Noise Dose Meter

ST-130/ST-130S
User's Manual

HB2ST1300000

Contents:

1. SAFETY PRECAUTIONS

When taking measurements:

- Avoid doing measurements in humid or wet places - make sure that humidity is within the limits indicated in section “environmental conditions”.
- Avoid doing measurements in presence of explosive gas, combustible gas, steam or excessive dust.

The following symbols are used:

Caution: refer to the user’s manual. An incorrect use may damage the tester or its components

The instrument conforms to the CE standard

1.1. Preliminary Description

The ST-130/ST-130s is designed to test noise exposure in accordance with OSHA,MSHA,DOS,ACGIH, and ISO standards.

Fast and easy on-site surveys help determine noise reduction requirements.

The meter can also be used in SLM(sound level meter)mode.
The SLM mode has a datalogging feature that can record up to 1000K readings which can be downloand to PC for analysis.
The built-in USB interface to connect PC.
Applications: Evaluation of environmental noise, Measurements of noise at workplaces, Assessment of product noise.

1.2. Note

CAUTION
Does not observe the warning and/or operation instruction, it’s possible to damage the instrument either its components or the operator

- Do not operate the instrument at temperature and humidity environment beyond to reference conditions of chapter 7.2.1.
- Keep the microphone dry and avoid severe vibration.
- Wind blowing across the microphone would bring additional extraneous noise. Once using the instrument in the presence of wind, it must mount the windscreen to prevent the undesirable signals.

2. PREPARATION FOR USE

2.1. Initial

The instrument has been checked mechanically and electrically prior to shipment. Take care to ensure the instrument reaches you undamaged.

However, it is wise to carry out a rapid check in order to detect any possible damage that may cause during transport.
If it's damage, claims to the dealer immediately.

Check the packaging content according to packing list reported in 7.3.1 chapter .In case of discrepancies, contact the dealer immediately.

In the event of re-shipment of the instrument please follow the instructions reported in chapter 7.3.1.

2.2. Calibration

The instrument complies with the technical specifications contained in this manual and such compliance is guaranteed for 1 year. The instrument is maybe need recalibration after one year.

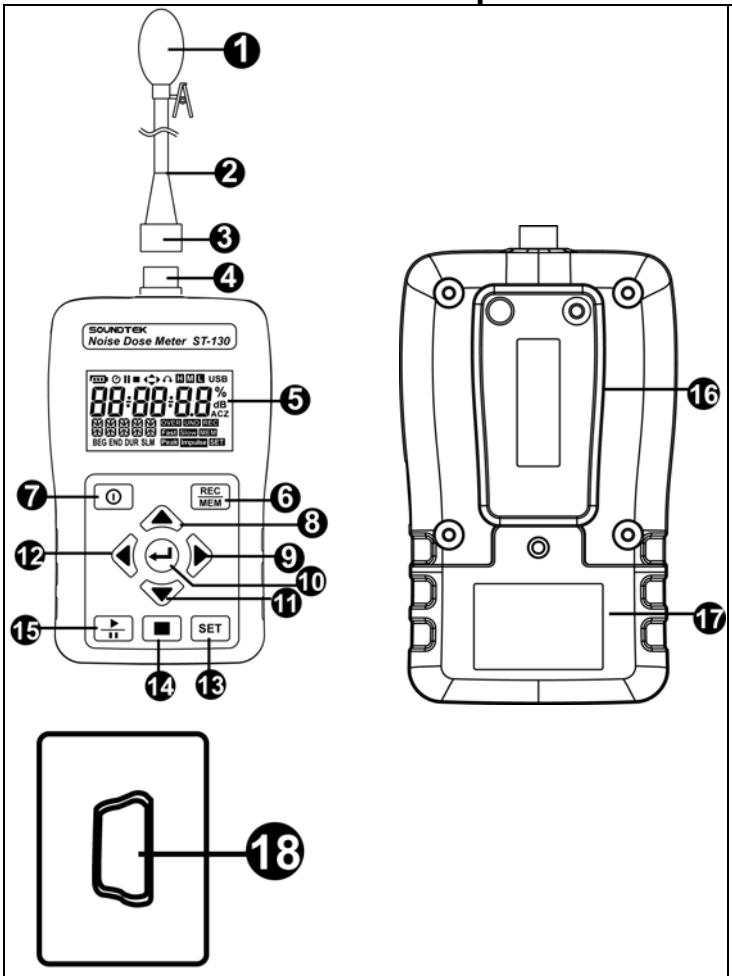
2.3. Storage

After a period of storage in extreme environmental conditions exceeding the limits mentioned in paragraph 7.2.1 let the instrument return to normal measuring conditions before using it.

