Noise Dose Meter

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

HB2ST1300004

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, Measuremen

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 its 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.

2.2 Supply Voltage

The instrument is powered by batteries.
When battery voltage is low than low battery voltage, turn on low battery symbol.

CAUTION

If you don't use the instrument for a long period, please take the batteries out to prevent eventual acid leakage from damaging the instrument

2.3 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.

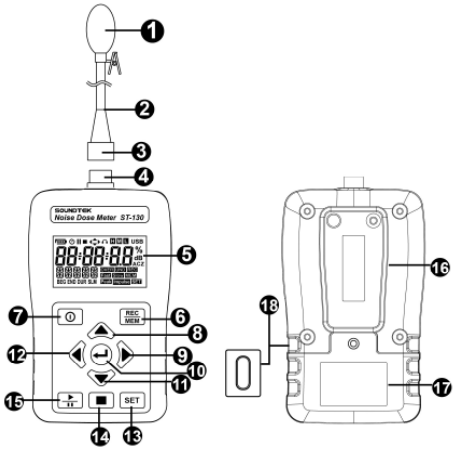
2.4 Storage

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 dada / Reading Record dada 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 cable

3.1.2 Display Description

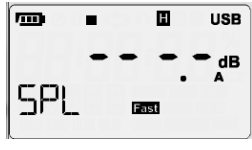
	Low Battery		Auto Power Off Enable
	Pause		115dB indicator(SPL)
	Stop	Peak	140 dB indicator (Peak)
	Start	USB	USB cable
H	SPL Hi dB Range (140~70)		dB Display
M	SPL Mid dB Range (110~50)		Testing mode
L	SPL Lo dB Range (90~30)	SLM	Sound Level Meter mode
%	Noise Dose %	dB	Sound Noise dB
A	A Weighting	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 < Lo 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

3.2 Noise Does Measurement Procedures



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

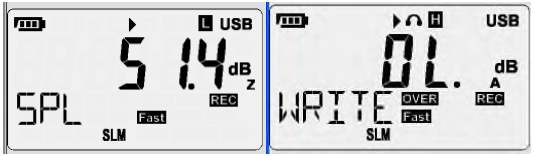
- Press ▶ select testing information
- SPL→Dose%→LPMAX→LPMIN→PKMAX→LEQ →SEL→LEP8→TWA8→LVAG→LN%
- Press ◀ to observe testing date information.
  Press ↵ change date display information.
- Time (hh : mm :ss) →date(YY-DD-MM)
- Press ■ stop testing

3.3 Sound Level Measurement Procedures

- Press ⏻ turn on meter
- LCD show **SLM** symbol
- Press ▶ button to select test function.
- SPL→ Leq → SEL → Peak MAX
- Press ▶❚❚ testing, press ▶❚❚ again pause testing
- If test data big than HI test range at the same time LCD showing **OVER**
- If test data small than Low test range at the same time LCD showing **UND**
- Leq integral time setting and 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.

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)
- 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.

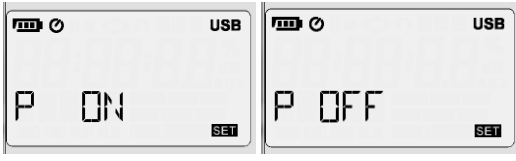
3.7 Set Mode

- 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 Function
- 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

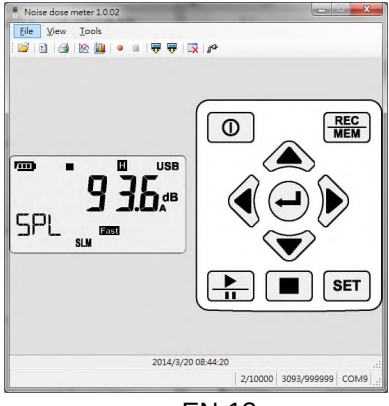
- Press  or  , change test function
- H→M→L
- Fast→Slow→Impulse
- A→C→Z
- Peak C →Peak Z
- Press  or  , select test function
- Sound level range →Time weighted →Frequency weighted →Peak frequency

4. Software

4.1 Software Installation

1. Link website https://www.tenmars.com/
   or scan below QR code:
2. Search ST-130.
3. Click on the ST-130 photo.
4. Click **File Download**, then select **Software** Download.
5. Download and unzip the software.
6. For the latest software information and installation procedures, please refer to the software installation guide.

