RS800
SDRAM MEMORY TESTER

Version 1.0.5
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MicroTest SYSTEM

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Table of Contents

1   Introduction

1.1   Welcome to RS800

Welcome to the RS800 memory tester. By using the RS800 LCD display or the RS800 Windows software, you can customize the RS800 memory tester to test SDRAM memory modules. You are able to modify the module configurations, edit the sequence of the testing logics, and alter the SPD data.

1.2   RS800 special features

- Test different types of SDRAM modules
- Alterable test logics sequences
- Read, write, and test SPD data
- Future system firmware upgrade

2 Installing RS800 Windows Software

2.1 System Requirements

Operating System

- Microsoft Windows 2000
- Microsoft Windows XP

Hardware

- Your PC must have an 800Mhz system or higher recommended.
- You must have at least 128MB RAM memory. Generally, more would be better.
- Graphics card with 8MB or higher (for video).
- 100MB of free hard drive space recommended. Generally, more would be better.
- One USB port.

> ⚠️ RS800 Windows USB driver does not currently work with SIS chipset based motherboard. Please don't install RS800 Windows software and USB driver to the SIS chipset based system.

2.2 Installing RS800 Windows Software

Step 1:   Double click on the "install.exe" file.

Step 2:   Follow prompts until you are finished installing the RS800 software. A pop-up window will be shown: (Fig. 01)
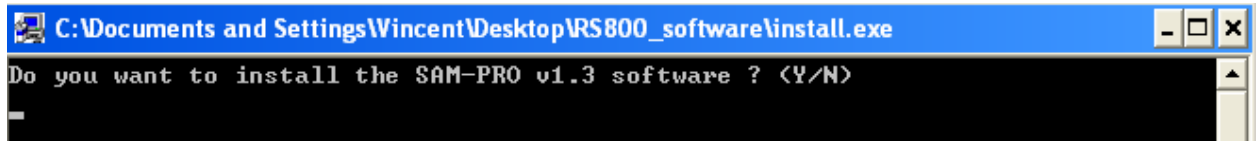

Fig. 01

Step 3:   Type "y" and press "Enter" in the Dos prompt to install the SAM-PRO software (if not previously installed).

Step 4:   Follow prompts until you are finished installing the SAM-PRO software.

Step 5:   Restart your PC.

2.3 Uninstalling RS800 Windows Software

Step 1:   Go to Start $\Rightarrow$ Settings $\Rightarrow$ Control Panel $\Rightarrow$ Add or Remove Programs.

Step 2:   Select RS800 in the Add or Remove Programs window and click "remove".

Step 3:   Select SAM-PRO in the Add or Remove Programs window and click "remove".

Step 4:   In some cases, you will find that when removing software, there will be one or two files that the operating system will ask if you want them removed since they may be shared by other programs. If you are unsure, always opt to keep these files.

Step 5:   Restart your PC.

3 Installing RS800 Windows Driver

⚠	Please verify the correct setting of voltage (115V/230V) before turning on the tester.

Step 1: Turn on the RS800 tester system by switching on the power switch. The following screen will first appear on the LCD display: (Fig. 02)
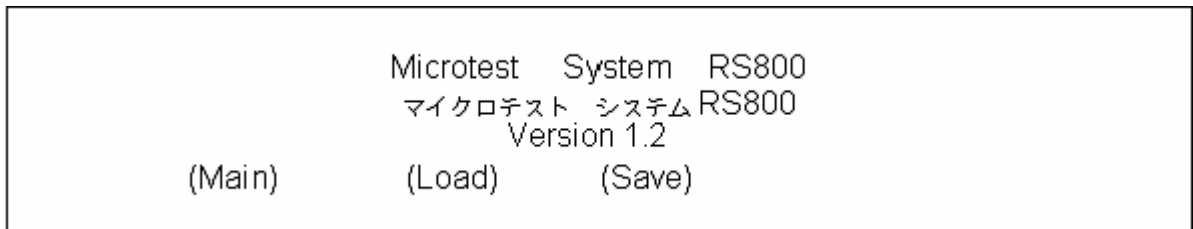
Microtest   System   RS800
マイクロテスト システム RS800
Version 1.2
(Main)   (Load)   (Save)

Fig. 02

Step 2: Plug one end of the USB cable to the RS800 USB port and the other end to an available PC USB port.

⚠	The PC will only recognize the tester when the USB cable is connected on the first LCD screen as shown in Fig. 02.

Step 3: Windows discovers a new USB device and "Found New Hardware Wizard" will appear on screen. Select "No, not this time option" and click on "Next" button to continue. (Fig. 03)

Fig. 03

Step 4: Select "Install from a list or specific location (Advanced)" and click on "Next" button to continue. (Fig. 04)
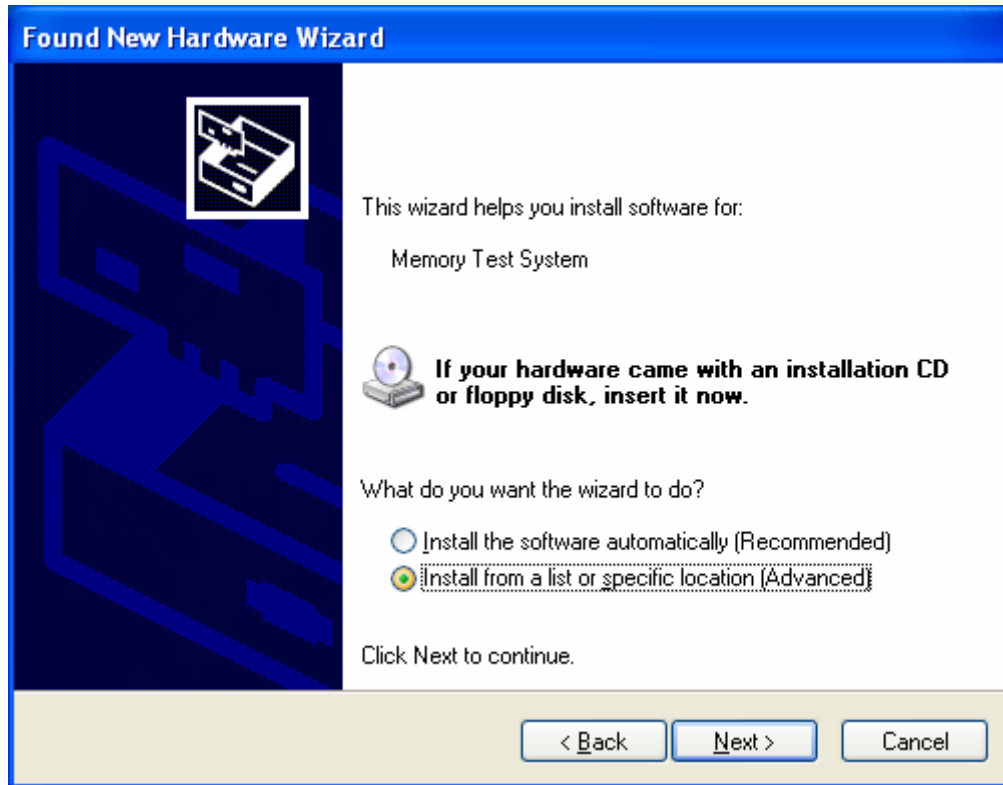

Fig. 04

Step 5: Select "Don't search. I will choose the driver to install" and click on "Next" to continue. (Fig. 05)
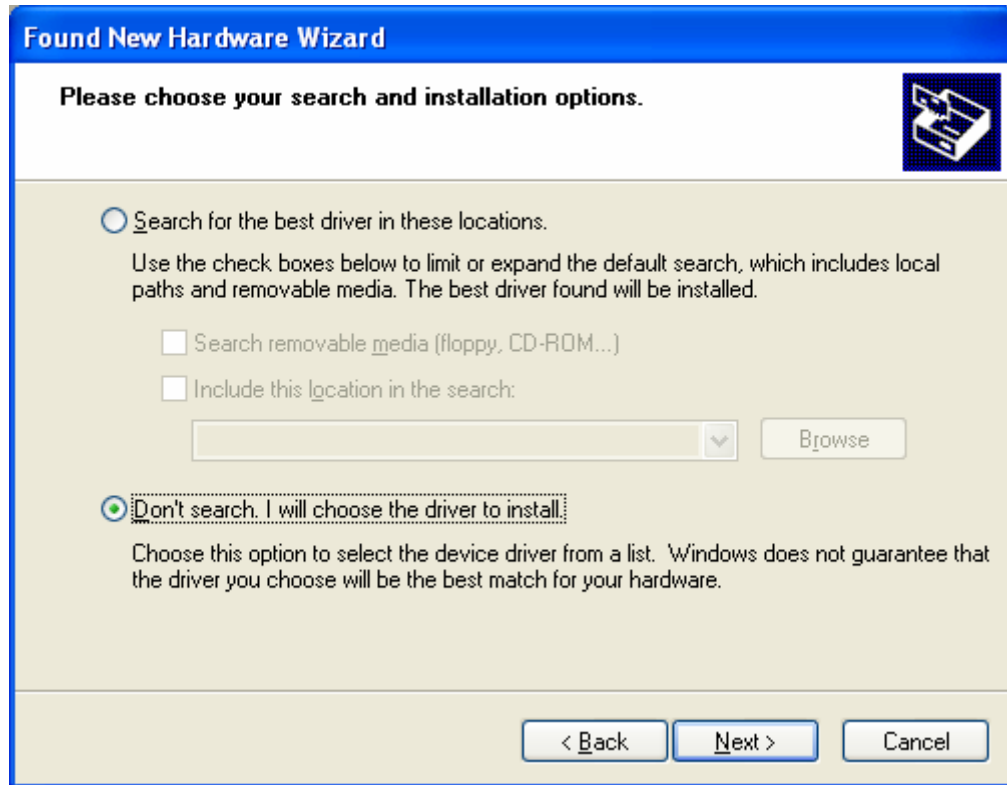
Found New Hardware Wizard

Please choose your search and installation options.

○ Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

☐ Search removable media (floppy, CD-ROM...)

☐ Include this location in the search:

[   ] [Browse]

● Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.

[< Back] [Next >] [Cancel]

Fig. 05

Step 6: Click on "Have Disk" button to continue. (Fig. 06)

Found New Hardware Wizard

Select the device driver you want to install for this hardware.

Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.

☑ Show compatible hardware

Model

atm6124.Sys ATMEL AT91xxxxx Test Board
atm6124.Sys ATMEL AT91xxxxx Test Board
System firmware download
System firmware download

⚠ **This driver is not digitally signed!**
Tell me why driver signing is important

Have Disk...

