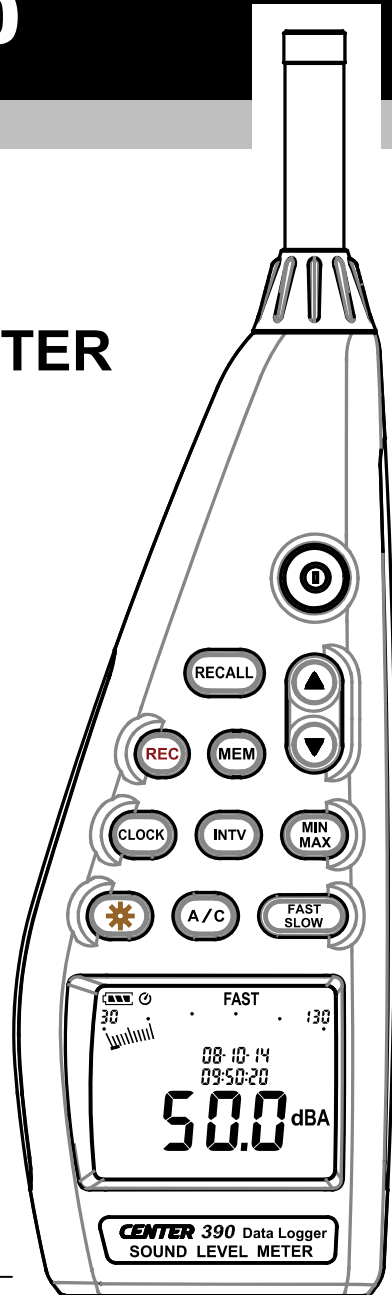


CENTER[®] 390

Data Logger

SOUND LEVEL METER



Instruction Manual
SE-390

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1. SAFETY INFORMATION

Read the following safety information carefully before attempting to operate or service the meter.

Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

Environment conditions

- Altitude up to 2000 meters
- Relatively humidity 90% max.
- Operation Ambient 0 ~ 40°C

Maintenance & Clearing

- Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instrument.

Safety symbols

 **Comply with EMC**

When servicing, use only specified replacement parts.

2. GENERAL DESCRIPTION

Thank you for using our Data Logger Sound Level Meter. To ensure that you can get the most from it, we recommend that you read and follow the manual carefully before use.

Measurement settings and results (level values and bar graph) are shown on the backlit LCD panel.

Data can be stored in the meter or directly saved on a computer through PC interface. Recorded data can be further processed on a computer.

3. FEATURE

- Complies with IEC 61672-1 class 2 standard
- 31,000 Records Data Logger
- Manual reading recording memory(99 points)
- LCD recording readout (99 memory recording)
- PC Interface

- With Windows software
- AC/DC Signal Output

4. SPECIFICATIONS

Standard applied: IEC61672-1 Class 2, ANSI S1.4 Type2.

Frequency range: 20Hz ~ 8KHz

Measuring level range: 30 ~ 130dB

Frequency weighting: A / C

Microphone: 1/2 inch electret condenser microphone

Display: Liquid Crystal Display

Digital display: 4 digits

Resolution: 0.1dB

Display Update: 0.5 sec.

Analog display: 50 segment bargraph

Resolution: 2dB

Display Update: 50 mS

Time weighting: FAST (125mS), SLOW (1 sec.)

Accuracy: ± 1.4 dB (under reference conditions @ 94dB, 1KHz)

Dynamic range: 100 dB

Alarm function: "OVER" is when input is more than upper limit of range.

" UNDER " is when input is Less than lower limit of range.

Data logging Capacity: 31,000 records

MAX/MIN hold: Hold readings the Maximum and Minimum Value.

AC output: 1 Vrms at FS (full scale).