4.2 Software Description

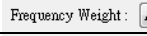
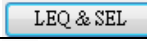
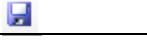


4.3 Tools Description

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

4.4 Open File

- Sound Level Log List Tool

	SPL→LEQ→SEL→PeakMax
	Fast→Slow→Impluse
	A→C→Z
	Calculate LEQ & SEL
	Save file as….
	Graph

■ Sound Level Logs Graph

	Zoom
	Drag
	Print
	Print Preview
	Print Setup

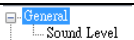
4.4.1 Zoom Function

- 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

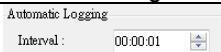
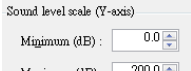
4.4.2 Drag function

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

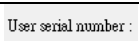
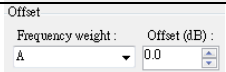
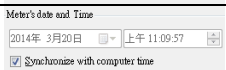
4.5 Option

	PC Setting Meter Setting

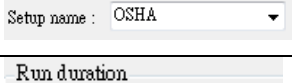
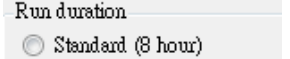
4.5.1 PC Setting

	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

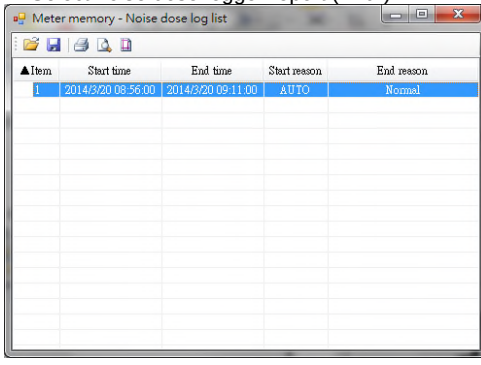
	Serial number (0~9; A~Z)16 word
	Alarm setting
	Offset setting MAX: +1.5dB MIN: -1.5dB
	Setting meter real time clock
	Enable/disable auto record. Setting sample time
	Enable/disable auto play noise dose function. Meter must be turn on and setting in NDM (noise does meter) mode

4.5.3 Dose Setting

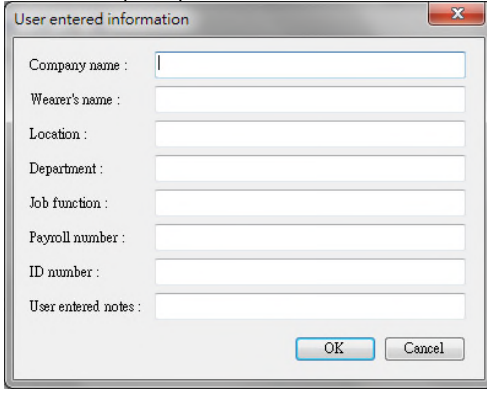
	Select noise dose standard
	Select noise dose play time. Default standard(8hour), Other 5；10；15；30min 1；2 ；4；8；10；12；24 hour
	Setting information import or export, file format(*.ncg)

4.6 Print Noise Dose Report

- Select noise dose logger report (*.ndr)

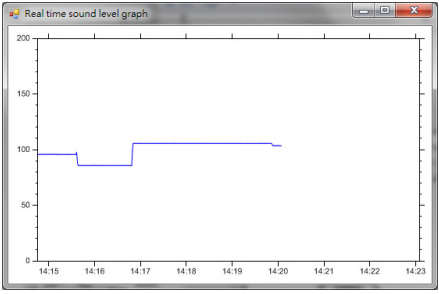


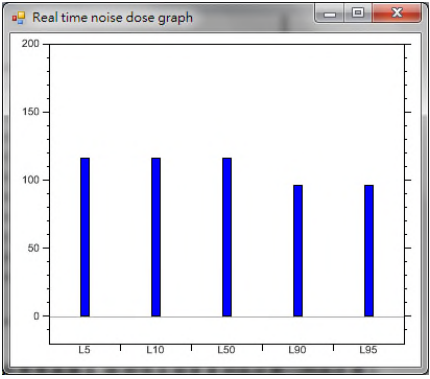
- Click  or  and key in user information, click ok, the output report



