

**Light Weight Vibrometer
Seismic Ground Vibration & Sound Analyzer
Blast Induced Ground Vibration & Sound Analyzer
EVS(Environmental Vibration & Sound) Measurement**

User Manual

Third Edition (Ver. 3.2)



SVIB Software Technologies Pvt. Ltd

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[Does & Don'ts]

Does	Don'ts
Device Should be charge before taking the measurements	Do not start the device without SD Card
check for the SD Card in device slot	don't use sharp object to touch the screen
Make sure to have memory in SD card to save result files	If device shows empty screen. Please email to info@svibtech.net
Connect the Ground Sensor & Micro Phone to the device before taking the measurements	Don't run 2 different versions of PC software at same time
Device should be switch off while removing & inserting the SD Card	
Uninstall the old PC software before installing the new versions of PC Software	
Please install crystal report Which is given along with the package	

[ICON of the EVS]



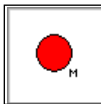
: EVS(Environmental vibration and sound) measurement mode selection



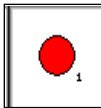
: Transducer option



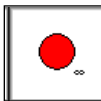
: Trigger option



: (M) Manual recording mode -> Manual start-stop recording without trigger option



: (S) Single recording mode -> Auto single recording with trigger option



: (C) Continuous recording mode -> Auto continuous recording with trigger option



: Manual Stop



: Open the saved result



: Print the saved results



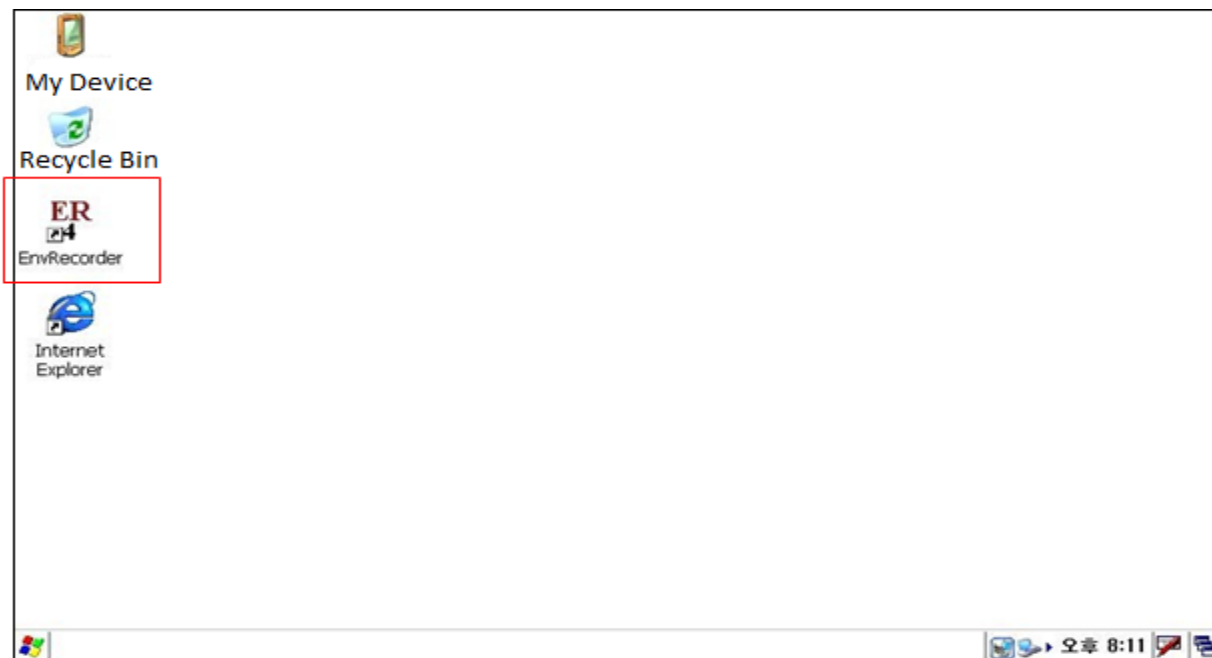
: Exit from program

[Procedure of the EVS]

1. Device Software Launching:

You can see the window if you turn on.

Please Double click "EnvRecorder" Icon.



2. EVS Settings:

Please click "EVS" and then "File" if it display as bellow window.

Sound (dB(A)):			
LeqIn	LeqAv	Lmax	Lmin
0.0	0.0	0.0	0.0
Vibro (dB(V)):			
	X	Y	Z
Lmax	0.0	0.0	0.0
Lv(In)/Lv(Av)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

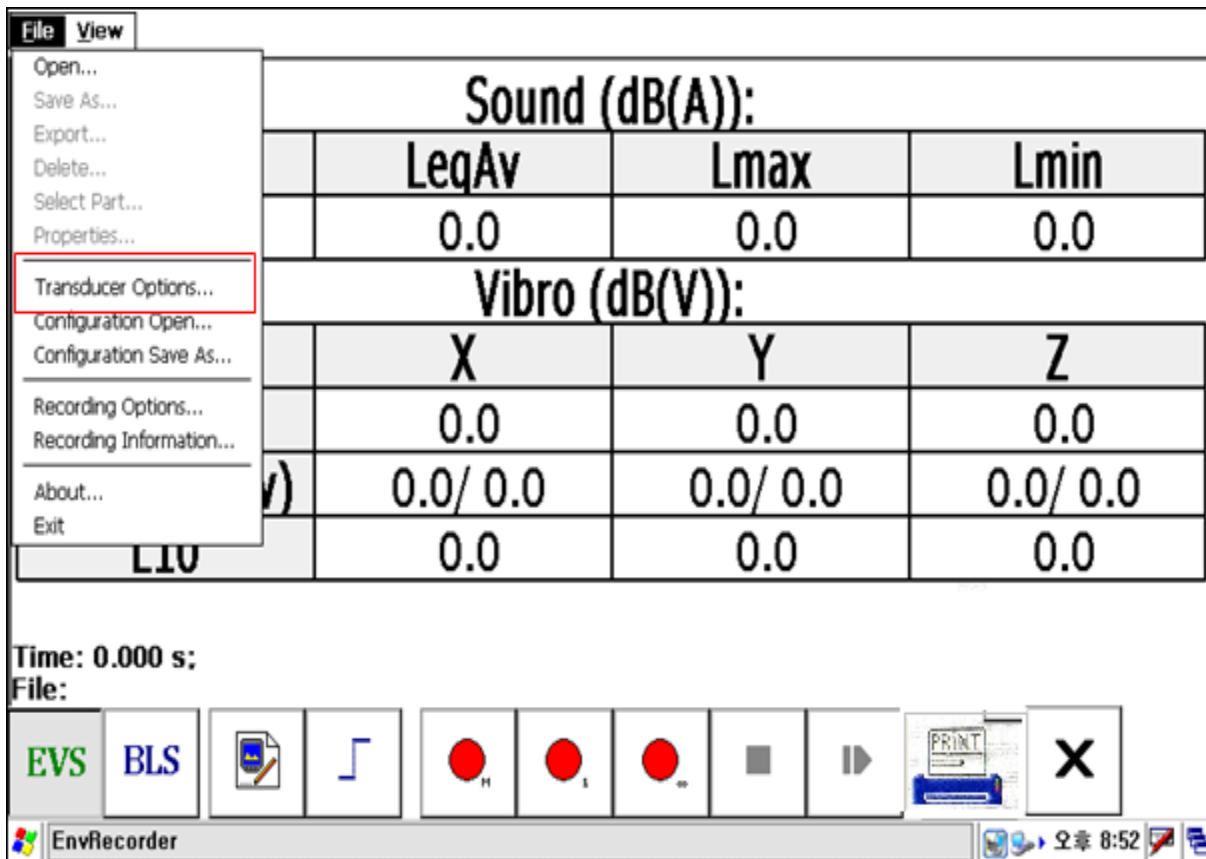
Time: 0.000 s:
File:

EVS BLS

EnvRecorder

3. Transducer Options:

To set up Sensor, Please do "Transducer Options" in the file.



3.1 Transducer Options Settings:

3.1.1. Transducer Options For V1:

Please select "V1" at the bottom to set up "Channel 1". Put the Sensitivity of sensor, with the calibrator, please put the "Norminal RMS" value and "Nominal Frequency" that the output of vibration calibrator was from, Please fix the vibration sensor with "X" direction, and then give the calibration signal, do the "Claibration channel 1" at the bottom, the channel 1 will automatically calibrate with the "Calibr. Coef" value. You can manually do the calibration if you meet an error. Manually to do the calibration, please put the sensitivity of the sensor and give the calibration signal, and then click "OK", and move the "Measurement window" to check the measuring value and put the "Calibra. Coef." value to be corresponded with the calibration signal value.

3.1.2. Transducer Options For V2,V3:

for the "V2"(Channle 2), "V3"(Channel 3), Please put the sensivity of vibration sensor's "Y" and "Z" axis, and put the "Calibr. Coef." Value as "X" axis.