3. INSTRUMENT INSTRUCTIONS

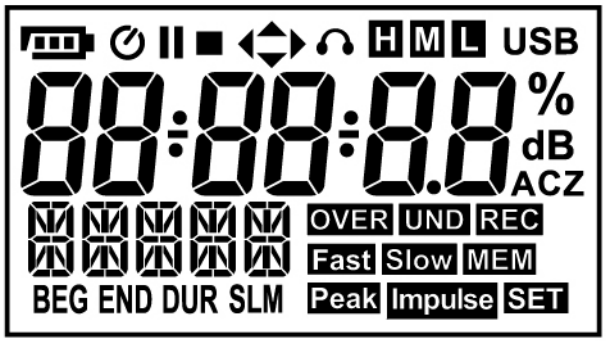
3.1. Instrument Description

3.1.1. Controls Description



1. Microphone
2. Microphone Cable
3. Microphone Connector(Male)
4. Microphone Connector(Female)
5. LCD Display
6. record data / Reading record data button
7. Power ON/OFF Button
8. UP Button
9. Right Button
10. Enter Button
11. Down Button
12. Left Button
13. SET Button
14. Stop Button
15. Start /Pause Button
16. Belt clip
17. Battery Cover
18. USB Interface

3.1.2. Display Description



	Battery Status		Auto Power Off Enable
	Pause		115dB indicator(SPL)
	Stop	Peak	140 dB indicator(Peak)
	Start	USB	USB Interface
H	SPL High dB Range (140~70)		dB Display
M	SPL Middle dB Range (110~50)		Testing mode
L	SPL Low dB Range (90~30)	SLM	Sound Level Meter mode
%	Noise Dose %	dB	Sound Noise dB
A	A Weighting	Fast	Fast Weighting
C	C Weighting	Slow	Slow Weighting
Z	Z Weighting	Impulse	Impulse Weighting
OVER	dB test data > Hi level	UND	dB test data < Low level
REC	Solid: Auto record standby: Flashing recording	BEG	Start test time
MEM	Visit record data	END	Stop test time
SET	SET mode turn on	DUR	Test duration

3.1.3. ST-130S Microphone

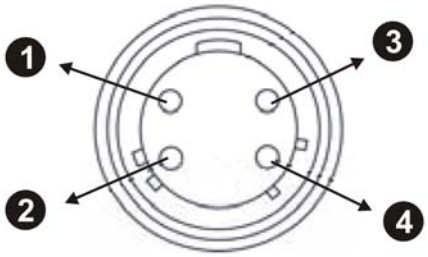
- Diameter : 1/2 inch
- Polarization voltage : 0V
- Dynamic range : 25dBA ~140dB
- Sensitivity : -32±3dB (250Hz 0dB=1V/Pa)
- Free field frequency response : ±2dB(25Hz～12.5kHz)

Frequency (KHz)	Deviation of pressure
0.25	0.0
1	-0.1
2	-0.5
3	-0.6
4	-0.9
5	-1.2
6	-1.7
7	-2.2
8	-2.8
9	-3.3
10	-4.1
12.5	-6.0

3.1.4. Input interface

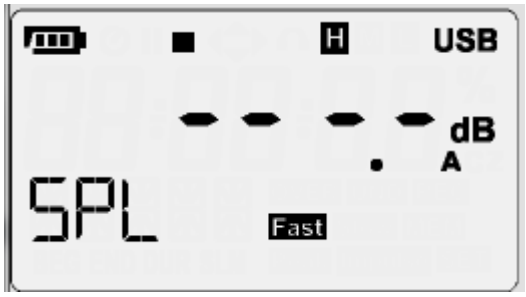
The front is PLT84RFR, the signal input receptacle.

ST-130
Pin 1 GND
Pin 2 Power
Pin 3 NC
Pin 4 NC



ST-130S
Pin 1 GND
Pin 2 Power(+)
Pin 3 N.C
Pin 4 Power(-)

3.2. Noise Does Measurement Procedures



- Press turn on meter
- LCD do not display **SLM** symbol.
- Press turn on noise dose testing. ，press again pause testing.
- Press select testing information

◎ SPL→Dose%→LPMAX→LPMIN→PKMAX→LEQ→SEL→LEP8→TWA8→ LVAG→LN%

- Press to observe testing date information. Press change date display information.