DC output: 10mV / dB

Power supply: Four IEC LR6P (AA-size) batteries

Power life: About 30hrs (alkaline battery)

Power consumption: Approx. 0.3W

AC adapter: Voltage 9 VDC (8-10VDC Max)

Operation temperature : 0 to 40°C (32 to 104°F)

Operation humidity: 10 to 90%RH

Storage temperature : -10 to 60°C (14 to 140°F)

Storage humidity: 10 to 75%RH

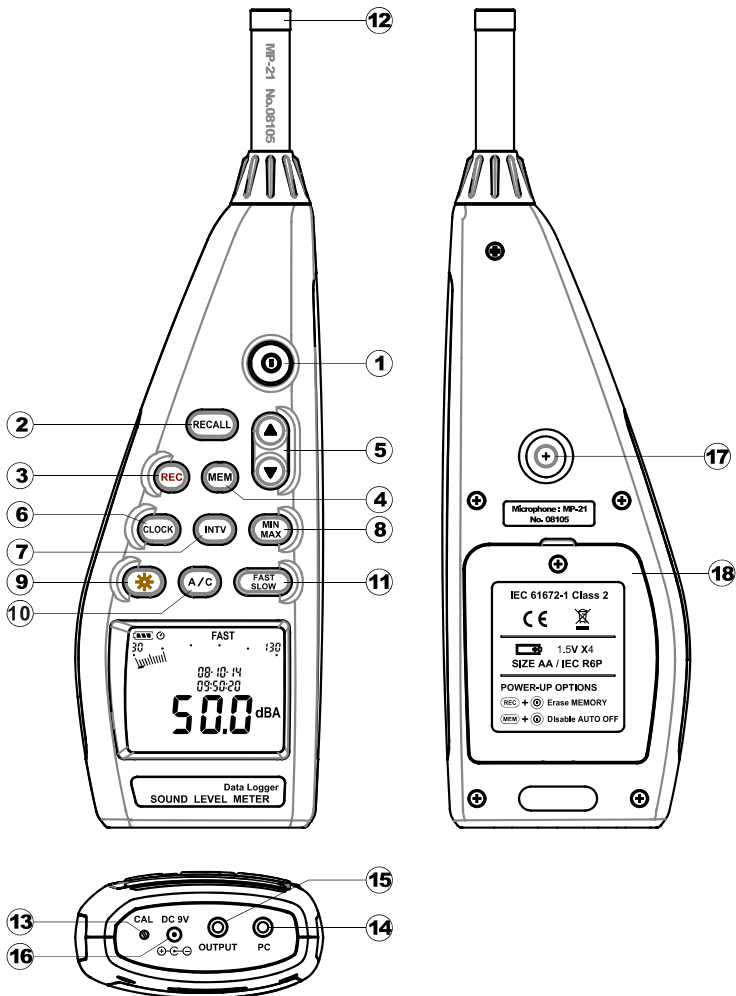
Dimensions: 272(L)×83(W)×42(H)mm; 10.7(L)×3.3(W)×1.6(H)inch

Weight: 390g (including battery)

Accessories: 1.5V battery X 4pcs, carrying case, Screwdriver, Instruction manual, Windscreen, 3.5φ plug, software, USB Cable.

Option: AC Adapter, Microphone Extension Cables (5m or 10m length).

5. NAME AND FUNCTIONS



Display Screen:



<u>SYMBOL</u>	<u>FUNCTION</u>
	Battery capacity indicator
	Auto power off indicator
MIN MAX	Maximum/Minimum indicator
FAST SLOW	Time weighting indicator
30-130	Level range indicator
	Bar graph
MEM	Manual store indicator
88-88-88	Time
88	Memory address
READ	Recall indicator
dBA/dBC	Frequency weighting indicator
188.8	Level reading
88-88-88	Date
OVER	Over-range signal indicator
FULL	Memory full
REC	Recording datalogger indicator
UNDER	Under-range signal indicator

① **Ⓞ Power button:**

Press the Ⓞ button to turn the unit on. To turn the unit off, press and hold Ⓞ button down until the “**P-OFF**” is shown.

▪ **Auto Power Off.**

To save battery life, by default, when the unit is powered on, it is under auto power off mode.

The unit will power itself off after 30 minutes if no key operation.

Auto power off will be disable under the following 2 circumstances.

- (1) When connecting to PC.
- (2) When recording function is on process.