Transducer Options:

OK

Cancel

Channel 1:

Amp.Gain: 2

Sensitivity: 800.000 mV/g

Norminal RMS: 6.937 m/s²

Norminal Freq: 60.000 Hz

Calibr.Coef: 1.000 1.0

Calibrate Channel 1

V1 V2 V3 Sn

EnvRecorder

오후 7:41

Transducer Options:

OK

Cancel

Channel 2:

Amp.Gain: 2

Sensitivity: 800.000 mV/g

Norminal RMS: 6.937 m/s²

Norminal Freq: 60.000 Hz

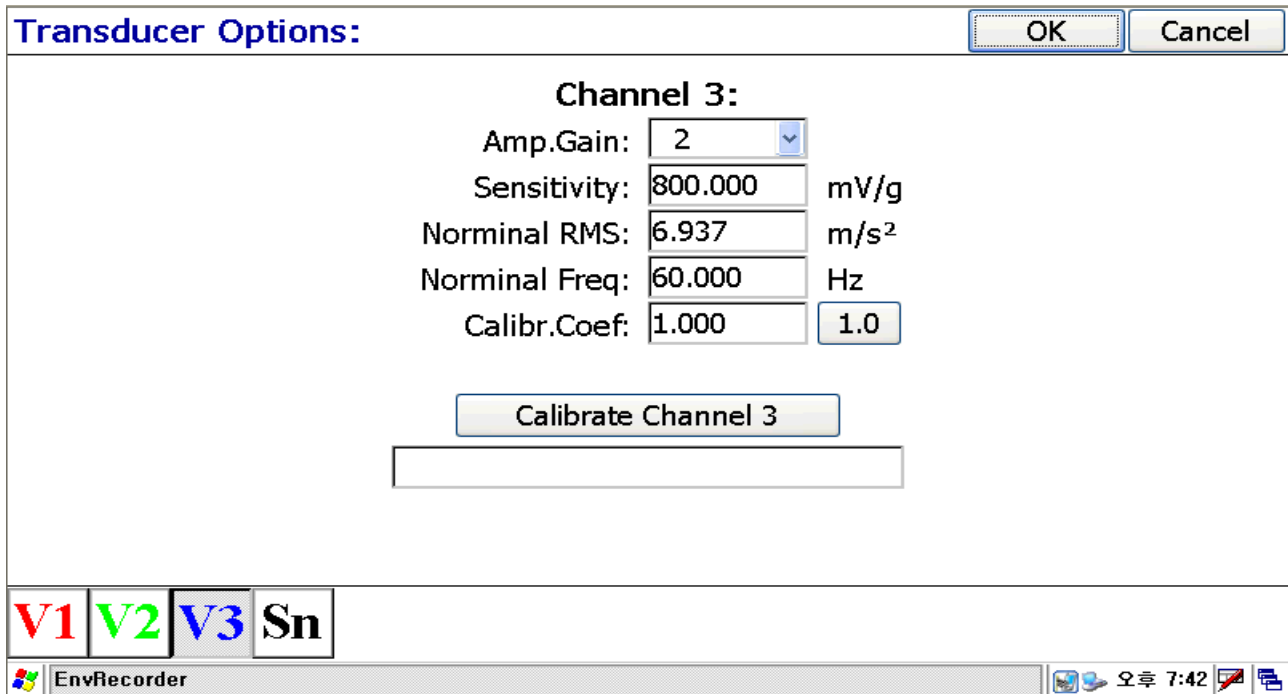
Calibr.Coef: 1.000 1.0

Calibrate Channel 2

V1 V2 V3 Sn

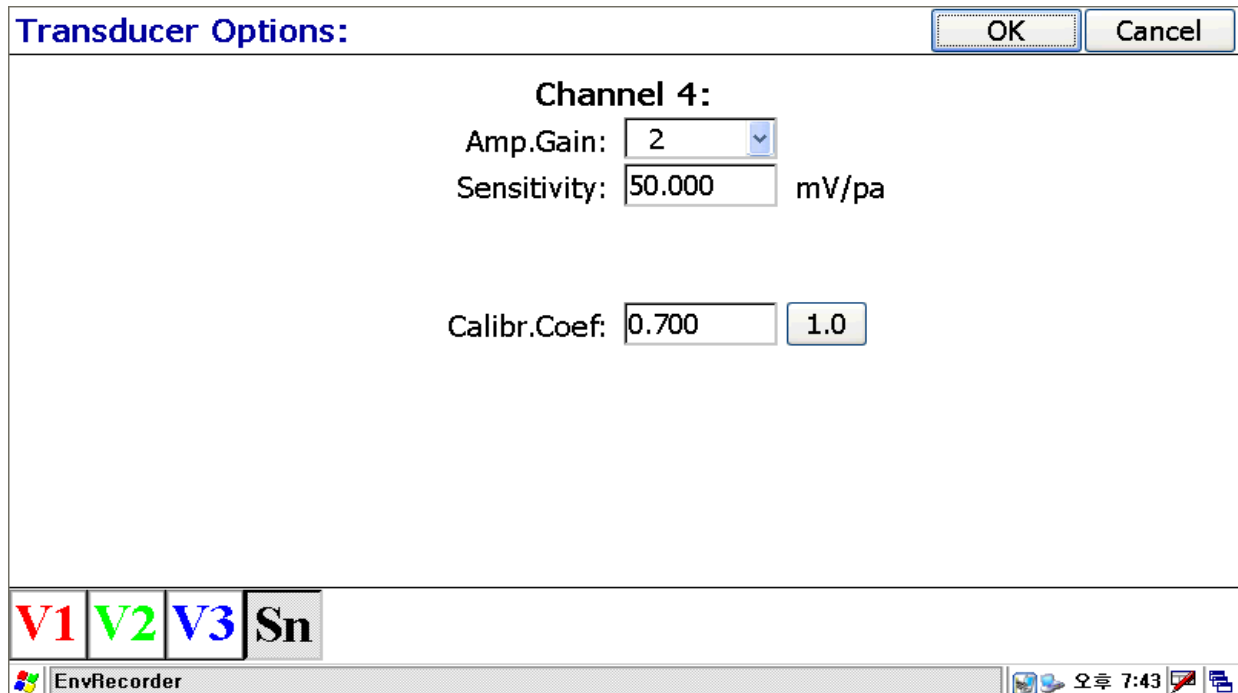
EnvRecorder

오후 7:41



3.1.3. Transducer Options for V4:

"Please put the sensitivity of the microphone for the Sn"(Channel 4), and connect the sound calibrator with 94dB output at 1kHz to the microphone, and generate standard signal, and click "OK"to move measurement window, and check the measuring value, please put "Calibra. Coef" value to becorresponded with that Leq value is 94dBw. If you finished all channels, please click "OK" to exit.



4. Recording Options:

Please move "File" menu again to do "Recording Option".

- a. File Name : write the file name to be stored
- b. File Format, PCM : select the file format to be stored.

Sound (dB(A)):			
	LeqAv	Lmax	Lmin
	0.0	0.0	0.0

Vibro (dB(V)):			
	X	Y	Z
	0.0	0.0	0.0
v)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
	0.0	0.0	0.0

Time: 0.000 s:
File:

Buttons: EVS, BLS, File, Waveform, Stop, Record, Play, Print, Close

Taskbar: EnvRecorder, 오후 8:52

Recording Options:

OK

Cancel

File Name: 00N.wav;

[File Format: PCM, 3 ch, 16 bits]

- Save raw and result data;
- Save raw data only (.wav file);
- Save result data only;

Ask about deleting;

Timer in Manual Recording (EVS,BLAST):

