RS1000
DDR MEMORY TESTER

Version 1.1.0
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www.microtestsystem.com

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Table of Contents

1 Introduction

1.1 Welcome to RS1000

Welcome to the RS1000 memory tester. By using the RS1000 LCD display or the RS1000 Windows software, you can customize the RS1000 memory tester to test different DDR and DDR2 memory modules. You are able to modify the module configurations, edit the sequence of the testing logics, and alter the SPD data.

1.2 RS1000 special features

- Test different types of DDR and DDR2 memory modules
- Alterable test logics sequences
- Read, write, and test SPD data
- Future system firmware upgrade

2 Installing RS1000 Windows Software

2.1 System Requirements

Operating System

- Microsoft Windows 2000 with .Net framework 1.1
- Microsoft Windows XP with .Net framework 1.1

Hardware

- Your PC system must have 800 MHz or higher.
- 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.

RS1000 Windows USB driver does not currently work with SIS chipset based motherboard. Please don't install RS1000 Windows software and USB driver to the SIS chipset based system.

2.2 Installing RS1000 Windows Software

Step 1: Double click on the “install.exe” file.

Step 2: Follow prompts until you are finished installing the RS1000 software. A pop-up window will be shown: (Fig. 01)

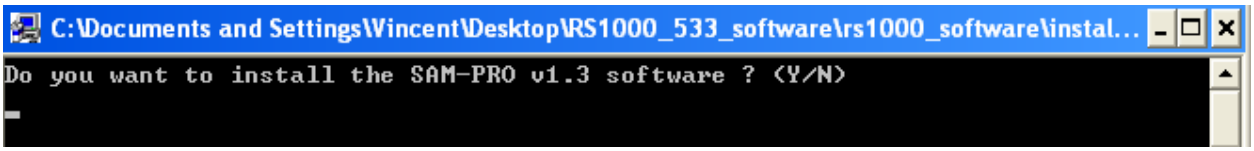

Fig. 01

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 RS1000 Windows Software

Step 1: Go to Start ⇒ Settings ⇒ Control Panel ⇒ Add or Remove Programs

Step 2: Select RS1000 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 RS1000 Windows Driver

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

Step 1: Turn on the RS1000 tester system by switching on the power switch. The following screen will first appear on the LCD display. (Fig. 02)

Fig. 02

Step 2: Plug one end of the USB cable to the RS1000 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)

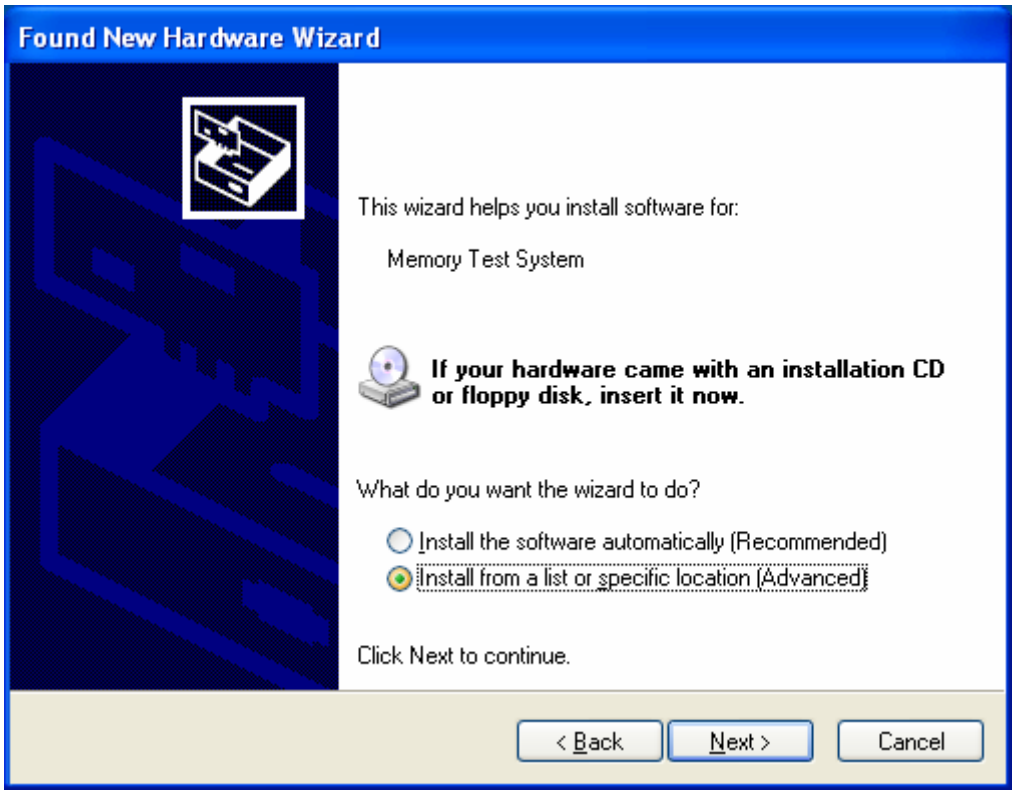

Fig. 04

Step 5: Select “Don’t search. I will choose the driver to install” and click on “Next” to continue. (Fig. 05)

