Manuals+

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Contents [hide]

TENMARS

TENMARS ST-107 Integrating Sound Level Meter

Product Information

Specifications

- **Model:** ST-107/ST-107S
- **Product Code:** HB2ST1070005
- **Test Modes:** SPL (LXYP), LEQ, SEL (LAE), PEAK MAXIMUM, RT60 (REVERBERATION TIME)
- **Weighting Options:** A, C, Z
- **Output:** Analog AC/DC

Product Usage Instructions

Safety Precautions

Before using the Integrating Sound Level Meter, please read the safety precautions in the user manual to ensure safe operation.

Preliminary Description

Get familiar with the basic functions and features of the ST-107/ST-107S as described in the manual.

Preparation for Use

Follow the steps outlined in the manual for setting up the Integrating Sound Level Meter.

SPL (LXYP) Test Mode

Instructions on how to perform sound pressure level testing using the LXYP method.

LEQ Test Mode

Details on setting up and conducting LEQ testing with the Integrating Sound Level Meter.

Software Installation

Guide on how to install the required software for the Integrating Sound Level Meter.

Maintenance

Learn about the maintenance procedures to keep your device in optimal condition.

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
CE	The instrument conforms to the CE standard

PRELIMINARY DESCRIPTION

Integrating Sound Level Meter. It may also survey: SPL(Lxyp), Lxmax, Lxmin, Lxeq, SEL (LAE) Lcpeak, RT60, three kind of at the same time frequency weighting (A, C, Z) and three kind of at the same time weighting (F, S, I) may simultaneously survey many kinds of appraisal target, the dynamic range is bigger than 100dB, it does not need to select the measuring range when doing measurements, the operation is simple.

Applications: Evaluation of environmental noise, Measurements of noise at workplaces, Assessment of product noise.

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 13.2.1.
- 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. (Refer to EN-7. Fig.1)

PREPARATION FOR USE

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 13.3.1 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.

Supply Voltage

The instrument is powered by batteries. When batteries are low, a low battery indication is displayed.
To replace/insert batteries as the instructions indicated in chapter.
The instrument can also be powered by the external power supply. The external power supply's voltage is 6~9V and its maximum output current is 500mA.

