1. Setup and start

1.1. Setup

(1) Before the setup

Inside power supply of LSS-6230 is controlled by POWER switch equipped on below part of the main body centrally.

Notes: If turn off the power during the test, the controlling PC may become unstable.
Please be sure to end the software before turning off the power.

(2) Setup of the software

Log on to Windows by ID with administrator authority.

Insert the setup CD-ROM to CD-ROM drive of the controlling PC and click [English] folder in LSS-6230 folder.

Click (Setup.exe).

The installation program starts. Forward the installation according to the indication on the screen.

After the installation, [start] -> [all programs (P)] (on the task bar) -> [NoiseKen] -> [LSS-6230] and [uninstallation] are registered in the program.

That is all for the installation.

(3) Installation of the driver

Installation of the driver is necessary to make the software available.

Log on to Windows by ID with administrator authority and Insert the setup CD-ROM to CD-ROM drive.

Connect the optical USB module to USB port of the controlling PC.

Windows recognizes the new hardware and following display is appeared on the screen.
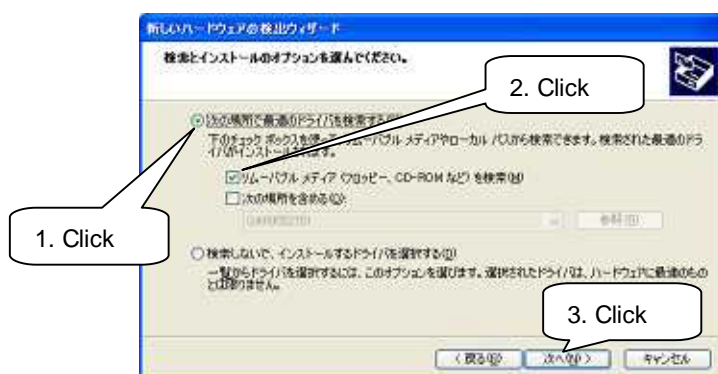
Select [Install from list or specific location], and click   <Next>.
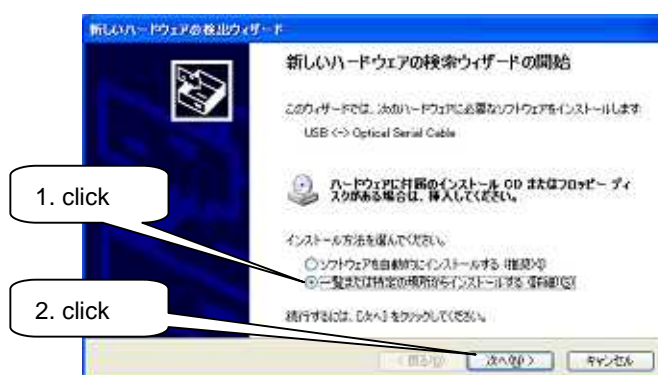
When the above display does not appear, reconfirm the connection between the PC and optical USB module.

If big capacity drive is connected to the networked drive, it may take some minutes for the display.
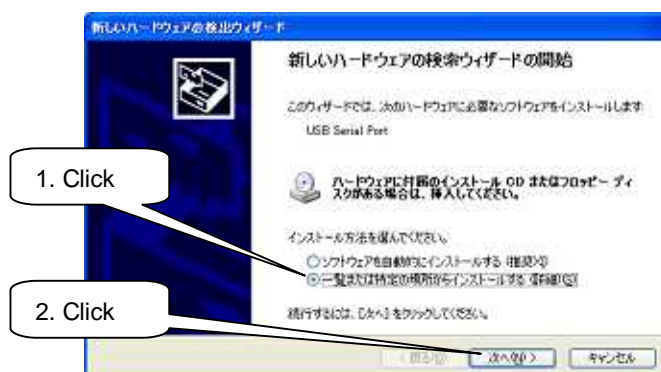
After clicking [Detect the best drivers in the following location], click [Removable medias] and do <Next>.
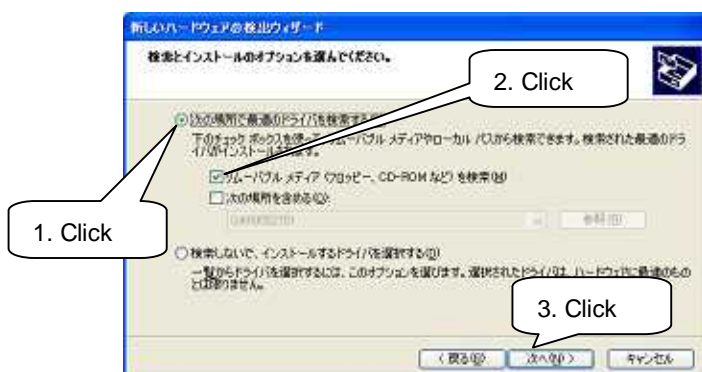