< Back   Next >   Cancel

Fig. 06

Step 7: Browse to the "C:\Program Files\RS800\Drivers" directory and click on "OK". Proceed by clicking on "Next". (Fig. 07)

Install From Disk

Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.

OK

Cancel

Copy manufacturer's files from:

C:\Program Files\RS800\Drivers   Browse...
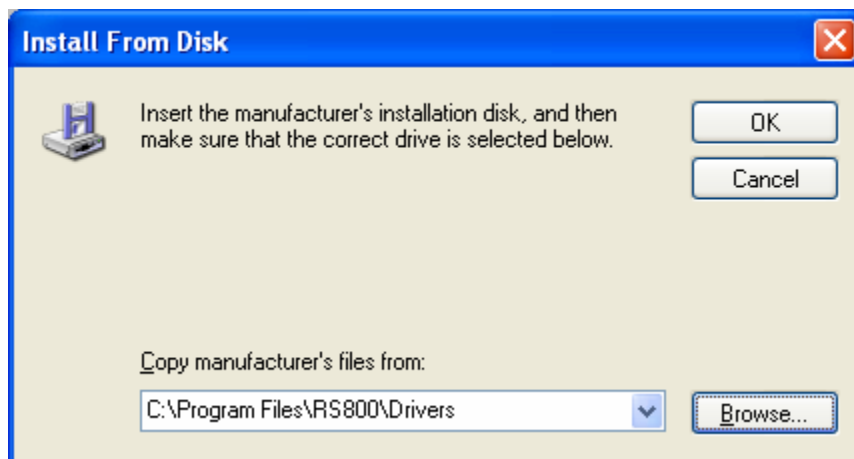
Fig. 07

Step 8: Click on "Continue Anyway" button to continue. (Fig. 08)

Fig. 08

Step 9: Click on "Finish" button. The installation is done. (Fig. 09)
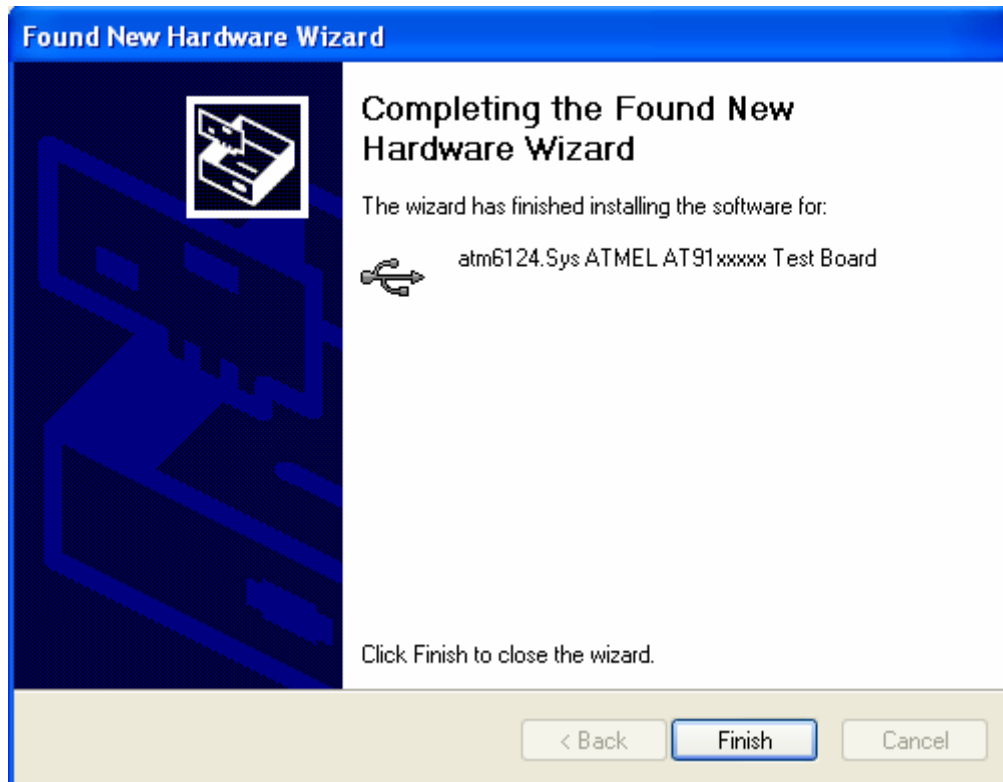
Fig. 09

4 Getting Started

⚠	Please verify the correct setting of voltage (115V/230V) before turning on the tester.

Turn on the RS800 tester system by switching on the power button. The following screen will first appear on the LCD display. (Fig. 10)
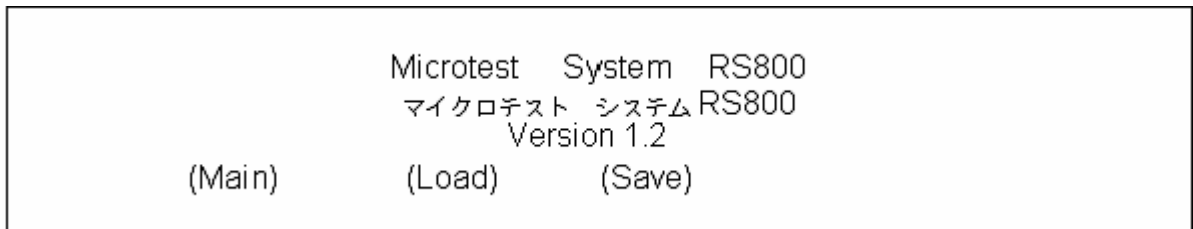
```
        Microtest   System   RS800
        マイクロテスト  システム RS800
               Version 1.2
   (Main)      (Load)      (Save)
```

Fig. 10

There are three buttons on the first LCD screen. They are "Main", "Load", and "Save".

- Main   Take you to the main menu screen of the RS800 system.

- Load   Load previously saved testing parameters.

- Save   Save testing parameters.

5 Main Menu

The main menu screen is composed by 2 regions: (Fig. 11)

```
                              MAIN
① 64M X 64    1-Bank    Unbuffered   133    SDRAM

② (AutoID)    (Manual)    (Spd)       (Tests)      (Exit)
```
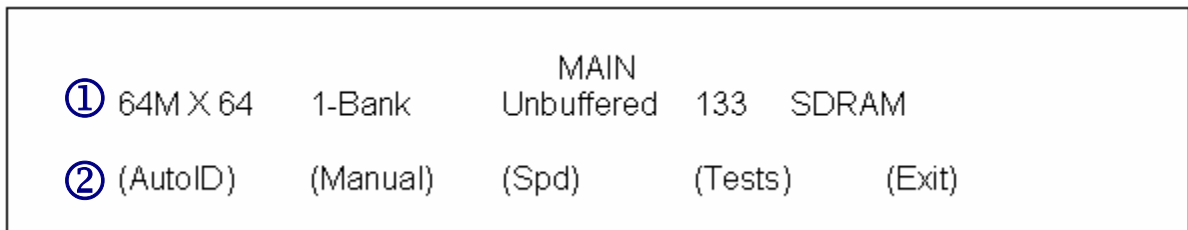
<p style="text-align:center">Fig. 11</p>

① Test module configurations.

② Buttons.

- AutoID: Automatically identify the test module parameters of address size, data width, number of external bank, BS, TCL, and TRCD by running the ID algorithm.

  > ⚠ AutoID will not automatically detect the module frequency. Please update it through (Manual) $\Rightarrow$ (Frq/Chp).

- Manual: Take you to the module configuration menu to set up the test module parameters manually.

- Spd: Take you to the Spd configuration menu to read or edit the Spd parameters manually.

- Tests: Take you to the test strategy configuration menu to set up test parameters.

- Exit: Return to the first screen.

6 Module Configuration Menu

6.1 Module Configuration Menu Screen

Press the (Manual) button in the main menu will take you to the module configuration menu. (Fig. 12)

```
                           Device Setup
①     16M X 64          1-Bank          Unbuffered         133    SDRAM

②     (Addr)          (Frq/Chp)          (Ecc/Reg)          (Tcl/rcd)       (Exit)
```

Fig. 12

① Test module configurations.

② Buttons.

- Addr: Take you to the Addr configuration menu.

- Frq/Chp: Take you to the Frq/Chp configuration menu.

- Ecc/Reg: Take you to the Ecc/Reg configuration menu.

- Tcl/rcd: Take you to the Tcl/rcd configuration menu.

- Exit: Return to the previous menu.

6.2 Addr Configuration Menu

```
Row = 13              BS = 2
Column = 10           External Bank = 1


     (Row)      (Col)       (Bs)       (ExtB)       (Exit)
```

Fig. 13

- Row: Change the Row value.

- Col: Change the Column value.

- Bs: Change the Bs value.

- ExtB: Change the External Bank value.

- Exit: Return to the previous menu.

6.3 Frq/Chp Configuration Menu

```
Frequency = 133 MHz
Chip Width = 8 bit

  (Freq)    (ChipWdh)                                    (Exit)
```

Fig. 14

- Freq   Change the frequency.

- ChipWdh   Change the Chip Width.

- Exit   Return to the previous menu.

6.4 ECC/REG Configuration Menu

```
ECC : OFF
Registered Dimm : OFF

(ECC)        (REG)                                    (Exit)
```

- Ecc   Enable or Disable Ecc.

- Reg   Enable or Disable Registered Dimm option.

- Exit   Return to the previous menu.

6.5 TCL/RCD Configuration Menu

```
TCL = 3
TRCD = 3

  (Tcl)        (Trcd)                                (Exit)
```

- TCL   Change the TCL value.

- TRCD   Change the TRCD value.

- Exit   Return to the previous menu.

7   Spd Configuration Menu

7.1   Spd Configuration Screen

Press the (Spd) button in the main menu will take you to the Spd configuration menu. (Fig. 17)

```
     00      00      00      00      00      00      00      00      00
①   08      00      00      00      00      00      00      00      00
     10      00      00      00      00      00      00      00      00
②   (Next)         (Prev)         (Edit)         (Read)         (Exit)
```
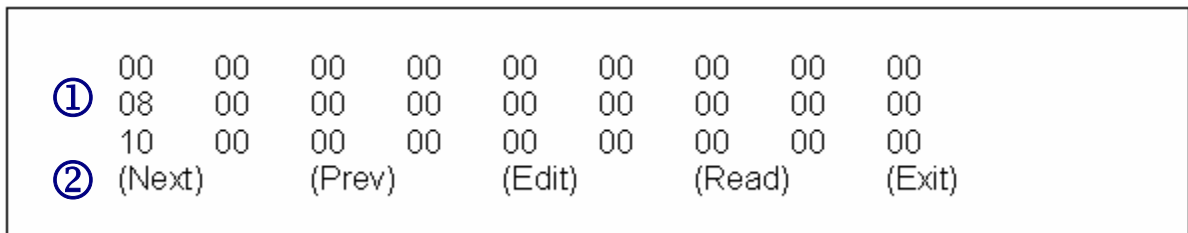
Fig. 17

① Spd data.