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

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.
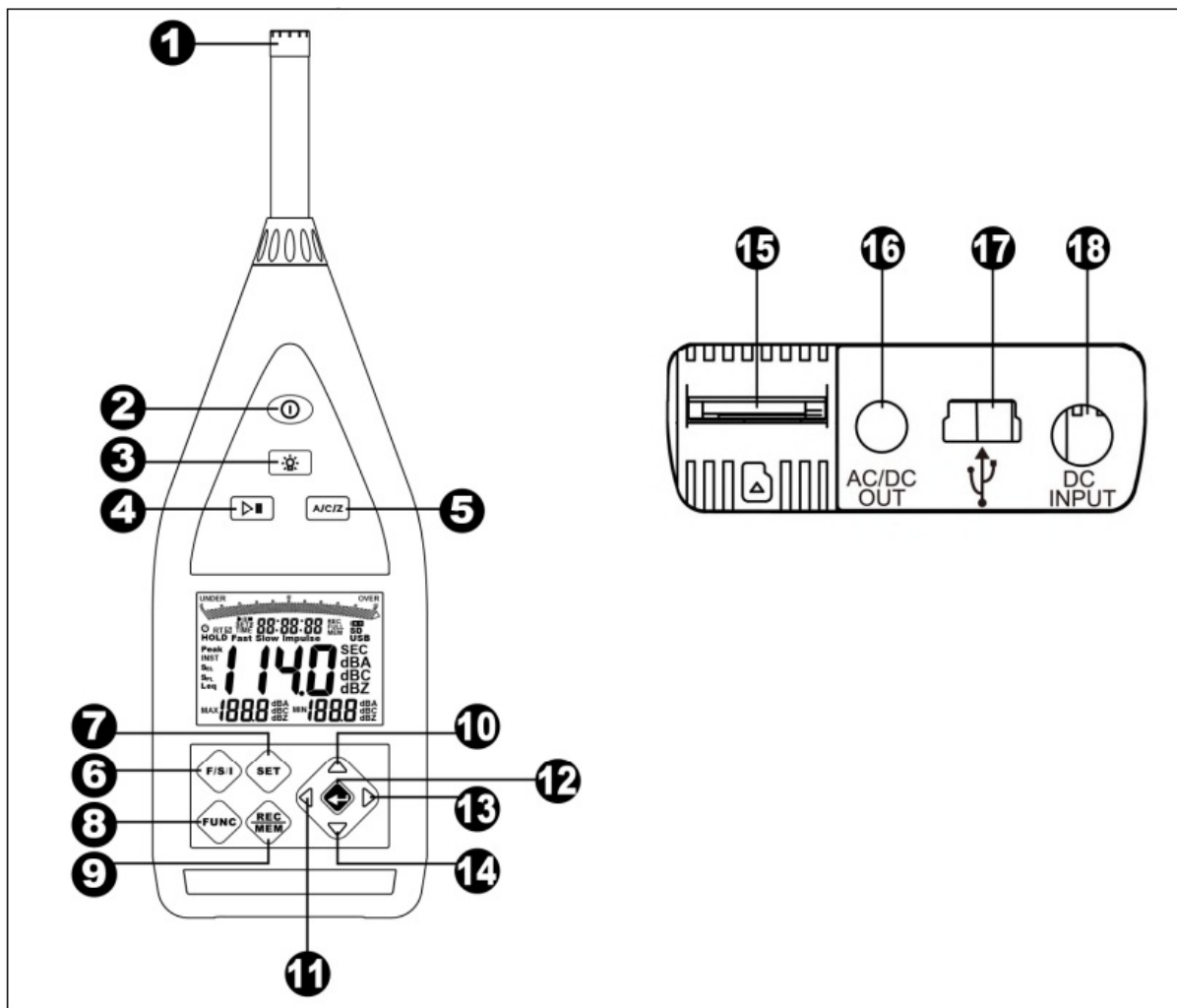
Storage

After a period of storage in extreme environmental conditions exceeding the limits mentioned in paragraph 11.2.1 let the instrument return to normal measuring conditions before using it.

INSTRUMENT INSTRUCTIONS

Instrument Description

Controls Description

1. Microphone

2. Power Button

3. Backlight Button

4. Start or Pause Test Button

5. Frequency Weighting Select Button

6. Time Weighting Select Button

7. Set Button

8. Test function select button

9. Record dada / Reading Record dada button

10. Data Hold/ up arrow button.

11. Clock switch/left arrow button

12. OK button

13. Clock switch/right arrow button

14. Shift switch/end measurement/down arrow button

15. MICRO SD card slot

16. Analog/RS232 professional output

17. USB

18. DC voltage input (6V~12V)

Display Description

UNDER |||||||||||||||||||||||||||||| OVER	Bargraph
⏻	Auto Power Off
RT60	Reverberation Time
HOLD	Data Hold
Peak	Peak
S$_{EL}$	Sound exposure level
S$_{PL}$	Sound pressure level
Leq	Equivalent continuous level
1888	Sound level read out
MAX	Maximum
MIN	Minimum
dBZ	Z Weighting
dBC	C Weighting
dBA	A Weighting
SEC	Reverberation Time unit
USB	USB deliver
SD	SD Install
▯+ −	Low Batty
REC	Record
FULL	Memory Full
MEM	Memory Viewing
Impulse	Impulse Response
Fast	Fast Response
Slow	Slow Response
88:88:88	Clock Read out t
▶	Start Measures
‖	Pause Measures
■	Stop Measures
SET8	Setup Mode
TIME	Measure Time

ST-107S 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

Measurement Procedures

- Press ⓞ button turn on sound level meter press this button again turn off sound level meter

- Press (FUNC) button to select test function.
    - Lxyp→Leq→LAE→PeakMAX→RT60

- Press (F/S/I) button to select time weighting.
    - Fast→Slow→Impulse

- Press [A/C/Z] button to select frequency weighting.
    - A weighting→C weighting→Z weighting