◎ Time(hh:mm:ss)→date(YY-DD-MM)

- Press stop testing and store all test data

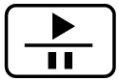
3.3. Sound Level Measurement Procedures

- Press turn on meter

- LCD show **SLM** symbol

- Press  button to select test function.

◎ SPL→Leq→SEL→PeakMAX

- Press  testing , Press  again pause testing
- If test data bigger than HI test range at the same time, LCD is showing **OVER**
- If test data is smaller than Low test range at the same time, LCD is showing **UND**
- Leq integral time setting is along with the same sampling time.
- When the sampling time is set to zero, the integration time until the user exits

- Press  stop testing

CAUTION
Wind blowing across the microphone would bring additional extraneous noise. Once using the instrument in the presence of wind with speed higher than 10m/s, it must mount the windscreen to prevent the undesirable signals. Keep the microphone dry and avoid severe vibration.

3.4. Auto Data Record

- Press  enabled Auto record function.
- LCD **REC** symbol will be flash.
- The bottom left of LCD display ”Write” , this mean the data will be writing to memory.

- The bottom left of LCD display “FULL”, this mean the data will be full.
- Auto record function can not use menu record.

3.5. Single Data Record

- Press REC/MEM each time to store the display reading and REC symbol flash.
- The bottom left of LCD display ”Write” , this mean the data will be writing to memory.

3.6. Viewing Logged Reading

- Press REC/MEM button more than 1 sec into the viewing logged reading mode.
- Press ▲ or ▼ to scroll through the readings.
- Press ▶ select dose record information. (Nosie Dose Meter mode)

  ◎ Test model→Start time→Test duration time →Total pause time→Test end time

- Press ◀ to change data or date, Press ↵ change Time. (hh:mm:ss→YY-MM-DD)
- Press REC/MEM more than 1 sec again to exit viewing logged reading mode.

3.7. Set Mode

- Press SET into set mode , can set 7 functions in set mode
- Press ↵ exit set mode

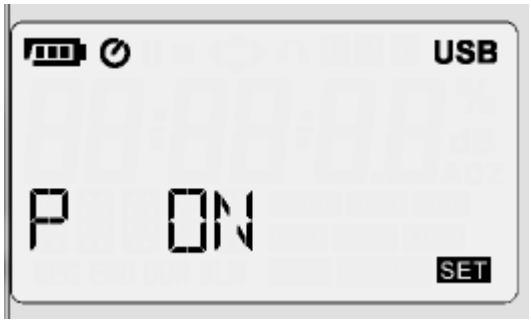
  ◎ Test Mode→Auto Power Off→Sampling Time & Auto Record→Real Time Clock→94dB Offset Adjust→Noise standard→SLM Fuunction
- Press SET again,save set and into next set mode

3.7.1. Test Mode Set

- Press  or  , change test mode. (NDM →SLM)

◎ NDM: Noise Dose Meter
◎ SLM:Sound Level Meter

3.7.2. Auto Power Off Set



- Press  or  , enable or disable Auto Power Off function

3.7.3. Sampling Time & Auto Record Set

- Press  or  , select auto records set or sampling time.
- Press  or  enable or disable Auto record, adjust sampling time.
- Minimum sampling time: 1 second; Maximum sampling time: 23 hours 59 minutes 59 seconds

3.7.4. Real Time Clock Set

- Press or , select option to adjust.
- Press or , adjust time digit.
-

3.7.5. 94dB Offset Adjust Set

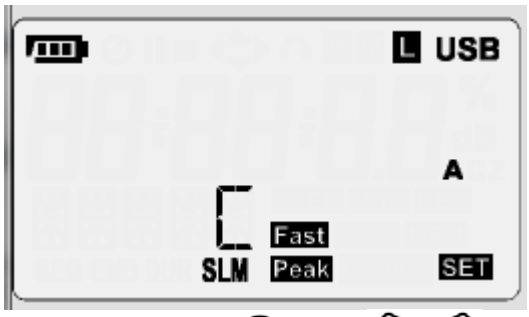
- Press , auto run 94dB offset adjust.
- Press or , change frequency weighted
- Press or , adjust offset