② Buttons.

- Next   Next page of Spd data.

- Prev   Previous page of Spd data.

- Edit   Take you to the Spd data edit menu.

- Read   Read Spd contents.

- Exit   Return to the previous screen.

7.2   Spd Edit Screen

```
Addr=00      Data=00


(Addr+)     (Addr-)      (Data+)      (Data-)      (Exit)
```
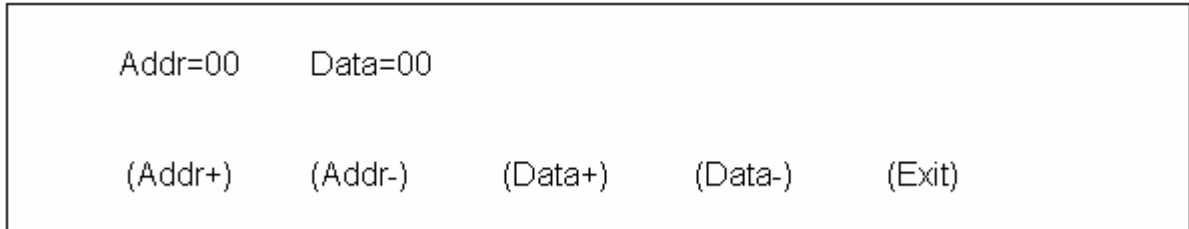
Fig. 18

- Add+   Increase Address value.

- Add-   Decrease Address value.

- Data+   Increase Data value.

- Data-   Decrease Data value.

- Exit   Return to the previous menu.

8 Test Strategy Configuration Menu

8.1 Test Strategy Configuration Screen

Press the (Tests) button in the main menu will take you to the module configuration menu. (Fig. 19)

Testlist	Voltage	Spd Test	Error Stop	
Strategy1	3.3V	None	Disable	
(TestList)	(Volt)	(Spd)	(ErrStp)	(Exit)

Fig. 19

- TestList   Select Basic (Strategy 1) or Detail (Strategy 2) test type.

- Volt   Change the voltage value.

- Spd   Select None, Write, Test or Wr&Tst option.

- ErrStp   Enable or Disable the Error Stop.

- Exit   Return to the previous menu.

8.2   TestList Configuration

Press the (TestList) button in the main menu will take you to the test list configuration menu. (Fig. 20)

Open/Shorts	Checkerboard	BL = 4
		Loop = 01
(Strat2) (Loop) (BL)		(Exit)

Fig. 20

- Strat: Select Basic (Strategy 1) or Detail (Strategy 2) test type.

- Loop: Change the number of loop(s) for testing module.

- BL: Set Burst Length of 1, 2, 4 or 8.

- Exit: Return to the previous menu.

9 RS800 Windows Software

9.1 Launching RS800 Windows Software

You can launch the software program either by

- Double click the software icon on the desktop

    OR

- Start $\Rightarrow$ Programs $\Rightarrow$ RS800 $\Rightarrow$ RS800

The program starts and displays the Main Window as follows: (Fig. 21)
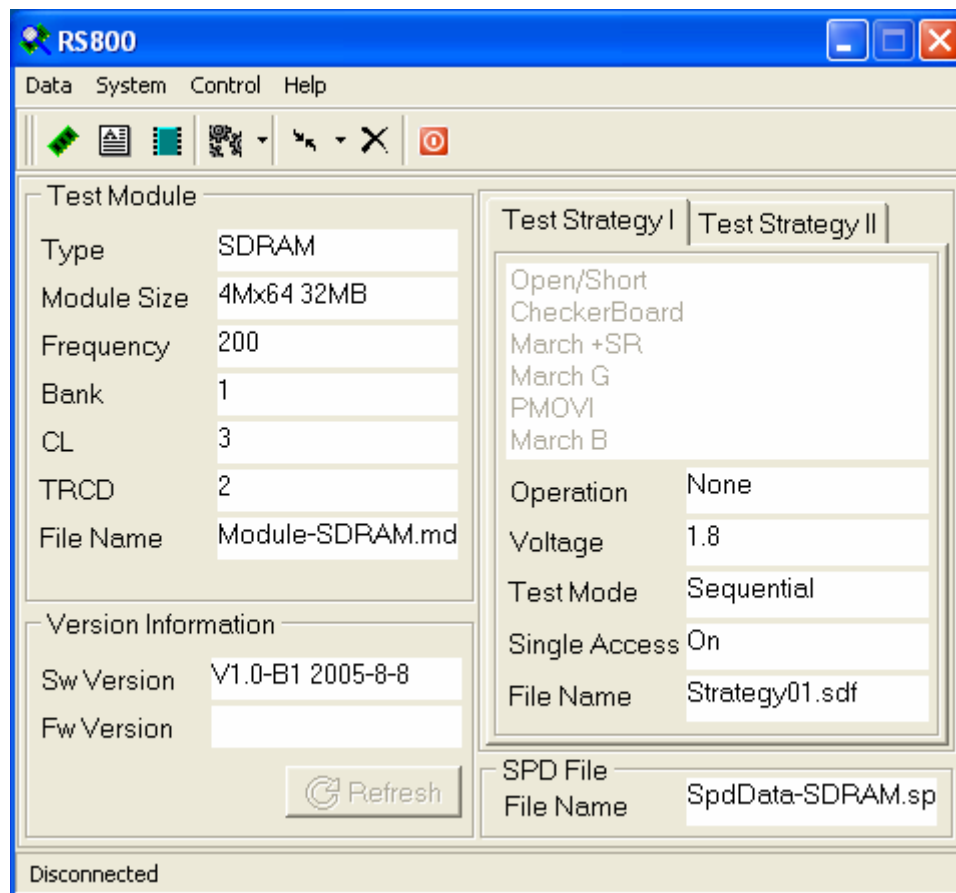
Fig. 21

9.2 Main Window

The main window is composed by 6 regions. (Fig. 22)
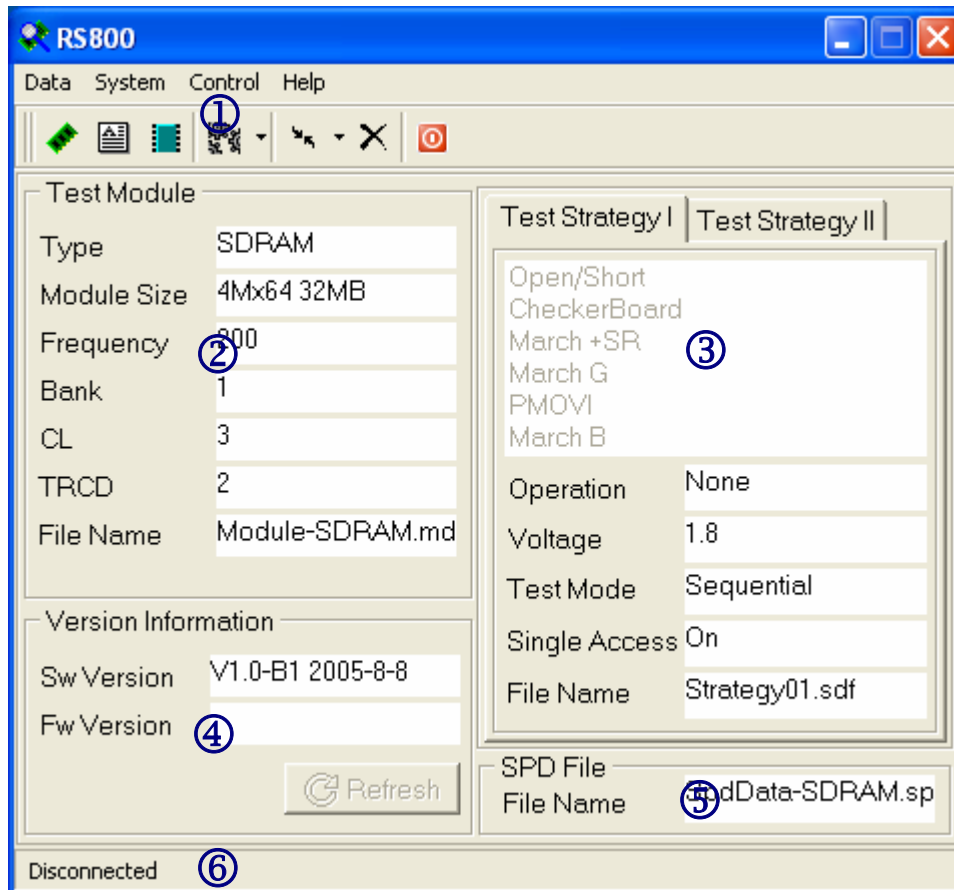
Fig. 22

① Main Menu and short-cut buttons

② Summary of Module configuration

③ Summary of Test Strategy (sequence of the test logics)

④ Version Information

⑤ SPD File Name

⑥ Connection status

9.3 Main Menu and Buttons

User can access various functions via the main menu or the short-cut buttons. (Fig. 23)
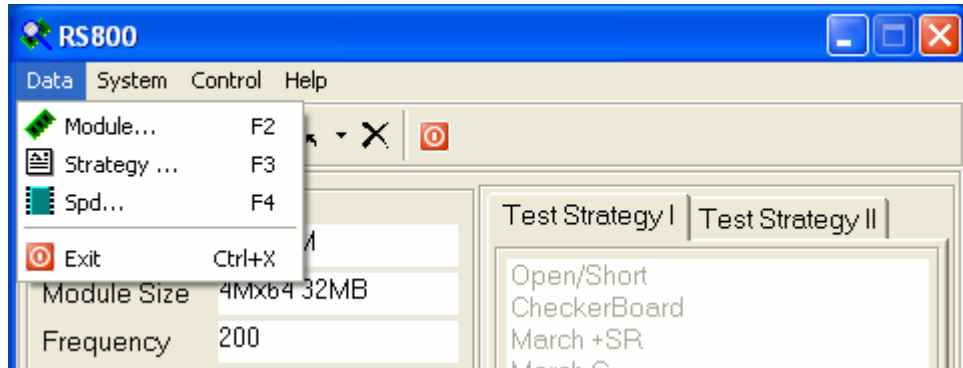
Fig. 23

 Start the Module editor.

 Start the Test Strategy editor.