▪ **Disabled Auto Power Off.**

Press and hold the (MEM) button and then power on the unit. Keep holding (MEM) button, until the meter starts function. Make sure the auto power off symbol Ⓞ disappears from display screen.

Note: When the user powers it on, the LCD will show how much internal memory space is available to use.

② (RECALL) **RECALL button:**

Serves to recall data from the manual store.

③ (REC) **REC button:**

When press the button, the unit will start recording, and the “**REC**”symbol display. To stop recording press again (REC) button.

④ (MEM) **MEM button:**

Press to store measurement data using manual store.

⑤ (▲)/(▼) **button:**

Press (▲) or (▼) to increase or decrease number.

⑥ (CLOCK) **CLOCK button:**

(1) Press the (CLOCK) button to turn Date and Time display ON or OFF.

(2) Press and hold (CLOCK) button at least 2 seconds Setting the Date and Time.



⑦ (INTV) **INTV button:**


Adjust auto store Interval time.


⑧  **MAX/MIN button:**

Press button to enter the maximum and minimum recording mode.

Under this mode, the maximum value and minimum value will be stored and automatically updated in the memory simultaneously.

Pressing the  button will display the “**MAX**” symbol and the Maximum value on the display. Pressing  button again will display the “**MIN**” symbol indicator and the Minimum value on the display.

Pressing  button again will cause the maximum and minimum indicators to blink together. Which means the meter is under maximum and minimum recording mode. The value displays on the screen is the present value.

To exit the maximum and minimum mode, press and hold  button down until the “**MAX MIN**” symbol is disappears.

⑨  **Back light button:**

Press it to turn on the LCD backlight, making it easier to read in dark environment.

Press it again to turn OFF backlight. The backlight will turn itself off automatically after 30 seconds.

⑩  **A/C button:**

Sets frequency weighting to A or C.

⑪  **FAST/SLOW button:**

Sets the time weighting to Fast or Slow.

⑫ **Microphone:**

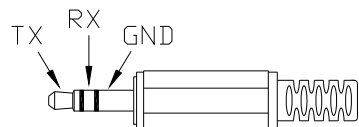
1/2 inch Electret Condenser microphone.

⑬ **CAL potentiometer:**

Calibration control, for level calibration adjustment.

⑭ **Connection to a Computer:**

The PC jack signal output is a 9600 bps N 8 1 serial interface. Using the accessory RS-232/USB interface cable.

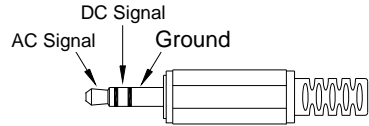


15 AC/DC signal output jack:

Connect the AC/DC output on the bottom of the unit to the level recorder.

AC: 1 Vrms Corresponding to 130dB.(with frequency weighting)

DC: Output: 10mV/dB

**16 External DC 9V power supply jack:**

Connect the AC adapter.

17 Tripod mounting thread:

For long-term measurements, the unit can be mounted on a camera tripod. Proceed carefully, to avoid dropping the unit

18 Battery Compartment.**6. DATA LOGGER & INTERVAL SETUP**

How to store data in memory and how to recall data from memory.

There are two different ways of storing data.

6.1 Auto store:

Auto store Interval time setup:

(1) Press **(INTV)** button, “**Int**” appears for interval, as well as a flashing second display.

(2) Now set the desired recording interval in minutes and seconds. Press **(▲)** or **(▼)** to increase or decrease number, Max 1 minute can be set. The minimum value is limited to “00:01”(=1s). After setting has been performed, actuate the press **(INTV)** button once, to get back to the display of the instantaneously measured values. If you want abort during a setup process, press **(⊙)** button to cancel.

When one presses the **(REC)** button starts saving the measured values .The values are stored in a memory location. Press **(REC)** button again will stop recording.

Note: During recording period, most of the buttons such as the **(RECALL)**, **(MEM)**, **(INTV)**, **(A/C)**, **(FAST SLOW)** are inoperative. All other settings must be made before starting the record operation.

LCD will show FULL symbol when 31000 recorders are stored in memory.