3.7.6. Noise Standard Set

- Press or ,select NDM testing law

◎ OSHA→MSHS→DOD→ACGIH→ISO85→ISO90→USER

3.7.7. SLM Function Set



- Press  or  , change test function

◎ H→M→L

◎ Fast→Slow→Impulse

◎ A→C→Z

◎ Peak C →Peak Z

- Press  or  ,select test function

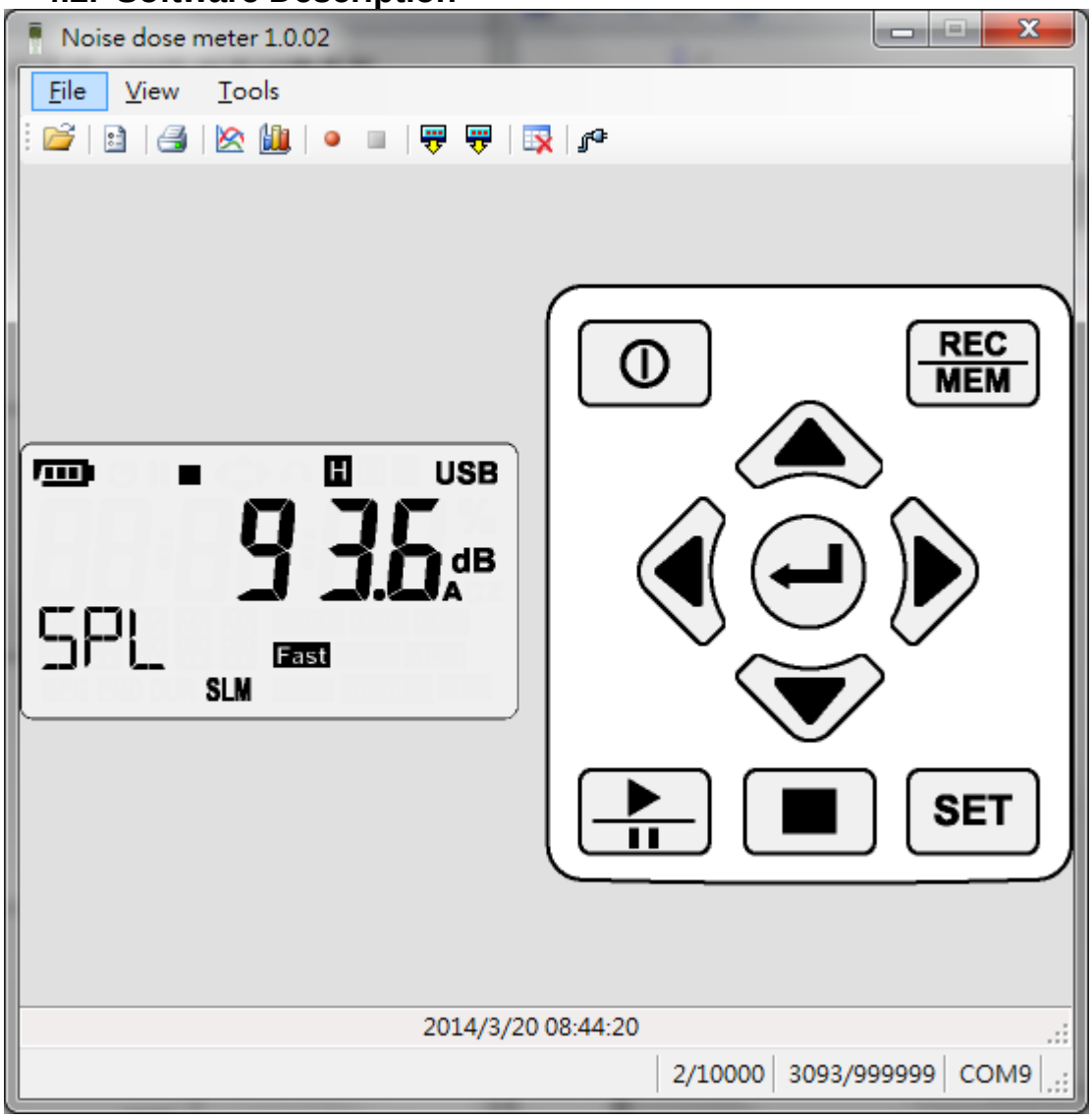
◎ Sound level range→Time weighted→Frequency weighted→Peak frequency