- Press [▷II] button start test, press [▷II] button again pause test

- Press ▽ button stop test

Turn on the meter deform test mode is Lxyp mode; A weighting; Fast weighting

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.
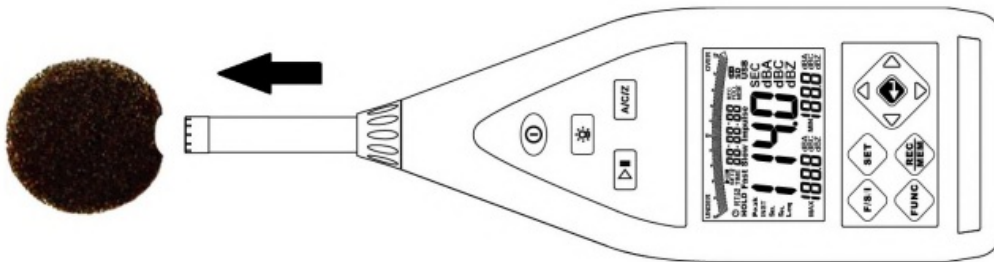
Fig. 1

Data Hold

- Press ⌂ button to lock display data, press this button again to unlock

Maximum/Minimum

- Press ▷❚❚ button to action MAX/MIN record mode, store maximum/minimum data, store time 99hours 59 minutes 59seconds,can press ▷❚❚ button end measure action in advance

Single Data Record

- Press REC/MEM button each time to store the display reading and memory location in

memory

Viewing Logged Reading

- Press (REC MEM) button more than 1 sec into the viewing logged reading mode
- Press △ or ▽ button to scroll through the readings
- Press ◁ or ▷ button to change time data (hh:mm:sec→YY-MM-DD)
- Press (REC MEM) button again to exit viewing logged reading mode

Set Mode

- Press (SET) button into set mode , can set 7 functions in set mode

Clock set

- Press ◁ or ▷ button to select option to adjust
- Press △ or ▽ button to change digit
- Press ⇦ button to store set and exit set mode
- Press (SET) button no store set data, into next set mode

Auto Record Time Set

- Press ◁ or ▷ button to select option to adjust

- Press △ or ▽ button to change digit

- Press ↩ button to store set and exit set mode

- Press SET button no store set data, into next set mode

- Minimum auto record time: 1 second; Maximum auto record time: 23 hours 59 minutes 59 seconds

- Set auto record time equal 0 second0 disable auto record function

Auto Power Off Time Set

- Press △ or ▽ button to change digit

- Press ↩ button to store set and exit set mode

- Press SET button no store set data, into next set mode

- If you want to not auto power off, you can set auto power off time to 0

- Maximum auto power off time: 99 minutes

Clear Data Logger Memory

- Press [REC/MEM] button to clear data logger memory for last record

- Press [←] button to store set and exit set mode

- Press [SET] button no store set data, into next set mode

Clear All Data Logger Memory

- Press [REC/MEM] button LCD will flash "ALL"

- Press [REC/MEM] button again clear all data logger

- Press [←] button to store set and exit set mode

- Press [SET] button no store set data, into next set mode

Copy All Data Logger To micro SD Card

- Before carrying on data to copy please insert micro SD card first
- Copy to micro SD card file to be named this machine ID; The max support capacity of micro SD card is 32GB
- This machine ID can be gone to by the user to define by oneself in the PC program, file format is ○○○○○○○.IAR; Can define word dollar as 0~9;A~F
- Press REC/MEM button Starts copying data logger data to micro SD Card
- Press button to store set and exit set mode
- Press SET button no store set data, into next set mode
- micro SD CARD suggests use Transcend
- When usage copy function, please use transformer the power (DC 6~9V/500mA)
- Please change into the format of the micro SD card FAT or FAT32 formats

Auto Backup

- The auto backup function is automatically copy memory data into miniSD card, and automatically delete record data
- Be in use auto backup function, please use transformer power supply
- Press button LCD will flash"On", be in use automatic backup function

- Press button to store set and exit set mode
- Press button no store set data, into next set mode

94dB Calibration

Please first semaphore of inputing the 94 dBA@s 1 KHZ to the meter.

