

6. PC PROGRAMS

While RAMCHECK is a stand-alone unit, the product includes the RAMCHECK PC Communications programs that allow you to upgrade your RAMCHECK's flash EPROM from our Web site (www.innoventions.com). This software also provides you with all the essential communication functions you will need between all members of the RAMCHECK product line and your PC.

The RAMCHECK PC Communications program provides you with:

- The capability to download updated firmware files from our FTP server onto the RAMCHECK Flash memory.
- A Realtime interface between RAMCHECK and the PC so that you can control RAMCHECK from your PC and also view, save, and print test results from the Test Log.
- SPD support for editing, saving, and programming of the SPD chip on your tested memory devices. **SPD support is for advanced users only.** It is extensively described in the PC Communications program On-Line Help, as well as on our website.
- Setup support for RAMCHECK.
- Graphics interface between RAMCHECK's screen to your PC display.
- Extensive, context-sensitive On-Line Help and Tutorials.



**This program
requires Windows
95/98/2000/NT/
ME/XP/Vista.**

HARD DISK INSTALLATION:

Insert the enclosed CD Companion into your CD ROM drive. The automatic program launcher will start and provide you a menu of installation options. Choose the INSTALL RAMCHECK option. You may also elect to view the on-line manual through this interface (you will need to install the included Adobe® Acrobat Viewer to view the on-line manual). If the program launcher does not start automatically, you can install the programs by clicking the Start button, selecting RUN and typing D:\SETUP.exe, where D: is your CD ROM drive.

The PC Communications program will be installed in a newly created RAMCHECK directory; the software will also create a shortcut icon on your desktop. Also included is an UNINSTALL utility which will remove the program and its components from your system should you ever wish to do so.

6.1 RAMCHECK DOWNLOADER

You must register your RAMCHECK to obtain the password for firmware download.

If your computer does not support serial interface, we offer a low cost USB to Serial converter.

The RAMCHECK Downloader portion of the PC Programs is the key utility for performing a RAMCHECK FLASH upgrade. By visiting our Web site (<http://www.innoventions.com>), you can register your RAMCHECK and download the current version of the RAMCHECK firmware.

Use the enclosed serial cable to connect RAMCHECK to an available serial port on your PC. In most modern PCs, the serial ports use the standard 9-pin D-SUB connector. Older computers may use a 25-pin D-SUB connector, for which will require the use of a 25-pin to 9-pin serial port adapter. NOTE: Conforming to the RS-232C standard, the RAMCHECK serial interface uses pin 2 for transmitting (TxD), pin 3 for receiving (RxD), and pin 5 for ground.

We recommend that you review RAMCHECK development log on our Web site, which outlines the latest changes and added features of the new RAMCHECK firmware.

6.1.1 AUTOMATIC FIRMWARE UPGRADE

If your computer has a dial-up or direct connection to the Internet, you may use an automated process to upgrade your RAMCHECK. You must first register your RAMCHECK at www.innoventions.com to obtain your password. Use the User Information page of the Software Setup menu to enter your e-mail (userId) and password.

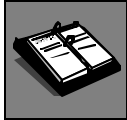
You may also click on



to activate the Automatic Firmware Upgrade Process.

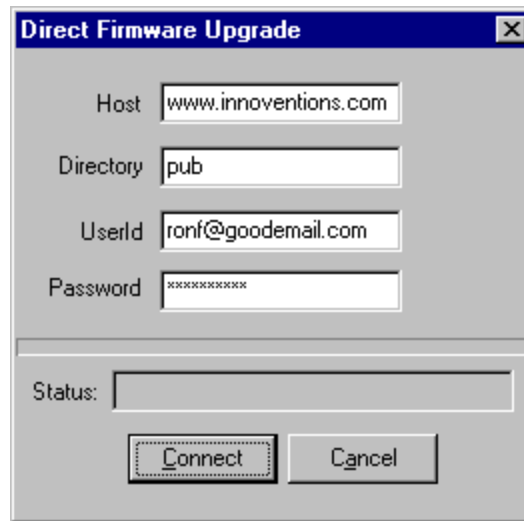
From the RAMCHECK menu, simply select Automatic Firmware Upgrade.