Click <Continue> after appearing of following display.

[Completion of the new hardware detection wizard] is displayed. Then, click <Complete>.
The new hardware detection wizard is displayed. Click [install from a list or specific location], and do <Next>.
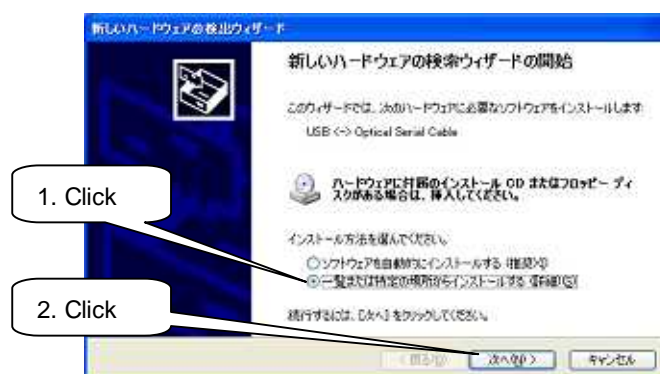

After clicking [Detect the best drivers in the following location], click [Removable medias] and do <Next>.
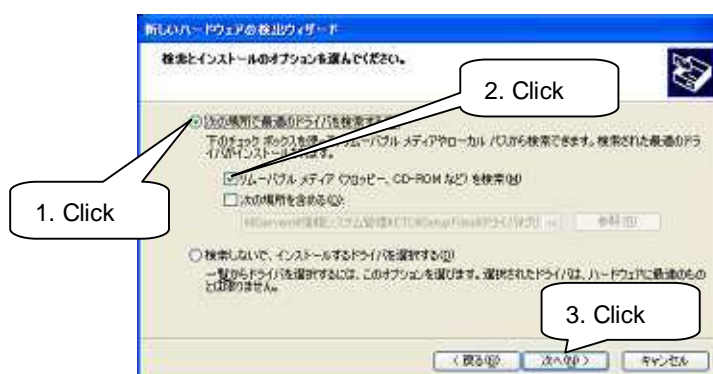

2

Click <Continue> after appearing of following display.

Click

[Completion of the new hardware detection wizard] is displayed. Then, click <Complete>.
Windows recognizes the new hardware and following display is appeared on the screen.

1. Click

2. Click

Select [Install from list or specific location], and click   <Next>.

2. Click

1. Click

3. Click

[Completion of the new hardware detection wizard] is displayed. Then, click <Complete>.

When insert position of the USB port the optical USB module connects is changed, reinstallation of the driver may be necessary sometime.
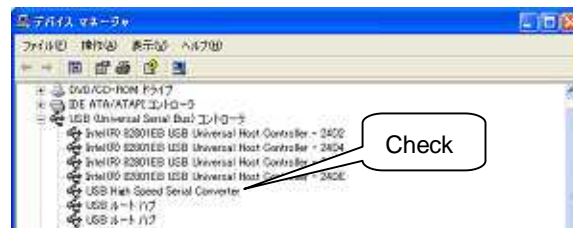
(5) installation confirmations

[start] -> [My computer] (on the task bar) and click [Display system information].

Click

[Properties of system] is displayed. Then, click <Hardware> tab and do <Device manager>.