4. SOFTWARE

4.1. System Requirements

- Operating: Windows® XP/Windows Vista/Windows 7/Windows 8
- Storage:200 MB of available hard disk space.
- Processor: Intel Pentium® 4
- Memory:1 GB RAM (XP), 1.5 GB (Windows Vista/Windows 7/Windows 8)
- Other: PL2303 Windows Drive ;Microsoft .NET Framework 3.5 Service Pack 1

4.2. Software Description



4.3. Tools Description

	Open file		Options
	Print noise dose report (*.ndr)		Sound level chart
	Noise dose chart (LN%)		Start to log sound level (*.csv)
	Stop to log sound level		Download sound level logs; Doenload noise does report
	Erase measured data that stored in meter		Automatic detect port which connect with meter

4.4. Open File

- Sound Level Log List Tool

Mode : SPL	SPL→LEQ→SEL→PeakMax
Time Weight : Slow	Fast→Slow→Impluse
Frequency Weight : A	A→C→Z
LEQ & SEL	Calculate LEQ & SEL
	Save file as….
	Graph

- Sound Level Logs Graph

	Zoom
	Drag
	Print
	Print Preview
	Print Setup

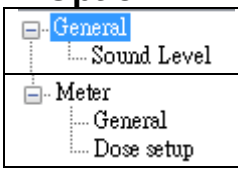
4.4.1. Zoom Function

- Click the left mouse button to zoom in
- Click the left mouse button to original size
- Hold the left mouse button to moving selection range
- Keyboard '+', '-' can zoom in or zoom out

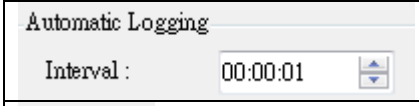
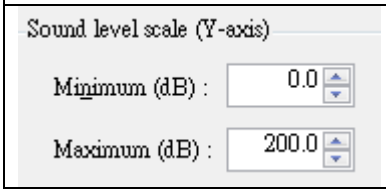
4.4.2. Drag function

- Hold the left mouse button can moving view range
- Hold CTRL+ left mouse button can be change view range and zoom

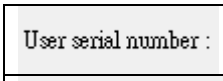
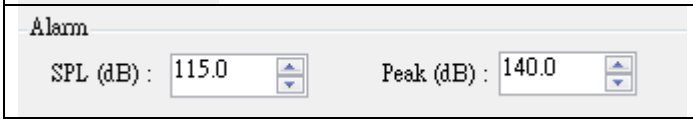
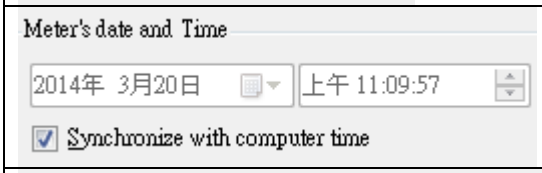
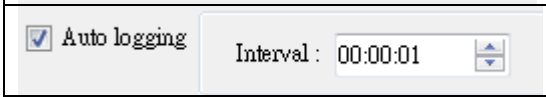
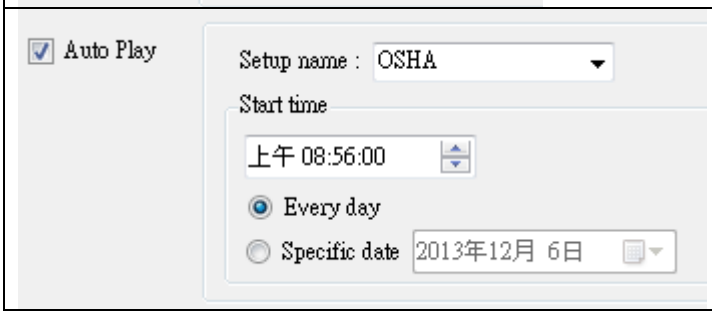
4.5. Option

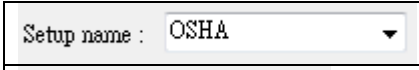
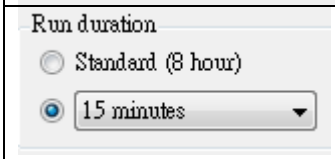
	PC Setting
	Meter Setting

4.5.1. PC Setting

	PC data logger sample time.
	Click the left mouse button to change the color box
	Graph (Y-axis) sound level range