It first connects to INNOVENTIONS' FTP server and downloads the "rcf.zip" file to the RAMCHECK program directory. It then unzips the "rcf.zip" into a new "rcf.bin" firmware file (after backing up any existing firmware file with the same name to "rcf.bak"). Finally, it activates the firmware Downloader program and prompts you to upgrade your RAMCHECK. Selecting SEND FIRMWARE will then begin your upgrade.



See Section 6.1.2 to review the Manual Firmware Upgrade function.

The following window appears when you activate the automatic upgrade:



If your computer is configured for an automatic dial-up connection, simply start the process by clicking the Connect button. (This may take a few seconds.) If your computer is not configured for an automatic dial-up connection (that is, you always need to manually activate the connection before accessing the Internet with your other programs), please activate your Internet connection before starting the process.

The FTP connection dialog box shows your e-mail (as registered) in the UserID and the password obtained during registration (if you have completed the Software Setup section). The status portion of the FTP connection dialog box shows the progress of the download process. At the successful end of the download process from the FTP server, the firmware Downloader is activated, prompting you to send the new firmware to RAMCHECK. Selecting SEND FIRMWARE will initiate the download to RAMCHECK. After a successful download, RAMCHECK must be reset in order to start with the new firmware.

While the process is automatic, it allows you to abort at various key points. If you abort during the FTP download, your older "rcf.bin" firmware file remains intact. If you abort the firmware Downloader program, your RAMCHECK will not be upgraded, but the firmware file "rcf.bin" will be updated. Please note that this process replaces your previous firmware file and keeps only one backup as "rcf.bak". You may want to keep previous hardware versions by renaming them "rcf_217.bin" or "rcf_218.bin" (for versions 2.17 and 2.18 respectively).



Be sure to check for upgrades every month to insure the best results from your RAMCHECK investment.

Once downloaded, you can quickly send the firmware file to RAMCHECK by pressing the buttons:



Select RCF.BIN



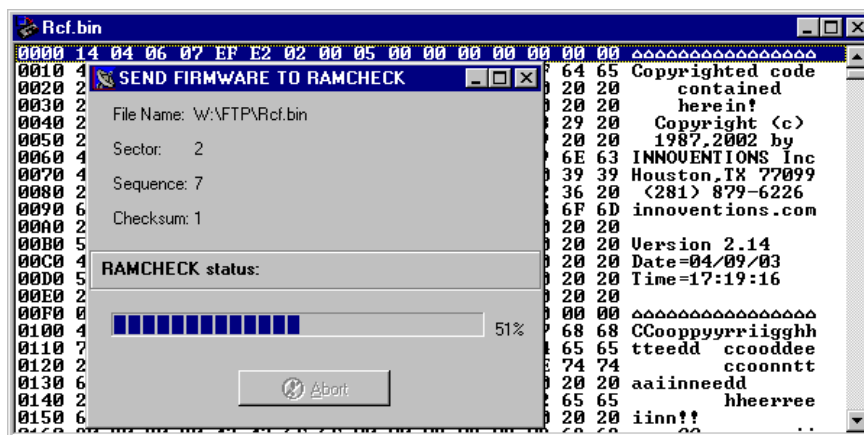
6.1.2 MANUALLY UPGRADING THE FIRMWARE

If you do not have a direct connection to the Internet, or you can only access our web site from a remote computer, you may elect to upgrade your tester manually by first acquiring the firmware file online, then downloading it to RAMCHECK using the RAMCHECK Downloader. The Downloader portion of the RAMCHECK Communications program sends a variety of file data to RAMCHECK, including Firmware files.

FIRMWARE FILES

Upgrading RAMCHECK is accomplished by following the procedure outlined below:

- **The RCF.BIN file is the current RAMCHECK firmware, which you must download from our Web Site to your computer as a zipped file called RCF.ZIP. Once downloaded you must unzip this file into a directory of your choice and open it in the PC interface.**
- Enter the PC PROGRAM INTERFACE by double clicking on the RAMCHECK icon on your desktop.
- Select FILE from the menu bar and choose OPEN. Select the file RCF.BIN from the RAMCHECK directory. Click the OPEN button.
- With RAMCHECK ON, select RAMCHECK from the menu bar and then select SEND DATA. Click on SEND FIRMWARE when prompted by the dialog box. RAMCHECK should now be downloading the new program. During the download, you will observe a progress indicator on your PC screen as the program is being transmitted and is flashed to RAMCHECK's memory.