- Right bottom LCD to display for test a value at present, Calibration range 91.0~97.0dB.
- Left bottom LCD displays for the correction data that estimates to write a memory.
- Press button store correction to be worth and escape from to set mode.
- Press button don't store correction to be worth and escape from to set mode.

SPL (LXYP) TEST MODE

- SPL (Lxyp) test mode deform frequency weighting is A weighting; time weighting is FAST.
- Press button start a Lxyp Max/Min measurement.
- Press to change frequency weighting before starting a measurement .
- Press button to change time weighting .
- Press button pause measurement after starting a measurement
- Press button can end a measurement in advance.
- LCD show on the period of the measurement is for experience time, the longest record 99hours 59 minutes 59sec.

Have not started measurement

Start measurement

Pause measurement

LEQ TEST MODE

- Leq test mode deform frequency weighting is A weighting; time weighting is FAST; Time of the integral 30 secs.
- Press [A/C/Z] to change frequency weighting before starting a measurement.
- Press [▷❚❚] button pause measurement after starting a measurement.
- Press ▽ button can end a measurement in advance.
- LCD show on the period of the measurement is an integral time,adopt countdown system .

 Have not started measurement

 Start measurement

 End measurement

LEQ Auto Record Setting: in LEQ measurement time setting toggle by 'RECORD/MEMORY' key

INTEGRAL TIME SET

Leq test mode press button into integral to set for time, can select that 9 kinds of integral time or hand operation establish definite integral for time .

 SET 0 prepare to establish integral time 10 sec

 SET 1 prepare to establish integral time 1 minutes

 SET 2 prepare to establish integral time 5 minutes

 SET 3 prepare to establish integral time 10 minutes

 SET 4 prepare to establish integral time 30 minutes

 SET 5 prepare to establish integral time 1 hour

 SET 6 prepare to establish integral time 8 hour

 SET 7 prepare to establish integral time 16 hour

 SET 8 prepare to establish integral time 24 hour

 SET 9 moveses to establish definite integral for time, the shortest integral calculus time 1 sec, the longest integral calculus time 30 days 23 hours 59 minutes 59 sec

- Press button choose integral calculus enactment.

- ◁;▷ button to select option to adjust.
- △;▽ button to change digit.
- Press ⬅ button to store set and exit set mode.

SEL (LAE) TEST MODE

- SEL (LAE) test mode deform frequency weighting is A weighting;time weighting is FAST.
- Press A/C/Z to change frequency weighting before starting a measurement
- Press ▷❚❚ button pause measurement after starting a measurement.
- Press ▽ button can end a measurement in advance.
- LCD to show on the period of the measurement is for experience time,the longest record 99hours 59 minutes 59sec


Have not started measurement

Start measurement

End measurement

PEAK MAXIMUM TEST MODE

- Peak test mode deform frequency weighting is C weighting; time weighting is Peak.
- Press ▷❚❚ button pause measurement after starting a measurement.
- Press ▽ button can end a measurement in advance.
- LCD show on the period of the measurement is for experience time,the longest record

99hours 59 minutes 59sec.

Have not started measurement

Start measurement

End measurement

RT60(REVERBERATION TIME) TEST MODE

- RT60 test mode deform frequency weighting is A weighting; time weighting is Fast.
- Press [A/C/Z] to change frequency weighting before starting a measurement.
- Press [▷❚❚] button pause measurement after starting a measurement.
- Press ▽ button can end a measurement in advance.
- MAX value is the 1st getting value equal / or more than 90dB.
- MIN value is MAX value minus 60 dB, the 60dB is a fixed/standard value after calculation.
- The reverberation time is for calculating the require time from MAX. value (i.e. 91dB) reduce to MIN (i.e.31dB) .