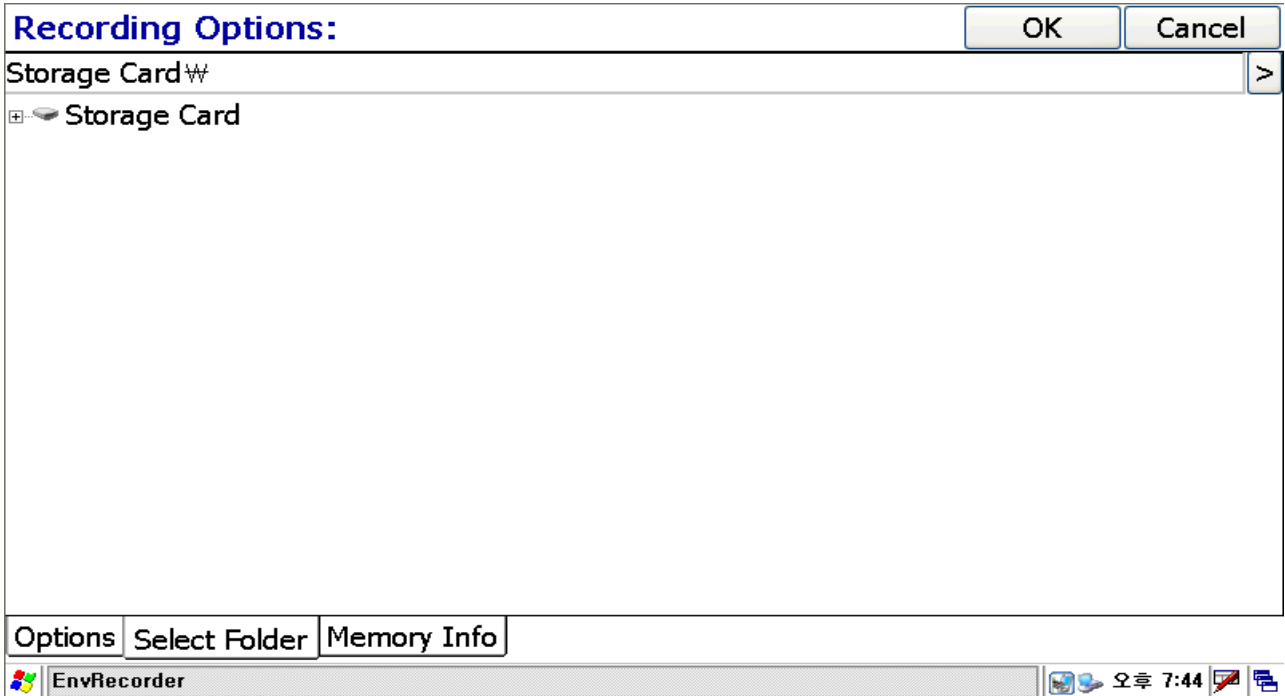
Options | Select Folder | Memory Info

EnvRecorder

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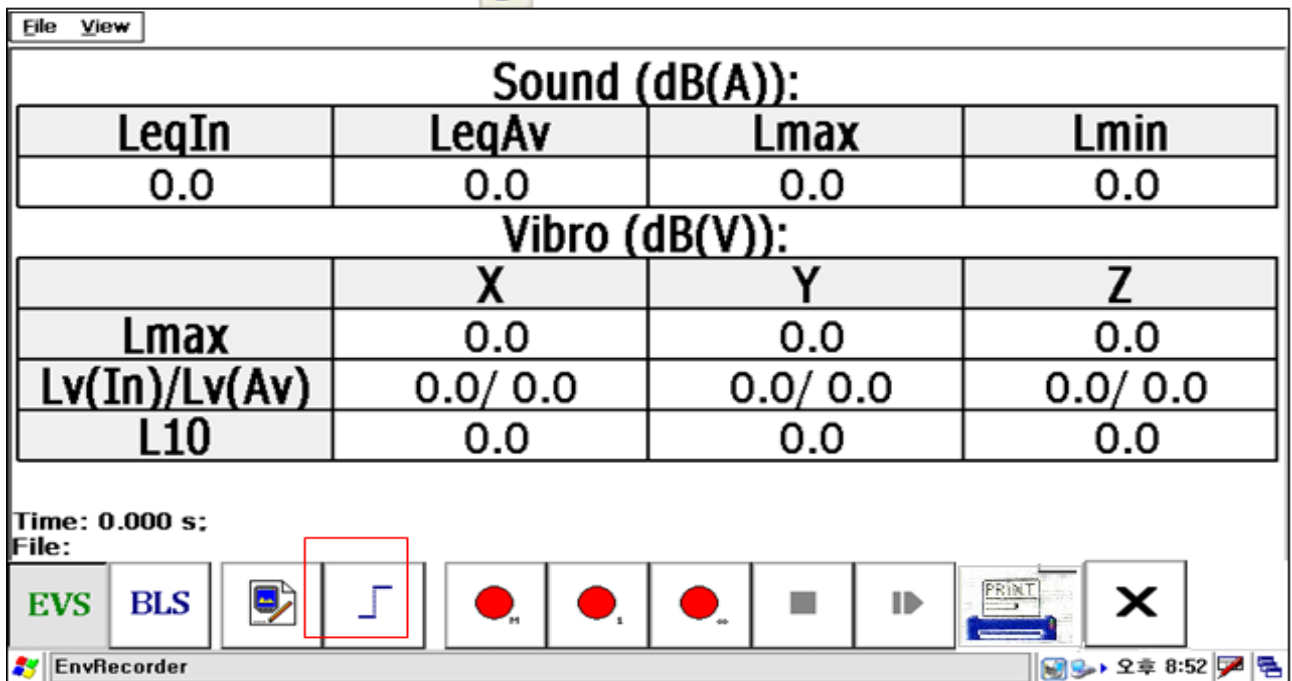
4.1. Folder selection:

Select "Folder" at the bottom in the "Recording Options", and select the position to save the File. The data has to be saved in the SD Memory by our program.



5. Trigger Options Display:

If display measurement window, click  icon at the bottom.



5.1. Trigger Options Settings:

Move "Trigger Options" window, and set up "trigger level" with dB by "Vibration RMS", and select "Recording Time". You can select "Trigger Level" by 1 dB step from 45dB to 60dB, Recording Time can be selected among 1s, 2s, 3s, 5s, 10s, 1min, 5min, 1hour. Please click "OK".

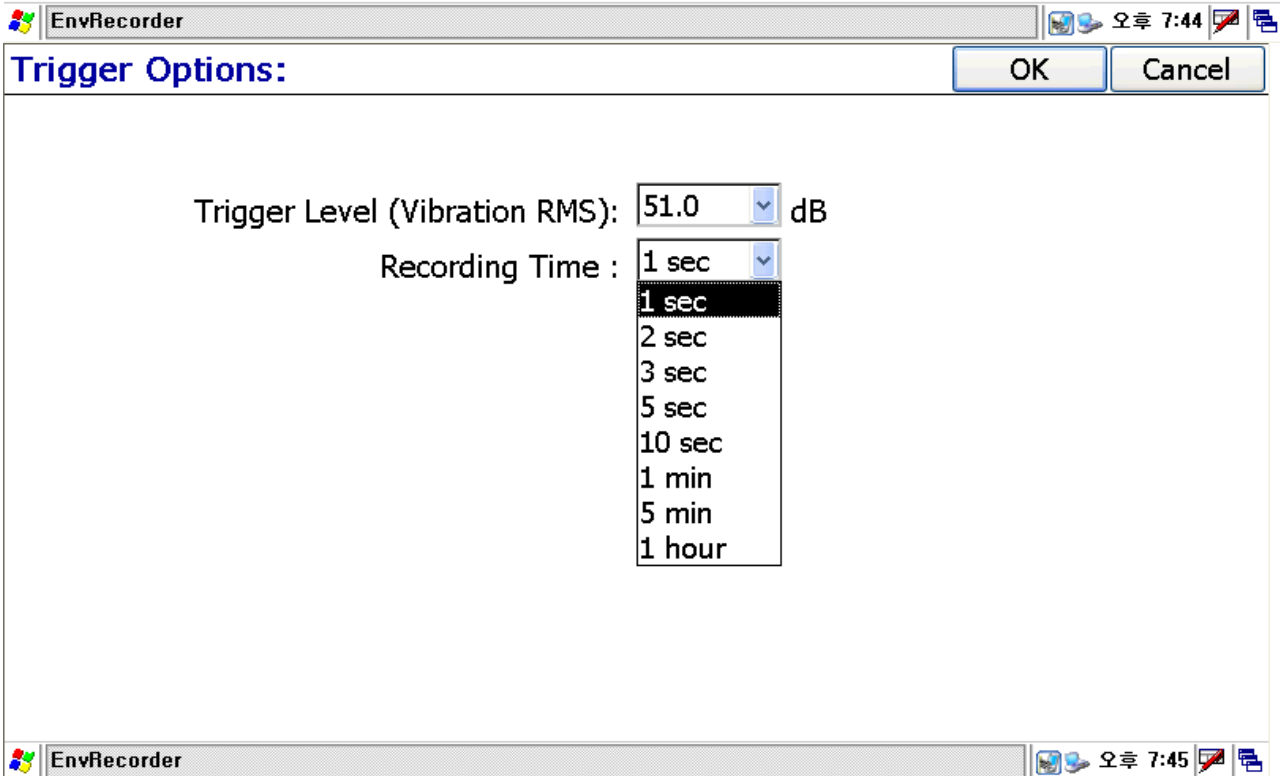
Trigger Options:



Trigger Level (Vibration RMS): 51.0 dB

Recording Time :

- 47.0
- 48.0
- 49.0
- 50.0
- 51.0**
- 52.0
- 53.0
- 54.0
- 55.0
- 56.0
- 57.0
- 58.0
- 59.0
- 60.0



The screenshot shows the "EnvRecorder" application window with the "Trigger Options" dialog box open. The dialog box has a title bar with "EnvRecorder" and "오후 7:44". The main content area contains the following settings:


- Trigger Level (Vibration RMS): 51.0 dB
- Recording Time : 1 sec

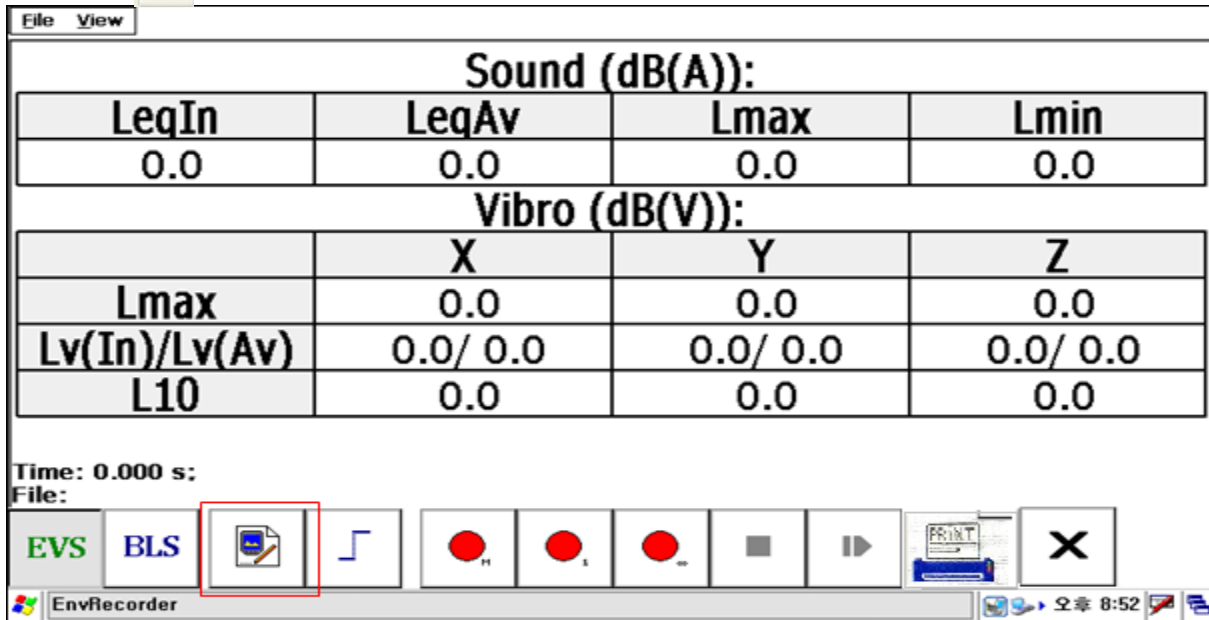
The "Recording Time" dropdown menu is open, showing the following options:

- 1 sec**
- 2 sec
- 3 sec
- 5 sec
- 10 sec
- 1 min
- 5 min
- 1 hour

The dialog box has "OK" and "Cancel" buttons in the top right corner. The taskbar at the bottom shows the "EnvRecorder" icon and the time "오후 7:45".