- When the transfer is complete, a brief message saying DOWNLOAD END: SUCCESS will appear on your monitor.

You can now press ESC and allow RAMCHECK to reset with the new program.

If you encounter a failure during this process, resend the file. If it still does not go through, turn the RAMCHECK off and then on again and resend.



You may also click on

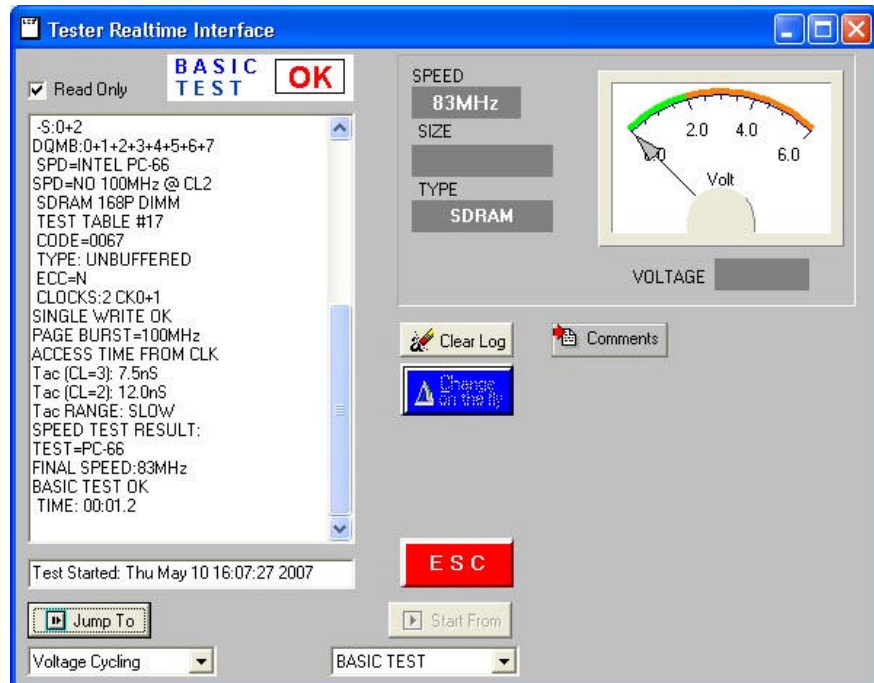


to activate the Realtime Interface.

6.2 REALTIME INTERFACE

The Realtime Interface allows you to control RAMCHECK from your PC. It also allows you to log data and to print the test results. Selecting Realtime Interface from the RAMCHECK menu activates this part of the program.

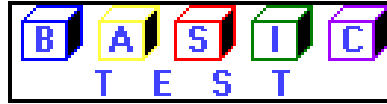
It includes a TEST LOG VIEWER, which provides a multitude of scrollable information on the tested module. You can add comments to the test log using the Comments button, or you can edit the Test Log text directly by un-checking the Read Only control.



A summary of the module's size, mode type, access time, and cycle time (for EDO/FPM only), along with the list of the various control signals is displayed after the Basic Test. A graphical indicator also displays the voltage used during the test.

This test log can be saved or printed by selecting the appropriate command from the FILE menu. The red ESC key can be pressed at any time to stop an existing test.

The RAMCHECK STATUS INDICATOR, located on the upper section of the test log window, monitors the existing stage of the module's test. This cycles from Basic Test, Extensive Test, etc., or error indications.



The CHANGE-ON-THE-FLY button allows you to change the speed and voltage parameters of the DUT during a test.



Upon selecting this function, the current test will pause while you select a different function from the change window. The options include dual voltage selection and speed override through a slide bar. The test will resume once a button is pressed. The test log will also reflect the new settings.

The START FROM button allows you to select a specific starting point for the test to be performed. The default is the Basic Test, but pressing the scroll button will allow you to select from the various test phases on the RAMCHECK program. After a selection is made, simply press the START FROM button to activate the function.

The JUMP TO button allows you to quickly switch to a different test phase during a test. Selecting the scroll button will display the different test phases to which you can jump to, with the default being the next phase in the standard test flow. Once the new phase is selected, pressing the JUMP TO button will redirect the test flow to the selected phase. The test flow will then continue normally from this point, unless you wish to activate the JUMP TO function once again. The test log will reflect the changed test flow in its viewer.