Have not started measurement

Start measurement

End measurement

RT 60 ESTIMATE MODE

- RT 60 estimate formula is RT60= 0.161×V /SA

- Press ⬦SET button for setting / input the room's m3 (cube meter), for example: 10

- Press ⬦SET button for setting the value of sound surface absorb accumulates value (SA), for

- Example : 1.0 .

- Press ⬦SET button for RT60 estimation, for example : 1.6 seconds

- Press ⬅ button to exit RT 60 estimate mode.

- ⬆; ⬇ button are for the input value modification (more or less) for room m3 or

EXPLANATION

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 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

A, C, Z WEIGHTING INSTRUCTION:

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

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

Z: 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.

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.

Input interface

The front is PLT 4, the signal input receptacle. The pin definition and function are shown in Fig 2

ST-107

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

ST-107S

- Pin 1 Power(+)
- Pin 2 GND
- Pin 3 Power(-)
- Pin 4 GND
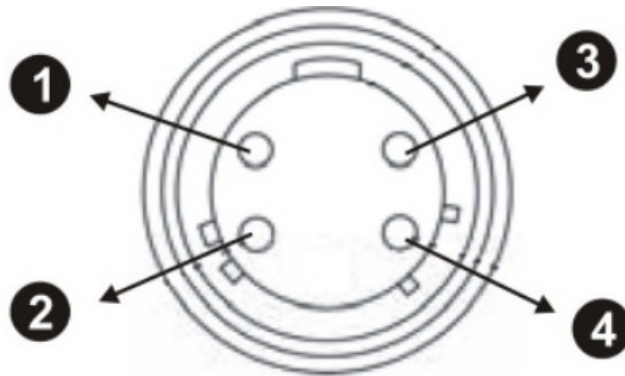
Fig 2

ANALOG AC/DC OUTPUT

- AC output:2 Vrms/130dB
- DC output: 2Vdc/130dB

Fig 3

output receptacle
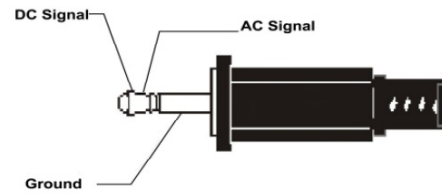
Fig 4

3.5mm output plug

The Microphone Lengthens The Test

In order to avoid the measurement deviation caused by the reflection effect and operation problem, use the cable to extend the microphone for measuring. (Refer to chapter 11.3.2).

1. Press ⊙ button to turn the power off.
2. Turn the preamplifier and microphone counterclockwise to be separated from the main body. (Refer to Fig 5).

   Connect the extension cable to the microphone and main body. (Refer to Fig 6).
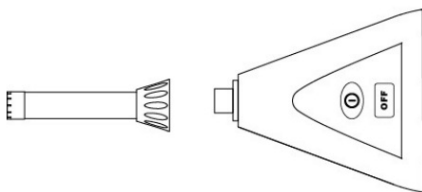
Fig 5
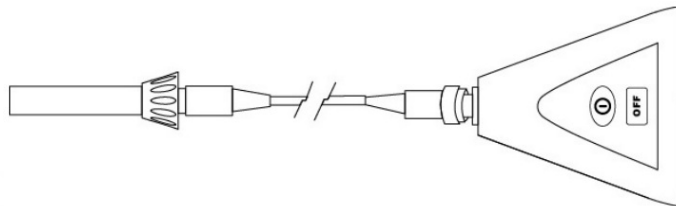
Fig 6

SOFTWARE INSTALLATION

1. Link website https://www.tenmars.com/

   or scan below QR code:
2. Search ST-107.
3. Click on the ST-107 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.

MAINTENANCE

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.