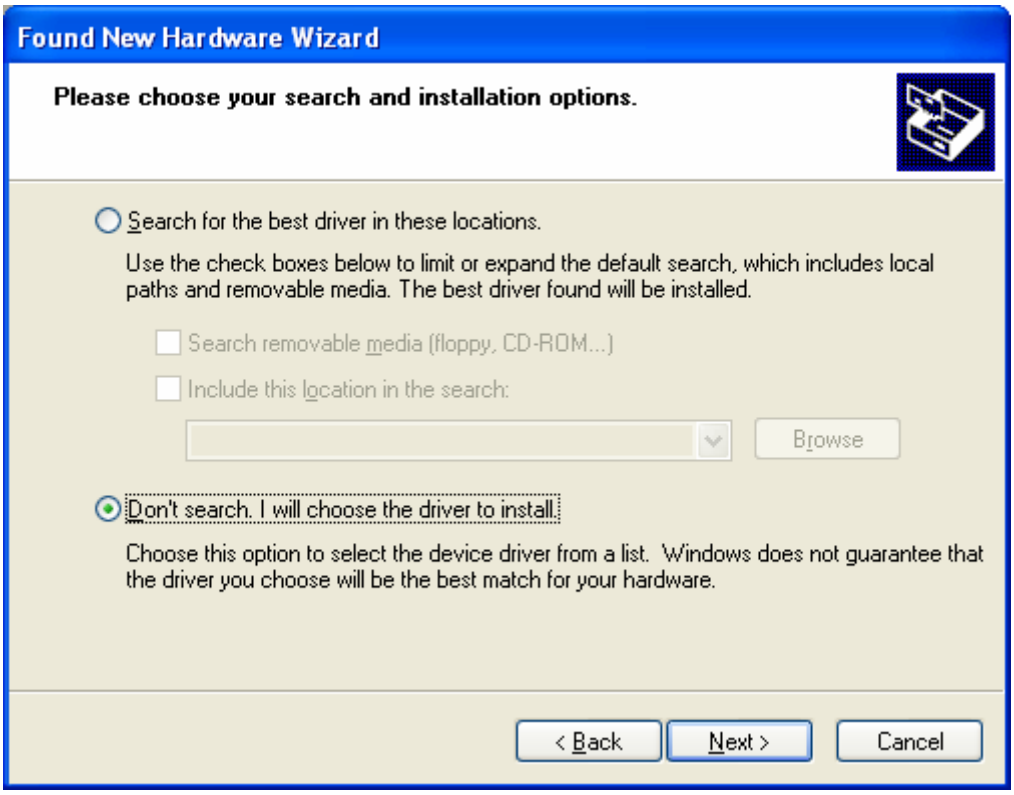

Fig. 05

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

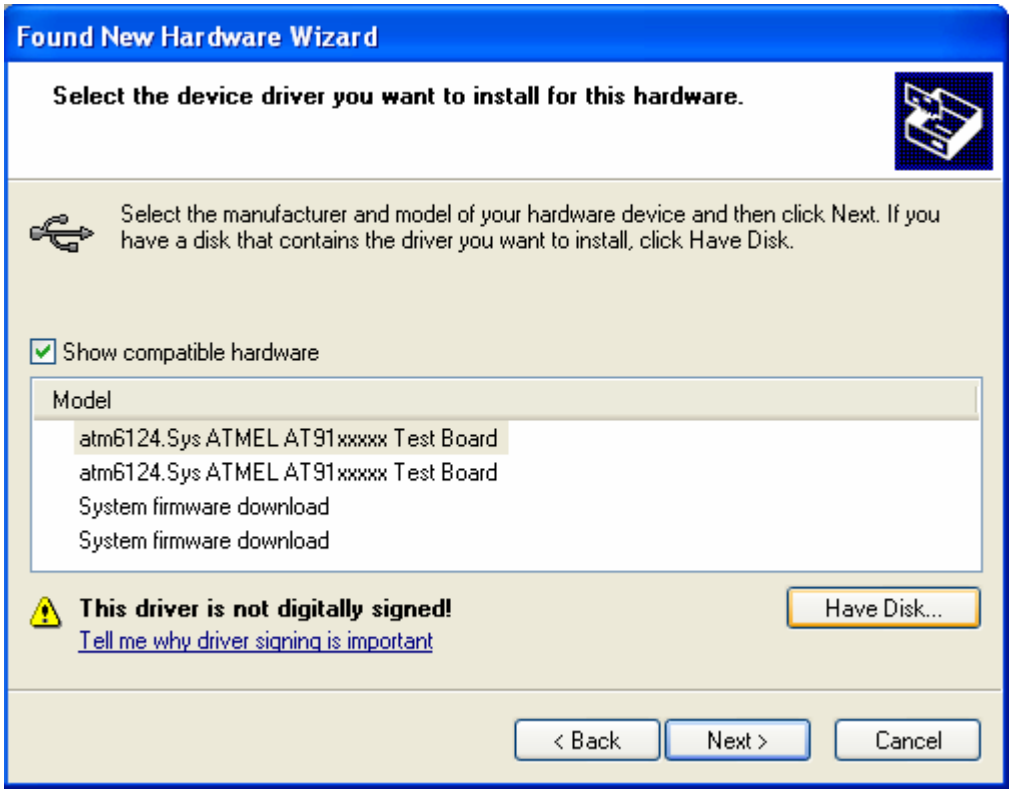

Fig. 06

Step 7: Browse to the “C:\Program Files\RS1000\Drivers” directory and click on “OK”. Proceed by clicking on “Next”. (Fig. 07)

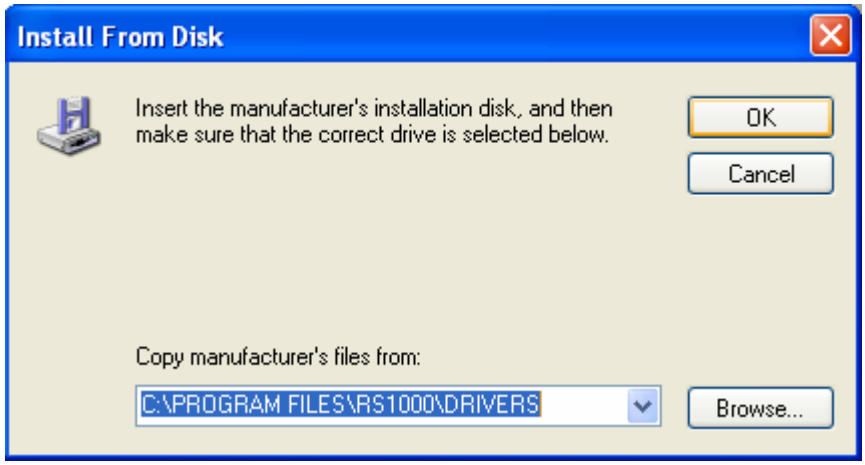

Fig. 07

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

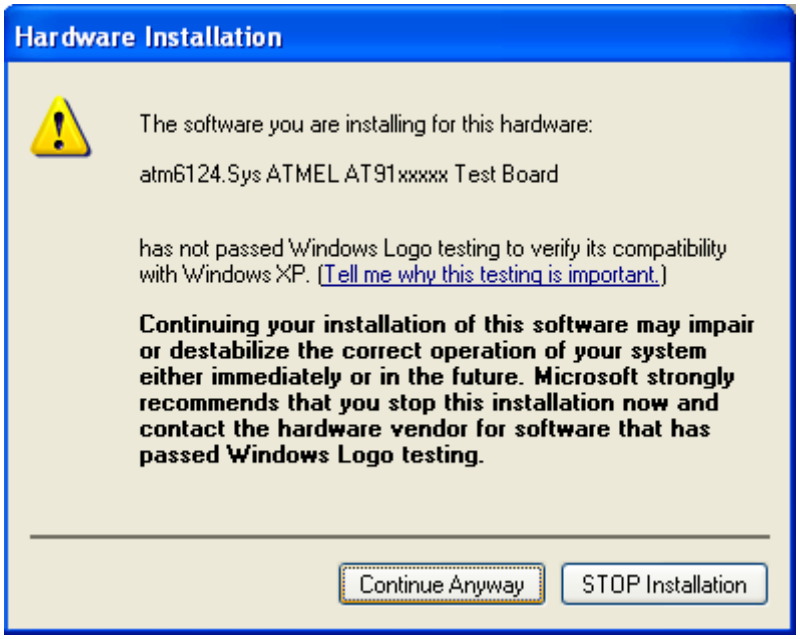

Fig. 08

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

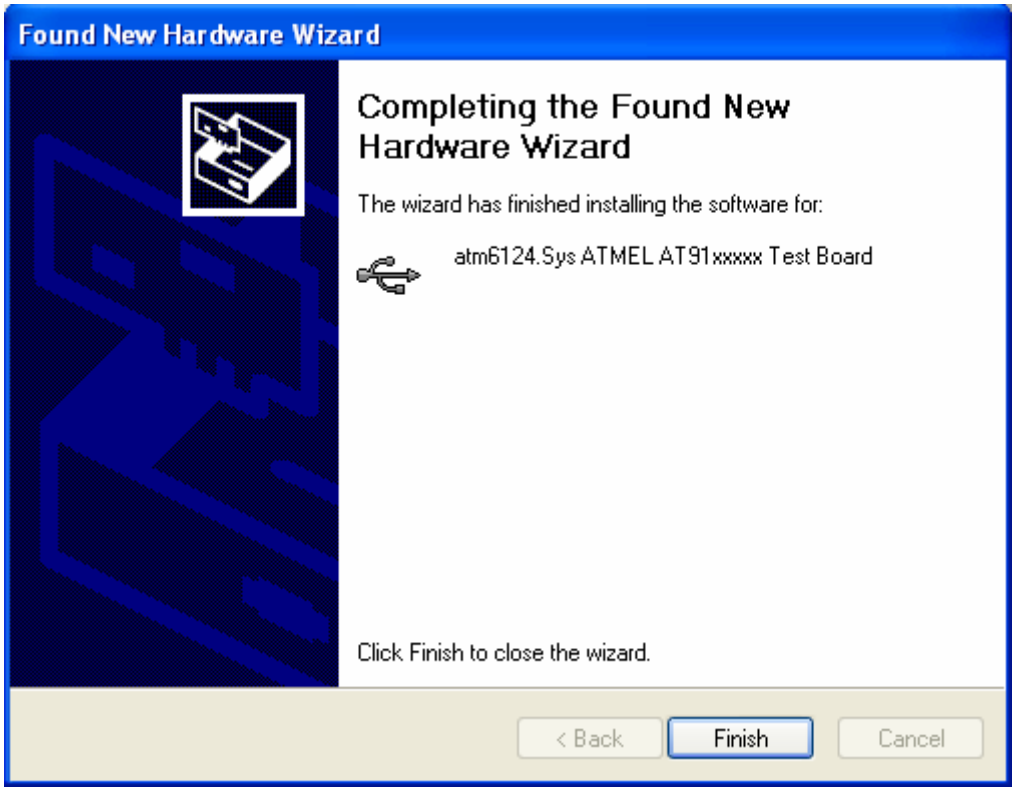

Fig. 09

4 Getting Started

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

Turn on the RS1000 tester system by switching on the power button. The following screen will first appear on the LCD display: (Fig. 10)

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 RS1000 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)

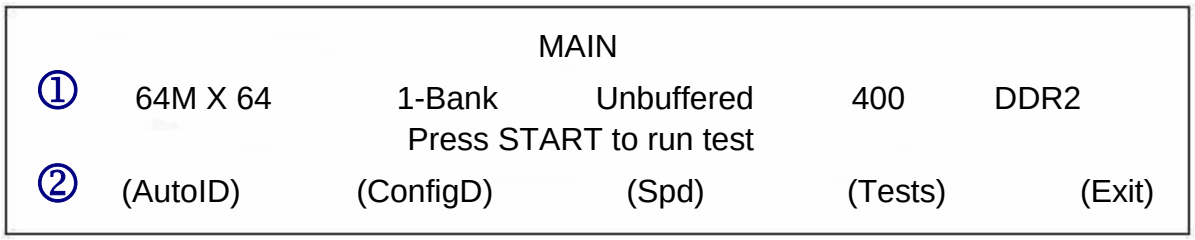

Fig. 11

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 (ConfigD) ⇒ (Frq/Chp).

- ConfigD: 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 (ConfigD) button in the main menu will take you to the module configuration menu. (Fig. 12)

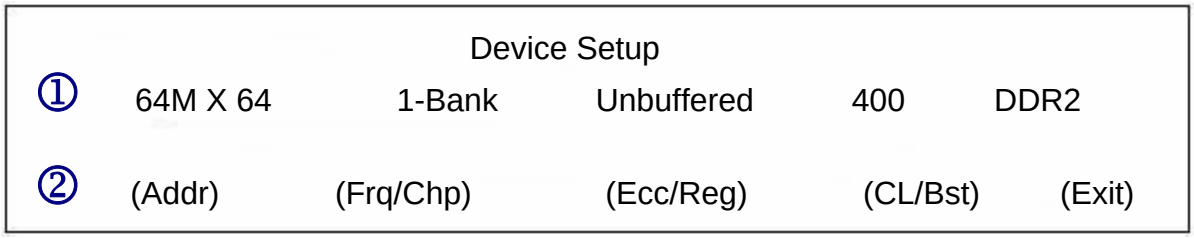

Fig. 12

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.
- CL/Bst: Take you to the Tcl and Burst configuration menu.
- Exit: Return to the previous menu.

