Sauter GmbH

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SW 1000 / SW 2000

User's manual (short)

Sound level meter with octave-band analyzer

SW 1000/SW 2000 devices belong to the new generation of sound level meters with octave-band analyzer. The devices are equipped in the processor of ARM architecture with FPU arithmetic coprocessor and instead of fixed-point calculations they perform floating-point calculations what definitely increases their accuracy and stability. Its own noise is reduced by the newly-designed analogue input module.

Main features

- Class 1 (**SW 1000**) and class 2 (**SW 2000**)
- It meets the requirements of GB/T 3785.1-2010, IEC 60651:1979, IEC 60804:2000, IEC 61672-1:2013, ANSI S1.4-1983, ANSI S1.43-1997 standards
- 1/1-octave-band analyser conforms to GB/T 3241-2010, IEC 61260-1:2014, ANSI S1.11-2004 standards.
  Frequency band:
  - SW 1000: 31.5 Hz~16 kHz
  - SW 2000: 31.5 Hz~8 kHz
- Added microphone:
  - SW 1000: MPA231T, class 1.50 mV/Pa, 10 Hz~20 kHz
  - SW 2000: MPA309T, class 2.40 mV/Pa, 20 Hz~12.5 kHz
- Own noise:
  - 1000 (sound): 18 dB(A), 23 dB(C), 31 dB(Z)
  - 1000 (electric): 11 dB(A), 16 dB(C), 21 dB(Z)
  - 2000 (sound): 20 dB(A), 26 dB(C), 31 dB(Z)
  - 2000 (electric): 14 dB(A), 19 dB(C), 24 dB(Z)
- Upper limit value:
  - 1000: 134 dB(A), increased with the use of the microphone of smaller sensitivity
  - 2000: 136 dB(A), increased with the use of the microphone of smaller sensitivity
- Frequency characteristics:
  - 1000: 10 Hz~20 kHz
  - 2000: 20 Hz~12.5 kHz
- Linearity range:
  - 1000: 20 dB(A)~134 dB(A)
  - 2000: 25 dB(A)~136 dB(A)
- Dynamic range: 1000: 123 dB, 2000: 122 dB
- Maximum range of carrier wave:
  - 1000: 45 dB(A)~137 dB(A)
  - 2000: 47 dB(A)~139 dB(A)
- A/B/C/Z frequency correction. F/S/I time constant and determination of the peak value
- One range covering the whole dynamic range
- $L_{XY(SPL)}$, L_{Xeq}, L_{XYSD}, L_{XSEL}, L_{XE}, L_{XYmax}, L_{XYmin}, L_{XPeak}, L_{XN}. where: X means frequency correction: A, B, C, Z; Y means time constant: F, S, I; N means statistical measure: 1~99
- Integration time: infinite, 1 s~24 h, number of repetitions: Inf, 1~9999
- Log cycles below 1 s: 0.1 s; 0.2 s; 0.5 s
- 3 parallel profile calculations with various frequency or time constant. 14 measurements defined by the user
- Possibility of importing/exporting 5 configuration patterns with the use of SD card
- Automatic turning on with external electric power supply, easy integration
- MicroSD (TF) memory card with the capacity of 4 GB, USB drive mode operation
- GRS-232 socket may be used as a control socket or in order to connect the thermal printer
- Output: alternate current voltage (maximum 5 V_{sk}), direct current voltage (10 mV/dB)
- Real time clock RTC with the buffer battery, factory calibrated, deviation within 30 days amounting to 30 s maximum (< 10 pm, RT)
- Internal GPS module (option), GPS time operation

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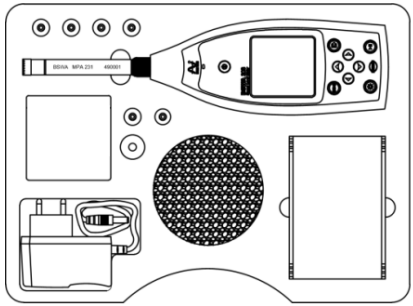
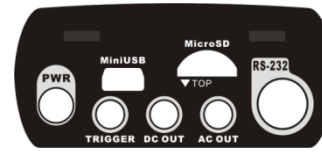
Packaging



Interface



PWR: Direct current power supply socket: 7 V~14 V.
☆NOTE: With the working voltage above 14 V, the device is damaged!
MiniUSB: USB disc mode or modem mode.
MicroSD card: Use standard microSD card (TF card).
☆ NOTE: The microSD card side is directed downwards!
☆ NOTE: The microSD card shall be formatted on the computer using format FAT32/4096 bytes!
RS-232: Interface (pin identification and protocol, see user's manual); it may also be used for connecting thermal printer in the printer mode.
TRIGGER: Flip-flop input, headphone jack plug 3.5 mm
For the device turning on or off.
DC OUT: Direct current voltage output, headphone jack plug 3.5 mm
AC OUT: Alternating current voltage output, headphone jack plug 3.5 mm

External view

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Button field

<PWR>: In order to turn on or turn off the sound level meter, push it and hold for 2 s.