 Start the SPD editor.

 Exit the program.
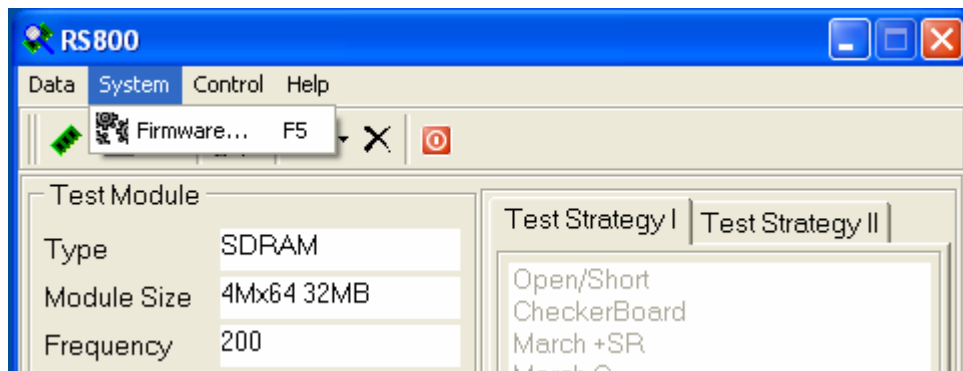
Fig. 24

 Start the Firmware Maintenance tool.
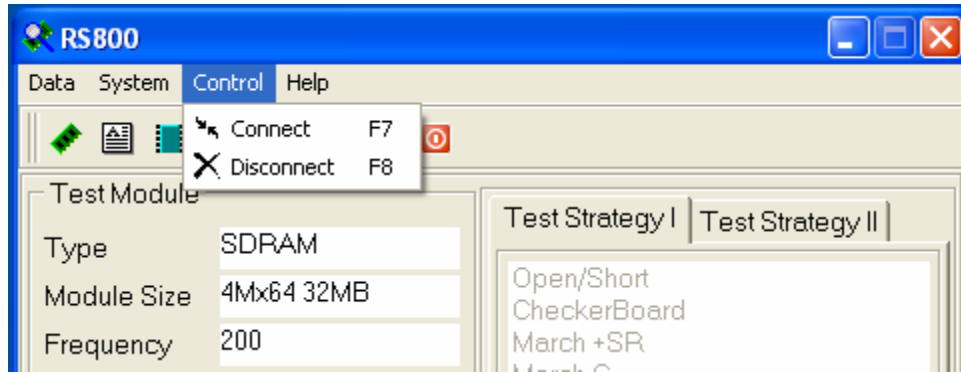
Fig. 25

Connect PC to the RS800 system.

Disconnect PC from the RS800 system

> The RS800 software has to connect to the RS800 system in order to perform the following operations: upload and download of module files, strategy files, SPD files, retrieve RS800 system firmware version information, and upgrade the RS800 firmware.
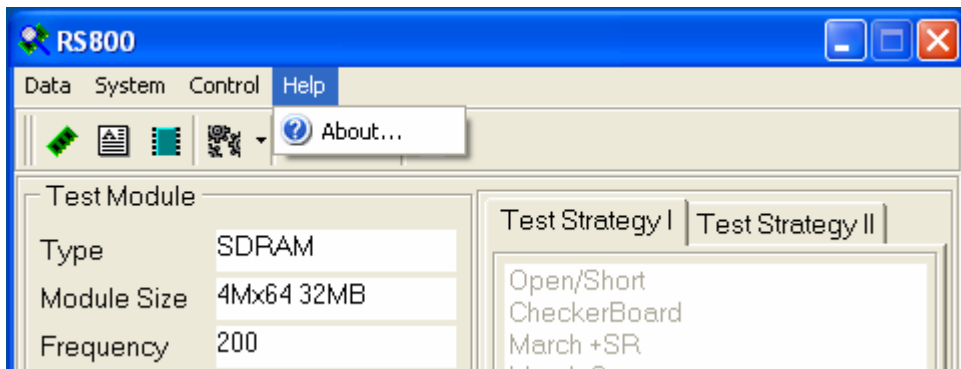
Fig. 26

Pop up the About dialogue box.

9.4   Connecting PC to RS800 tester

Step 1: Turn **ON** the RS800 tester and connect USB cable to tester. Then, connect the other end of USB cable to the operating PC. The tester **MUST** be in the start-up screen as shown: (Fig. 27)

Microtest   System   RS1000
マイクロテスト システム RS1000
Version 1.0
(Main)   (Load)   (Save)
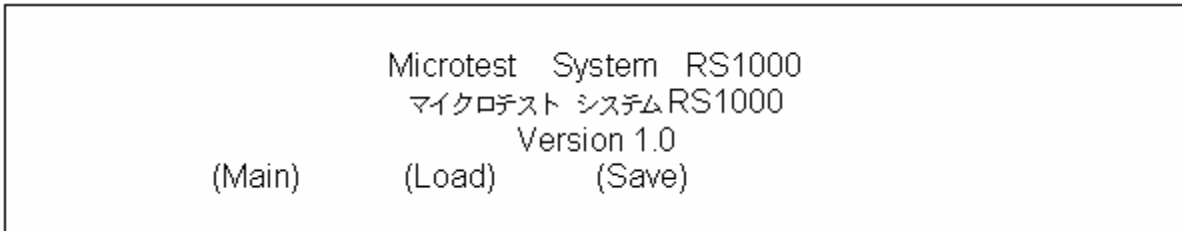
Fig. 27

Step 2: Launch the RS800 software. Click on the ⬝ icon next to the "Connect" icon ⤡ to pick the correct virtual serial port for connecting the tester (which usually is the highest port available). (Fig. 28)
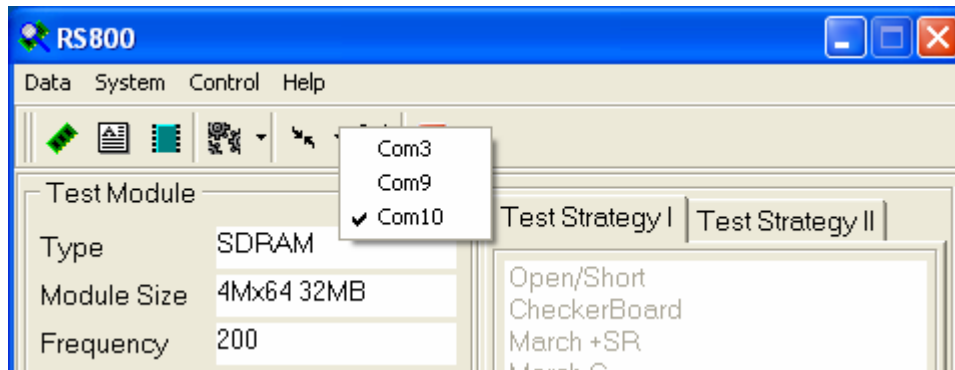
Fig. 28

Step 3: Click on the "Connect" icon ⤡. The below pop-up window will be shown: (Fig. 29)
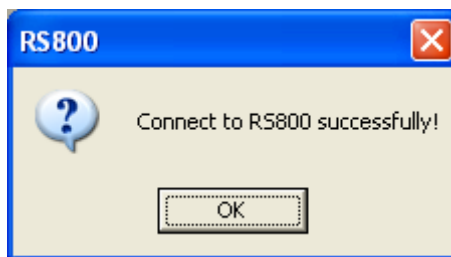
Fig. 29

Step 4: Click on "OK" and the RS800 software is now connected to the tester. If you have chosen the incorrect serial port, the window will show: (Fig. 30)
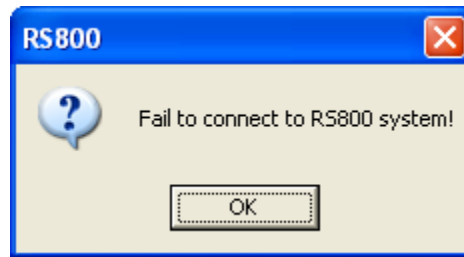
Fig. 30

You will then need to click "OK" and **QUIT** the software. Turn **OFF** the tester and wait for 5 seconds before turning it back **ON**. Proceed with **Step 2** to reconnect the PC to the tester**.**

9.5   Disconnecting PC from RS800 tester

Step 1: Leave the tester **ON**. Click on the "Disconnect" icon ✕ in the software. The following screen will be shown: (Fig. 31)
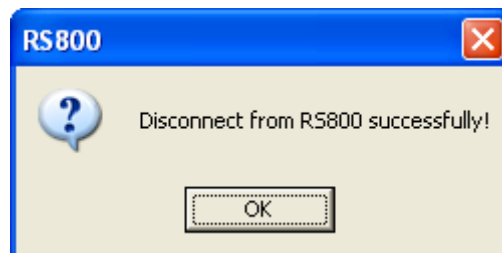
Fig. 31

> If the tester is accidentally turned off before clicking on the "Disconnect" icon ✕, simply exit the software and follow section **9.4** to reconnect the PC to the tester.

Step 2: Click "OK" and exit from the RS800 software by clicking the 🔴 icon.

Step 3: Unplug the USB cable from both ends. You have properly disconnected the tester.

> The RS800 software will only connect and disconnect **ONCE** from tester, you will need to exit the software and follow section 9.4 each time to reconnect the tester.

10 Module Configuration in RS800 Software

10.1 Modify the module configuration

Step 1: In the Main Window, click on the "Module" item under the "Data" menu.

OR

Click the [icon] icon on the short-cut bar.