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.
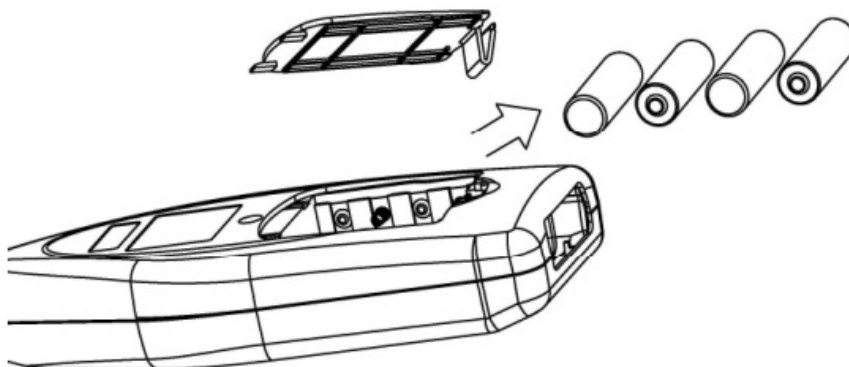
Fig 1: Opening and closing of battery cover

CLEANING

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

 END OF LIFE

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

TECHNICAL SPECIFICATIONS

FEATURE

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

Display	Double rows LCD MAX reading 1999
Display Refresh Rate	1 Time/sec
Major Applicable Standards	IEC 61672-1 2002 Class2(ST-107/ST-107S) JJG-188-2002 Class 2(ST-107S)
Other Standards	IEC60651:1979 TYPE 2(ST-107/ST-107S) IEC60804:2000 TYPE 2(ST-107/ST-107S) ANSI S1.4:1983 Type12(ST-107/ST-107S)
Microphone(ST-107S)	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-107)	1/2 inch Electret condenser microphone
Measurement Items	Lxyp, Lxmax, Lxmin, Lxeq, LAE, Lcpeak,RT60
Measurement Range	30dB to 130dB (A) 35dB to 130dB (C) 40dB to 130dB (Z)

Dynamic Range	100 dB
Integrate Time Setup	Randomly, 10s, 1m, 5m, 10m, 30m, 1h, 8h, 16h, 24h
Internal memory	24C512 × 4 MAX Datalogger data 37,000
Micro SD Card	The max support capacity of micro SD card is 32GB 37,000 data about story space 300KB
Maximum Peak C Weighting Sound Level Measurement	70~133 dB
Time Weighting	Fast, Slow, Impulse, Peak
Frequency Weighting	A/C/Z
Frequency Range	31.5Hz~8KHz(ST-107)
	20Hz~8KHz(ST-107S)
DC Output	2Vdc/130dB
AC Output	2Vrms/130dB
Starting Time	10 Second
Battery Life	30 hours (LR6 : 4 Alkaline batteries)
AC Adapter	Input : 100V~240V ACV,Output:6V~9V DCV
Dimensions	285(L) x 90(W) x 39(H) mm
Weight	500g (including Batteries)

ENVIRONMENT

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%

EMC

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

ACCESSORIES

Standard Accessories

- Meter x 1.
- User's manual.
- Switching power supply: 100V ~ 240V AC to DC 6V~9V/500mA.
- Carrying case.
- 4 batteries 1.5 V – LR6 – AA – AM3 – MN 1500.
- 60mm diameter windscreen.
- USB Cable.

SERVICE

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.

The contents of this manual may not be reproduced in any form whatsoever without the manufacturer's authorization.

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.

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.
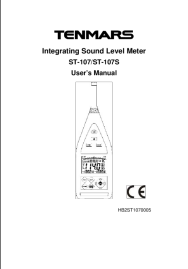
E-mail: service@tenmars.com

http://www.tenmars.com

FAQ

How do I adjust the weighting options on the ST-107/ST-107S?

To change the weighting from A to C or Z, follow the instructions provided in section 10.2 of the user manual.

Documents / Resources

[TENMARS ST-107 Integrating Sound Level Meter](#) [[pdf](#)] User Manual ST-107, ST-107S, ST-107 Integrating Sound Level Meter, Integrating Sound Level Meter, Sound Level Meter, Level Meter, Meter

References

- [User Manual](#)

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🏷 Integrating Sound Level Meter, Level Meter, Meter, Sound Level Meter, ST-107, ST-107 Integrating Sound Level Meter, ST-107S, TENMARS

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