6.2 Addr Configuration Menu

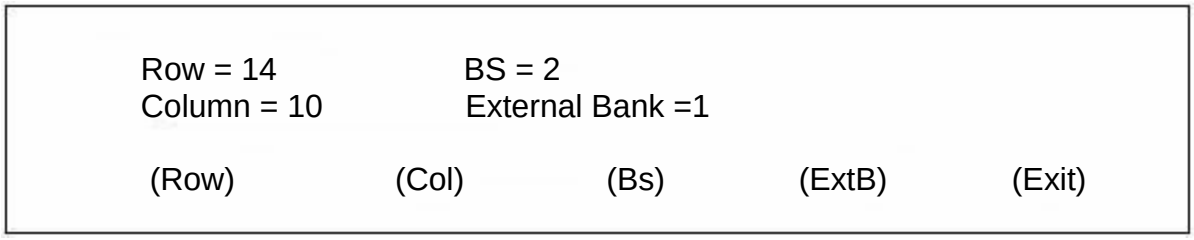

Fig. 13

- Row: Change the row value.
- Col: Change the Col value.
- Bs: Change the Bs value
- ExtB: Change the External Bank value.
- Exit: Return to the previous menu.

6.3 Frq/Chp Configuration Menu

Fig. 14

- Freq: Change the frequency.
- ChipWdh: Change the Chip Width.
- Type: Change the Dut type.
- Timing: Modifies default timing settings.
- Exit: Return to the previous menu.

6.4 Timing Setting

Fig. 15

- tIS: Address and Control input setup time.
- tDQSS: Positive DQS latching edge to associated clock edge
- tDS: DQ and DM input setup time relative to DQS
- tAC: DQ output access time from CK
- Exit: Return to the previous menu.

6.5 ECC/REG Configuration Menu

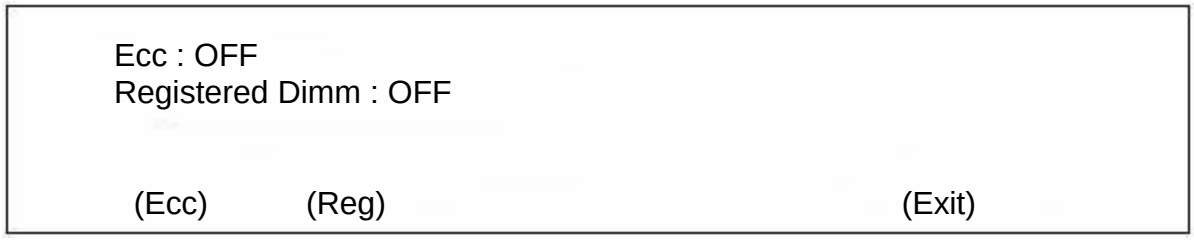

Fig. 15

- ECC: Enable or Disable ECC.
- REG: Enable or Disable Registered Dimm option.
- Exit: Return to the previous menu.

6.6 TCL/RCD Configuration Menu

Fig. 16

- Tcl: Change the TCL value.
- Trcd: Change the TRCD Value.
- Burst: Change the burst type and burst length.
- 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)

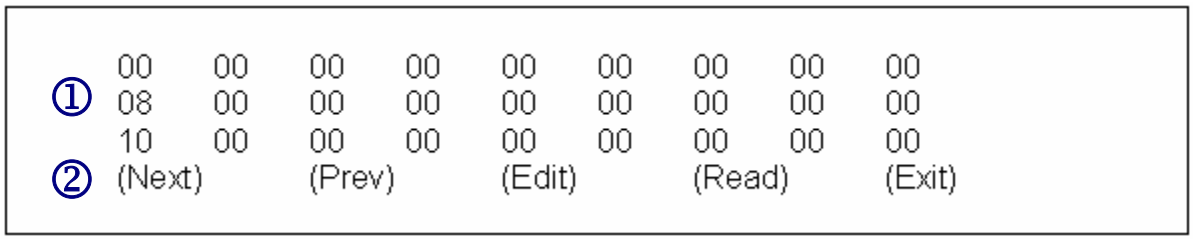

Fig. 17

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

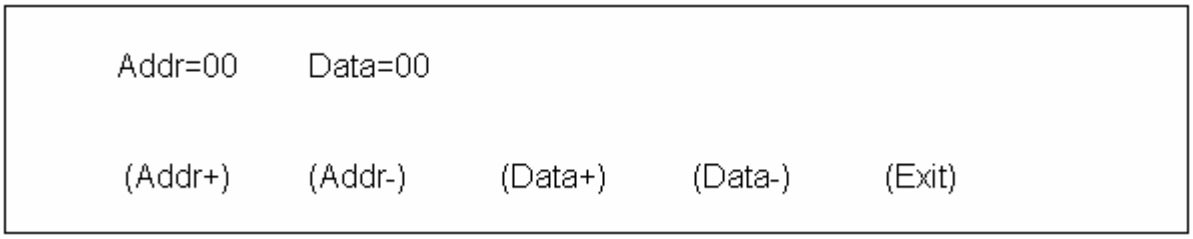

Fig. 18

- 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 test strategy configuration menu. (Fig. 19)

Fig. 19

- TestList: Bring up the test list configuration menu.
- Volt: Change the voltage value.
- Spd: Enable SPD function only, no patterns will be performed.
- ErrStp: Enable/Disable the Stop of failure function.
- 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)

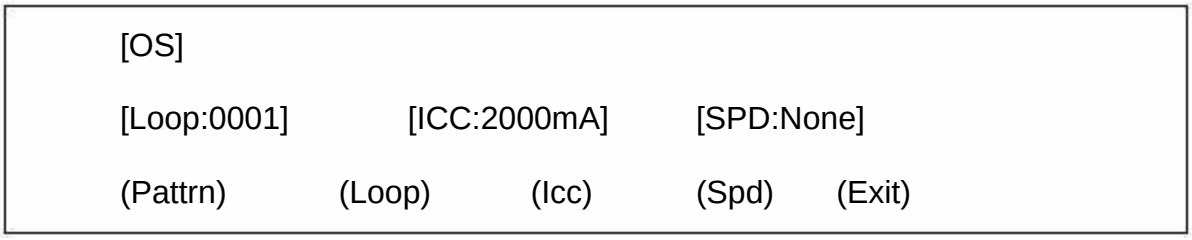

Fig. 20

- Pattrn: Enable/Disable individual patterns.
- Loop: Change the number of loop(s) for module testing.
- Icc: Sets the threshold current for the module.
- Spd: Defines the type of SPD function to be performed.
- Exit: Return to the previous menu.

9 RS1000 Windows Software

9.1 Launching RS1000 Windows Software

You can launch the software program either by

- Double click the software icon on the desktop OR
- Start ⇒ Programs ⇒ RS1000 ⇒ RS1000