Please refer to Section 4.4 for further information on SPD Management.

6.3 SPD SUPPORT

The Serial Presence Detect is a small 256-byte, 8-pin EEPROM chip mounted on most modern memory modules. It contains important information regarding the speed, size, addressing mode and various timing parameters of the module, so that the motherboard memory controller (chipset) can better access the memory device. Wrong data in the SPD, or a module without SPD, may cause your PC to crash, or even not to boot up at all.

RAMCHECK as a stand-alone unit, and together with the RAMCHECK Communications program, provides you with useful tools for complete SPD management. You can view, edit, manage SPD files on your computer, and perform actual SPD programming. The SPD Wizard provides you with complete information for each SPD byte/bit you edit, while the SPD Text Editor allows you to type regular text into an "unused" section of the SPD file. Memory module manufacturers can also use the Production Mode to automatically program their modules' SPD chips at the conclusion of the test.

WARNING: WRONG SPD DATA ON A MEMORY MODULE MAY HALT THE PC ON WHICH IT IS INSTALLED! SPD PROGRAMMING SHOULD BE DONE ONLY BY ADVANCED USERS. ALWAYS KEEP BACKUP FILES!

OVERVIEW OF SPD MANAGEMENT

RAMCHECK SPD Management mode is the operational mode to read and program SPD data. When RAMCHECK operates as a stand alone unit, you can read SPD data from a master module into a buffer in RAMCHECK's own memory, and then use the buffer's data to verify or program SPD chips on other modules.

When RAMCHECK communicates with the PC Communications program, you can further read SPD data into the PC, edit the data on your PC screen, save it into *.spd files on your PC, or download stored SPD files into RAMCHECK's buffer for programming other modules.

RAMCHECK BUILT-IN SPD MANAGEMENT

ACCESSING SPD MANAGEMENT MODE

You can access the SPD Management mode either from Standby Mode or from Basic Test.

ACCESSING FROM STANDBY: From Standby mode, press F4 and select F3 for SPD MANAGEMENT.

```

SELECT VIEWER
F1 VIEW TEST LOG
F2 VIEW SETUP LIST
F3 SPD MANAGEMENT

```

ACCESSING FROM BASIC TEST: After the Basic Test is complete, several summary screens will follow, concluding with the following screen that allows you to access SPD Management by pressing F5:

```

2Mx72^S STRUCTURE:
SERIAL PRD
TO ACCESS THE SPD F5
ECC=Y

```

You can skip to the SPD management access screen during the Basic Test, without waiting for the end of the test, by entering F5→F3→F5.

RAMCHECK SPD MANAGEMENT FUNCTIONS

The SPD Management menu provides four functions:

```

SPD MANAGEMENT:
F1 READ SPD
F2 SHOW BUFFER
F3 PROGRAM F4 VERIFY

```

READ SPD

Use F1 to read the SPD data of the current DUT into RAMCHECK's internal buffer.

The SPD viewer displays information in a multipage list format. Use the ↑ and ↓ keys to scroll between the pages. The following screen images show a partial view of the SPD codes for a typical SDRAM 168-pin DIMM.

<pre> SPD VIEWER-DUT SERIAL PRESENCE DETECT - 128 BYTES: 0-3:80 08 04 08 </pre>	<pre> 4-7:0A 01 40 00 8-11:11 46 12 00 12-15:00 FF FF FF 16-19:FF FF FF FF </pre>
<pre> 244-247:FF FF FF FF 248-251:FF FF FF FF 252-255:FF FF FF FF </pre>	

In the above examples, byte 0 contains "80", byte 1 contains "08", byte 5 contains "04", and byte 9 contains "46". You will also note that bytes 244 through 255 contain "FF"; this is an indication that these bytes are not being used. You must be familiar with HEX notation (0,1,2,...,9,A,B,C,D,E,F) to work with SPD data.

SHOW BUFFER

Use F2 to display the data in RAMCHECK II's buffer. You can copy data from a master SPD device into the buffer for later copies to other modules, or you can download an SPD file from your PC to the buffer.