Step 2: On the next window, user is ready to configure the module. (Fig. 32)
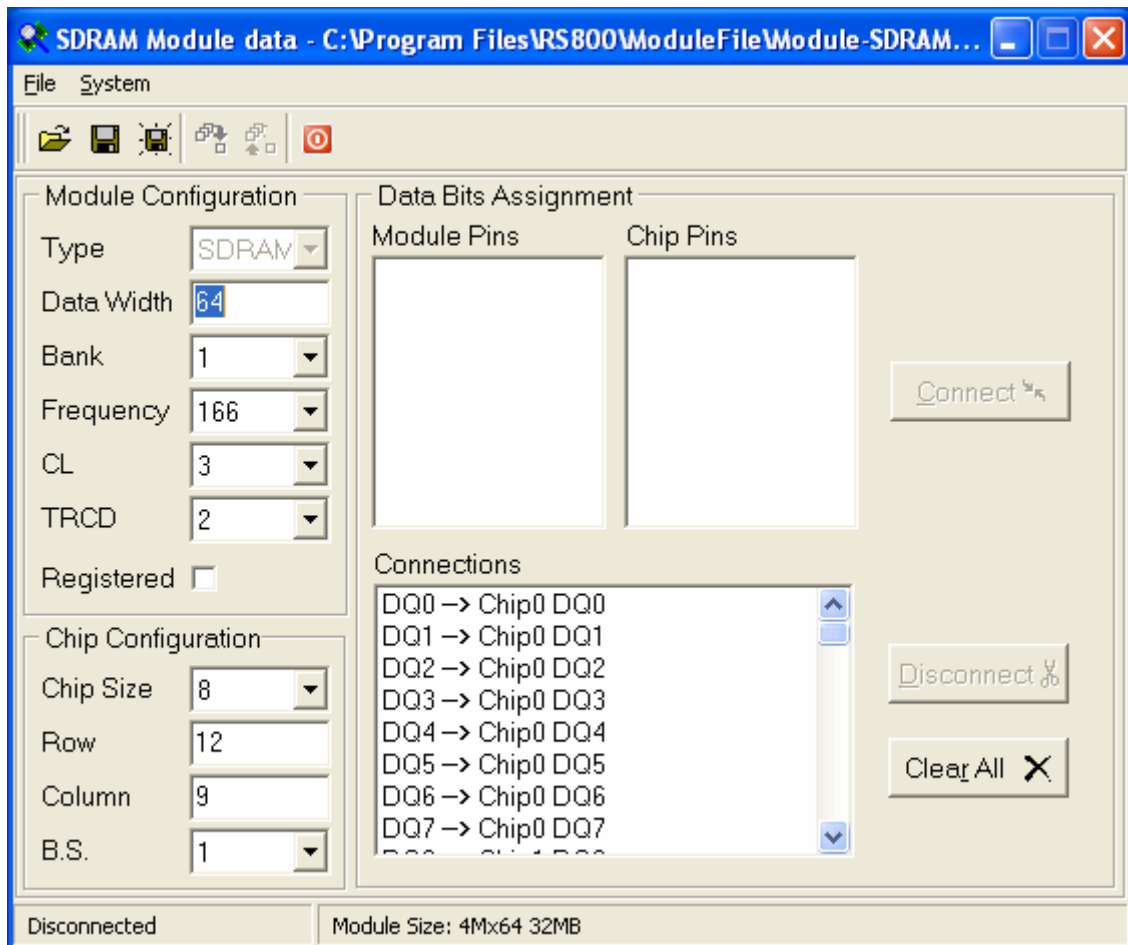
Fig. 32

Step 3: Once all the modifications have been finished, user can save the module information by four simple ways. (Fig. 33)
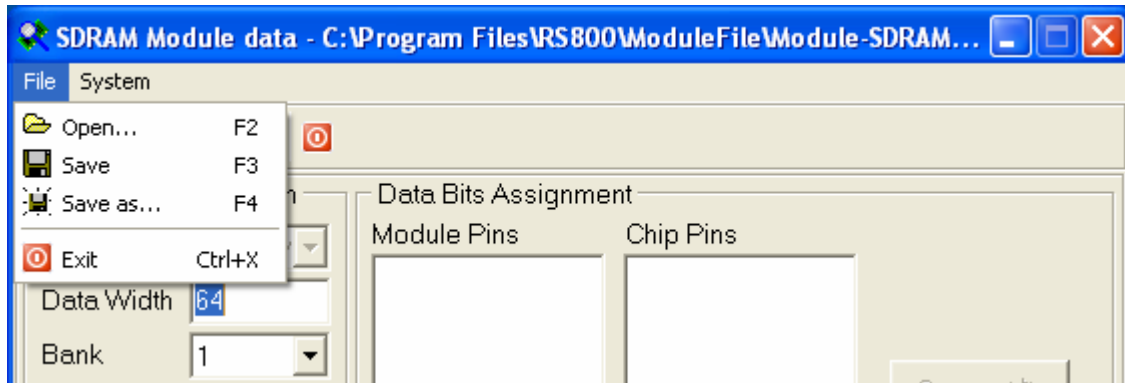

Fig. 33

Option 1:   Click the "Save" item under the file menu to save the module information into the file with the same filename.

Option 2:   Click the 💾 icon in the short-cut bar to save the module information into the file with the same filename.

Option 3:   Click the "Save as…" item under the file menu to save the module information into the file with a different filename.

Option 4:   Click the 💾 icon in the short-cut bar to save the module information into the file with a different filename.

10.2 Upload and download module configuration

User can also upload or download the module configurations to the RS800 system if the PC is connected to the RS800 system. (Fig. 34)
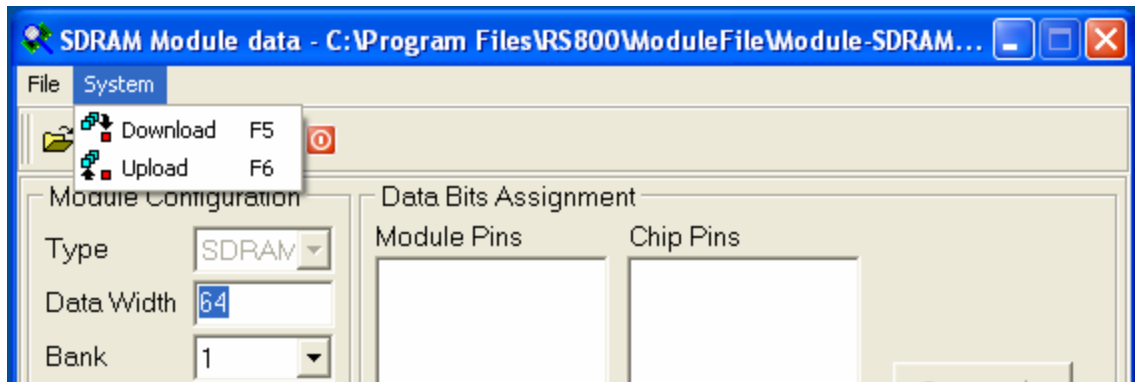
Fig. 34

Download: Select the "Download" item under the system menu.

OR

Click the ⬚ icon in the short-cut bar.

Upload: Select the "Upload" item under the system menu.

OR

Click the ⬚ icon in the short-cut bar.

11 Test Strategy Configuration in RS800 Software

11.1 Modify the test strategy configuration

Step 1: In the Main Window, click the "Strategy" item under the "Data" menu.

OR

Click the 🖺 icon on the short-cut bar.

Step 2: From this next window, user is now ready to configure the test logic sequence. RS800 can have maximum 6 different sequences of test logic in one single test. You can open and edit two test strategy files from the windows interface. By clicking the "Test Strategy I" tab or the "Test Strategy II" tab to select which is the currently editing test strategy file. (Fig. 35)
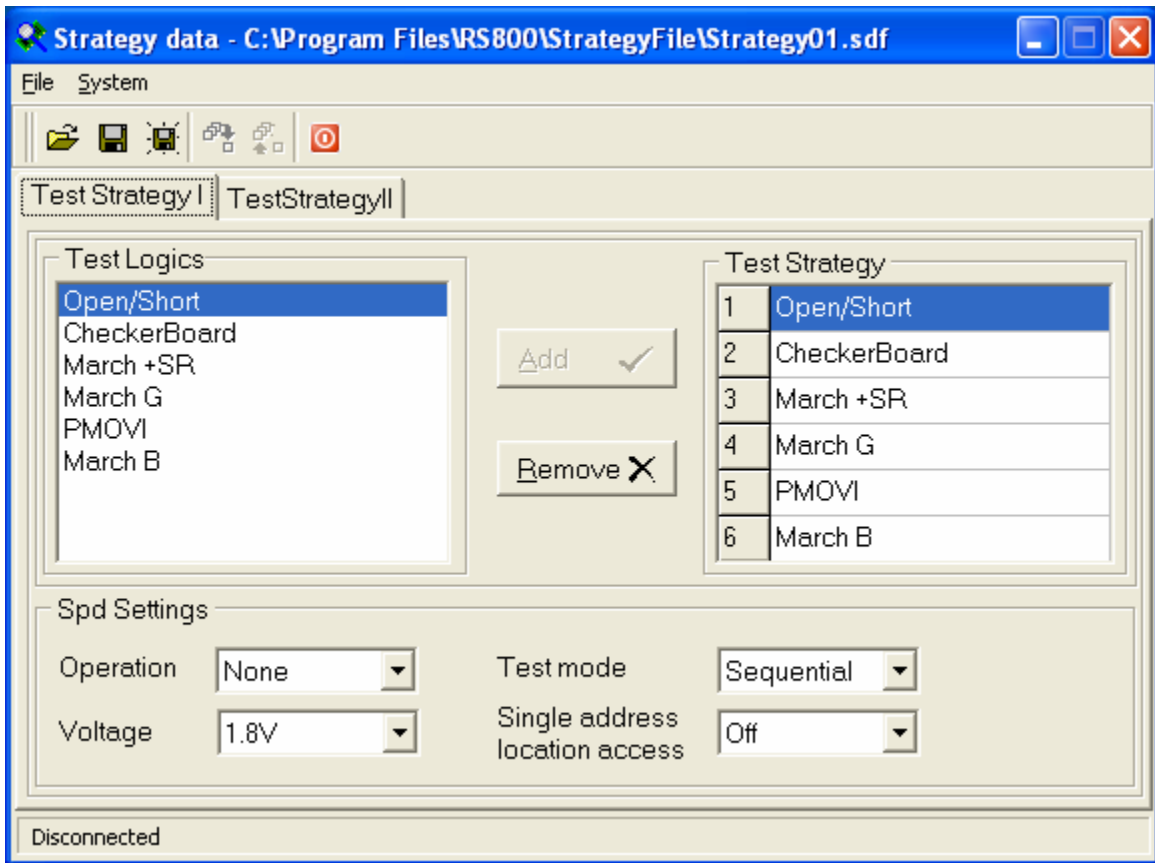
Fig. 35