6.2 Clearing Stored Data (From Auto Store):



If you want to clear the memory, power off the unit, then press and hold (REC) button and then press (⊙) button and hold at least 5 seconds, then LCD will show "CLr" and "SURE" to clear the memory.

6.3 Manual store:

Press the (MEM) button to store measurement data using manual store. Up to 99 data sets can be stored in the internal memory.

6.4 Reading Stored Data (From Manual Store):

- (1) Press the (RECALL) button. The "READ" symbol appears.
- (2) Press the (▲) or (▼) buttons to select the data number in which the data were stored. The data are shown on the LCD. When there are no data in a number the LCD shows "MEM00"
- (3) To terminate the recall mode, press the (RECALL) button once more.

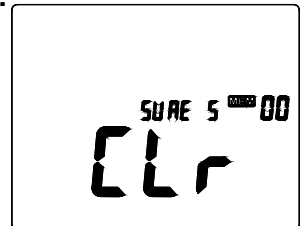
Note:

The battery indicator "▬▬▬" shows the remaining battery power. The number of black bar decreases as the battery running out. When the power is almost empty, "▬" will disappear. Press (MEM) or (REC) button, LCD display will show "Lo bat" warning indication. If the meter is under record mode, it will stop.



6.5 Clearing Stored Data (From Manual Store):

If you want to clear the memory, power off the unit, then press and hold (RECALL) button and then press (⊙) button and hold at least 5 seconds, then LCD will show "CLr" and "SURE" to clear the memory.



7. SETTING THE DATE AND TIME

Year/month/day

Hour/minute/second

The unit incorporates a clock which allows recording the date and time along with measurement data on the memory.

(1) Press and hold **(CLOCK)** button at least 2 seconds.

(2) Press **(▲)** or **(▼)** to increase or decrease number, press clock button to adjust next item.

The adjusting order is **year**→**month**→**day**→**hour**→**minute**→**second**, then press **(CLOCK)** button to finish adjusting. If you want abort during a setup process, press **(⊙)** button to cancel.

Note: An internal rechargeable backup battery keeps the clock of the unit running when the power is turned off the backup battery is recharged by the main batteries. The clock will keep running for 30 minutes on the backup battery alone. If the unit is not to be used for an extended period, the main batteries should be taken out to prevent possible damage due to battery fluid leakage. After reinserting the batteries, be sure to set the date and time.

8. CALIBRATION PROCEDURES

(1) Make the following switch settings.

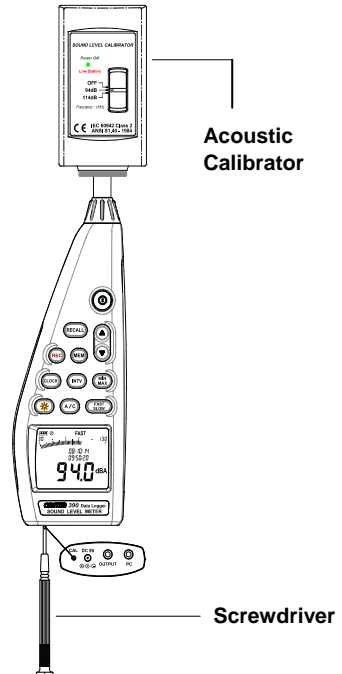
- Display: dBA
- Time weighting: FAST
- Measurement mode:
MAX MIN Mode function disables.
- Level range: 30 to 130dB.

(2) Insert the microphone housing carefully into the insertion hole of the calibrator.

(3) Turn on the switch of calibrator and adjust the CAL potentiometer of the unit. The level display will indicate the desired level. All products are well calibrated before shipment.

Recommended Recalibration cycle:

1 year.



