Simple Sensor Application Kit

The Simple Sensor Application Kit provides a design reference for designers to implement the Dallas 1-Wire®
bus technology in a Rabbit-based system. These Getting Started instructions and sample applications based
on four 1-Wire® devices will help users to better understand and implement this communications bus
system using a Prototyping Board and a RabbitCore module.

Application Kit Contents

- *Dynamic C*® CD-ROM with complete product documentation and sample programs related to the
  Simple Sensor Application Kit.
- RCM4300 module.
- Prototyping Board with four 1-Wire devices installed.
- 512 MB *miniSD™ Card* with SD Card adapter
- Universal AC adapter, 12 V DC, 1 A (includes Canada/Japan/U.S., Australia/N.Z., U.K., and
  European style plugs).
- USB programming cable with 10-pin header.
- Cat. 5 Ethernet crossover cable.
- 10-pin header to DB9 serial cable.
- *Getting Started* instructions.
- Plastic and metal standoffs with 4-40 screws and washers.
- A bag of accessory parts for use on the Prototyping Board.
- *Rabbit 4000 Processor Easy Reference* poster.
- Registration card.

Visit our online Rabbit store at www.rabbit.com/store/ for the latest information on peripherals and accessories that are available for the RCM4300 series of RabbitCore modules.

Step 1 — Install Dynamic C®

Before doing any development, you must install Dynamic C. Insert the CD from the Application Kit in
your PC's CD-ROM drive. If the installation does not auto-start, run the `setup.exe` program in the root
directory of the Dynamic C CD. Install any other Dynamic C modules after you install Dynamic C.

Hardware Connections

Step 1 — Prepare the Prototyping Board

To facilitate handling the Prototyping Board, snap in the four standoffs to the four holes at the corners from the bottom side of the Prototyping Board as shown in Figure 1.
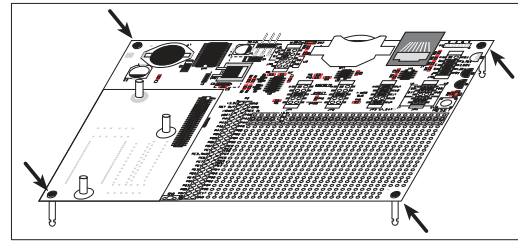
Step 2 — Attach Module to Prototyping Board

Figure 1. Insert Standoffs

Turn the RCM4300 module so that the mounting holes line up with the corresponding holes on the Prototyping Board. Insert the metal standoffs as shown in Figure 2, secure them from the bottom using the 4-40 × 3/16 screws and washers, then insert the module's header J4 on the bottom side into socket RCM4XXX on the Prototyping Board.
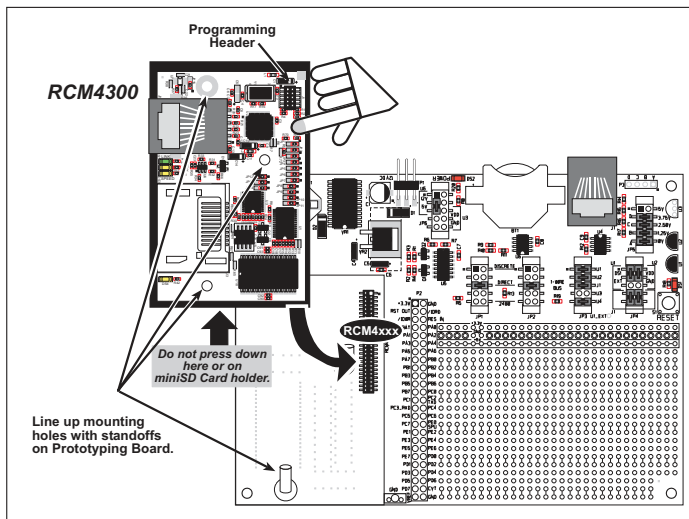

Figure 2. Install the RCM4300 Module on the Prototyping Board

CAUTION: You will sense a soft click once you insert the *miniSD™ Card* completely. To remove it, gently press the card towards the middle of the RCM4300 — you will sense a soft click and the card will be ready to be removed. Do ***not*** attempt to pull the card from the socket before pressing it in — otherwise the ejection mechanism will get damaged. The ejection mechanism is spring-loaded, and will partially eject the card when used correctly.