PROGRAM

Use F3 to program the data in the buffer into the SPD on the inserted DIMM module. To avoid casual users from programming wrong SPD data, the default SPD setting in your RAMCHECK is to have SPD programming disabled:

```
PROGRAMMING DISABLED!
USE SETUP-CONFIG-SPD
```

To enable SPD programming, go to setup mode (F2) and select CONFIG. (F3), MORE (F4), SPD (F3):

```
SPD PROGRAMMING
F1ENTER      ABORT Esc
←DISABLED   →
```

Use the right arrow button to select the programming mode:

BYTE MODE PROGRAMMING - each byte of the SPD is written to a specific address in the SPD EEPROM. This is the slowest mode but it should work with almost all SPD devices.

8 or 16 BYTE PAGE MODES - write data into the SPD at groups of 8 or 16 bytes at a time. These are faster modes but may not be compatible with all SPD devices.

```
SPD PROGRAMMING
F1ENTER      ABORT Esc
←16-BYTE PAGE MODE →
```

ALWAYS MAKE BACKUP FILES BY UPLOADING THE SPD DATA TO YOUR PC AND SAVING IN *.SPD FILES. Once backups are made, you can experiment with the various Programming Modes to find the one best suited for your application.

Remember that you must have a valid SPD file in the RAMCHECK buffer (use SHOW BUFFER to make sure) before you start programming. Press F3 at the SPD Management mode to program your SPD. RAMCHECK programs the SPD and verifies the data with an OK (or fail) message at the bottom of your screen:

```
PROGRAMMING...
(16-BYTE PAGE) ****
OK
```

VERIFY

The VERIFY function (F4) compares the actual SPD data on the inserted module with RAMCHECK's internal buffer.


PC COMMUNICATIONS PROGRAM SPD SUPPORT

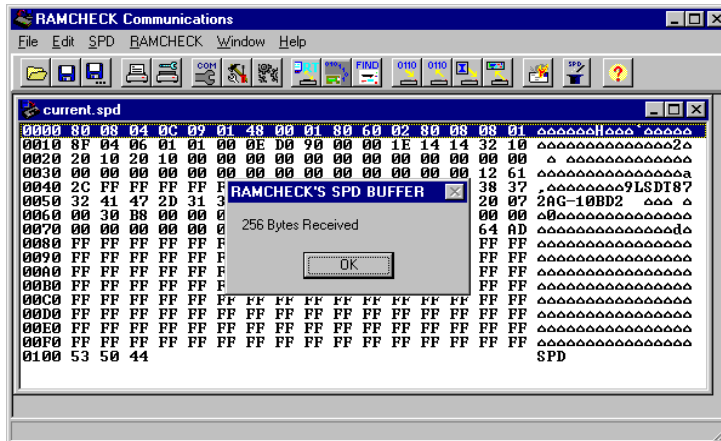
The RAMCHECK **PC Communications program** significantly enhances your SPD support:

- It allows you to transfer SPD data between RAMCHECK's buffer and the PC.
- It provides an advanced SPD Hex Editor with which you can change or print the SPD data. While the SPD Hex Editor is opened, you can activate the new SPD Wizard or the new SPD Text Editor.
- Verify and correct the SPD Checksum Byte 63.
- It provides unlimited filing on your PC hard disk for all your SPD files. You can download your edited SPD or stored SPD files back onto RAMCHECK for subsequent programming of your modules.
- If you are a memory manufacturer, you can use the new Production Mode to automatically program your modules' SPD chips at the conclusion of the test.


SPD TRANSFERS BETWEEN RAMCHECK AND THE PC

The RAMCHECK Communications program allows you to upload SPD data from RAMCHECK's buffer to the PC, to edit the SPD data, to save and retrieve SPD data files, and to download SPD data into RAMCHECK's buffer.

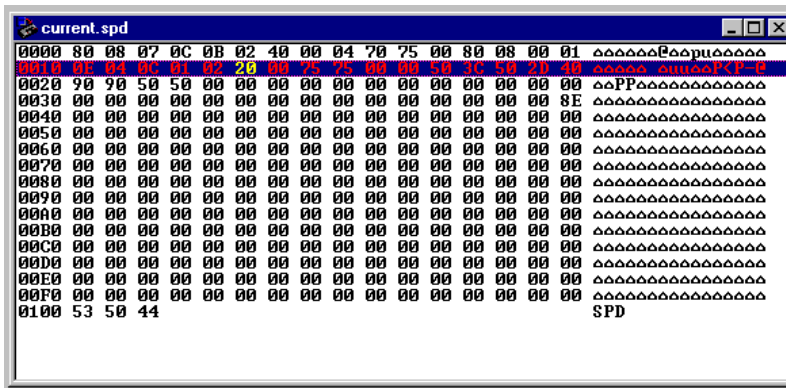
Once you have read the SPD data into RAMCHECK's buffer (by pressing F1=READ SPD on RAMCHECK's own SPD Management menu), you may click the  button to download the SPD data to the PC. The following SPD main Viewer will appear after acquiring the 256 SPD bytes.