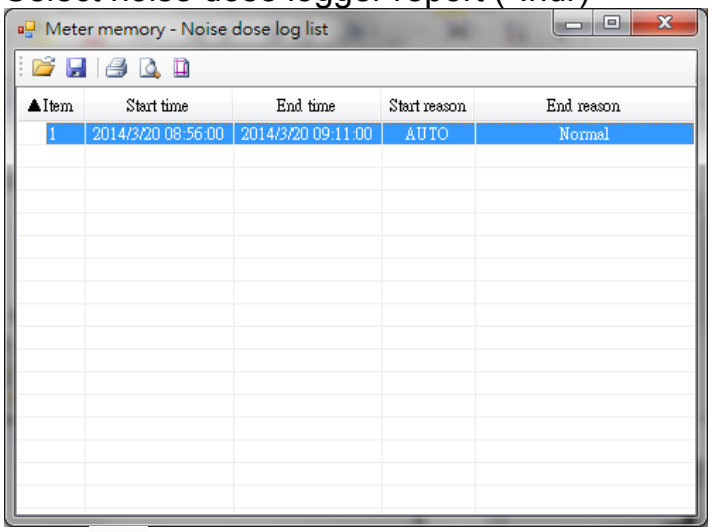
4.5.2. Meter Setting

	Serial number(0~9;A~Z)16 word
	Alarm setting
	dB Offset setting MAX:+3.9dB MIN:-3.9dB
	Setting meter real time clock
	Enable/disable auto Record. Setting sample time
	Enable/disable auto play noise dose function. Meter must be turn on and setting in NDM(noise does meter) mode

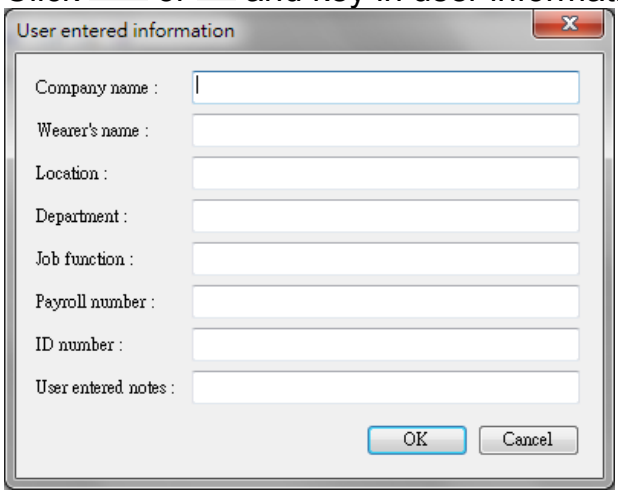
	Select noise dose standard
	Select noise dose play time. Default standard(8hour), Other 5；10；15；30min 1；2 ；4；8；10；12；24 hour
	Setting information import or export ,file format(*.ncg)

4.6. Print Noise Dose Report

- Select noise dose logger report (*.ndr)

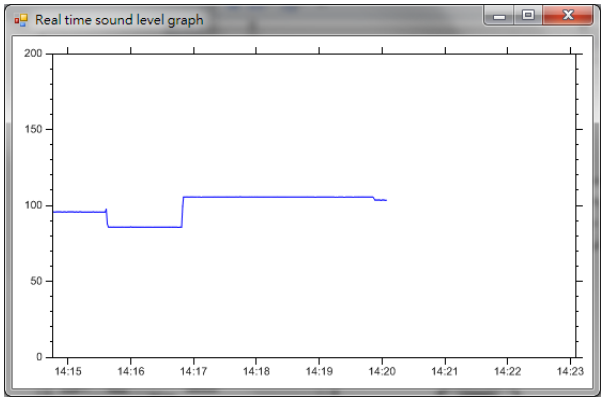


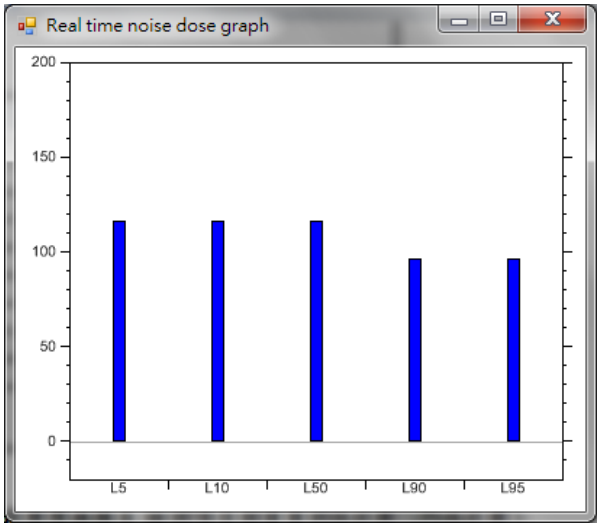
- Click  or  and key in user information , click “ok” ,the output report