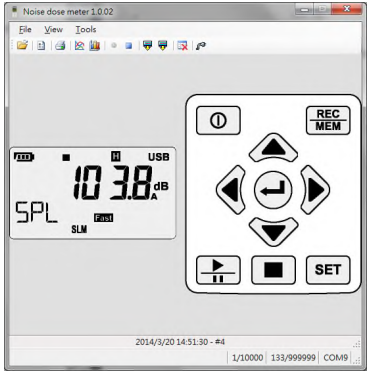
4.7 Sound level chart & Noise dose chart (LN %)

- 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 Download Record data

Click download sound level logs or noise dose report on the meter mrmory
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. Explanation

5.1 Measurement Parameters:

Test Function	Screen parameter	Explanation
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 measurement for A weighting
SEL	LCE	Frequency weighted sound exposure level for the duration of the measurement for C weighting
SEL	LZE	Frequency weighted sound exposure level for the duration of the measurement for A weighting
Peak	Lcpeak	Instantaneous C peak level

5.2 A, C, Z Weighting Instruction:

A: The A weighting curve is based on 40 Phon fletcher-Munson Equal Loudness Contour. For noise assessments of the effects of noise on human hearing, the A weighting mode is recommended.

C: The C weighting mode is recommended for machine sound monitoring (steady, drone type).

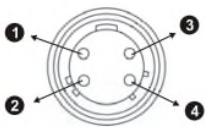
Z: The Z weighting offers a linear signal response that is not processed through the meter's filter. Z weighting is suitable for monitoring electrical signals (AC or DC signals for research purposes, for example).

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.

5.2.1 Input interface

The front is PLT 4, 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 NC
Pin 4 Power (-)

6. MAINTENANCE

6.1 General Information

This is a precision instrument. To guarantee its performances 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 it 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 batteries are to 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 depend on the local laws and regulations to process the waste battery.

	WARNING
	If not used for a long time or more than 1 month, please remove the battery to prevent battery leakage and corroding the internal components.

6.3 Cleaning

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

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°C ± 5°C, relative humidity < 80%.

Display	999999 count LCD
Display Refresh Rate	1 Time/sec
Standards	IEC 61252-1993 IEC 61672-1-2002 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)	SPL, DOSE%, LPMAX, LPMIN, PKMAX, LEQ, SEL, LEP8, TWA8, LAVG, L5%, L10%, L50%, L90%, L95%
Measurement Items (SLM)	SPL, LEQ, SEL, PKMAX
Measurement Range	30dB to 140dB (A) 35dB to 140dB (C) 40dB to 140dB (Z)
Primary RMS Range @1Khz	41dB to 86dB (L) 55dB to 106dB (M) 75dB to 125dB (H)

Dynamic Range	60 dB
Accuracy	±1.5dB@ ref 94dB 1KHZ
Internal memory	MAX Datalogger data： 10000(NDM);1000000(SLM)
Maximum Peak C Weighting Sound Level Measurement	90~143 dB
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	113(L) x 65(W) x 34(H) mm
Weight	160g (not including battery)

7.2 Environment

7.2.1 Environmental Conditions

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

7.2.2 EMC

EN61326-1: CISPR 11: Group 1, Class A

- ✧ Class A – Equipment for use in domestic establishments and outside facilities.
- ✧ Group 1 – RF energy generated is needed for internal functioning.

7.3 Accessories

- ■ Meter: Noise Dose body.
- ■ User's manual.
- ■ Carrying case.
- ■ 1 batteries 9 V Alkaline
- ■ Diameter windscreen.
- ■ USB Cable.

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.

Our products are patented. The logotypes are registered. We reserve the right to modify characteristics and prices as part of technological developments which might require them.

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