1. Click

2. Click
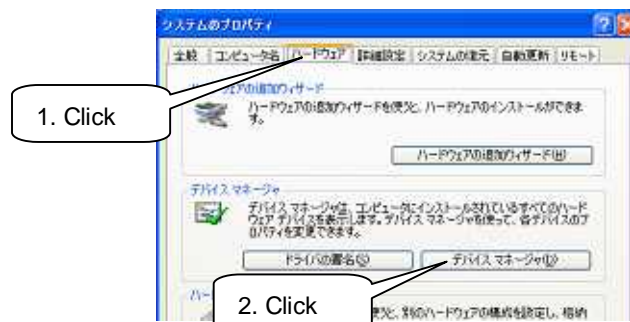
Confirm [USB High Speed Serial Converter] following to [USB controller] is displayed and there is neither "!"nor "x" mark.

Check

Confirm [USB Serial Port] following to [Port] is displayed and there is neither "!"nor "x" mark (Numbers following to COM may be changed depending on the environment of the PC).

Check
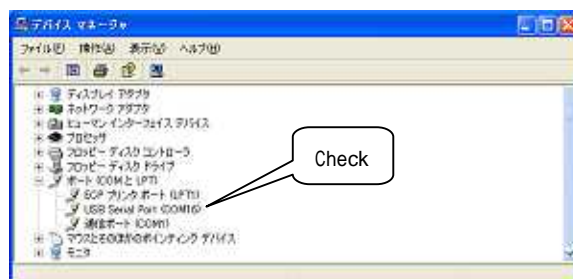
(6) Uninstallation

Executed along selection [Start] ->   [All programs (P)] -> [Noiseken] ->[LSS-6230] -> click [Uninstallation] (on the task bar) for the uninstallation of the software.

Done along selection [Start] -> [My computer] -> click [Add/remove program].   Then, select [FTDI USB Serial Converter Driver] in the displayed list, and click   <Change and delete> along the display indication.

(7) Connection with LSS-6230

Connect USB cable of the optical USB module to the controlling PC.

Connect the optical cable attached in the optical USB module to the REMOTE control port on the front of the main body and the module.

Turn on POWER of the main body.

Start up the software.

That is all for the connection.

Please be sure to turn on POWER of the main body first and then, start software.

(8) Termination of the software and turning-off of the power

Terminate the software.

Turn off POWER of the main body.

Please be sure to terminate the software first, and then turn off POWER of the main body.

Also, terminate the software fist when removal of the connection cable is required.

If the power is turned off or the connection cable is removed without the termination of the software, the controlling PC may become unstable or OS may not work.

The procedure is explained with examples of the displays and operation ways in case of category view of Windows XP. The displays and the operations procedures may be somewhat different depending on the other version of OS or setting.

1.2. Start-up

Select [start] -> [All programs (P)] -> [NoiseKen] -> [LSS-6230], and start the software.
The connect with LSS-6230 is automatically checked and confirmed and the main screen is displayed (The details to be explained in the next chapter).
When the communication is failed, goes wrong, the following selectable display is appeared.

Model name selection screen

   <Model name selection> drop-down list
   For selecting the combination of LSS-6230 operated by the remote control and CDN.
   <Restart> button
   For starting up the software as the selected model.
   <Retry> button
   For retrying the communications with LSS-6230.
   <Exit> button
   For stopping start-up of the software.

   * When <Start> is selected, although the software starts up, **the test is not started.** It is used for confirming the test conditions and setting.