The viewer is a hexadecimal line editor, with edits 16 bytes per line. The first column indicate the starting SPD address for the group of 16 bytes of the current line. The following 16 bytes (two hex digits each) are the actual data to be edited. The last wide column is the ASCII representation of the data, which is meaning-less for the module memory parameters, but may reveal manufacturer's codes.

Once the SPD information is edited, it can be saved by choosing the SAVE AS function from the File menu and saved with a *.SPD extension, or it can be sent to RAMCHECK buffer (by clicking the  button) for subsequent programming the SPD of your modules. Similarly, previously saved SPD files can be opened and sent to RAMCHECK.

SPD DATA EDITING



You may also press



to send SPD data to the Communications Program.

To edit this information, double click on any byte shown. The line will be highlighted and the selected byte will change its color and allow you to enter a new value. Use the mouse or the right/left arrows keys to navigate throughout the highlighted line.


NOTE: Any byte changes in the highlighted line will not be accepted until the <Enter> key is pressed or a new line is selected.

NEW SPD EDITING UTILITIES

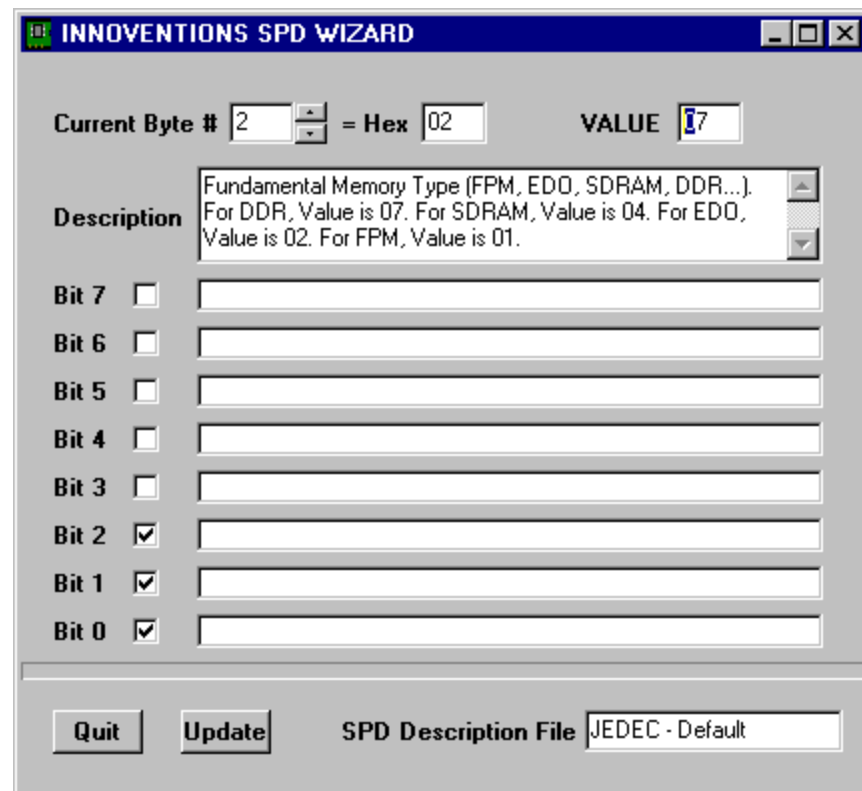
We have added two new editing utilities with Version 2.14 of the RAMCHECK Communications program. You can obtain the updated version from our website.

SPD WIZARD

The SPD Wizard is a specialized popup utility, which assist you in determining the functionality of each byte (and bit) of the open SPD file. With it, editing SPD files become much easier as you do not need to flip through several pages of SPD description manual - the SPD Wizard guides you on line!

