable and the DB9 to 10-pin adapter cable to connect your digital multimeter (DMM) to the RS-232 header on the Prototyping Board. Be sure to orient the marked (usually red) edge of the adapter cable towards pin 1 of the connector.

#### Additional Hardware Information

The *RabbitCore RCM3000 Getting Started Manual* included with this kit provides more detailed hookup and Dynamic C debugging information. The *RabbitCore RCM3000 User's Manual* on the Dynamic C CD-ROM provides complete information on using and developing applications for the RCM3000, and includes further information on the Prototyping Board and the LCD/keypad module.



**Figure 4. Connect DMM to RS-232 Header on Prototyping Board**

## Running the Software

Configure your PC with the IP address and netmask to be used by the sample program.

1. Go to control panel (**Start > Settings > Control Panel**) and start **Network Connections**.
2. Select **Local Area Connection** and chose **Properties**.
3. Select **Internet Protocol (TCP/IP)** and chose **Properties**.
4. Check **Use the following IP Address** and fill in the following fields:



☒ Use the following IP address:

IP address:	10 . 10 . 6 . 231
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	10 . 10 . 6 . 1

5. Click **<OK>** and **<Close>** out of **Local Area Connection** and **Network Connections**.

Locate the CD-ROM with the sample program and information specific to the Serial-to-Ethernet Application Kit. Load the CD in your CD-ROM drive and follow the instructions in the **Ser2EthReadMe.txt** file to add the files and code needed for your Dynamic C installation.

Now you may start Dynamic C by double-clicking on the Dynamic C icon or by double-clicking on **dcrabXXXX.exe** in the Dynamic C root directory, where **XXXX** are version-specific characters. Find the **Ser2Eth.c** sample program that you copied per the above instructions, open it with the **File** menu, compile it using the **Compile** menu, and then run it by selecting **Run** in the **Run** menu.

In order to capture data from the DMM, you will need a terminal emulation program such as Tera Term, which is available online at no charge from [hp.vector.co.jp/authors/VA002416/tera-term.html](http://hp.vector.co.jp/authors/VA002416/tera-term.html). Download Tera Term and follow the directions to unzip and install the software on your PC. Once the installation is complete, start Tera Term up and you will be presented with a connection dialog. Enter the IP address of the serial-to-Ethernet bridge (10.10.6.230) and click OK to get connected.



Select the desired reading on the DMM (e.g., DC Volts) and enable the RS-232 readout. You should be able to see readings from the DMM in the Tera Term window. You can select a log file by going to **File > Log** in Tera Term to collect the data from the DMM. Once you have collected the data, you can import it to a spreadsheet program such as Excel to process the data.

## Where Do I Go From Here?

Application Note AN403, *Getting on the Wire*, provides additional information. If there are any problems:

- Check the Z-World/Rabbit Semiconductor Technical Bulletin Board at [www.zworld.com/support/bb/](http://www.zworld.com/support/bb/).
- Use the Technical Support e-mail form at [www.zworld.com/support/support\\_submit.html](http://www.zworld.com/support/support_submit.html).

**NOTE:** If you purchased your Serial-to-Ethernet Application Kit through a distributor or through a Z-World or Rabbit Semiconductor partner, contact the distributor or partner first for technical support.