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

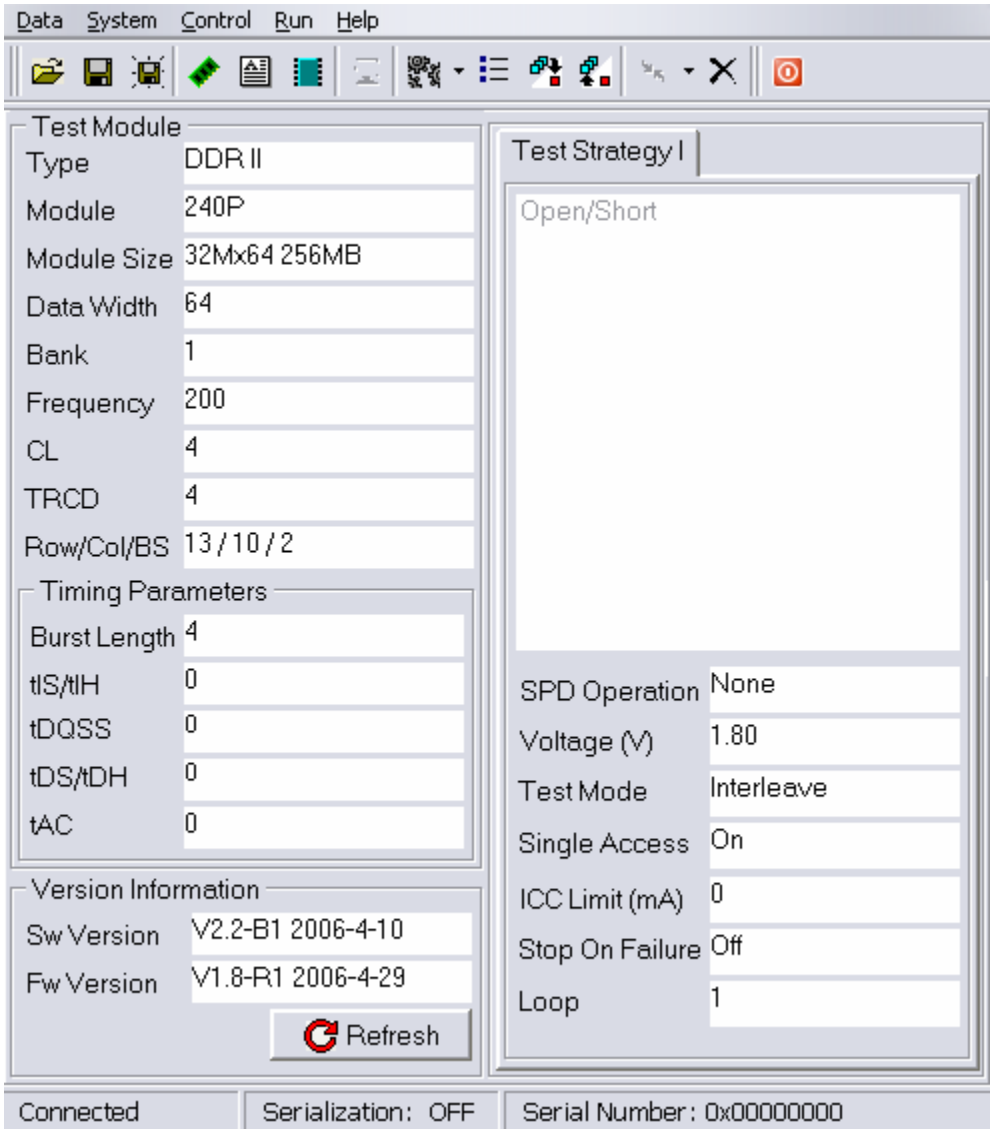

Fig. 21

9.2 Main Window

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

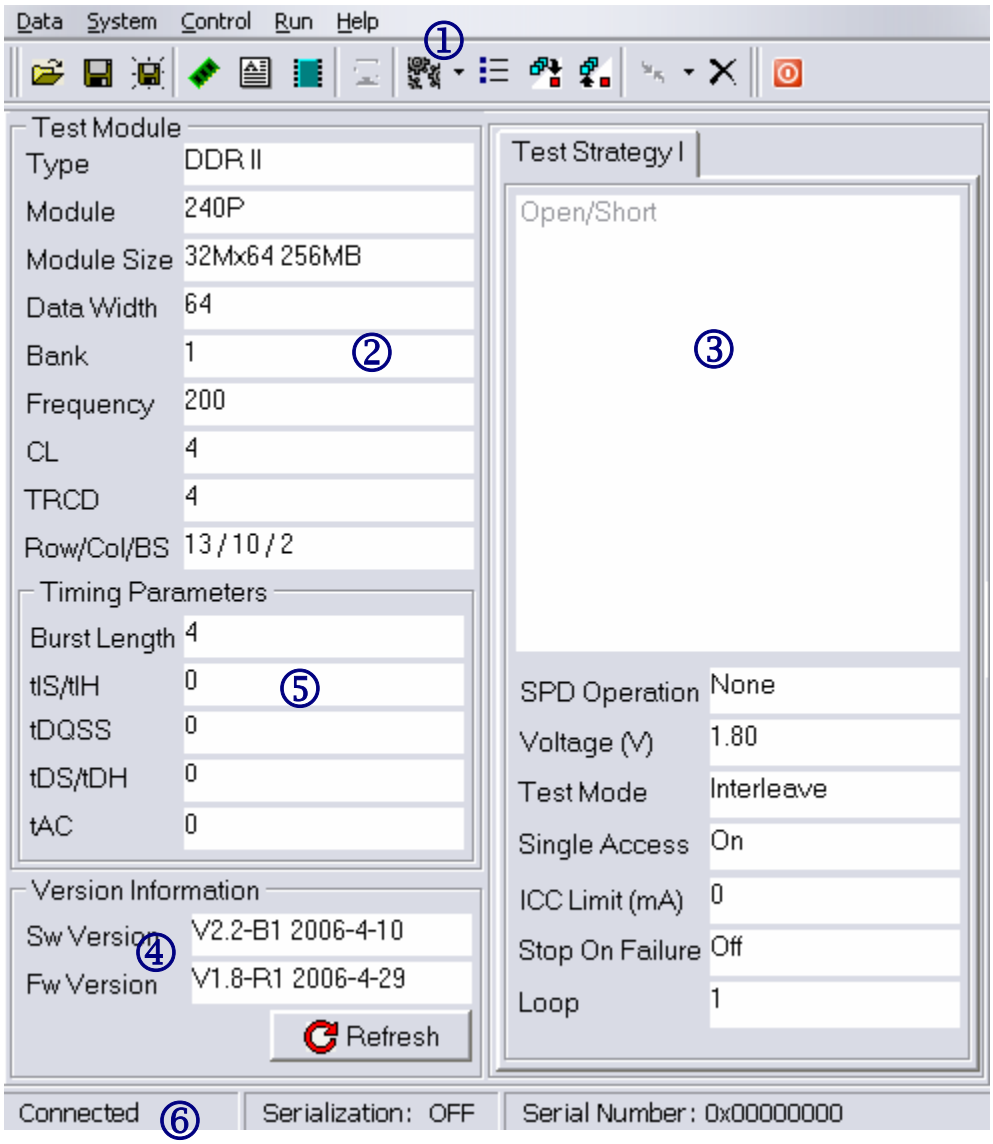

Fig. 22

① Main Menu and short-cut buttons ② Summary of Module configuration

③ Summary of Test Patterns and Settings ④ Version Information

⑤ Timing Settings 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)

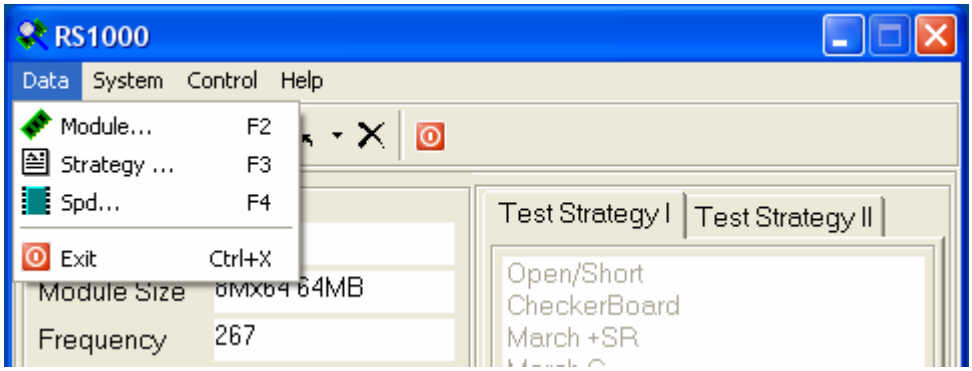

Fig. 23

Start the Module editor.

Start the Test Strategy editor.

Start the SPD editor.

Exit the program.

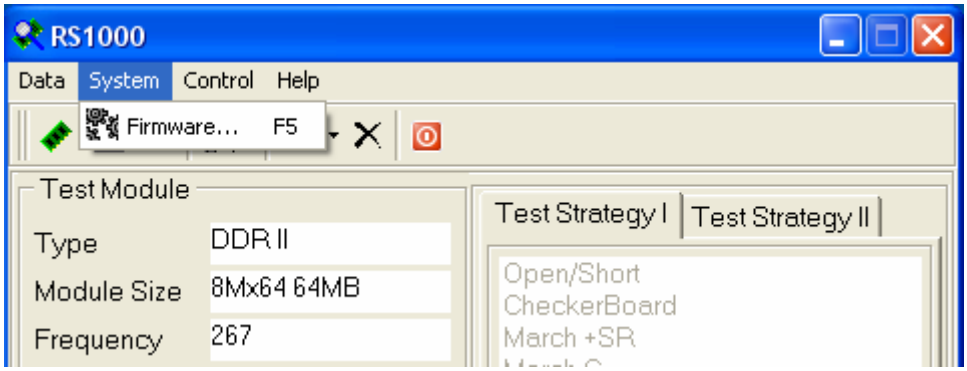

Fig. 24

Start the Firmware Maintenance tool.

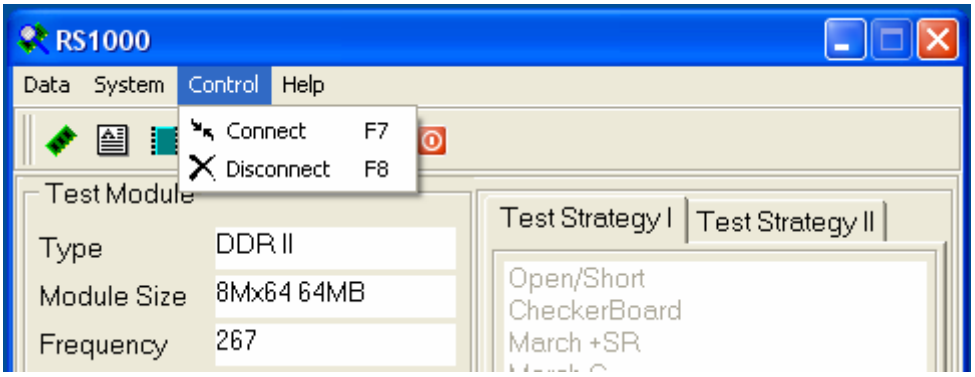

Fig. 25

Connect PC to the RS1000 system.