6. Analyzing Options:

Click  the Icon at the bottom in the measurement window again.



The screenshot shows the EnvRecorder software interface. At the top, there are menu options 'File' and 'View'. Below that, the 'Sound (dB(A))' section contains a table with the following data:

LeqIn	LeqAv	Lmax	Lmin
0.0	0.0	0.0	0.0

Below the sound data is the 'Vibro (dB(V))' section, which contains a table with the following data:

	X	Y	Z
Lmax	0.0	0.0	0.0
Lv(In)/Lv(Av)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

At the bottom of the window, there is a control bar with 'Time: 0.000 s:' and 'File:' labels. The control bar includes buttons for 'EVS', 'BLS', a document icon (highlighted with a red box), a waveform icon, three red circular indicators, a square indicator, a play button, a 'PRINT' button, and a close button. The taskbar at the bottom shows the 'EnvRecorder' application name and the system clock '오후 8:52'.

6.1. Analyzing Options Settings:

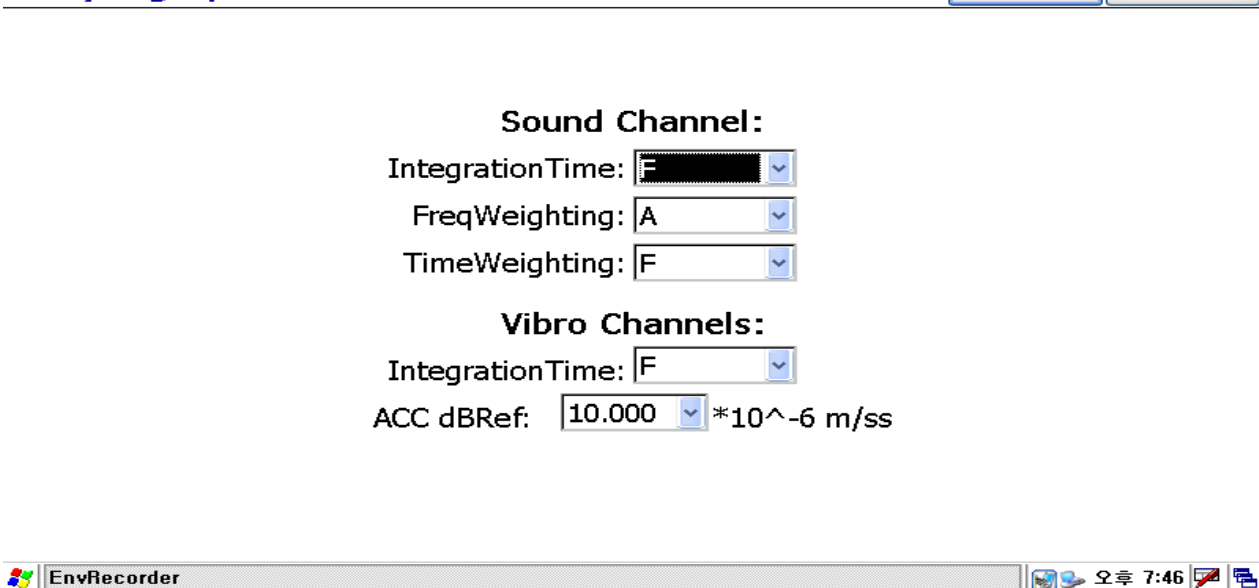
Move to "Analyzing Options" window, and set up the options of Sound channel and Vibration channels.

6.1.1. Sound Channel:

Select "Integration time (F, S)", "Frequency Weighting (Z, A, B)", "Time Weighting(S, F, I, U)". Usually, please select "Fast" for the "Integration time" and select "A" for the "Frequency Weighting", and select "Fast" for the "Time Weighting".

Analyzing Options:

OK Cancel



The 'Analyzing Options' dialog box is shown with the following settings:

Sound Channel:

- IntegrationTime: F
- FreqWeighting: A
- TimeWeighting: F

Vibro Channels:

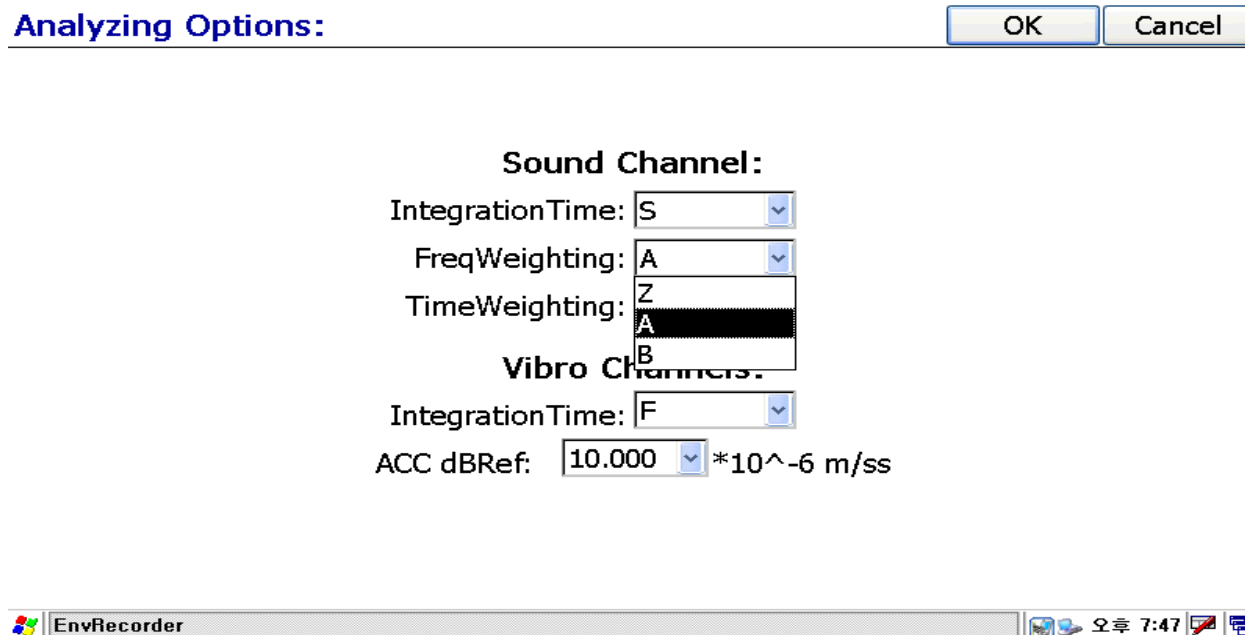
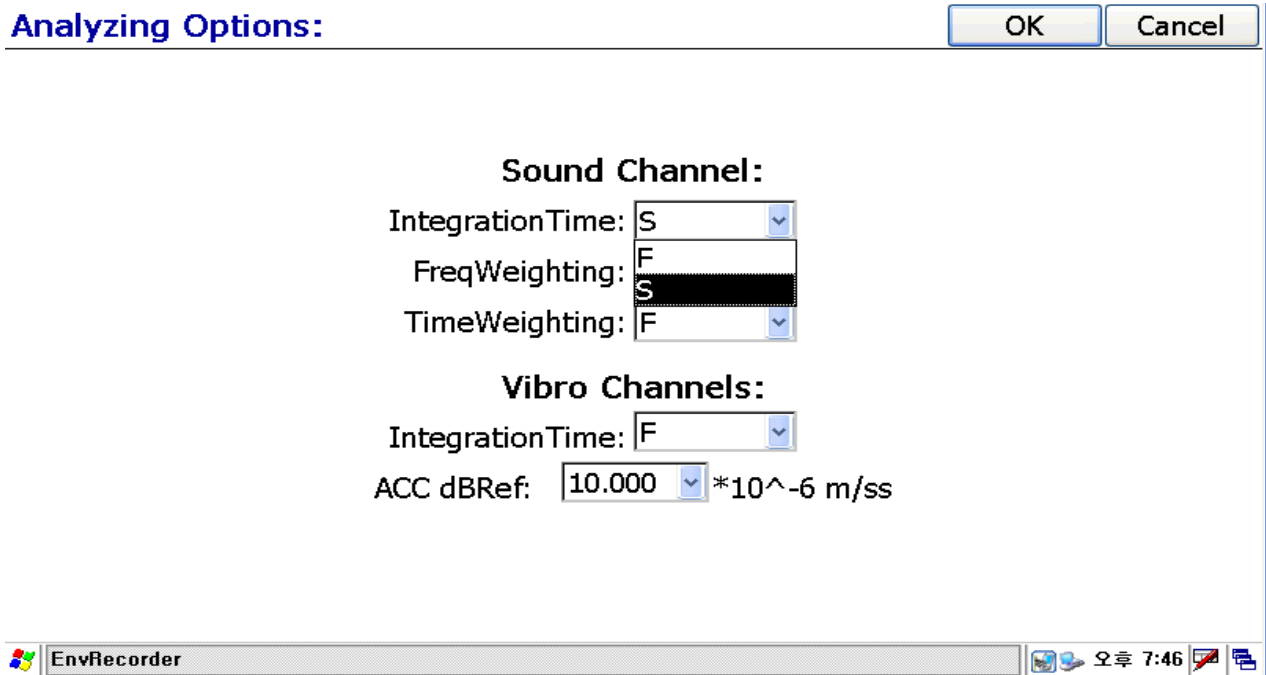
- IntegrationTime: F
- ACC dBRef: 10.000 *10⁻⁶ m/ss

The taskbar at the bottom shows the 'EnvRecorder' application name and the system clock '오후 7:46'.