> **NOTE:** It is important that you line up the pins on header J4 of the module exactly with socket RCM4XXX on the Prototyping Board. The header pins may become bent or damaged if the pin alignment is offset, and the module will not work. Permanent electrical damage to the module may also result if a misaligned module is powered up.

Press the module's pins firmly into the Prototyping Board socket—press down in the area above the header pins. For additional integrity, you may secure the RCM4300 to the standoffs from the top using the remaining three 4-40 screws and washers.

Step 3 — Connect Programming Cable

The programming cable connects the RCM4300 to the PC running Dynamic C to download programs and to monitor the RCM4300 module during debugging.

Connect the 10-pin connector of the programming cable labeled **PROG** to header J1 on the RCM4300 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 presently not supported by the RCM4300.)

Connect the other end of the programming cable to an available USB port on your PC or workstation.
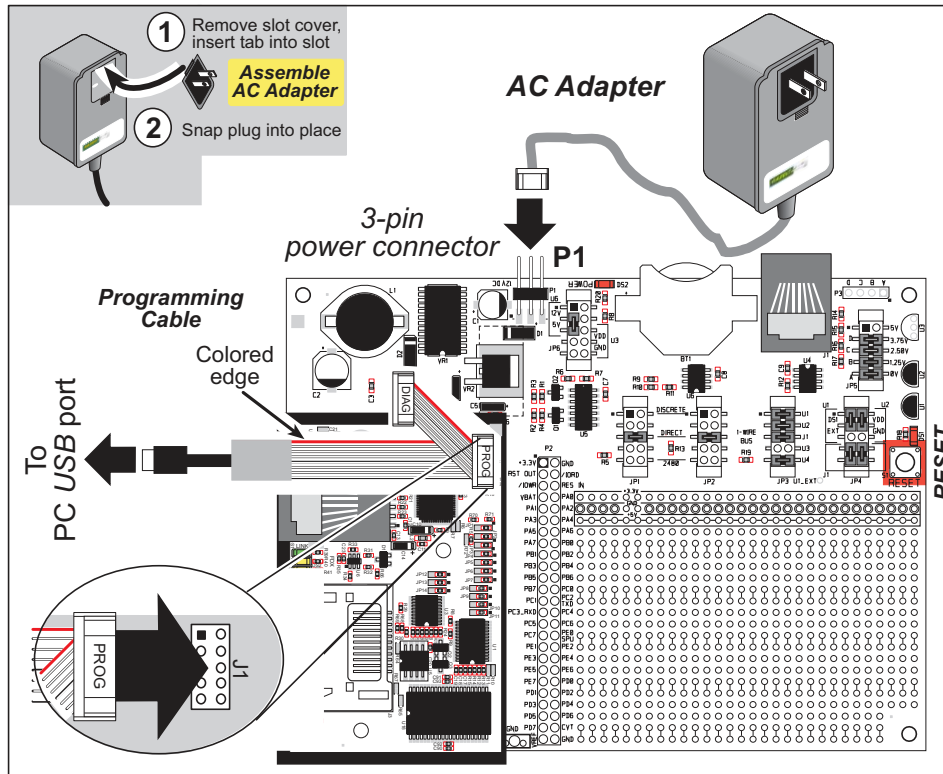
Figure 3. Connect Programming Cable and Power Supply

Your PC should recognize the new USB hardware, and the LEDs in the shrink-wrapped area of the USB programming cable will flash — if you get an error message, you will have to install USB drivers. Drivers for Windows XP are available in the Dynamic C **Drivers\Rabbit USB Programming Cable\ WinXP_2K** folder — double-click **DPInst.exe** to install the USB drivers. Drivers for other operating systems are available online at www.ftdichip.com/Drivers/VCP.htm.