9. MEASUREMENT PREPARATION

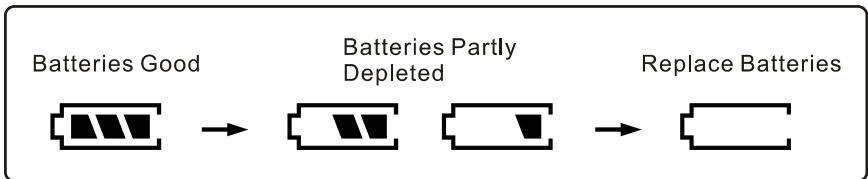
(1) Battery Loading:

- (a) Back out the screw at the top of the battery cover and lift the cover away from the unit.
- (b) Insert the four AA batteries, observing proper polarity as depicted on the bottom of the battery compartment.
- (c) Replace the battery cover and tighten the screw.

Note: It is possible to use size AA rechargeable batteries, but a separate charger must be provided for such batteries, since the unit is not designed to recharge batteries.

(2) Battery capacity indicator:

When operating the unit on batteries, periodically check this indicator to determine the remaining battery capacity.



(3) AC Adapter Connection:

When the AC adapter is used, insert the plugs of the adapter into the DC9V connector on the bottom panel.

Note: When the AC adapter is connected, the unit will be powered from the adapter, also when batteries are inserted. (The AC adapter has priority)

10. OPERATING PRECAUTIONS

- (1) Wind blowing across the microphone would bring additional extraneous noise.

When using the instrument in the presence of wind, it is a must to mount the windscreen to not pick up undesirable signals.

- (2) Calibrate the instrument before operation if the instrument was not in use for a long time or operated in bad environment.


- (3) Do not store or operate the instrument at high temperature and high humidity environment.
- (4) Keep microphone dry and avoid severe vibration.
- (5) Please take out the battery and keep the instrument in low humidity environment when not in use.

11. MEASUREMENT

(1) Turn power on and select the desired response Time and frequency Weighting. If the sound source consists of short bursts or only catching sound peak, set response to FAST. To measure average sound level, use the SLOW setting. Select A-weighting for general noise sound level and C-weighting for measuring sound level of acoustic material.

(2) Hold the instrument comfortably in hand or fix on tripod and point the microphone at the suspected noise source, the sound pressure level will be displayed.

(3) When MAX MIN (maximum, minimum hold) mode is chosen. The instrument captures and holds the maximum and minimum noise level for a long period using any of the time weightings.

Press the  button 2 seconds to clear the maximum and minimum reading, “ **MAX MIN** ” symbol disappears.

(4) Turn OFF the instrument.

12. SETUP TestLink SE-390 (Sound Level Meter)— RS232 interface software:

- **The SE-390 package contains:**
 - 1.80mm CD.
 2. Custom designed USB cable for SE390.
- **System Required:**
Windows NT 4.0/ NT2000/ XP / VISTA.
- **Minimum Hardware Required:**
PC or NoteBook with Pentium 90MHz or higher, 32 MB RAM ;
At least 50 MB byte hard disk space available to install SE390.
Recommended resolution 800X600.

Install SE-390:

1. We recommend close all other application before installing SE390.
 2. Insert setup CD disk to CD disk drive.
 3. Choose the Start button on the Taskbar and select Run.
 4. Type E:\SETUP and choose OK, then it will copy SE390.exe (executable file) and help file to your hard disk (default is c:\program files\SE390).
- For detailed other operation instruction, please refer to the online help while executing SE390.

▪ Main Menu

File | Open- Retrieve files from the disk.

Save - Save the active window (when the caption bar is highlighted) data to the disk.

Print - Print the data of the active window(graph or list).

Printer Setup - Select printer.

File | **Exit**: Terminates SE390 program.

View | **Control Panel**: By opening the Panel Window, the user can control meter via the button in this window.

View | **Real-Time Graph**: Open Real-Time Graph display to graph the present data.