Disconnect PC from the RS1000 system

The RS1000 software has to connect to the RS1000 system in order to perform the following operations: upload and download of module files, strategy files, SPD files, retrieve RS1000 system firmware version information, and upgrade the RS1000 firmware.

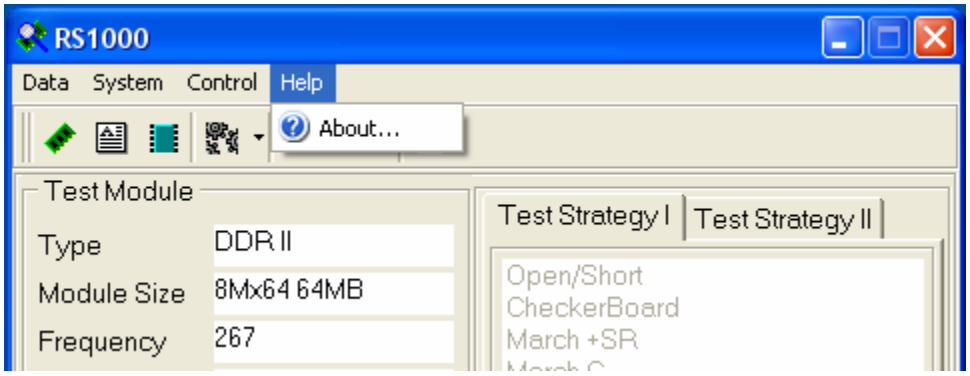

Fig. 26

Pop up the About dialogue box.

9.4 Connecting PC to RS1000 tester

Step 1: Turn **ON** the RS1000 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)

Fig. 27

Step 2: Launch the RS1000 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)

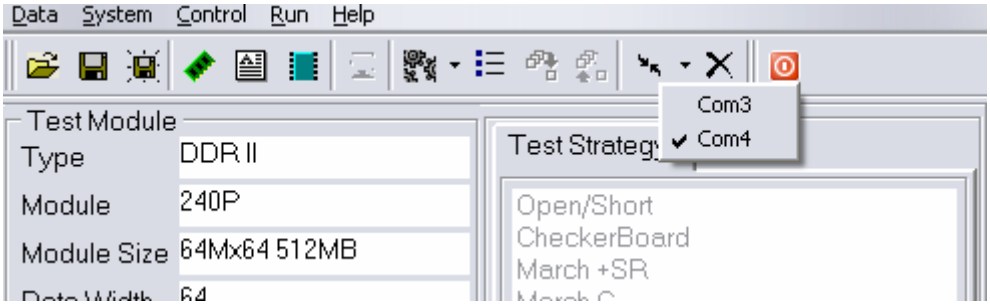

Fig. 28

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

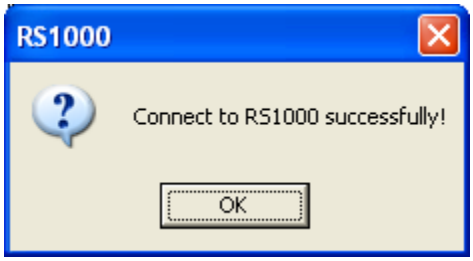

Fig. 29

Step 4: Click on “OK” and the RS1000 software is now connected to the tester. If you have chosen the incorrect serial port, the window will show: (Fig. 30)

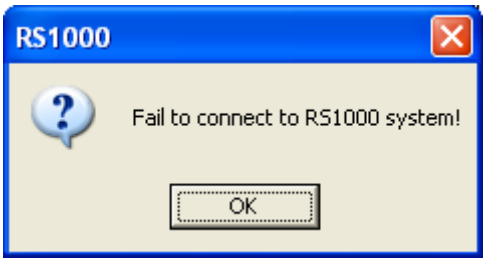

Fig. 30

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 RS1000 tester

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

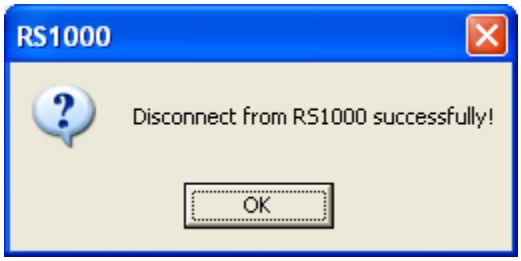

Fig. 31

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 RS1000 software by clicking the  icon.

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

The RS1000 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 RS1000 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 on the short-cut bar.