When the connection with LSS-6230 is done after starting-up of this application, confirm POWER of LSS-6230 is turned on and select [Option (O)] -> [Connect (C)], and start up the simulator connection status dialog.
When the connection is succeeded, <Connect> is displayed, when it is failed, <None> is displayed. For the information, it may take some seconds to establish the connection in order to attempt communications with the simulator.
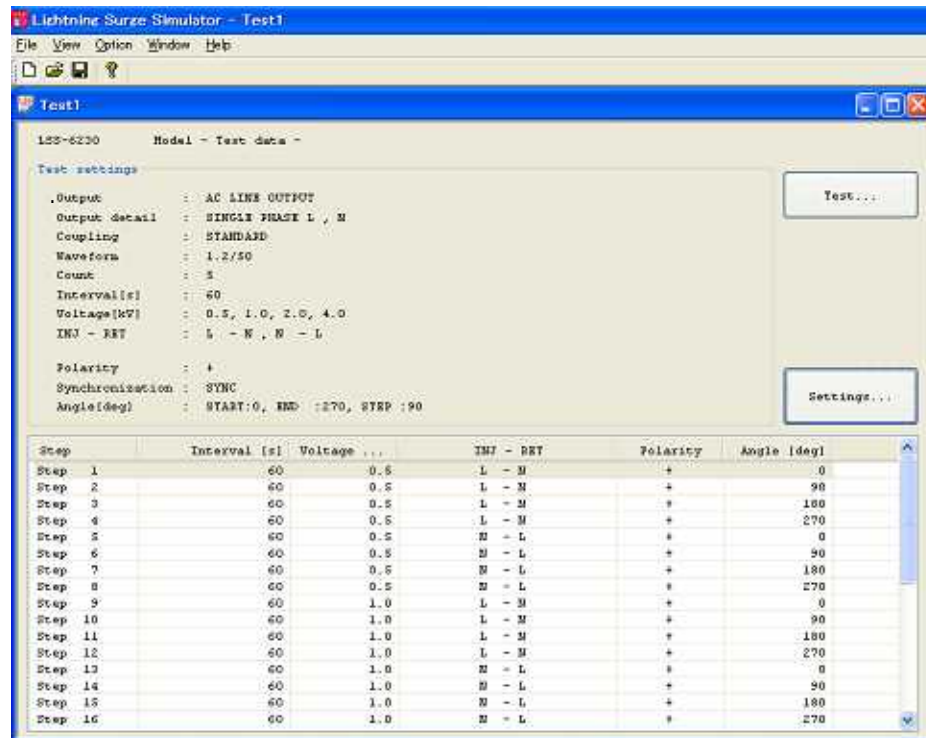

Simulator connection status dialog

2. Operation procedure

2.1. Main screen

In the software, the minimum unit for the test is called as "Step".
Also, <sweep> means the testing way which sets Start – End - Step and varies the set value to an arbitrary value automatically.   The following screen is the main screen which sets the test conditions and displays the all Step.

Main screen

Test settings
The setting conditions can be confirmed.
The order to change the variable items begins from the right end of   Step and shirts to the left one by one.   That is, change the set values in order phase angle, polarity, INJ-RET, and voltage.
For example, the phase angle is varied first -> and when it returns to the initial value at the point the variation ends, the polarity is varied -> again, the phase angle is varied -> the phase angle and polarity return to the initial values -> INJ-RET is varied...
Such flow repeats.

Step list
Orders of the tests and detailed tests contents can be realized by the lists which develop the tests conditions into.   What orders the tests are performed can be confirmed in the Step lists.

<(Test conditions) Settings> button
To open the test conditions dialog.

<Test (run)> button
To open the test environment dialogue and the test run dialogue.

2.1.1.   Test conditions setup

Set up the test conditions.

Screen of the test conditions settings

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Polarity

Select <+>, the test in positive polarity is performed.
Select <->, the test in negative polarity is performed.
Select <+/->, the test in positive polarity is performed first, and then it in negative polarity is done subsequently.

Voltage
Input 0.5[kV]-6[kV] per 0.1[kV] step.

Select <Fix>, the test is performed in one voltage setting.
Select <Sweep>, the test is performed according to the set in "Start – End – Step" with the voltage variation.
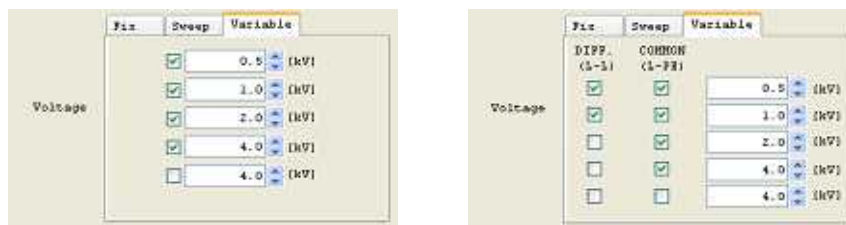
Figure example of the valuable selection 1   Figure example of the valuable selection 2