6.1.2. Vibration Channel:

Set up "Integration Time(F, S)" and "dBref" value of vibration. Generally,select "Slow", and put $10 * 10^{-6}$ m/ss for ACC dBref value. And click "OK".

[참조] Sound Channel-Integration Time : S(Slow) integrate every 1 second, F(Fast) integrate every 125ms, and calculate Euivalent Sound Level(Leq).



[Example] Sound Channel-FreqWeighting : Select the frequency weighting among Z, A, B. A frequency weighting is designed to meet with human ear.

Analyzing Options:

OK

Cancel

Sound Channel:

IntegrationTime: S

FreqWeighting: A

TimeWeighting: F

Vibro Ch

IntegrationTime: I

ACC dBRef: 10.000 *10^-6 m/ss

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[Example] Sound Channel-TimeWeighting : Time weighting is weighted by time F(Fast) is sampled every 125ms, S(Slow) is sampled every 1 sec, I(Impulse)is sampled every 35ms.

Analyzing Options:

OK

Cancel

Sound Channel:

IntegrationTime: S

FreqWeighting: A

TimeWeighting: F

Vibro Channels:

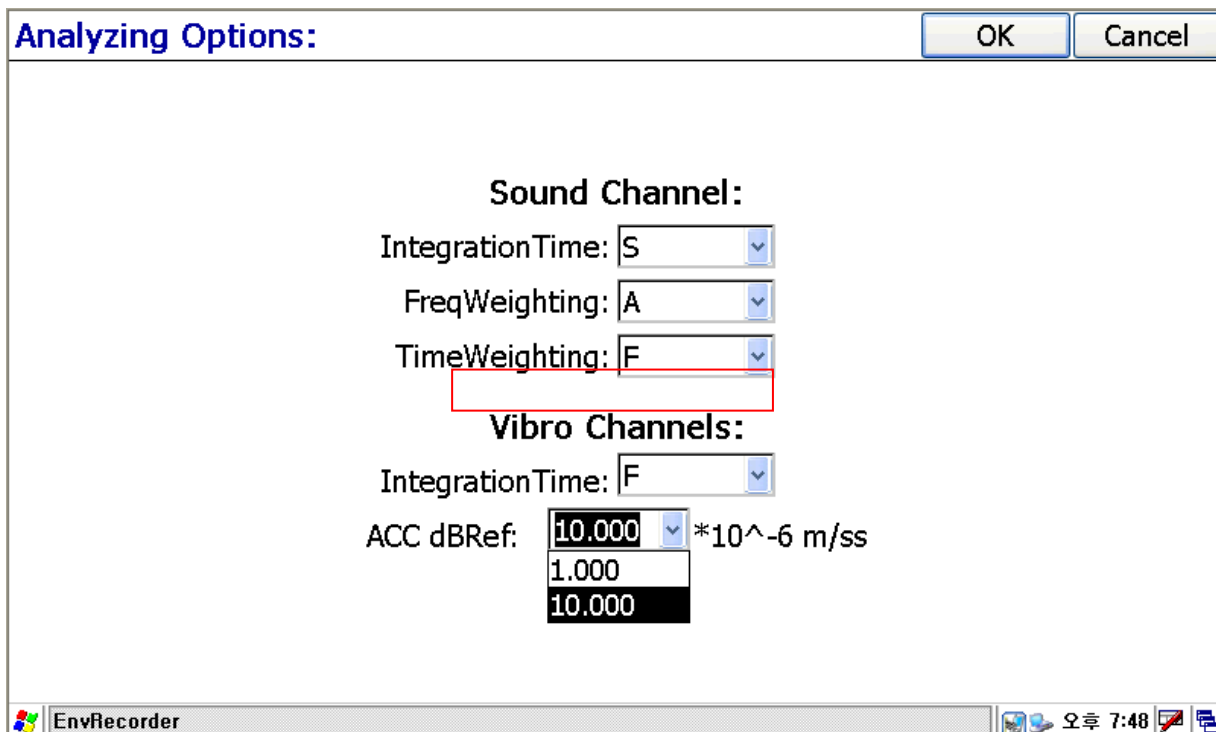
IntegrationTime: F

ACC dBRef: 10.000 *10^-6 m/ss

EnvRecorder

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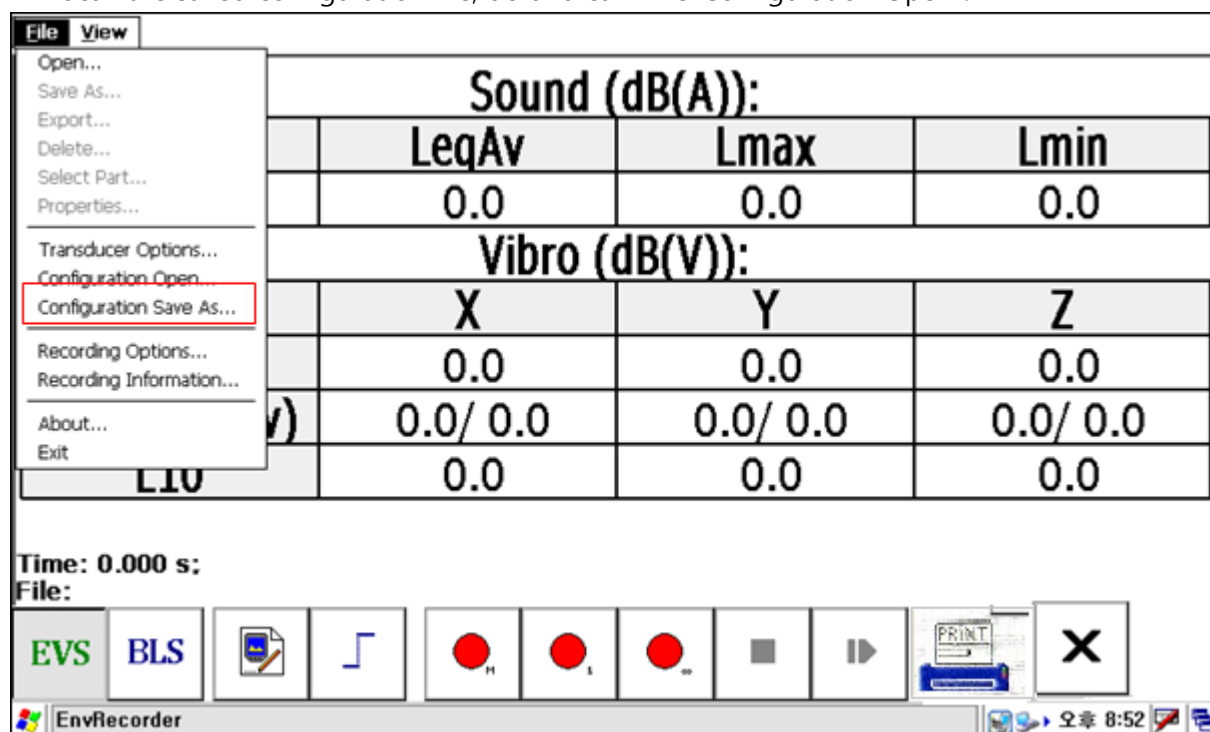
[Example] Vibro Channels-IntegrationTime : Set up Integration time for the vibration channels. F(Fast) has 100ms of integration time, S(Slow) has 1 sec of Integration time.