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

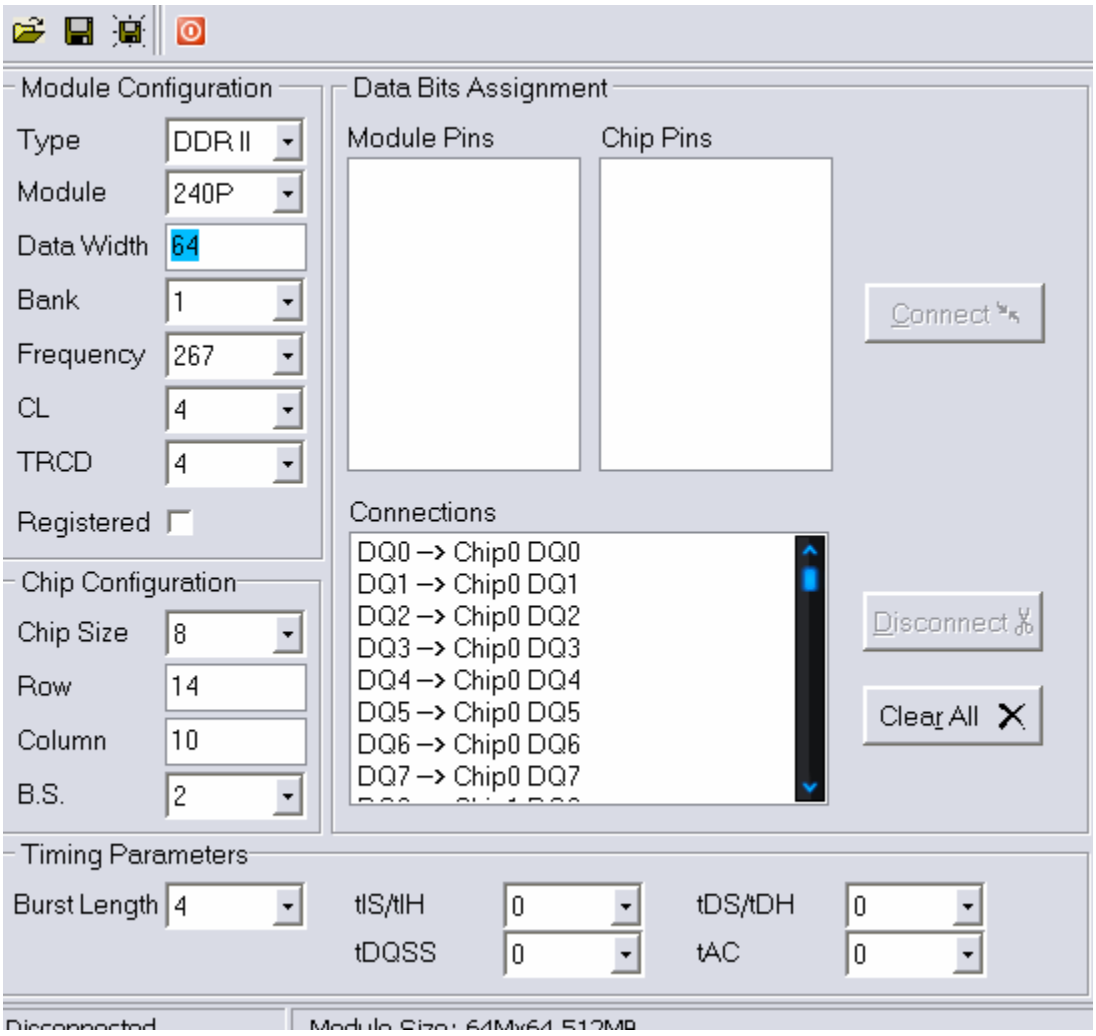

Fig. 32

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

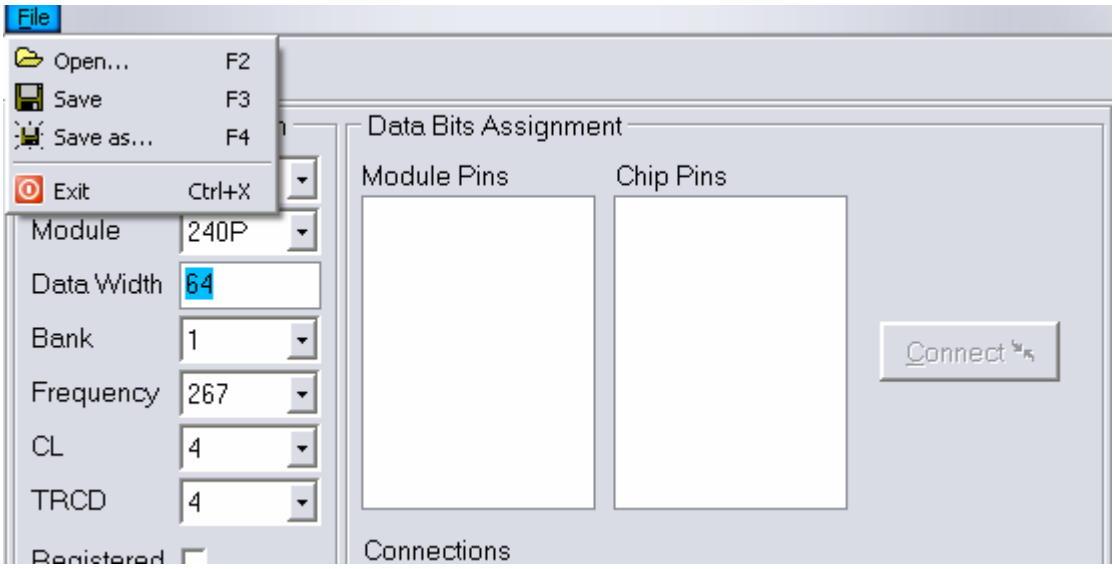

Fig. 33

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.

11 Test Strategy Configuration in RS1000 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. RS1000 can have a maximum of 8 different patterns in one single test.

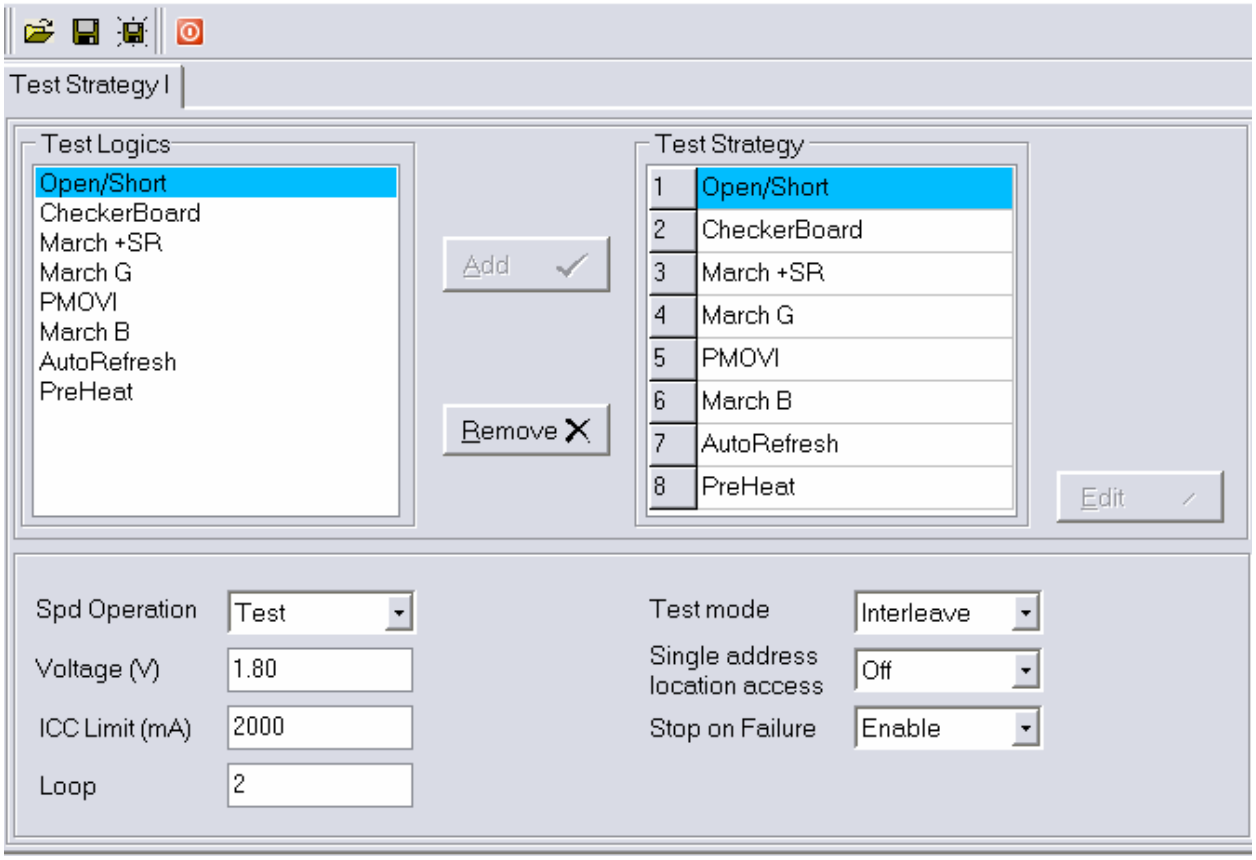

Fig. 35

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

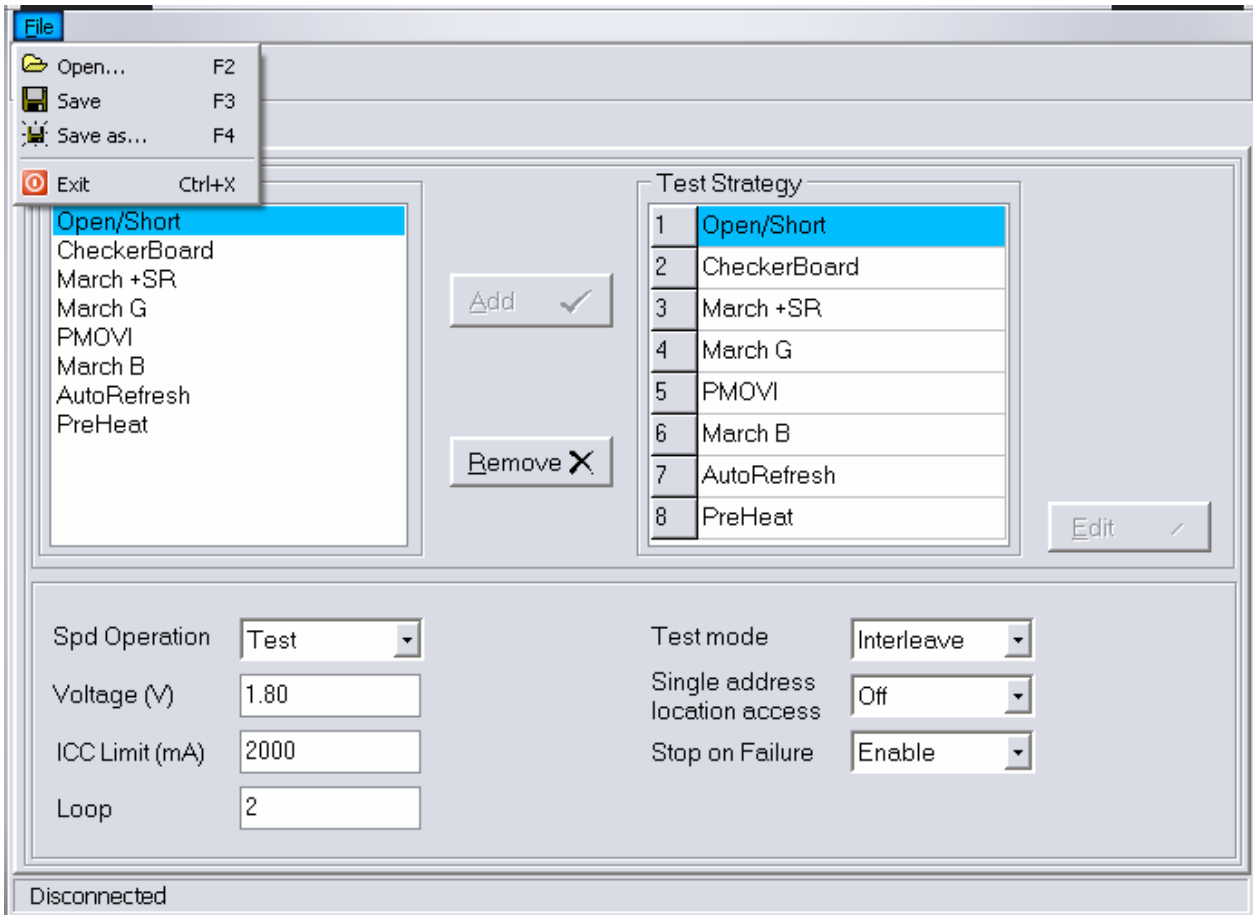

Fig. 36

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.