Select <Valuable>,   the test with the voltages checked on the checkboxes is performed sequentially from the top.
Maximally five voltages can be set previously.
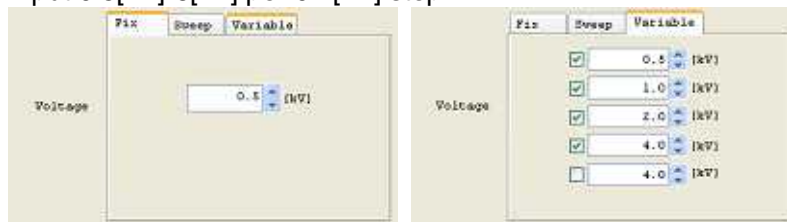"Figure example of the valuable selection 2" is shown in case of selecting the output details of there is PE in AC or DC.
The tests in different voltages between L - L (line - line) and between L - PE (line - PE) can be performed.
In the example of Fig. 2, the tests in NORMAL mode with 0.5kV, COMMON mode with 0,5kV, NORMAL mode with 1.0kV, COMMON mode with 1.0kV and COMMON mode with 2.0kV are performed in the order.
(The test in NORMAL mode with 2.0kV is skipped since there is no check on the box)

Count (Number of discharge)

Count	5 ⏶⏷

Input the number of the discharge in one Step.

(Discharge) Interval

Interval	10 ⏶⏷	[s]

Input the discharges interval.   However, it is automatically adjusted per the output voltages as below.

- In case the waveform is 1.2/50, 10[s] in the output voltage   4kV, 20[s] in the output voltage 4.1kV.

- In case the waveform is 10/700, 10[s] in the output voltage   4kV, 20[s] in the output voltage   4.1kV.

For the information, only the 1st discharge in the 1st step can be put out in the minimum time without relation to the set interval.

Output

Output	AC LINE OUTPUT ⌄
	AC LINE OUTPUT
Wavefor	DC LINE OUTPUT
	SURGE OUTPUT

Select where the discharge should be put out to.

The selectable lines the discharge is put out to are varied in LSS-6230.

Also, the selectable items are varied per the lines the discharge is put out to.

AC LINE OUTPUT	Coupling to AC line.
	Output from the terminal on the front of LSS-6230.
DC LINE OUTPUT	Coupling to DC line.
	Output from the terminal on the front of LSS-6230.
TELECOM LINE OUTPUT	Coupling to TELECOM line.
	Output from the terminal on the back of LSS-6230.

2.1.1.1. Test conditions setup - Output setup section screen
<AC LINE OUTPUT>

Waveform	Select 1.2/50 or RING in AC LINE OUTPUT.
Impedance	Effective only in selection of RING waveform.. Select 30Ω or 12Ω.
INJECTION – RETURN Detail	Select the same power specification as the equipment under test (EUT).
Coupling	Select among STANDARD (Standard provisions), 10Ω + 9uF (fix), or 18µF (fix). In case of STANDARD, it is set at 18µF in NORMAL mode and done at 10Ω + 9µF.
DIFFERENTIAL (NORMAL)	Select the combination of the coupling phase between L - L (line - line) and the return phase. Select the multiple combinations, the test is performed to the all selected lines.
COMMON	Select the combination of the coupling phase between L - PE (line - PE) and the return phase. Select the multiple combinations, the test is performed to the all selected lines.
Phase angle synchronization	Select Synchronize or Asynchronies. Select Synchronize, the discharge is synchronized to the phase angle of AC line. Select Asynchronies, the discharge is done at the point when the interval becomes "0".

In case of selecting the multiple lines in NORMAL, the return phase is swept in the coupling phase fix.   The sweep ends, and then the coupling phase is swept.
In case of selecting line in COMMON, the sweep starts after the sweep in NORMA ends.