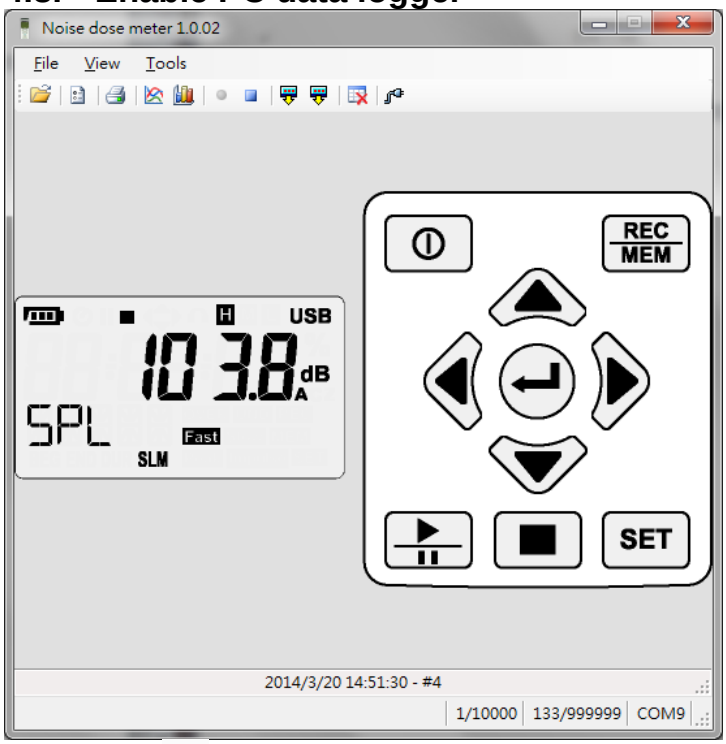
4.7. Sound level chart & Noise dose chart (LN %)

- Sound level char. X-axis is the time coordinate.Y-axis is the sound coordinate.
- Noise does chart. X-axis is the LN%. Y-axis is the sound coordinate.





4.8. Enable PC data logger



- Click enable data logger.
- Create a new log file (*. csv) in the hard disk.
- Click stop data logger.

4.9. Dowload Record data

- Click download sound level logs or noise dose report on the meter memory.
- Download 100K record data. it takes about 15 minutes time-consuming, please be patiently.

4.10. Erase Record data

- Click delete all records of the meter.

5. EXPLAINATION

5.1. 1. MEASUREMENT PARAMETERS:

Test Function	Screen parameter	Explaination
SPL	LAFp	Sound pressure level (SPL)
SPL	LASp	Sound pressure level (SPL)
SPL	LCFp	Sound pressure level (SPL)
SPL	LCSp	Sound pressure level (SPL)
SPL	LZFp	Sound pressure level (SPL)
SPL	LZSp	Sound pressure level (SPL)
Leq	LAFq	Equivalent continuous level for the duration of the measurement for A weighting
Leq	LCFq	Equivalent continuous level for the duration of the measurement for C weighting
Leq	LZFq	Equivalent continuous level for the duration of the measurement for Z weighting
SEL	LAE	Frequency weighted sound exposure level for the duration of the measuremen for A weighting
SEL	LCE	Frequency weighted sound exposure level for the duration of the measuremen for C weighting
SEL	LZE	Frequency weighted sound exposure level for the duration of the measuremen for A weighting
Peak	Lcpeak	Instantaneous C peak level

5.2. A, C, Z WEIGHTING INSTRUCTION:

1. : The A weighting curve is based on 40 Phon Fletcher-Munson Equal Loudness Contour, Noise assessment in human, suggest to use the A weighting.

2. The C weighting in essentially is approximate smooth. With labor safety concern, suggest using the C weighting.

3. The Z weighting for the electric instrument interior not the linear signal which processes after the filter, suits in wants to output AC or the DC signal does other research to use.

   The Z weighting is a linear signal which is not processed through the filter.

   It's suitable to output AC or DC signal for research.

4. **Sound Level Meter Class Description:**

- Class 0: use in the laboratory reference standard.
- Class 1: laboratory or field use.
- Class 2: laboratory or field use.
- Class 3: general field use.