12 SPD Configuration in RS1000 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)

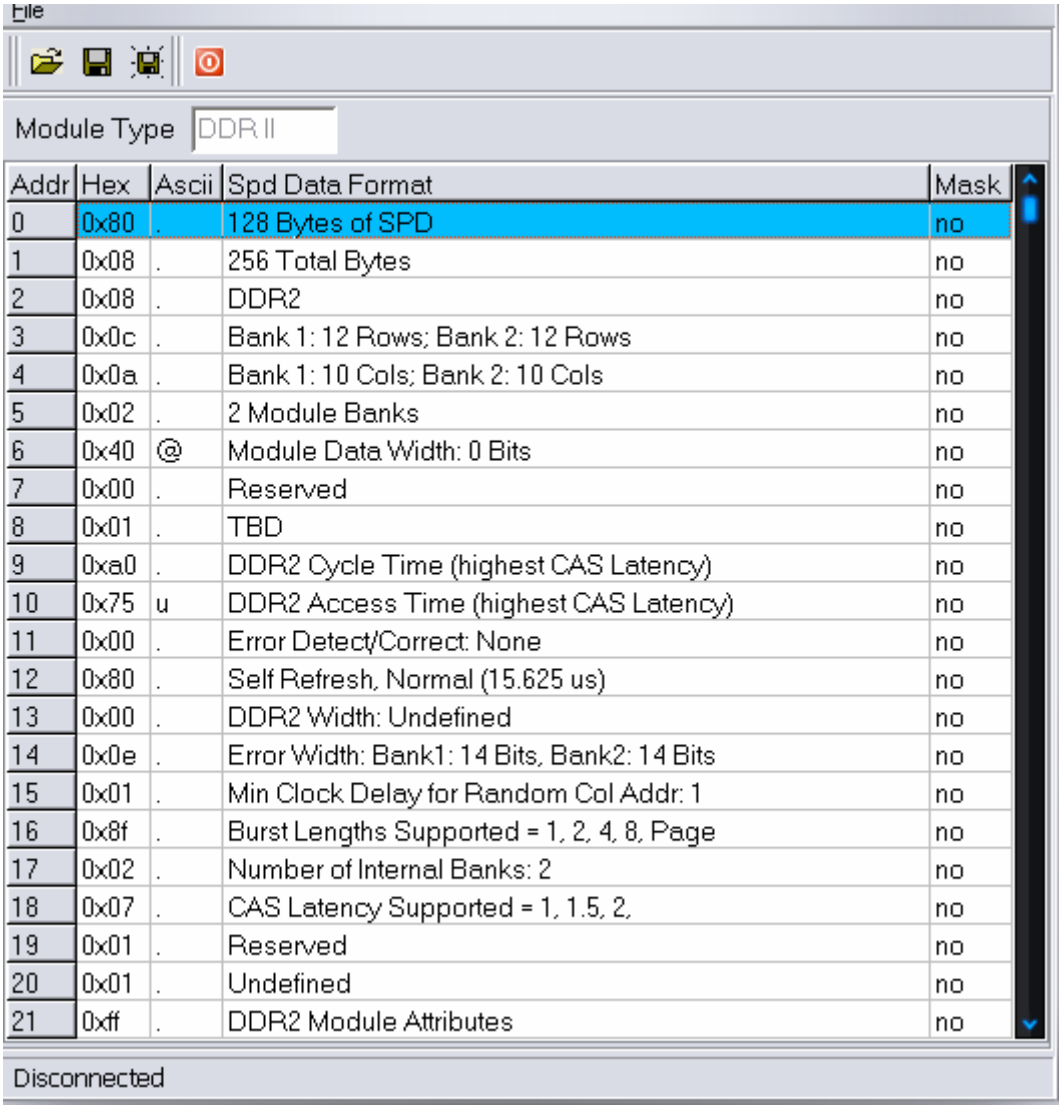

Fig. 38

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

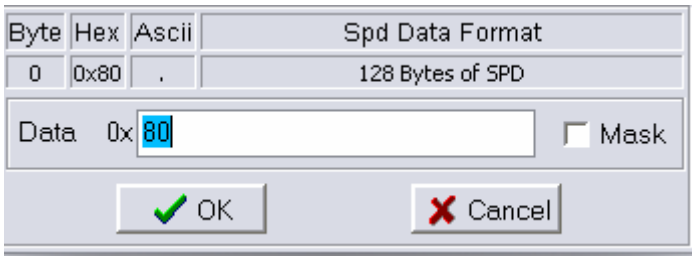

Fig. 39

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

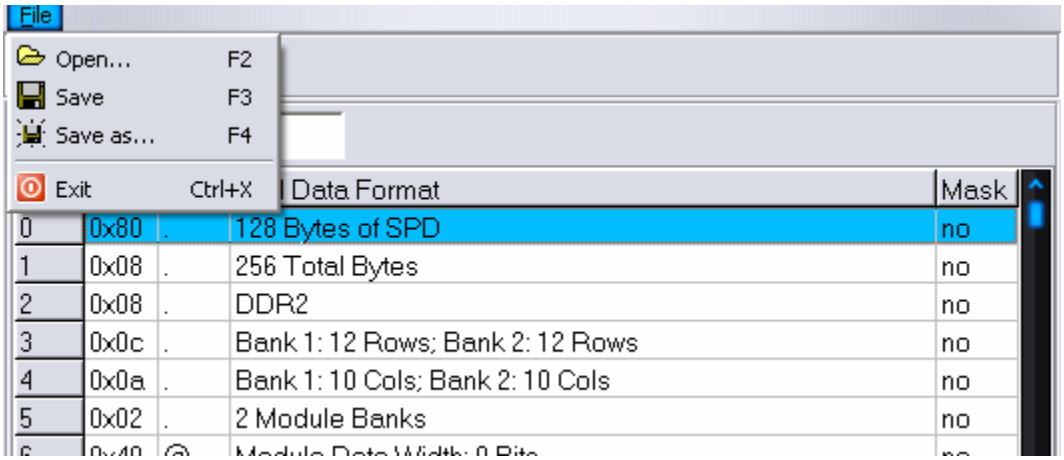

Fig. 40

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.

13 Test Configuration Download and Upload

13.1 Upload and download test configuration

User can upload or download the module configurations to the RS1000 system if the PC is connected to the RS1000 system. (Fig. 34)

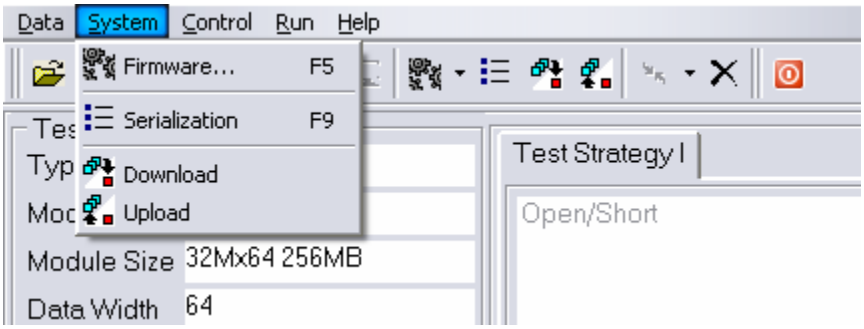

Fig. 34

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.

14 System Firmware Upgrade

Step 1: Power **OFF** the RS1000. Exit from RS1000 software and unplug the USB cable (if plugged).

Step 2: 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)

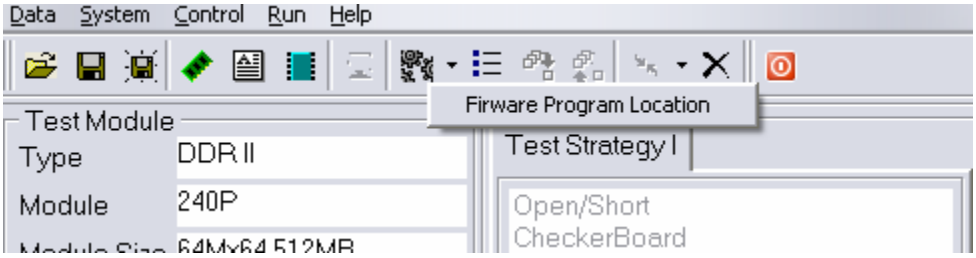

Fig. 42

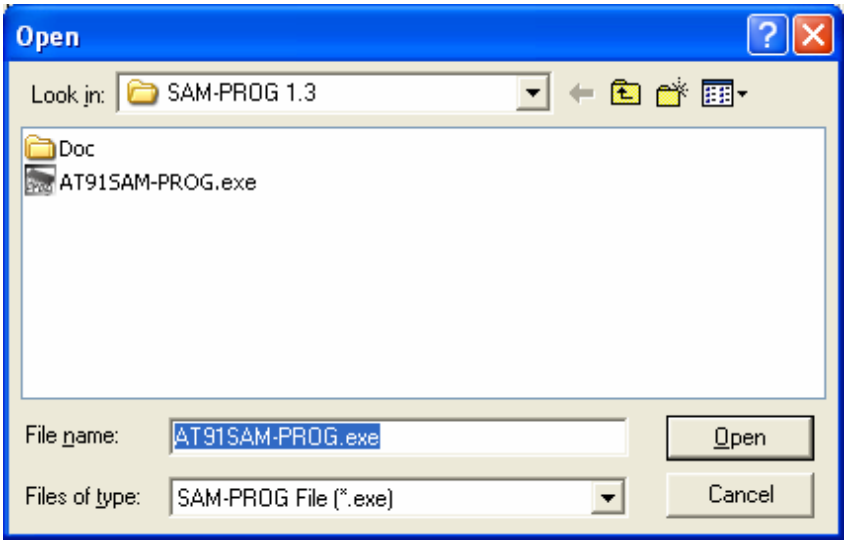

Fig. 43

Step 3: The SAM-PRO window will pop up and the user is now ready for firmware upgrade operation. (Fig. 44)