<DC LINE OUTPUT>

Waveform	Select 1.2/50 or RING in DC LINE OUTPUT.
Impedance	Effective only in selection of RING waveform.. Select 30Ω or 12Ω.
INJECTION – RETURN Detail	Select the same power specification as the equipment under test (EUT).
Coupling	Select among STANDARD (Standard provisions), 10Ω + 9uF (fix), or 18μF (fix). In case of STANDARD, it is set at 18μF in NORMAL mode and done at 10Ω + 9μF.
DIFFERENTIAL (NORMAL)	Select the combination of the coupling phase between L - L (line - line) and the return phase. Select the multiple combinations, the test is performed to the all selected lines.
COMMON	Select the combination of the coupling phase between L - PE (line - PE) and the return phase. Select the multiple combinations, the test is performed to the all selected lines.

<TELECOM LINE OUTPUT>

Waveform	Only 10/700 in TELECOM LINE OUTPUT.
RETURN Detail	Select 2 lines or 4 lines along the equipment under test (EUT). Select according to the specification of CDN which is connected to the back of LSS-6230.
Coupling (Matching resistor)	Select 40Ω or 15Ω.

2.1.2. Test environment setup

Set up the test environment.

The setting is reflected to the test report.

Unless otherwise it is saved with <Save> button, the input description is cleared at the time when the software is ended.

Screen of the test environment

Date	Press <Test (run)> button on the main screen and display the date preparation for the test is completed. The date cannot be changed.
Time	Press <Test (run)> button on the main screen and display the time preparation for the test is completed. The time cannot be changed.
Temperature	Input the temperature in the test environment.
Humidity	Input the humidity in the test environment.
Model / Type	Input product and model name of the equipment under test (EUT).
Serial No.	Input serial number of the EUT.
Operator	Input name of the operator.
Standard	Input Standard the test follows.
<Save> button	The input information can be saved. Use the saved contents as the default for the subsequent tests from now on. However, the test date and test time are not saved.

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2.1.3.　　Test run

Control the simulator.

The tests which are set up on the test setup screen are run continuously.

Screen of the test run

Step No.
Indicates what step numbered test is performed.

Count (Number of discharges)
Counts up from 0, and shift to the next step upon reach to the set number.

(Discharge) Interval
Counts down and discharge when it becomes "0".
For the information, only the 1st discharge in the 1st step can be put out in the minimum time
without relation to the set interval.

Warning lamp

Turn-off   Turn-on

Turned on in LINE ON and blinking while the test runs.

<EUT Line> button
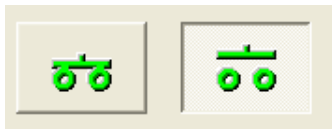
Turn on or off powers supply to the equipment under test.
The selected button is dented.
The above figure is in the conditions of line off.

<Start>, <Pause>, <Stop> buttons

<Start> button	Start the test. <Start> button turns into a <Pause> button while the test runs. During the pause, <Pause> button turns into <Start> button. If the test does not start, the reason is displayed on the LCD screen of LSS-6230.
<Stop> button	Suspend the test.

Test list

```
The selected step and subsequent step are executed, when the step No. is sselected.
```

Step	Interval [s]	Voltag...	INJ - RET	Polarity	Angle [deg]	Result	Comment
Step 1	60	0.5	L - N	+	0	------	
Step 2	60	0.5	L - N	+	90	------	
Step 3	60	0.5	L - N	+	180	------	
Step 4	60	0.5	L - N	+	270	------	
Step 5	60	0.5	N - L	+	0	------	
Step 6	60	0.5	N - L	+	90	------	
Step 7	60	0.5	N - L	+	180	------	
Step 8	60	0.5	N - L	+	270	------	
Step 9	60	1.0	L - N	+	0	------	
Step 10	60	1.0	L - N	+	90	------	
Step 11	60	1.0	L - N	+	180	------	
Step 12	60	1.0	L - N	+	270	------	
Step 13	60	1.0	N - L	+	0	------	
Step 14	60	1.0	N - L	+	90	------	
Step 15	60	1.0	N - L	+	180	------	
Step 16	60	1.0	N - L	+	270	------	

Displays the list of Steps whose tests conditions are run in the order.

The test can be restarted from the arbitrary Step number which is clicked during suspension of the test.

The result is replaced to [Pass] when the set number of the test is finished.

Also, if the Step is double-clicked during suspension of the test, rewriting of the result or input of some comment are enabled.