Step 3: Once all the modifications have been finished, user can save the test logics sequence by four simple ways. (Fig. 36)
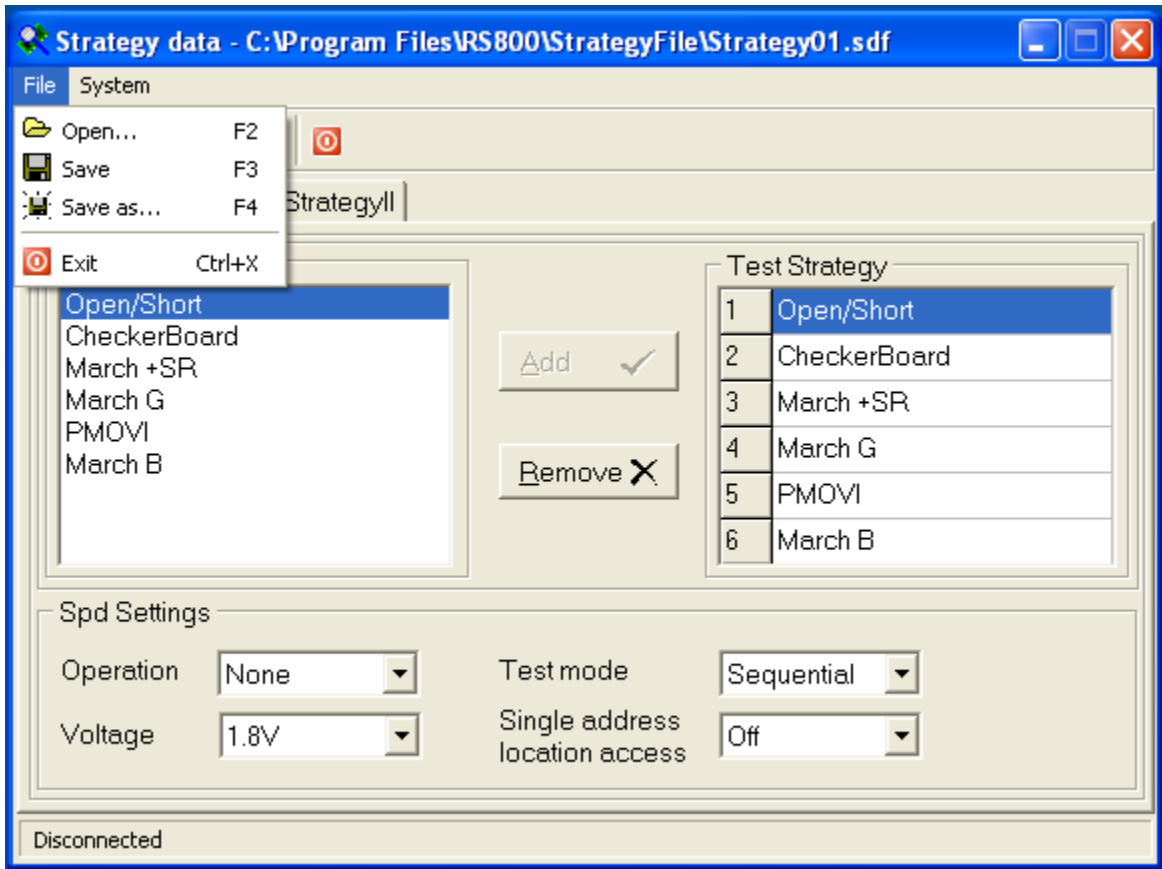
Fig. 36

Option 1: Click the "Save" item under the file menu to save the currently editing test logic sequence into the file with the same file name.

Option 2: Click the 🖫 icon in the short-cut bar to save the currently editing test logic sequence into the file with the same file name.

Option 3: Click the "Save as…" item under the file menu to save the currently editing test logic sequence into the file with different filename.

Option 4: Click the 🖫 icon in the short-cut bar to save the currently editing test logic sequence into the file with different filename.

11.2 Upload and download module configuration

User can also concurrently upload or download two sets of test logic sequences to the RS800 system if the PC is connected to the RS800 system. (Fig. 37)
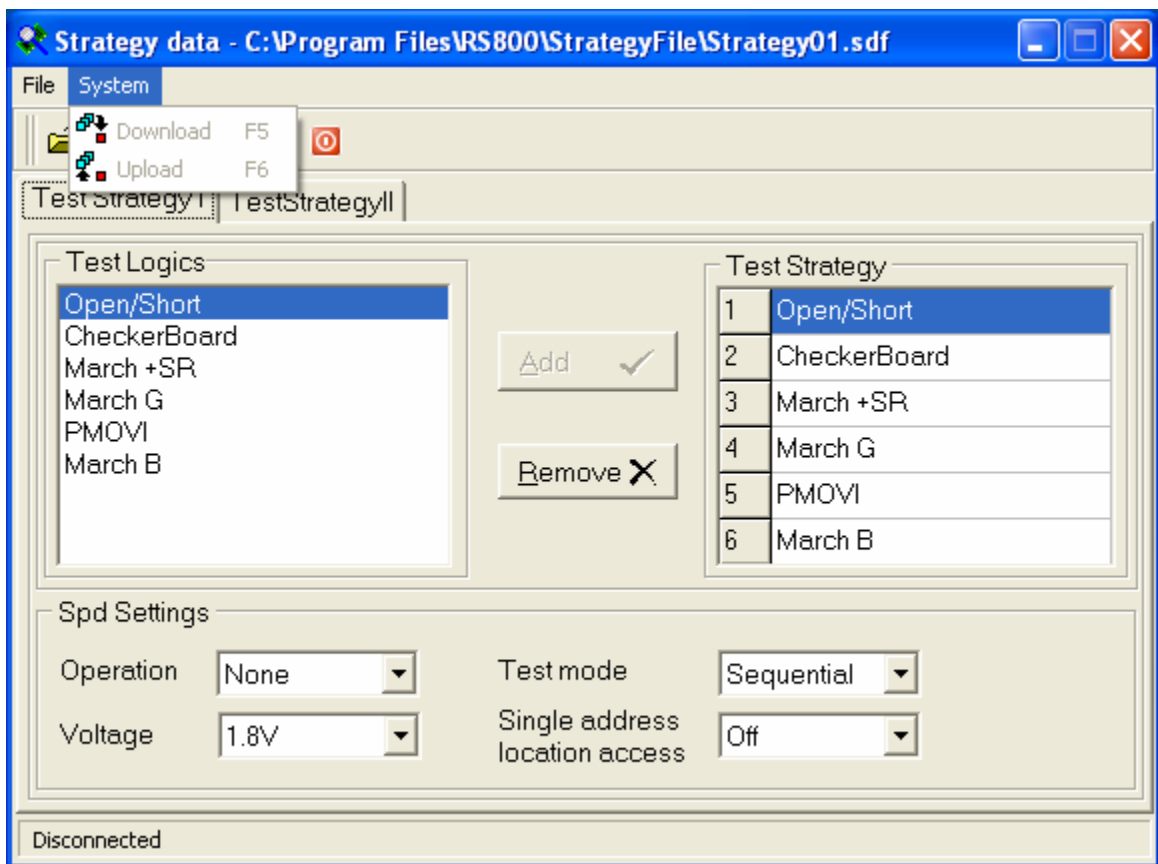

Fig. 37

Download: Select the "Download" item under the system menu.

OR

Click the icon in the short-cut bar.

Upload: Select the "Upload" item under the system menu.

OR

Click the icon in the short-cut bar.
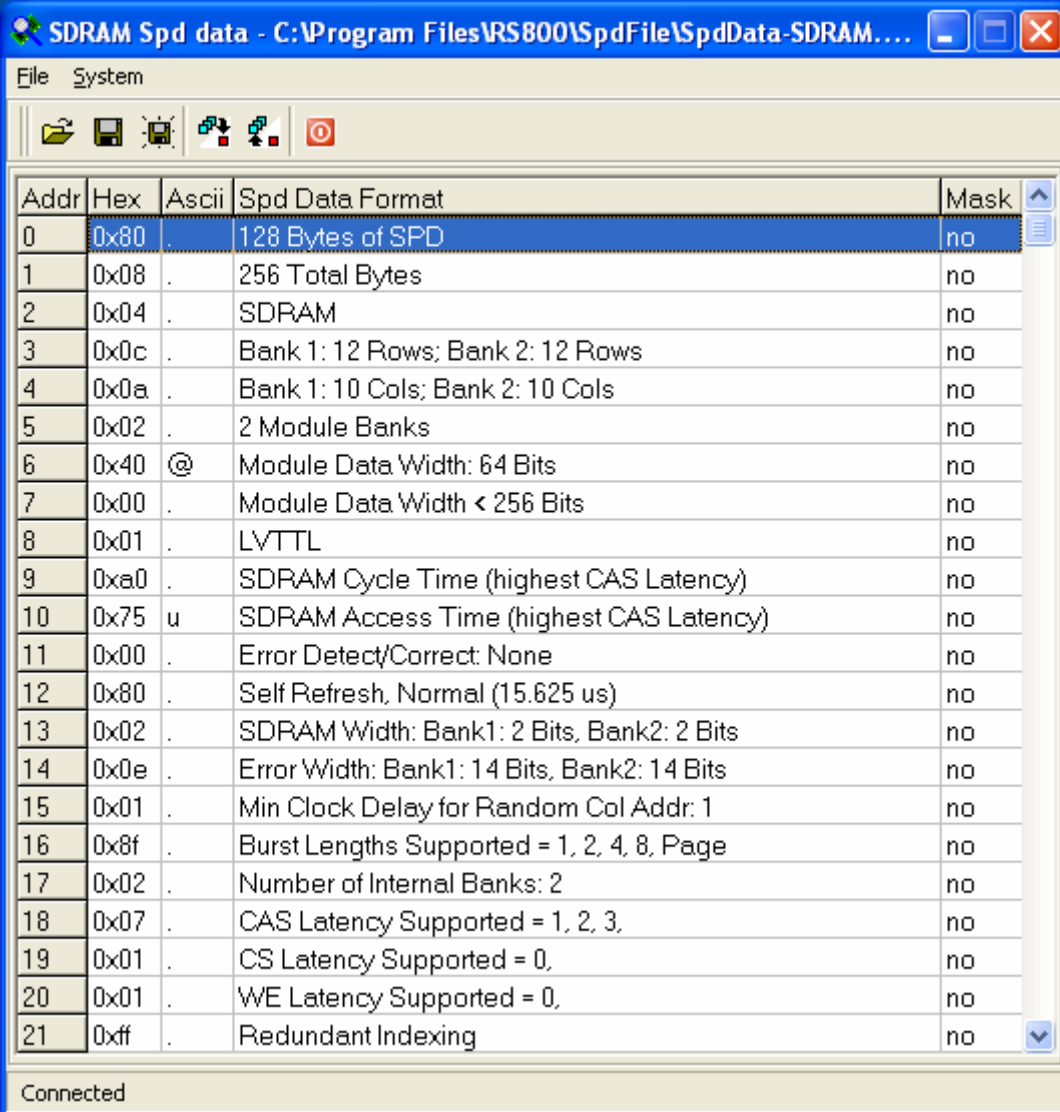
12 SPD Configuration in RS800 Software

12.1 Modify the SPD configuration

Step 1: In the Main Window, click on the "SPD" item under the "Data" menu.

OR

Click the icon on the short-cut bar.