You can activate the SPD Wizard only when the SPD Hex Editor is opened with either an SPD file or with SPD data read from RAMCHECK's SPD buffer. One way to activate the SPD Wizard it to click the  button. Another way is to select the "SPD Wizard" (or press Ctrl+w) from the "SPD" menu item. Yet another way is to right click the mouse and to select "SPD Wizard" from the Popup Menu.

You can control the starting byte for the SPD Wizard by clicking the desired byte on the SPD Hex Editor before activating the SPD Wizard.



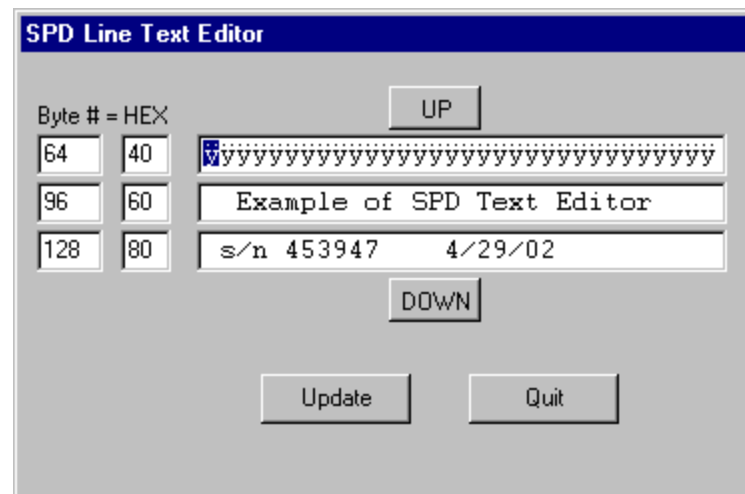
We have designed the SPD Wizard to be intuitive and easy to use. It has an on-line help (accessed by pressing F1) which provides detailed information on the various controls.

Special Credits: SPD Wizard and associated SPD byte description files were written by Oren Feinstein, an engineering student from the University of Texas, as part of his 2001/2002 Internship.

SPD TEXT EDITOR

Unlike the Hex Editor and the SPD Wizard which allow you to edit SPD bytes as binary/hexadecimal number, the SPD Text Editor provides a convenient and intuitive way for editing text sections of the SPD file.

You can activate the SPD Text Editor only when the SPD Hex Editor is opened with either an SPD file or with SPD data read from RAMCHECK's SPD buffer. One way to activate the SPD Wizard it to select the "SPD Text Editor" (or press Ctrl+t) from the "SPD" menu item. Another way is to right click the mouse and to select "SPD Wizard" from the Popup Menu. Yet another way is to click on the right column of the Hex Editor (in line #5 or above).



The SPD Text Editor has an on-line help (accessed by pressing F1) which provides detailed information on the various controls. The program's on-line help also include a detailed tutorial on how to use all the SPD editing tools.

PRODUCTION MODE

RAMCHECK also utilizes a new feature called **Production Mode**. This mode enables RAMCHECK to automatically program the SPD of your tested modules, either after Basic Test, or after Extensive Test.

6.4 RAMCHECK SETUP



You can setup RAMCHECK on your PC and store setup parameters in *.rsu (RAMCHECK Setup) files. To enter Setup Mode, select SETUP RAMCHECK from the RAMCHECK menu.

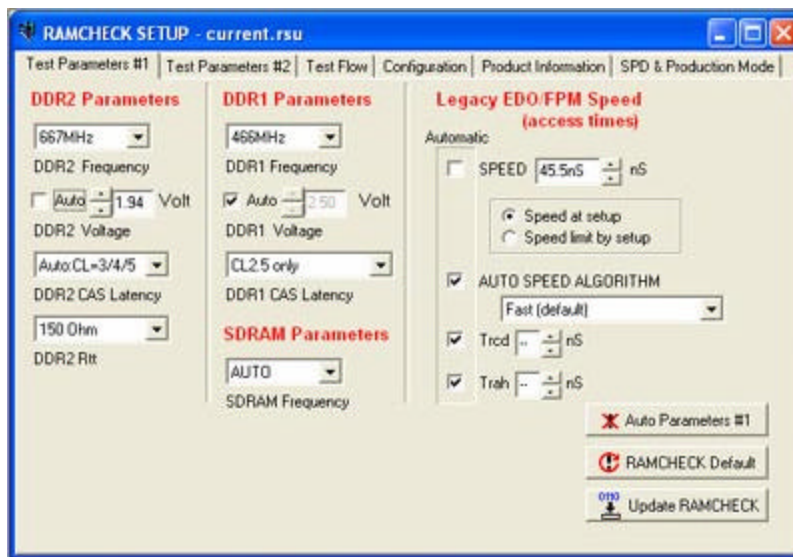
You may also select



to enter setup mode, and press



to send setup data to RAMCHECK.