Test result setting and report creating

[Test Result setting]	Select the judgment. When <Set All Result> button is pressed, the selection is reflected to the test run list.
<Set All Result> button	Changeable to the selection in [Test Result].
<Del. All comments> button	All input comments can be deleted.
<Create Report> button	In case MS-Excel2000 afterwards is installed to the controlling PC, start up the MS-Excel and write the test conditions and the test result. The report can be edited on the MS-Excel. In case MS-Excel2000 afterwards is not installed, the report cannot be made.

* Since the judgment and comment can be subordinated to the test result, they cannot be saved with the saving function of the test setting in the software. If necessary, please use the function of MS-Excel for the saving.
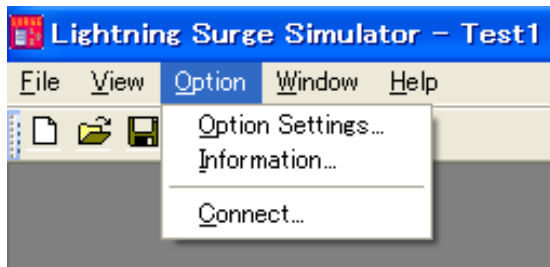
2.2. Others

Presents the other functions.

2.2.1. File menu
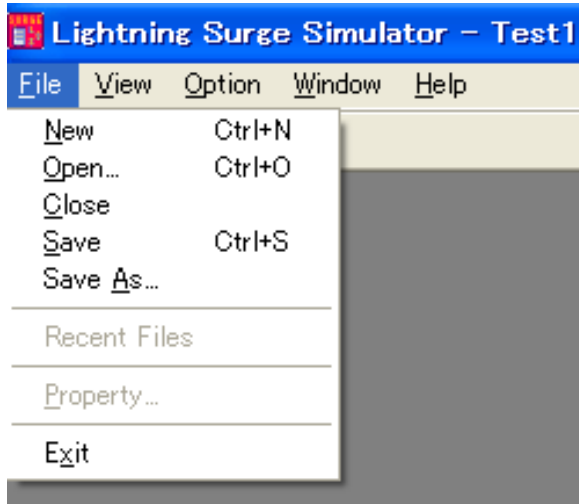
New (N)	Creates a test window newly.
Open (O)	Opens saved tests settings.
Close (C)	Closes the test setting window which is displayed now.
Save (S)	Overwrites and saves the test setting window which is being edited now.
Save As (A).	Names and saves the test setting window which is being edited now newly.
Exit (X)	Ends the application.

2.2.2. Option menu

Option settings (O)	Opens setting screen for the option. Input company name and tested site to the option. The name and site are reflected in the report. The settings in the option are saved in the systems drive.
Information (I)	Opens screen for the test environment setting. Input temperature, humidity and the information about the equipment under test for the test environment. See Test environment setup for the details. The setting is saved in the system drive only when a <save> button is pressed. If not, it is cleared at the time when the software is ended.
Connect (C)	Confirms the connection with LSS-6230.

2.2.3. Version information menu
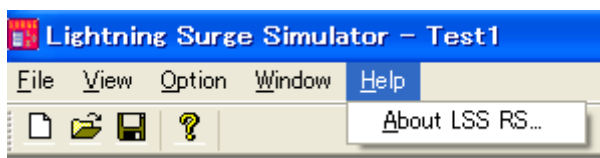
Displays confirmation screen of the version for this application.

3.   Operation environment

Computer   :   PC/AT compatible
CPU   :   Recommend 1GHz or more for the clock frequency.
Main memory   :   Recommend 1024MB or more.
HDD   :   32MB or more (for installation and start-up of the application)
OS   :   Microsoft® Windows® XP® Vista or 7 Operating Systems)

Graphic   :   Supportable more than SXGA resolution (1280*1024*32767 color)

In addition, followings are conditioned besides the above.
- There must be pointing devices, such as a mouse.
- There must be CD-ROM or DVD-ROM drive.
- There must be unused USB port at least one (1 port to be occupied)
- Connection between the simulator and the controlling PC (the software is installed) must be confirmed before starting up the remote control programs.
  (If not, the communication cannot be realized)
- When the support function for making the report is used, MS-Excel afterwards must be installed in the controlling PC in advance.