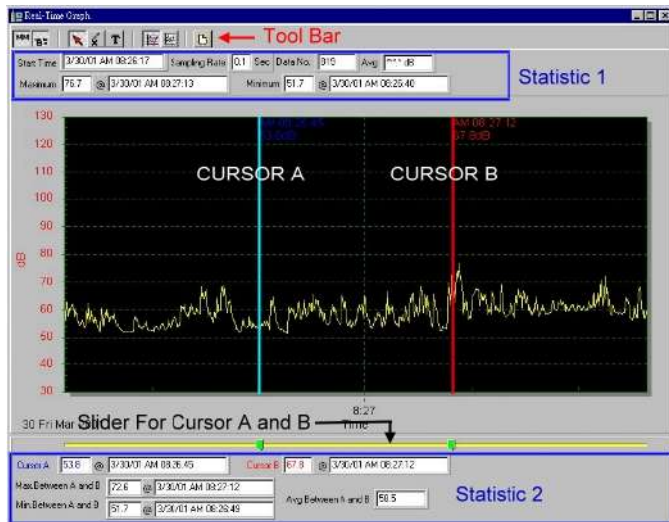
Real Time Data | **Run** - Start collecting real time data.

Stop - Stop collecting real time data.

DataLogger: By opening the DataLogger Window, the user can load recorded data of meter to PC in this window.

Output To Graph - Graphing tabular data.

Graph



Tool Bar



- Display or hide Statistic1.



- Display or hide Statistic2.



- Normal cursor.



- When selected, the mouse cursor will become a cross sign when moving to the graph, click on the graph to mark a cross sign on the graph.



- When selected, the mouse cursor will become a "I" sign when moving to the graph, click on the graph to annotate.



- Color graph.



- Monochrome graph.

You can choose a rectangle area on the graph to zoom in for detail.

There are two vertical line (CURSOR A and CURSOR B) in the graph. There are time and value display on top and right side of each cursor. You can move mouse cursor over cursor A or B and click to drag cursor to move left or right. Right below cursor A and B is a slider. You can also click and drag slider to move cursor A or B. Below the slider is the statistic, it displays start time, sampling rate, data number, maximum and minimum of the graph. The statistic also displays the maximum, minimum and average between cursor A

and B and these data will update automatically when cursor A or B is moving. You can double click the graph to call the option dialog. In option dialog, it is allowed to customize your graph style.

And you can right click the graph (real time graph is not allowed) to call out the popup menu.

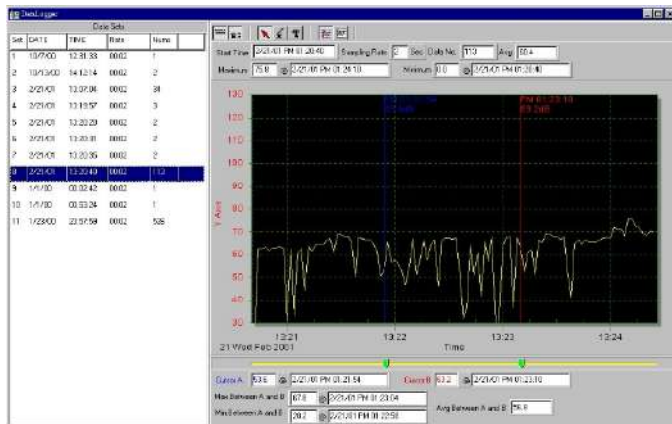
You can Zoom this graph by using mouse:

To Zoom:

1. Press the left mouse button and drag the cursor to select the new extents.
2. Release the mouse button.

To Undo the Zoom - Right click on the graph, there will be a pop-up menu, select Undo Zoom.

DataLogger



When you have Sound Level DATA LOGGER meter connected to PC and select "DataLogger" from main menu or click from tool bar to load recorded data from the meter and there will be a progress indicator to show the loading progress, if error occurs, just click "DataLogger" again.

After the data was loaded, the left hand side will show how many data sets were loaded and detail information for each data set (start data, start time, recording rate and record numbers).

for examples:

Data Sets				
Set	DATE	TIME	Rate	Nums
1	1999/7/25	PM 01:24:52	00:02	10
2	1999/7/25	PM 01:25:38	00:02	5142
3	1999/7/25	PM 09:29:08	00:02	21
4	1999/7/25	PM 09:32:04	00:02	3
5	1999/7/25	PM 09:32:09	00:02	1
6	1999/7/25	PM 09:32:14	00:02	9
7	1999/7/25	PM 10:03:43	00:02	1896
8	1999/7/25	PM 11:06:57	00:02	3
9	1999/7/25	PM 11:49:47	00:02	9086

It will transfer first data set to graph and tabular on the right hand side every time after you load recorded data from the Sound Level Meter and you can click at any data set to change the set for graph.