The setup screen uses a multi-tab dialog box. The following tabs are available:

- **Parameters #1** - Used for setting up DDR2, DDR1, SDRAM and legacy EDO/FPM test parameters, including frequency, CAS latency and more.
- **Parameters #2** - Used for set up of Size, Voltage, Mode, Refresh, Test Patterns, and some special setup codes.
- **Test Flow** - Used for modifying RAMCHECK's test flow from its default setting.
- **Configuration** - Used for set up of RAMCHECK's configuration, including outside peripherals.
- **Product Information** - Includes "read only" information about RAMCHECK's key parameters, including upgrade status and calibration data. This page also includes a setup file memo that you can append to a saved setup file on the PC.
- **SPD & Production Mode** - Used for set up SPD and Production Mode. Recommended for memory manufactures only. This mode allows you to program the SPD of your memory modules after the completion of Basic Test, or after the Extensive Test.



See Section 5. to learn more about RAMCHECK Setup.

When you finish selecting the setup options, choose SEND DATA from the RAMCHECK menu to transfer your setup changes to RAMCHECK where they are automatically saved.

Once the new setup is transferred, RAMCHECK will respond with a message indicating that the new setup data has been saved in the RAMCHECK non-volatile setup memory. RAMCHECK will not save unchanged setup data.

You may also select



to activate the Program Setup.

PC PROGRAM SETUP

Selecting the Setup Software item in the RAMCHECK menu allows you to setup the PC program. The minimum setup you must do is to enter your Password and UserId (your e-mail as registered) in the User Information page. This entry is required for the important firmware upgrade. You can also enter your company name to label the software printouts.

You can use the Setup Serial COM if you need to change any of the default setup.

Any change in the PC Program Setup menu is automatically saved on your PC.



You may also press



to send an opened bitmap file to RAMCHECK and press



to capture a screen.

6.5 RAMCHECK GRAPHICS COMMUNICATIONS

The RAMCHECK Graphics Communications allows you to send graphics (bitmaps) to RAMCHECK and to capture RAMCHECK's LCD screen. Choose SEND BITMAP from the RAMCHECK menu to send graphics, or choose GET SCREEN to perform a screen capture. You may note that certain screens change in a matter of moments after being displayed, so if you wish to capture these screens, you must select GET SCREEN at the precise moment.

You may choose to save the bitmap under a different name, or you may use the default name of LCD.bmp. The saved file will be under the same directory as your RAMCHECK PC Software.

Clicking the DEMO ON button can enable the Graphics Demo Mode. It repeatedly displays RAMCHECK's LCD screen, providing an animated display connection to RAMCHECK during product demonstration. The bitmap graphic on the PC display can be increased or decreased, and can be printed by clicking the print button. The Graphics Communications function is generally of limited use for most end users. However, we use it extensively in developing the graphics for the RAMCHECK firmware. It is also a great tool for demonstrating the product.

6.6 RAMCHECK TEXT EDITOR

Selecting NEW from the file menu opens the RAMCHECK Text Editor. The text editor uses a standard Rich Edit to allow you to create, open and review, edit, print, and save various text files. Such files can be test log files (*.log) that are saved by the Realtime Test Log, or they can be any other type of text file for that matter. You can also use the text editor to print the "ramcheck.ini" (the configuration file for this program). When you create a regular text file, please use the default *.txt extension. The text editor uses the same editing features that are available on other simple editors.



You may also press



to view the diagnostics window.

6.7 RAMCHECK DIAGNOSTICS

This mode allows you to view the actual ASCII characters that RAMCHECK uses in its communication with the PC via the serial port. Select COMMUNICATION DIAGNOSTICS from the RAMCHECK menu to open this window.

In addition to troubleshooting use, this mode is also utilized in some of our diagnostic procedures to view the structure of unsupported modules. You may be requested by our Tech Support department to set up RAMCHECK itself at some debug mode and then to view and print the communications' data.