6. MAINTENANCE

6.1. GENERAL INFORMATION

This is a precision instrument. To guarantee its performance be sure to use it or keep it stored on suitable environmental conditions. Do not expose it to high temperatures or humidity or direct sunlight. Be sure to turn the power off after use. If you expect not to use the instrument for a long period remove batteries to avoid leakages of battery liquid which could damage the its inner components.

6.2. BATTERY REPLACEMENT

The low battery "  " indication is displayed; the battery should be replaced.

- Turn off the instrument.
- Remove the battery cover.
- Remove all the batteries from the battery holder.
- Insert four new batteries of the same type respecting the polarity signs.
- Install the battery cover.
- Please follow the local laws and regulations to process the waste battery.

6.3. CLEANING

To clean the instruments use a soft dry cloth. Never use a wet cloth, solvents or wate.

6.4. END OF LIFE

Caution: this symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal.

7. TECHNICAL SPECIFICATIONS

7.1. FEATURE

Environmental conditions: temperature 23℃ ± 5℃, relative humidity < 80%.

Display	Single LCD MAX reading 999999
Display Refresh Rate	1 Time/sec
Standards	IEC 61252-1993 IEC 61672-1-2003 ANSI S1,25-1992 ANSI S1,4-1983 ANSI S1,43-1997
Microphone(ST-130S)	1/2” pre-polarized condenser microphone build in preamplifier: 1V/Pa@250HZ, frequency range: 20 Hz~12.5 kHz, Thermal noise: <25 dB(A)
Microphone(ST-130)	1/2 inch Electret condenser microphone
Measurement Items(NDM)	Does%,Lxyp,Lxmax,Lxmin,Lxeq,SEL(LAE),PeakMAX,LAVG,TWA,LEP,LN%
Measurement Items(SLM)	Lxyp,Lxmax,Lxmin,Lxeq,SEL(LAE),PeakMAX
Display Range	30dB to 90dB (L) 50dB to 110dB (M) 70dB to 140dB (H)
Primary RMS Range @1KHZ	41dB to 86dB (L) 55dB to 106dB (M) 75dB to 125dB (H)
Maximum Peak C Weighting Sound Level Measurement	90~143 dB
Dynamic Range	60 dB
Accuracy	±1.4dB@94dB /1KHZ
Internal memory	MAX Datalogger data：10000(NDM);999999(SLM)
Time Weighting	Fast, Slow, Impulse
Frequency Weighting	A/C/Z
Frequency Range	20Hz~8KHz
Starting Time	＜10 Second
Battery Life(ST-130)	24 hours (9V×1 battery Alkaline)
Battery Life(ST-130S)	20 hours (9V×1 battery Alkaline)
Dimensions	107(L) x 65(W) x 33(H) mm

7.2. ENVIRONMENT

7.2.1. Environmental Conditions

- For inside use, max height: 2000m
- Reference temperature: 23° ± 5℃
- Operation temperature: 5 ~ 40 ℃
- Operation humidity: <80% RH
- Storage temperature -10 ~ 60 ℃
- Storage humidity <70%

7.2.2. EMC

This instrument was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-2 (2006).

7.3. ACCESSORIES

7.3.1. Standard Accessories

- Noise Dose Meter.
- User's manual.
- Carrying case.
- 9 V battery 、NEDA 1604 、IEC 6F22 or JIS 006P.
- Microphone diameter windscreen.
- Software.
- MINI USB Cable (Mini B type).

8. SERVICE

8.1. WARRANTY CONDITIONS

This instrument is guaranteed for one year against material or production defects, in accordance with our general sales conditions. During the warranty period the manufacturer reserves the right to decide either to repair or replace the product.
Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to non-original packaging will be charged anyhow to the customer.

The warranty doesn't apply to:
Accessories and batteries (not covered by warranty)
Repairs made necessary by improper use (including adaptation to particular applications not foreseen in the instructions manual) or improper combination with incompatible accessories or equipment.
Repairs made necessary by improper shipping material causing damages in transit.
Repairs made necessary by previous attempts for repair carried out by non-skilled or unauthorized personnel.
Instruments for whatever reason modified by the customer himself without explicit authorization of our Technical Dept.

8.2. SERVICE

Shouldn't the instrument work properly, before contacting your distributor make sure that batteries are correctly installed and working, check the test leads and replace them if necessary.

TENMARS ELECTRONICS CO., LTD
6F, 586, RUI GUANG ROAD, NEIHU,
TAIPEI 114, TAIWAN.
E-mail: service@tenmars.com
http://www.tenmars.com