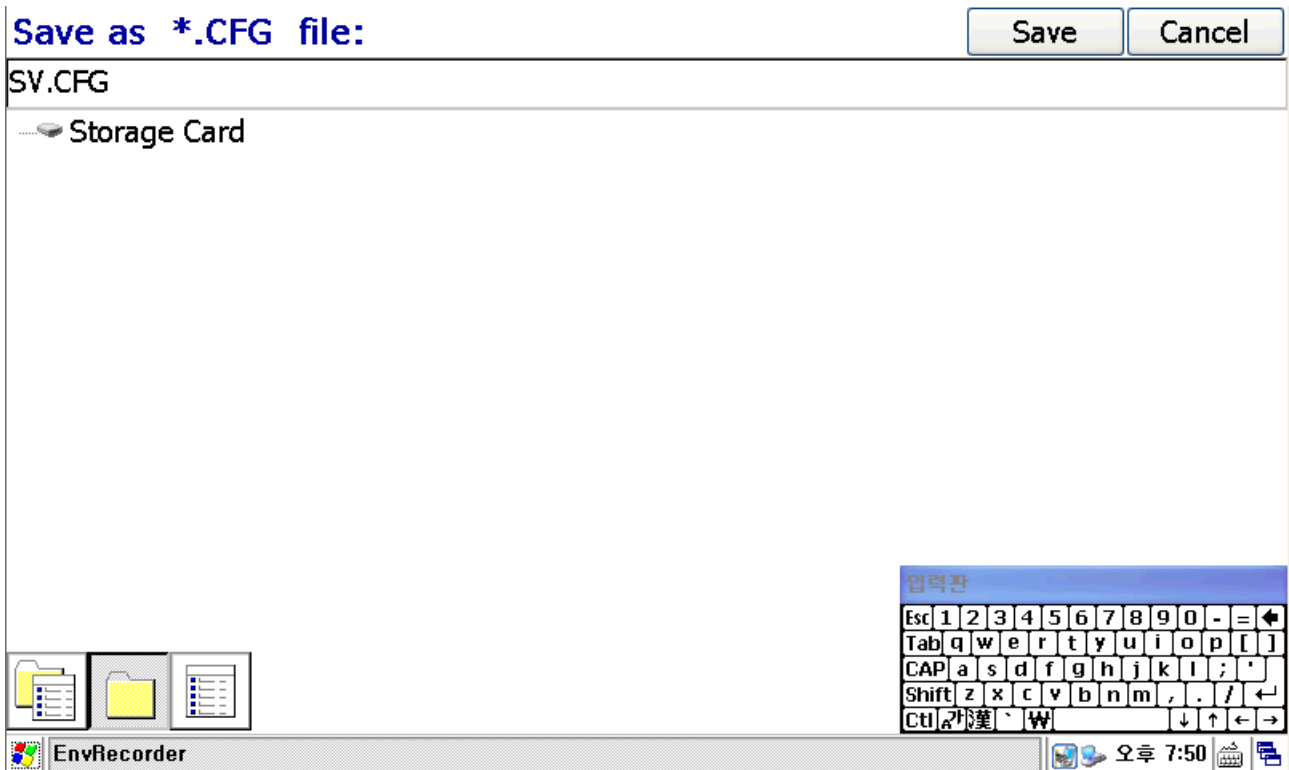
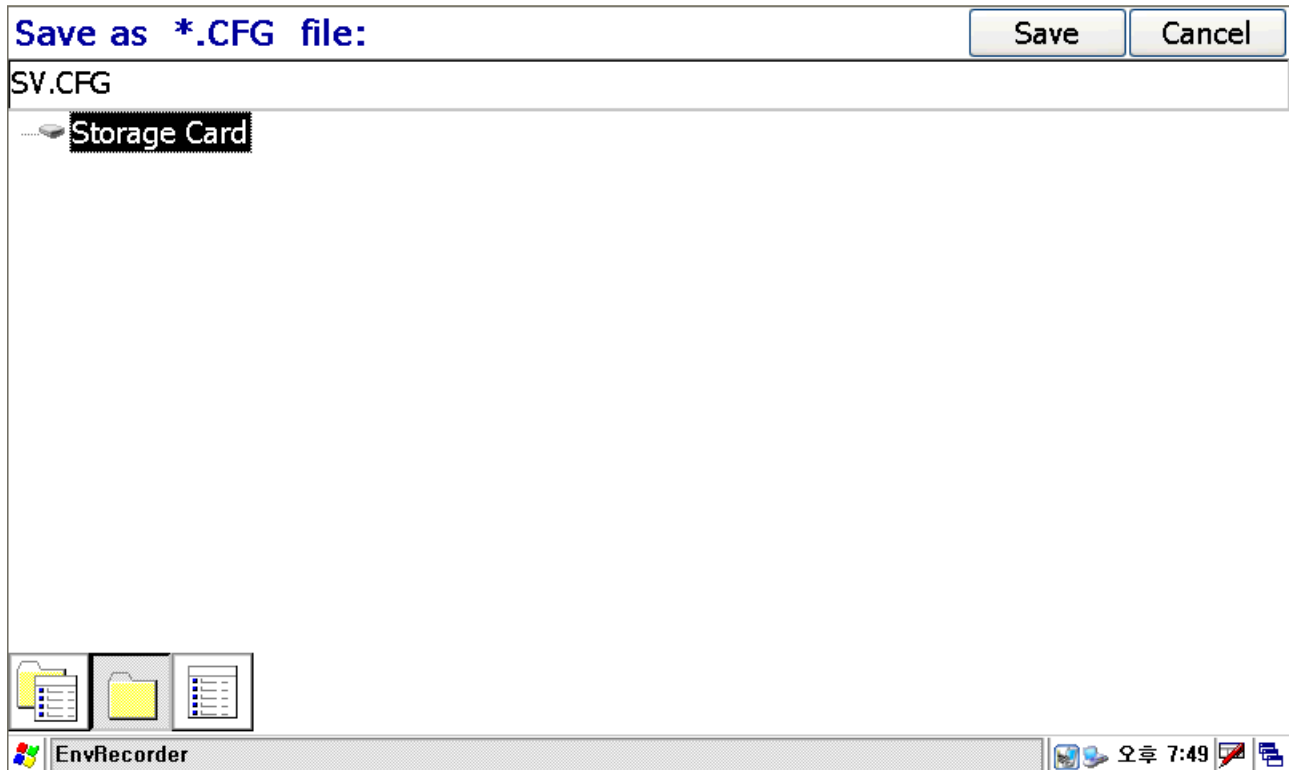


[Example] Vibro Channels : Please select between 1 and 10, Usually 1 is used in Europe as a vibration reference value, Korea and Japan are used 10.

7. Configuration Save As:

After set up all, do "Configuration Save As" at the file menu. Select the position to be saved the "Configuration file", and write file name using the touch key board at the bottom, and click "Save".
 Tocal the saved configuration file, do and call "File-Configuration Open".





[Example] Click Key board Icon at the right side of bottom, to remove the key board icon from the display, select the key board disappear by pressing the key board icon.

8. Configuration Open:

The screenshot shows the EnvRecorder software interface. The 'File' menu is open, and 'Configuration Open...' is highlighted. The main display area shows the following data:

Sound (dB(A)):			
	LeqAv	Lmax	Lmin
	0.0	0.0	0.0

Vibro (dB(V)):			
	X	Y	Z
	0.0	0.0	0.0
v)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
	0.0	0.0	0.0

Time: 0.000 s
File:

EnvRecorder

The screenshot shows the 'Open *.CFG file:' dialog box. The file list contains the following entries:

Name	Size	Date	Time
SV.CFG	43K	2012-06-07	오후 7:36:36

EnvRecorder

9. Taking Measurements:

To do measurement and saving the measured data, use "Red recording" Icon.

9.1. Recording M:

Click "Manual". Then you can measure and save till click "Stop"

9.2. Recording S (1 Recording):

With "Single-shot recording option", it will be measured and saved by the recording time defined at Position 5.1.

9.3. Recording C (Continuous Recording):

If click "recording" Icon, It will start the data acquisition by the trigger level, and stop the data acquisition by defined time, and wait the next Trigger Level. If meet "Trigger Level" signal, it will measure and save the data till you click "Stop", continuously it will be doing the measurement and save the data repeatedly.

Sound (dB(A)):			
LeqIn	LeqAv	Lmax	Lmin
0.0	0.0	0.0	0.0

Vibro (dB(V)):			
	X	Y	Z
Lmax	0.0	0.0	0.0
Lv(In)/Lv(Av)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

Time: 0.000 s;
File:

Control panel icons: EVS, BLS, File, Waveform, **Red Recording (M)**, **Red Recording (S)**, **Red Recording (C)**, Stop, Play, Print, Close.

10. Data saving to SD Card:

The saved data will be stored in the SD memory card, you can move the saved data of the SD memory card to your PC, and you can analyze the data with the PC EVS analysis software.

11. Summary Printout:

User can print only saved result file.

11.1. Steps to take Summary printout of saved result file.

- Feed the paper into the printer
- Connect the printer cable between device & Printer.
- Power on the printer.
- Select result file (menu File/Open... or toolbar or just saved file).
- Press [Print] button.

The screenshot shows a software window titled "Sound (dB):" and "Vibro (mm/sec):". The window has a menu bar with "File" and "View". Below the title bars, there are two tables. The first table, "Sound (dB)", has four columns: "LeqIn", "LeqAv", "Lmax", and "Lmin". The second table, "Vibro (mm/sec)", has three columns: "X", "Y", and "Z". Below the tables, there is a status bar showing "Time: 0.000 s:" and "File: SV_000478.WAV". At the bottom, there is a toolbar with icons for "EVS", "BLS", "M", "S", "C", a folder icon, a play button, a printer icon, and a close button. The Windows taskbar is visible at the bottom with the Start button, "EnvRecorder" taskbar, and system tray showing the time "3:29 PM".