Step 2: On the next window, user is ready to modify the SPD data. (Fig. 38)

Addr	Hex	Ascii	Spd Data Format	Mask
0	0x80	.	128 Bytes of SPD	no
1	0x08	.	256 Total Bytes	no
2	0x04	.	SDRAM	no
3	0x0c	.	Bank 1: 12 Rows; Bank 2: 12 Rows	no
4	0x0a	.	Bank 1: 10 Cols; Bank 2: 10 Cols	no
5	0x02	.	2 Module Banks	no
6	0x40	@	Module Data Width: 64 Bits	no
7	0x00	.	Module Data Width < 256 Bits	no
8	0x01	.	LVTTL	no
9	0xa0	.	SDRAM Cycle Time (highest CAS Latency)	no
10	0x75	u	SDRAM Access Time (highest CAS Latency)	no
11	0x00	.	Error Detect/Correct: None	no
12	0x80	.	Self Refresh, Normal (15.625 us)	no
13	0x02	.	SDRAM Width: Bank1: 2 Bits, Bank2: 2 Bits	no
14	0x0e	.	Error Width: Bank1: 14 Bits, Bank2: 14 Bits	no
15	0x01	.	Min Clock Delay for Random Col Addr: 1	no
16	0x8f	.	Burst Lengths Supported = 1, 2, 4, 8, Page	no
17	0x02	.	Number of Internal Banks: 2	no
18	0x07	.	CAS Latency Supported = 1, 2, 3,	no
19	0x01	.	CS Latency Supported = 0,	no
20	0x01	.	WE Latency Supported = 0,	no
21	0xff	.	Redundant Indexing	no

Fig. 38

Step 3: By double click on the byte that is desired to edit, a data input window pops up for data entry. (Fig. 39)
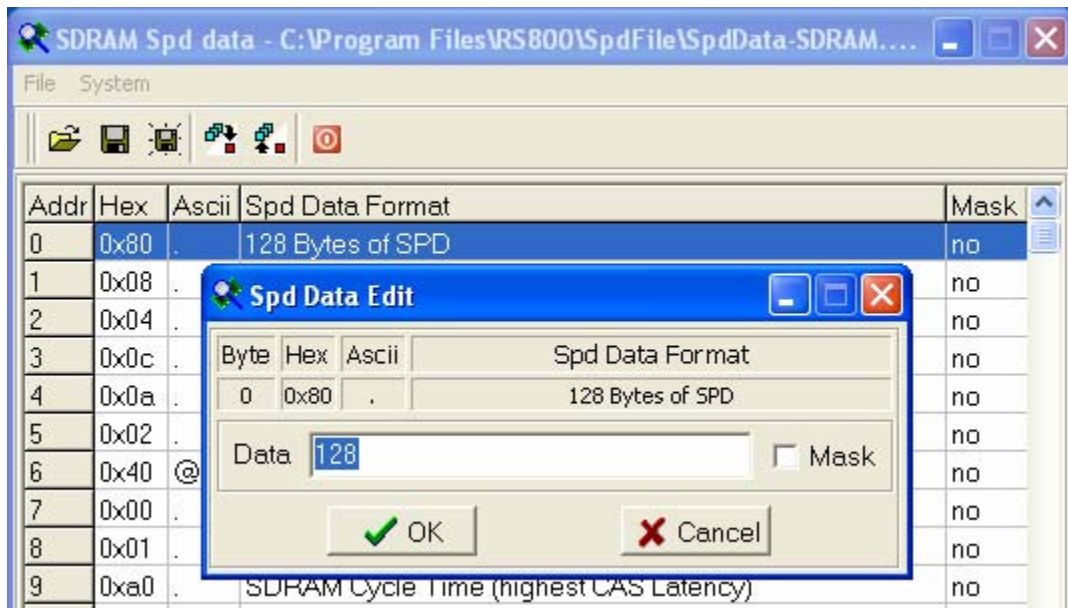

Fig. 39

Step 4: Once all the modifications have been finished, user can save the SPD information by four simple ways. (Fig. 40)
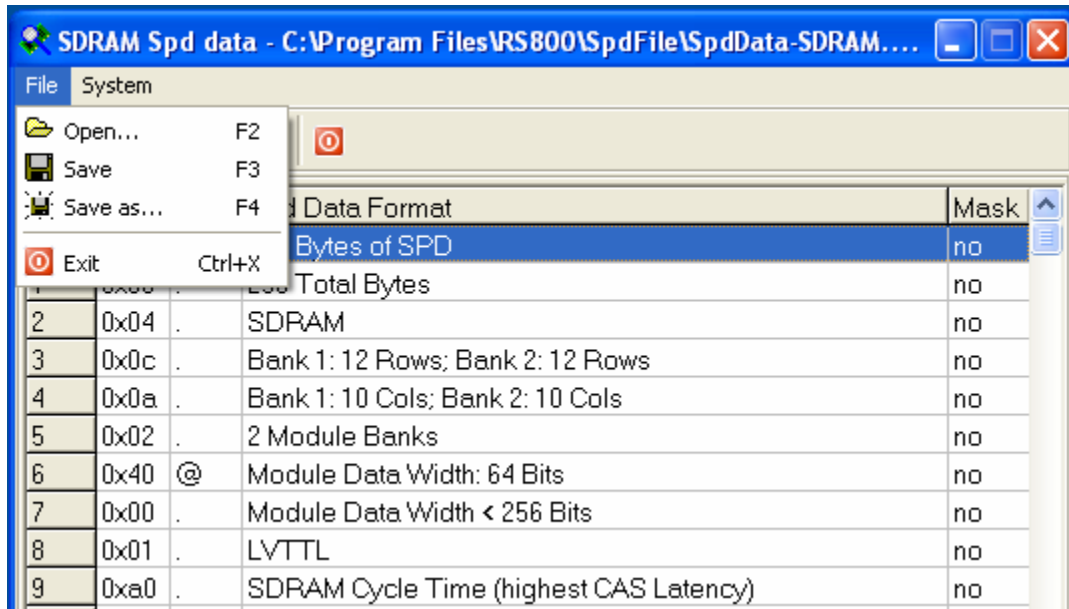

Fig. 40

Option 1:   Click the "Save" item under the file menu to save the SPD information into the file with the same file name.

Option 2:   Click the ▢ icon in the short-cut bar to save the SPD information into the file with the same file name.

Option 3:   Click the "Save as…" item under the file menu to save the SPD information into the file with different filename.

Option 4:   Click the ▢ icon in the short-cut bar to save the SPD information into the file with different filename.

12.2 Upload and download SPD information

User can also upload or download the SPD information to the RS800 system if the PC is connected to the RS800 system. (Fig. 41)
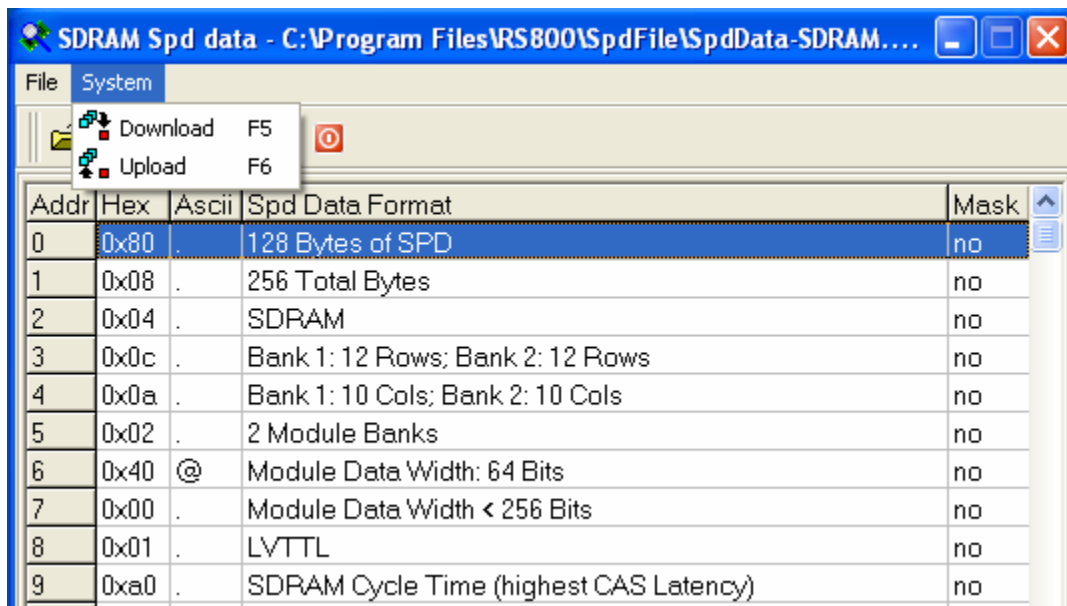

Fig. 41

Download: Select the "Download" item under the system menu.

OR

Click the icon in the short-cut bar.

Upload: Select the "Upload" item under the system menu.

OR

Click the icon in the short-cut bar.

13 System Firmware Upgrade

Step 1: Power **OFF** the RS800. Exit from RS800 software and unplug the USB cable (if plugged).

Step 2: Press and hold the green button located at the back of the RS800

Step 3: While **Holding** the green button at the back of the RS800, turn **ON** the RS800.

Step 4: Wait for 10 seconds and turn **OFF** the tester while still holding the green button. Now the firmware has been erased.

Step 5: Release the green button and turn back **ON** the tester.

Step 6: Plug in the USB cable and it will prompt you for the driver.

Step 7: Go thru the same process as **Chapter 3 – Installing RS800 Windows Driver**. Follow the remaining steps and click on "Finished" when prompted.

Step 8: Now, turn **OFF** the tester (do not restart) and launch the RS800 software. Proceed to step 9.

OR

Turn **OFF** the tester and launch the SAM-PRO software. Skip to Step 10.

Step 9: In the Main Window, click on the "Firmware" icon ▦ under the System menu or on the short-cut bar.