Step 4 — Connect Power

Once all the other connections have been made, you can connect power to the Prototyping Board.

First, prepare the AC adapter for the country where it will be used by selecting the plug. The RCM4300 Development Kit presently includes Canada/Japan/U.S., Australia/N.Z., U.K., and European style plugs. Snap in the top of the plug assembly into the slot at the top of the AC adapter as shown in Figure 3, then press down on the spring-loaded clip below the plug assembly to allow the plug assembly to click into place. Release the clip to secure the plug assembly in the AC adapter.

Connect the AC adapter to 3-pin header P1 on the Prototyping Board as shown in Figure 3. The connector may be attached either way as long as it is not offset to one side—the center pin of P1 is always connected to the positive terminal, and either edge pin is ground.

Plug in the AC adapter. The **POWER** LED on the Prototyping Board next to the power connector at P1 should light up. The RCM4300 and the Prototyping Board are now ready to be used.

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

Run a Sample Program

Once the RCM4300 is connected as described in the preceding pages, start Dynamic C by double-clicking on the Dynamic C icon on your desktop or in your **Start** menu. Select **Store Program in Flash** on the "Compiler" tab in the Dynamic C **Options > Project Options** menu. Make sure that the **Enable Separate Instruction & Data Space** option is checked. Then click on the "Communications" tab and verify that **Use USB to Serial Converter** is selected to support the USB programming cable. Click **OK**.

You may have to select the COM port assigned to the USB programming cable on your PC. In Dynamic C, select **Options > Project Options**, then select this COM port on the "Communications" tab, then click **OK**.

Use the **File** menu to open the sample program **PONG.C**, which is in the Dynamic C **SAMPLES** folder. Press function key **F9** to compile and run the program.The **STDIO** window will open on your PC and will display a small square bouncing around in a box.

Where Do I Go From Here?

You are now ready to go on to other sample programs and to develop your own applications. Application Note AN420, *Simple Sensor Application Kit*, takes you through loading and using the sample programs included with this Application Kit, and describes Rabbit's software drivers. The *RCM4300 User's Manual* provides complete hardware reference information and describes the software function calls for the RCM4300 RabbitCore modules. The *FAT File System* document on the Dynamic C CD describes the FAT file system and discusses the function calls and sample programs available for the Dynamic C implementation of the FAT file system.

Troubleshooting

If Dynamic C cannot find the target system (error message **"No Rabbit Processor Detected."**):

- Check that the RCM4300 is powered correctly — the red **PWR** LED on the Prototyping Board should be lit when the RCM4300 is mounted on the Prototyping Board and the AC adapter is plugged in.

- Check both ends of the programming cable to ensure that they are firmly plugged into the PC and the **PROG** connector, not the **DIAG** connector, is plugged in to the programming port on the RCM4300 with the marked (colored) edge of the programming cable towards pin 1 of the programming header.

- Ensure that the RCM4300 module is firmly and correctly installed in its socket on the Prototyping Board.

- If a program compiles and loads, but then loses target communication before you can begin debugging, it is possible that your PC cannot handle the default debugging baud rate. Locate the **Serial Options** dialog in the Dynamic C **Options > Project Options > Communications** menu. Choose a lower debug baud rate.

Press **<Ctrl-Y>** to force Dynamic C to recompile the BIOS. You should receive a **Bios compiled successfully** message once these steps are completed successfully.

If there are any other problems:

- Use the Dynamic C **Help** menu to get further assistance with Dynamic C.

- Check the Rabbit Technical Bulletin Board and forums at www.rabbit.com/support/bb/ and at www.rabbit.com/forums/.

- Use the Technical Support e-mail form at www.rabbit.com/support/.

> **NOTE:** If you purchased your Simple Sensor Application Kit through a distributor or through a Rabbit partner, contact the distributor or partner first for technical support.