Sound (dB):			
LeqIn	LeqAv	Lmax	Lmin
0.00	0.00	~0.00	0.00

Vibro (mm/sec):			
	X	Y	Z
VelPeak (Inst)	0.00	0.00	0.00
VelPeak (Hold)	0.00	0.00	0.00

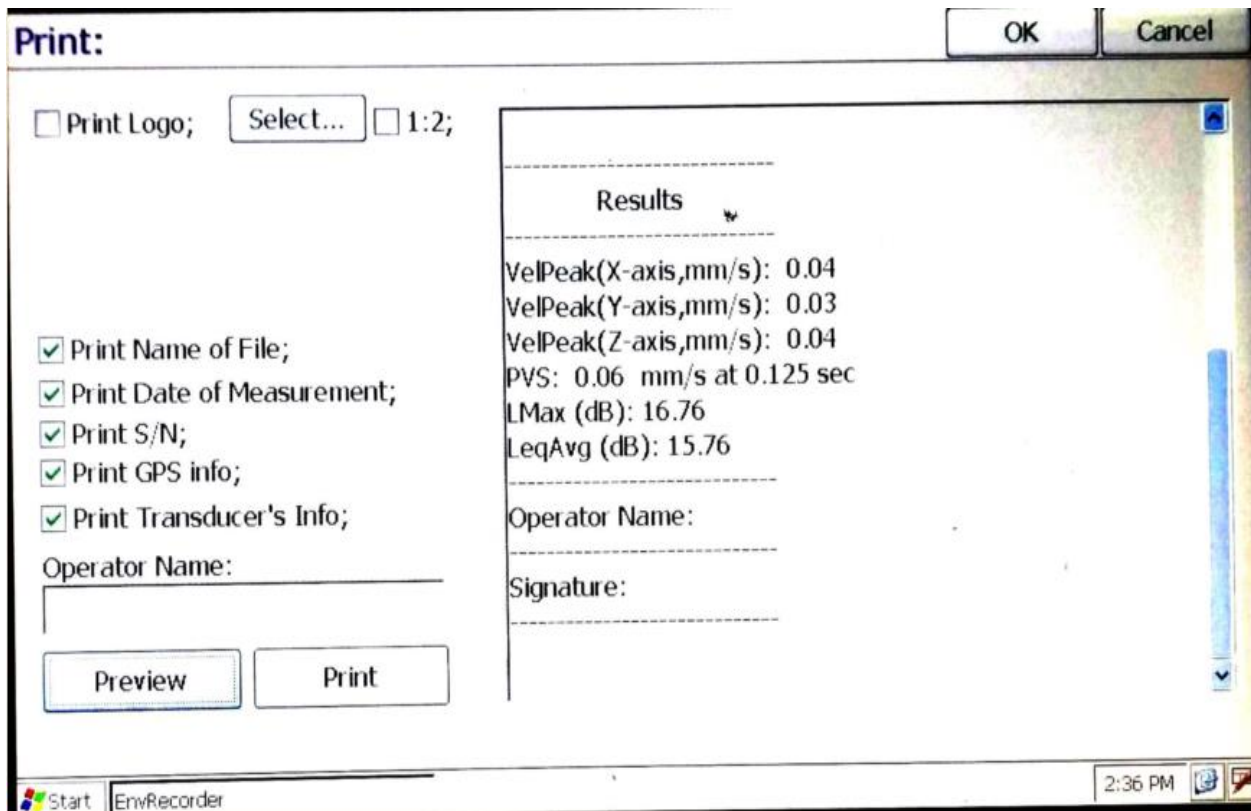
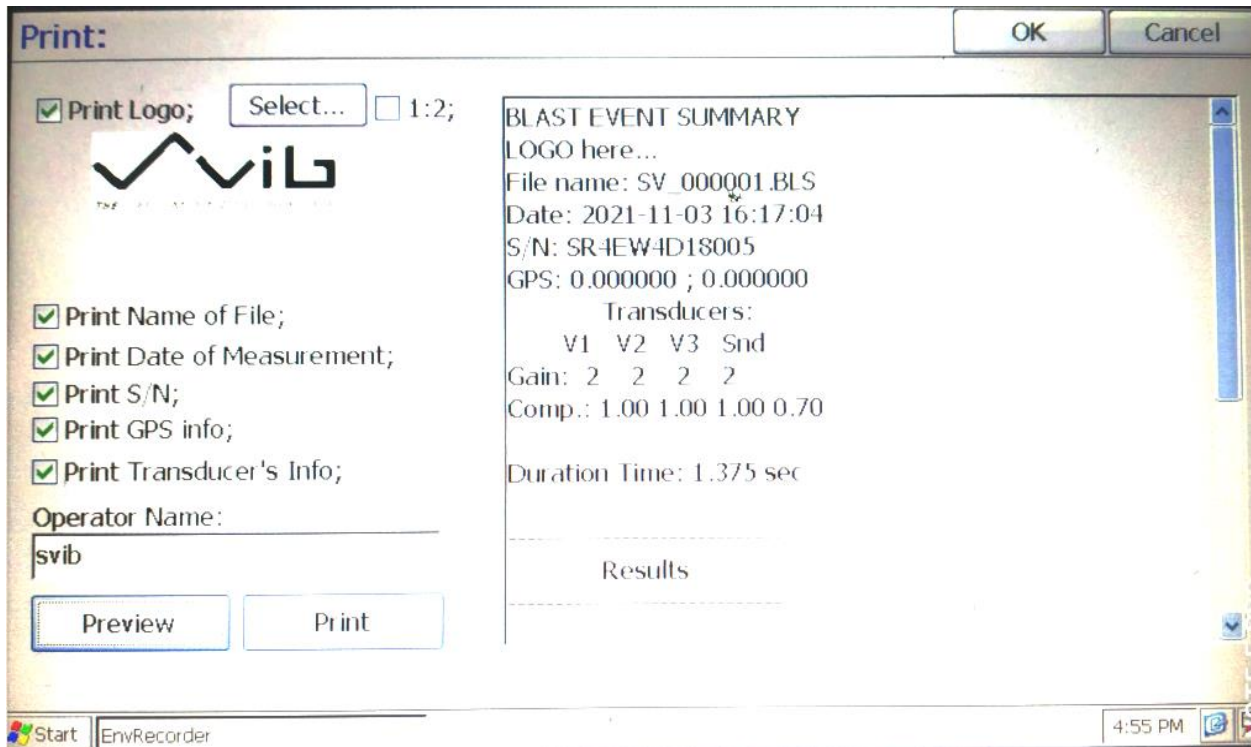
Time: 0.000 s:
File: SV_000478.WAV

EVS BLS M S C [Folder] [Play] [Print] [Close]

Start EnvRecorder 3:29 PM

11.2. Print Preview of summary Printout:

- Before printing the summary printout user can check file content with [Preview] function. Logo picture is not available in preview, just string "Logo here...".
- User can check all other check boxes (Print Name of File, Print Date of Measurement, Print S/N, Print GPS info, Print Transducer's info) as per user requirement.
- So the Print Preview of summary Printout will show the selected checkbox data & the result with Peak velocity of X, Y, Z, PVS, LMax, LeqAvg & operator name & Signature as shown below.
- To set logo in the summary printout user need to select the image from the device & that image should follow the rules as discussed in 11.3.



11.3. Logo picture requirement:

- Image should be Monochrome type;
- Image Width is not more 240px,
- Image Height is not more 100px;
- Width should be a multiple of 8 (preferably);

EVS app displays the selected logo-picture in its real size. But printer stretches its height into 2 times. So the selected logo image will show 2 times stretchable than the original image.

There are two ways to fix it:

11.3.1. Editing Logo image:

1. User should edit logo-image before selecting the logo image in the device by himself (compress the Logo image height in ~2 times in a picture editor, for ex. Paint)
2. Select the Checkbox "Print Logo" in Preview Window.
3. select the edited image in Preview Window.

11.3.2. select the check box option <1:2>:

1. User should select the check box option <1:2> in the preview window
2. But its Quality may be worse as compared to 11.3.1.

Note:

If printer is not connected but user press [Print] button in <Print> dialog then the app sends data to printer device anyway. User should wait of process ending (it's not possible to interrupt it). Print function takes about 10-15 sec for a file.

[Appendix]

1. To open the saved data and to display the file information

(1) Please do "File-Open".

The screenshot shows the EnvRecorder software interface. The 'File' menu is open, with 'Open...' highlighted. The main display area shows a table of sound and vibration data. Below the table, the time is 0.000 s and the file name is L10. The bottom toolbar contains icons for EVS, BLS, and various playback controls.

Sound (dB(A)):			
	LeqAv	Lmax	Lmin
	0.0	0.0	0.0
Vibro (dB(V)):			
	X	Y	Z
	0.0	0.0	0.0
v)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

Time: 0.000 s
File: L10

EnvRecorder

(2) Select the data to be opening, click "Open".

(3) Please do "File-Properties", you can see the saved file information Open.