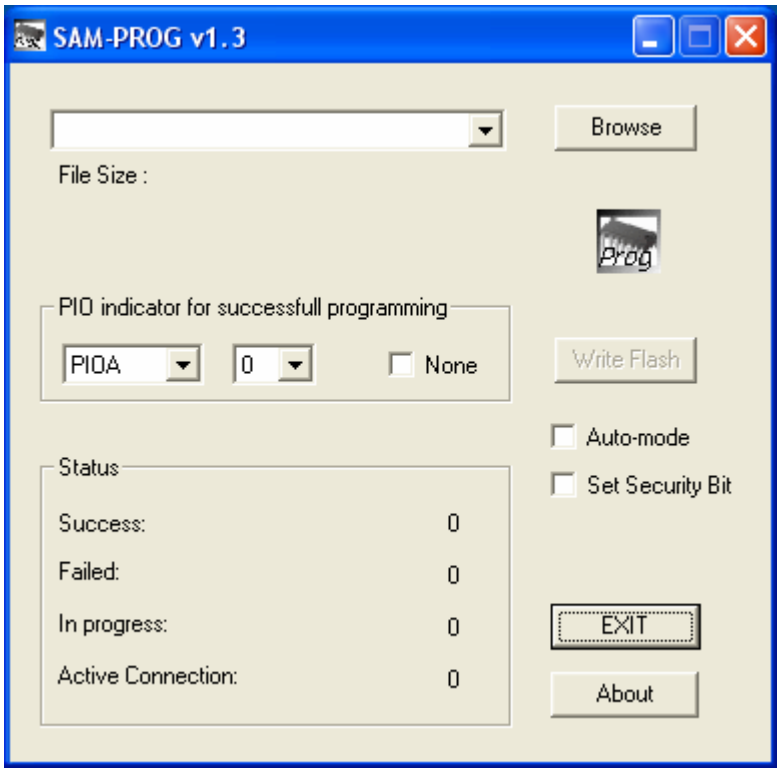

Fig. 44

Step 4: Click on “Browse” and select the correct firmware file (.bin extension) from the open file dialogue box. (Fig. 45)

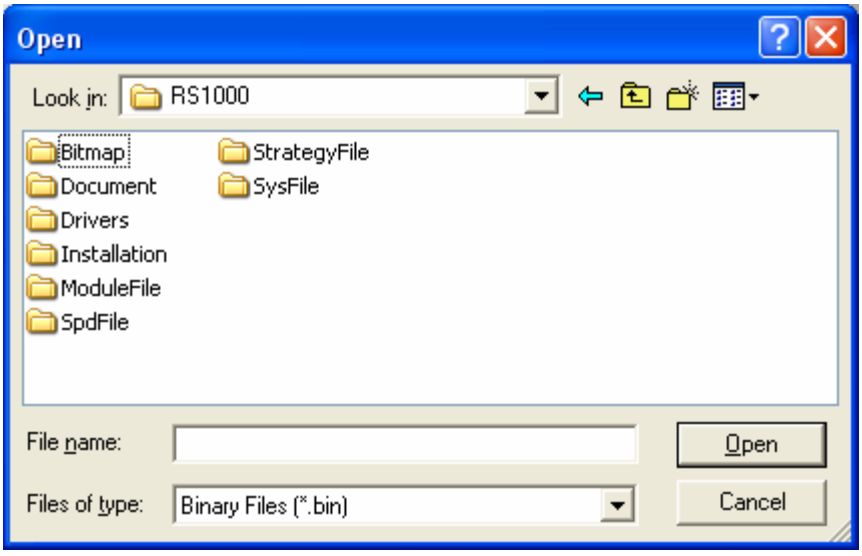

Fig. 45

Step 5:

- Select “None” for the “PIO indicator for successful programming”.
- Uncheck “Auto-mode”.
- Uncheck “Set Security Bit”.

Step 6: Press and hold the green button located at the back of the RS1000. System should still be **OFF.**

Step 7: While **Holding** the green button at the back of the RS1000, turn **ON** the RS1000. **For systems with the serial no. ending with ‘R’, proceed to step 10.**

Step 8: Wait for 10 seconds and turn **OFF** the tester while still holding the green button. Now the firmware has been erased.

Step 9: Release the green button and turn back **ON** the tester.

Step 10: Plug in the USB cable and it will prompt you for the driver.

Step 11: Go thru the same process as **Chapter 3 – Installing RS1000 Windows Driver**. Follow the remaining steps and click on “Finished” when prompted.

Step 12: The “Write Flash” button will be clickable. You should see the window shown below: (Fig. 46)

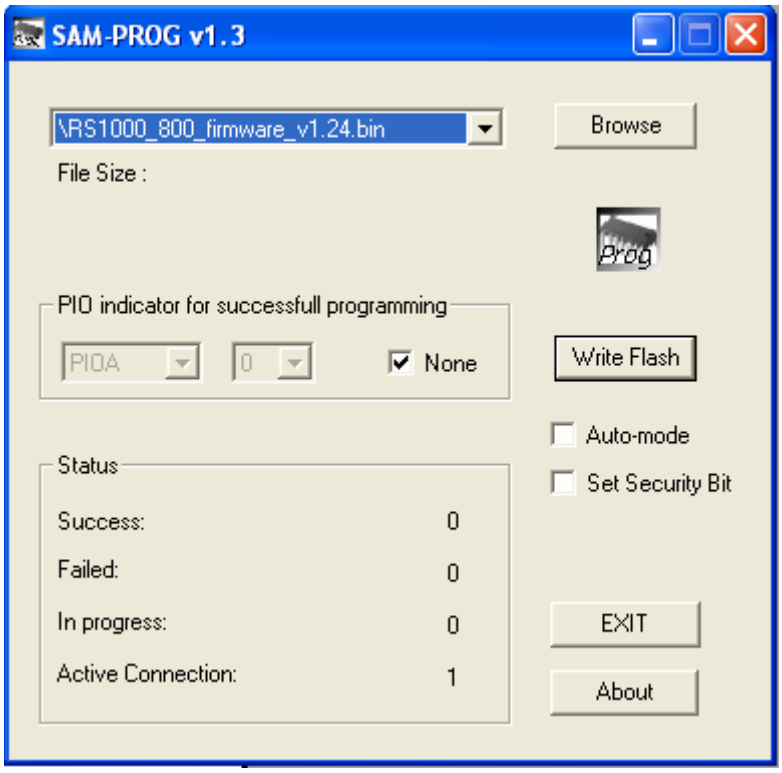

Fig. 46

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.

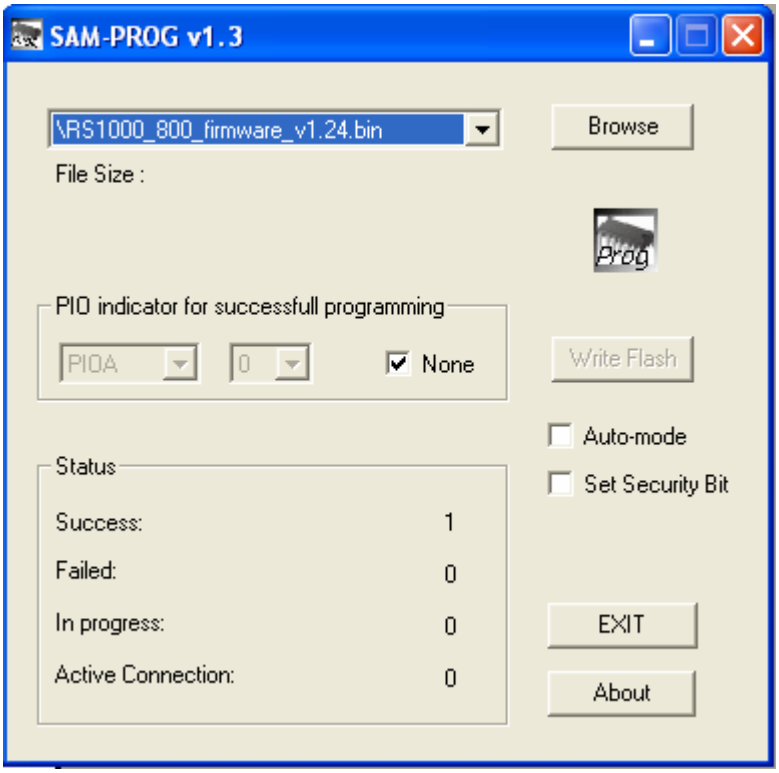

Fig. 47

Step 15: The firmware is being updated. **EXIT** from both SAM-PRO program and RS1000 software and restart the tester. You should now see the latest version of firmware on the startup screen.

Thank you for purchasing the RS1000 tester from
Microtest System!