On the right hand side sets the waveform graph and statistic information of the data set you choose as refer to the graph.


▪ Tutorial - Quick Start to Use SE390


(1.) Recording real time data in waveform.

1. Power on the Sound Level Meter first and connect it to a PC RS-232 serial port with the cable.

2. Start SE390 program.


3. If the connection is successful the panel will display the same value as the Sound Level Meter. If fail to connect the meter with PC, it will display "No Connection" on the panel window in SE390.

4. When the connection is successful, click  to start recording real time data and there will be a waveform on the Real Time Graph Window.

5. Click  to start recording.



(2.) How to save the recorded real time data to a file?

1. Click the graph window you want to save and the graph window will become active, then choose File | Save from main menu or click  from the tool bar.




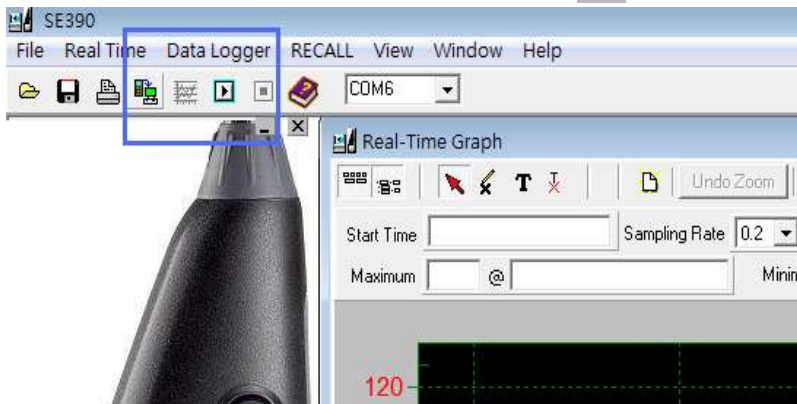
2. There will be a save dialog window for you to choose the file name and file type to save. There are three types of file name you can choose, binary file (*.ghf), text file (*.txt) and EXCEL format file (*.csv). The *.ghf file use much fewer disk space to save the data than the other two file

format, but it can only be used in SE390. Text file can be opened by SE390 and any other word processor program like word, notepad etc. EXCEL format file can be opened by SE390 and Microsoft EXCEL.



(3.) How to load the recorded data from the memory of Sound Level Meter and save it to a file? (Only for the model with Data Logger)

1. Power on the Sound Level Meter.
2. Press the REC button of the meter to start recording data .
3. After a while, press REC button again to stop recording data.
4. Connect the Sound Level Meter to PC
5. Start SE390 program.
6. Choose Data Logger from main menu or click  from tool bar.



7. In reference to Data Logger, see DataLogger.

▪ **Frequently Asked Question:**

1. I had connected Sound Level Meter to PC serial port and turned meter power on, but it still shows "NO CONNECTION".

Answer: It could be that all serial port are occupied by other application, close all other application. If it still don't work. Restart your computer and run SE390 again.

2. How can I save the graph to a file which can be used in EXCEL?

Answer: When you save a graph to a file, the default file format is "*.ghf" and you can select *.csv to save files. CSV is an EXCEL file format. You can open it in EXCEL.

3. How to uninstall SE390?

Answer: Uninstall SE390 by launching the Add/Remove Programs applet out of the Control Panel, highlighting the SE390, and clicking on the Add/Remove... push button, then it will remove the SE390 folder and files from your computer.

4. Why loading data fail?

Answer: This might cause by the slow respond from some of the notebook PC system.

5. How to zoom the graph?

Answer: Press the left mouse button and drag the cursor to select the new extents, and then release the mouse button.

6. When I setup the real time sampling with a fast rate (eg. 0.1 sec), some of the sampling data might be lost.

Answer: This might be caused by slow response time of the PC.

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