The screenshot shows the EnvRecorder file explorer window. The title bar reads 'Open *.EVS file:'. The file list is displayed on a 'Storage Card' and includes the following files:

Name	Size	Date	Time
SV001.EVS	72M	2000-01-03	오후 6:09:46
SV002.EVS	72M	2000-01-03	오후 7:28:02
SV003.EVS	1K	2000-01-03	오후 7:28:02
SV004.EVS	1K	2000-01-04	오전 10:34:28
SV005.EVS	72M	2000-01-04	오후 12:48:54
SV006.EVS	72M	2000-01-04	오후 2:23:46
SV007.EVS	72M	2000-01-04	오후 3:39:24
SV008.EVS	1K	2000-01-04	오후 3:39:24
SV009.EVS	1K	2000-01-04	오후 4:22:50

EnvRecorder

File View

- Open...
- Save As...
- Export...
- Delete...
- Select Part...
- Properties...
- Transducer Options...
- Configuration Open...
- Configuration Save As...
- Recording Options...
- Recording Information...
- About...
- Exit

Sound (dB(A)):			
	LeqAv	Lmax	Lmin
	0.0	0.0	0.0
Vibro (dB(V)):			
	X	Y	Z
	0.0	0.0	0.0
v)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

Time: 0.000 s:
File:

EV5 BLS

EnvRecorder 오후 8:52

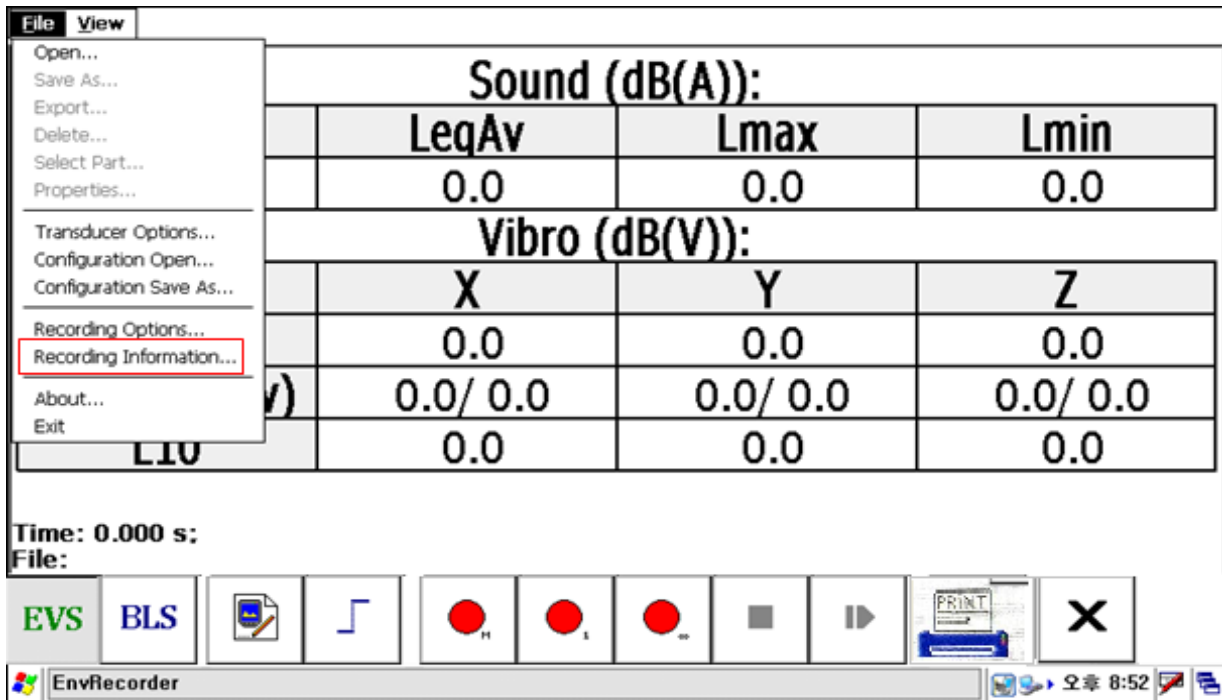
File Properties: Close

Name	Value
File	SV001.WAV
Data	2000-01-03
Time	16:53:13
Name	Name
Object	Object
Location	Location
#1 Axis	x-Axis
#2 Axis	y-Axis
#3 Axis	z-Axis
Duration	3600.250 seconds
Sample Rate	512 Hz
#1 Sensitivity	800.000 mV/g
Gain	Amp: x2; Comp: 1.000;
#2 Sensitivity	800.000 mV/g
Gain	Amp: x2; Comp: 1.000;
#3 Sensitivity	800.000 mV/g
Gain	Amp: x2; Comp: 1.000;

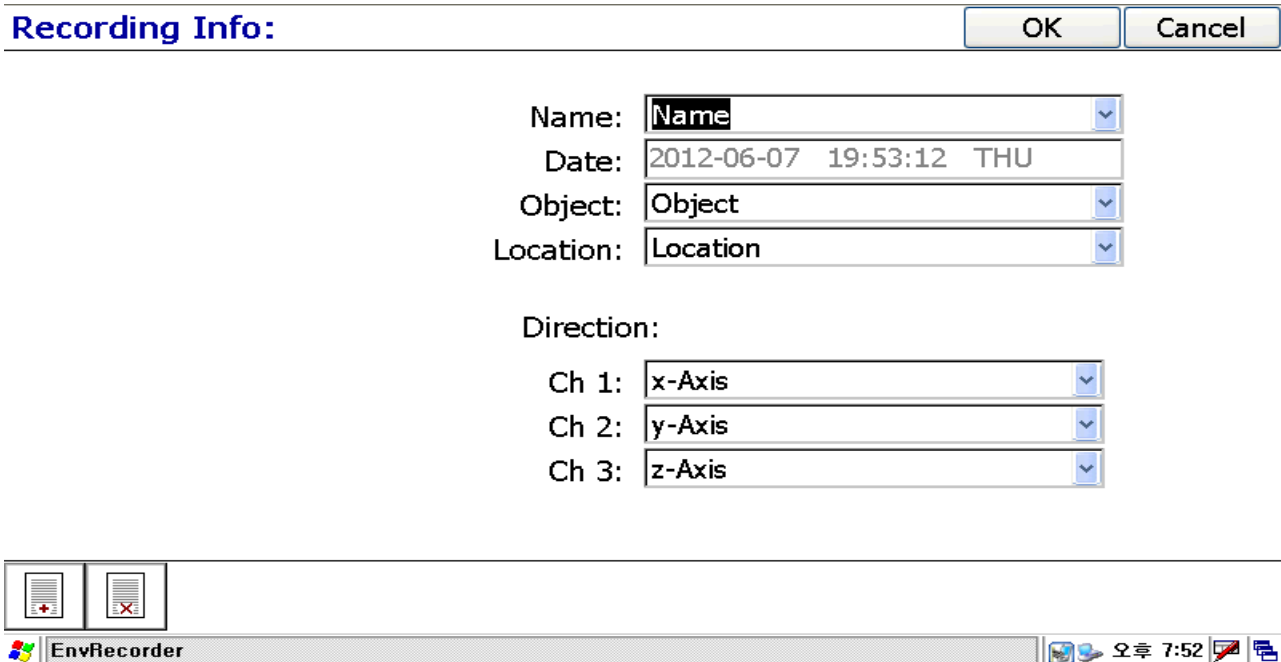
EnvRecorder 오후 7:52

2. Set up "Recording Information" for the data to be saving

(1) Please do "File-Recording Information".



(2) Put the saving information for the data. Name of person, Object of measurement, measuring position, Axis direction information of 1,2,3 channels for vibration name.



3. To Set GPS Coordinates

- (1) GPS data are related to the place where measurement is done, but not to a place where file is printing. So GPS data should be saved to the result file before the measurement starts and are printed with result data. If user doesn't set the GPS data before the measurement starts it will take the previous values.

To set GPS data in GPS dialog box go to menu View/GPS...):

The screenshot shows the 'View' menu with 'GPS...' selected. The main window displays a table with the following data:

Sound (dB):		
LeqAv	Lmax	Lmin
0.00	0.00	0.00
Vibro (mm/sec):		
X	Y	Z
0.00	0.00	0.00
0.00	0.00	0.00

Below the table, the status bar shows 'Time: 0.000 s' and 'File: SV_000478.WAV'. There are also buttons for 'EVS', 'BLS', and three red circular indicators labeled 'M', 'S', and 'C'. A taskbar at the bottom shows the 'Start' button and the application name 'EnvRecorder'.

Below screen will appear. User can set GPS data in the blocks for each file

The screenshot shows a dialog box titled 'GPS:' with 'OK' and 'Cancel' buttons. The dialog contains two input fields:

Latitude: 22.954210

Longitude: 46.345329

The taskbar at the bottom shows the 'Start' button and the application name 'EnvRecorder'.

4. To change the background color of the display

(1) View-Color Schema: If select "Black&White" Background color will be white and letter will be black,if not select it, background will be black and letter will be green. Under shine, it will illegible, So please check the "Black&White".

Sound (dB(A)):			
LeqAv	Lmax	Lmin	
0.0	0.0	0.0	

Vibro (dB(V)):			
X	Y	Z	
0.0	0.0	0.0	

Lv(In)/Lv(Av)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

Time: 0.000 s:
File:

EnvRecorder

Sound (dB(A)):			
LeqAv	Lmax	Lmin	
0.0	0.0	0.0	

Vibro (dB(V)):			
X	Y	Z	
0.0	0.0	0.0	

Lv(In)/Lv(Av)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
L10	0.0	0.0	0.0

Time: 0.000 s:
File:

EnvRecorder

5. Display the information of the measuring system

- c. If do "File-About", you can find the software version and hardware firmware version of the measuring system.

The screenshot shows the main interface of the EnvRecorder software. The 'File' menu is open, with 'About...' highlighted. The main display area contains two tables of measurement data.

Sound (dB(A)):			
	LeqAv	Lmax	Lmin
	0.0	0.0	0.0

Vibro (dB(V)):			
	X	Y	Z
	0.0	0.0	0.0
v)	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
	0.0	0.0	0.0

Time: 0.000 s:
File:

Control buttons: EVS, BLS, File, Stop, M, I, M, Stop, Play, Print, Close.

Taskbar: EnvRecorder, Windows, 오후 8:52

The 'About' dialog box provides the following information:

4-Channel EVS Pocket Analyzer:

SW Version: 3.0.5.4c (ENG)
[for CE5.0 RPA]
Copyright (C) SVIB
www.svibtech.net

Firmware Information:
V3.1 401; 4 channels; MaxFS=16384Hz;

Analyzing Library:
Version: 2.0.2

Device ID:
SR4EW4D18005

Taskbar: Start, EnvRecorder, 4:58 PM

*****END*****