OR

Click on the ⊡ icon next to the "Firmware" icon ▦ to locate the SAM-PRO program for firmware upgrade (Fig. 42). Look for the executable file "AT91SAM-PRO.exe" under the SAM-PRO folder. (Fig. 43)
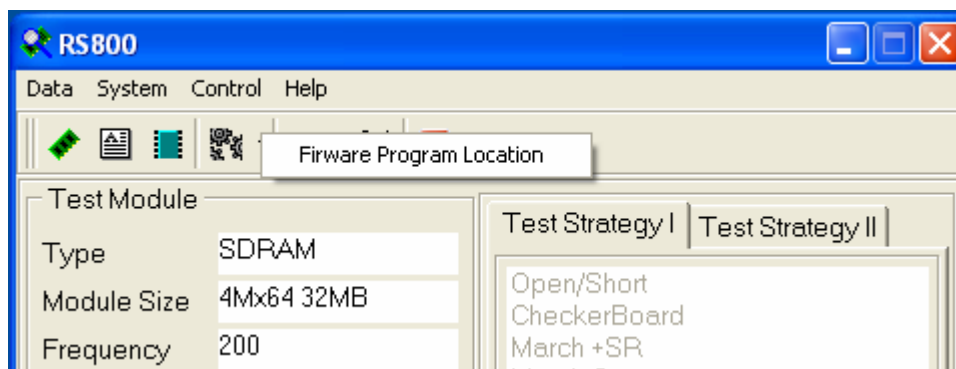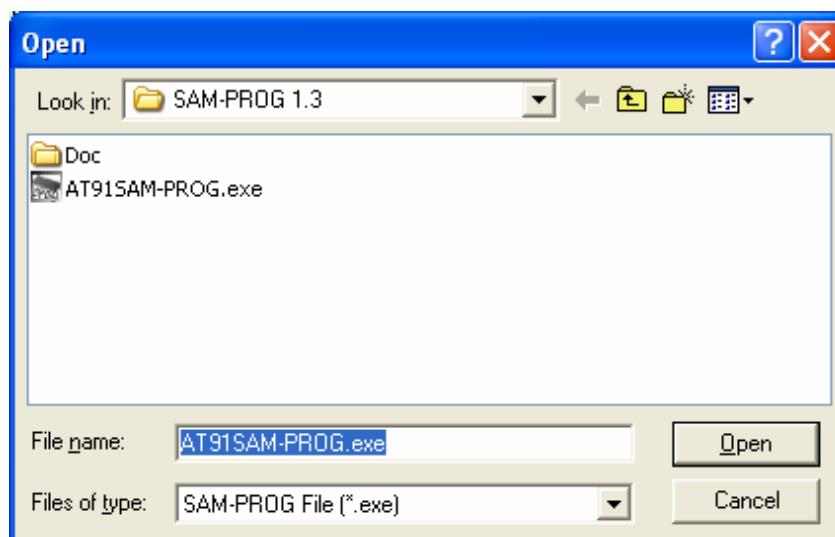

Fig. 42

Fig. 43

Step 10: The SAM-PRO window will pop up and the user is now ready for firmware upgrade operation. (Fig. 44)
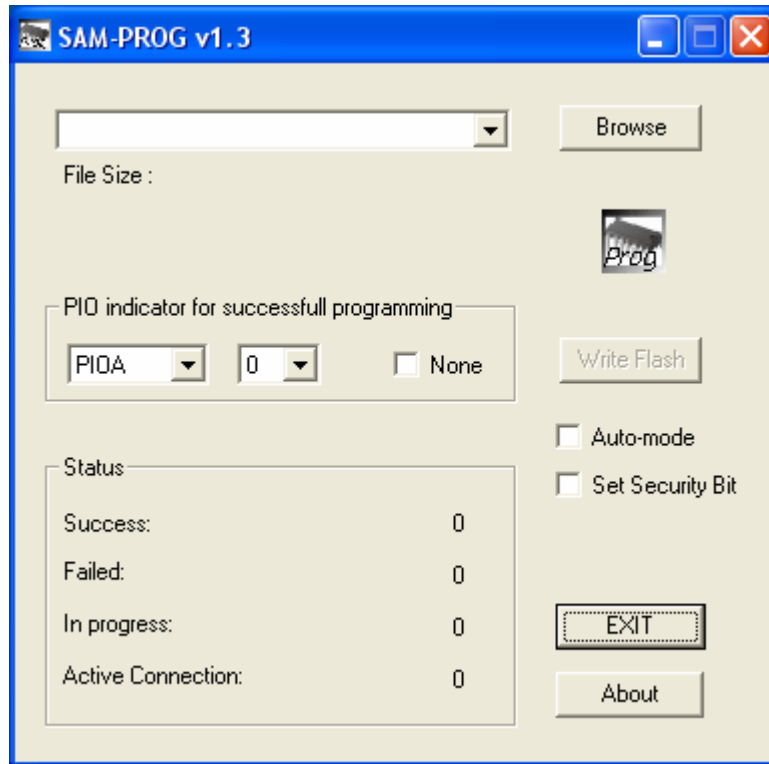

Fig. 44

Step 11: Click on "Browse" and select the correct firmware file (.bin extension) from the open file dialogue box. (Fig. 45)
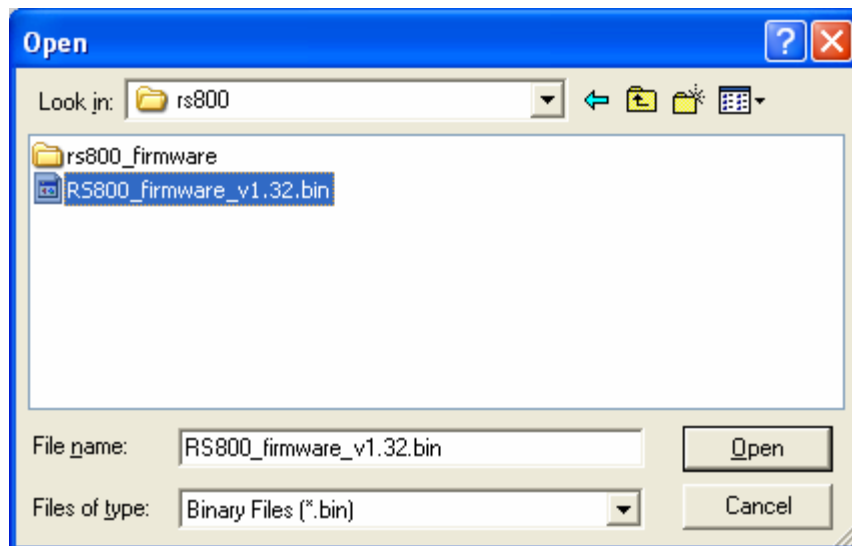

Fig. 45

Step 12:

- Select "None" for the "PIO indicator for successful programming".

- Uncheck "Auto-mode".

- Uncheck "Set Security Bit".

Step 13: Turn **ON** the tester and the "Write Flash" button will be clickable. You should see the window shown below: (Fig. 46)
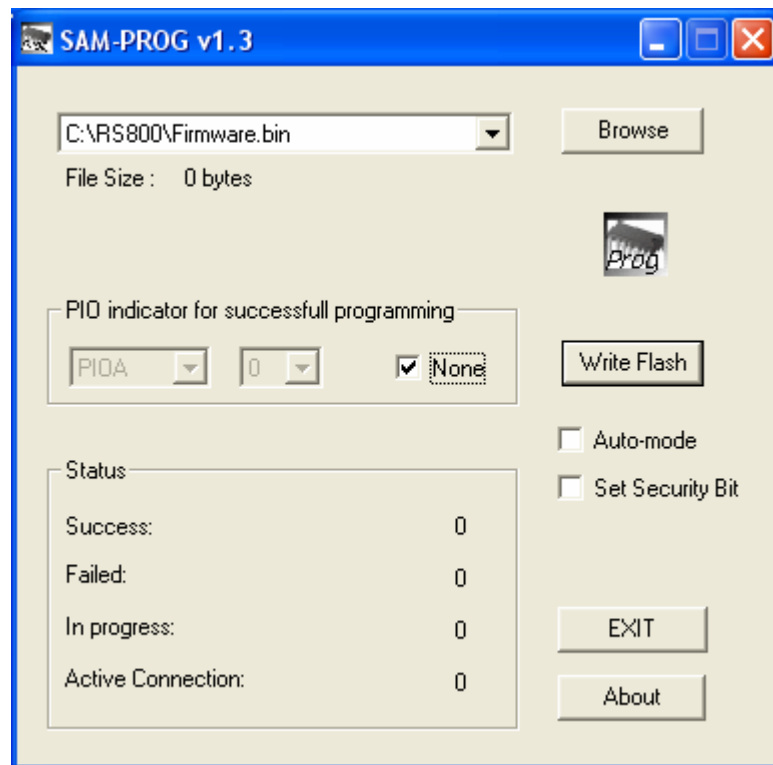

Fig. 46

Step 14: Click on the "Write Flash" button to download and upgrade the tester firmware. The *Status* window will show *Success* to be 1 (Fig. 47). If not, repeat Step 1.
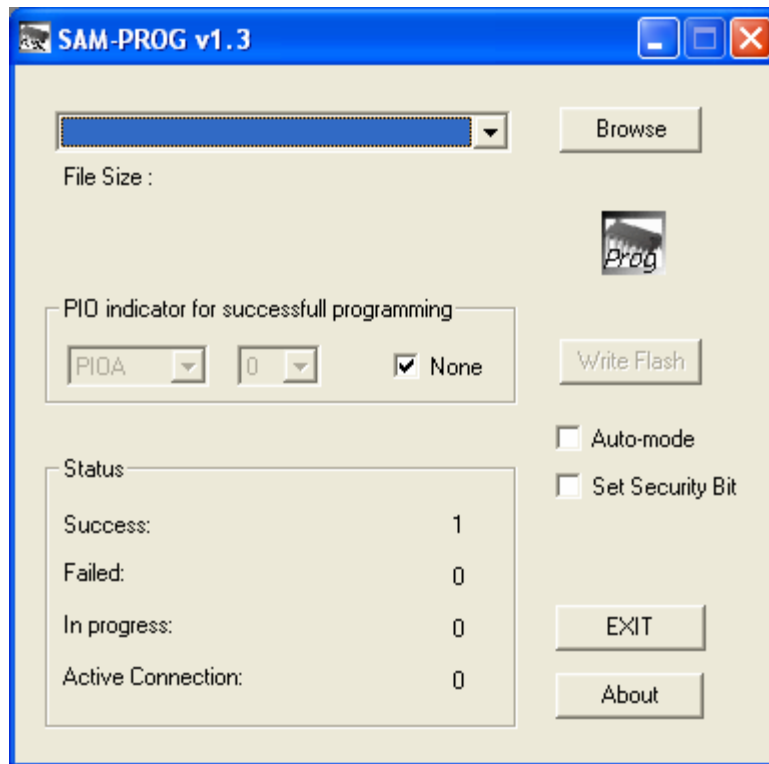
Fig. 47

Step 15: The firmware is being updated. **EXIT** from both SAM-PRO program and RS800 software. Now, restart the tester. You should now see the latest version of firmware on the startup screen.

**Thank you for purchasing the RS800 tester from
Microtest System!**