☆**NOTE: It is not possible while the measuring device is taking measurements!**

<ESC>: Pushing the button causes closing of the menu, returning to the previous screen or deleting the characteristics on the "Time course" screen.

<Enter button>: Pushing it causes the display of the next menu; saving of the change introduced; saving in the form of CSD file with the device turned off.

<Backlight>: Turning on/off of the LCD display backlight. Setting the backlight time in the menu **Settings (Ustawienia) –>Backlight (Podświetlenie)**.

<Start/Stop>: Measurement start/stop; calibration start with the use of the menu **Calibration (Kalibracja) –> After the measurement (Po pomiarze)**.

<▲>: Up arrow button, while selecting the option or changing the value.

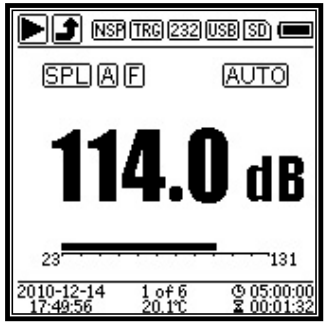
<▼>: Down arrow button, while selecting the option or changing the value.

<◄>: Left arrow button, while selecting the option, changing the value or moving to the next screen.

<►>: Right arrow button, while selecting the option, changing the value or moving to the next screen.

<Menu>: Pushing it causes the display of the menu.

Display screen



The meaning of the given symbols:

▶ ❚❚	Measurement start/stop.
↶ ↷	Range exceeded (above or below).
NSP	ICCP module status. Shows whether ICCP module is turned off.
TRG	Flip-flop status. It is displayed in the flip-flop mode.
232 PRT	RS-232 interface status. It is displayed in the remote control mode 232 and in the printer mode PRT.
USB	USB port status. It is displayed after connecting the device to the computer.

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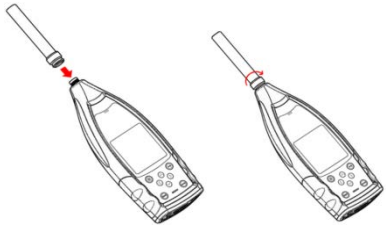
SD	MicroSD card status. It is displayed while data are being saved.
	Working voltage and battery status.
SPL PEK LEQ MAX	Measuring parameters.
A B C Z	Frequency correction.
F S I	Time constant.
AUTO	Range status: one range, automatic indication mode.
114.0 dB	Measurement value.
23 131	Measurement value in the form of the bar graph display.
2010-12-14 17:49:56	Date and time.
1 of 6	Current screen number and the total number of screens.
20.1°C	Internal temperature.
05:00:00 00:01:32	: Integration time. : Measurement time.

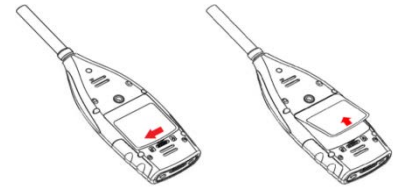
Microphone assembly

Put the microphone into TNC socket. Then tighten the thread.

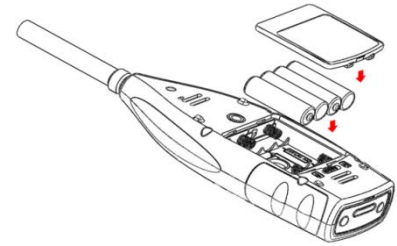


Battery replacement

In the sound level meter there are 4 alkali batteries (LR6/AA/AM3) used. Do not use old and new batteries at the same time. Unlock and open the cover.



Replace the batteries paying attention to the polarity. Close and lock the cover.



Operation

Function:

Select **Sound level (Poziom dźwięku)** mode or **Octave-band (Oktawa)**.

Calibration:

Start after selecting **After the measurement (Po pomiarze** option and calibrator. The calibration coefficient may also be changed manually.

Measurement (Pomiar) –> Measurement settings (Ustawienia pomiaru) –> Delay (Opóźnienie):

The delay may be set within the range from 1 to 60 s. It is possible to select 4 additional synchronization options.

Measurement (Pomiar) –> Measurement settings (Ustawienia pomiaru) –> Integration

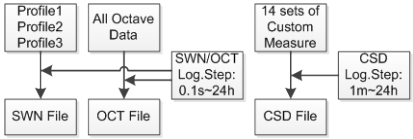
time (Czas całkowania):
Time for calculating integration data, for example LEQ, MAX, MIN etc. The integration time may set as infinite.

Measurement (Pomiar) –> Measurement settings (Ustawienia pomiaru) –> Number of repetitions (Liczba powtórzeń):
Integration time × Number of repetitions = Total measurement time

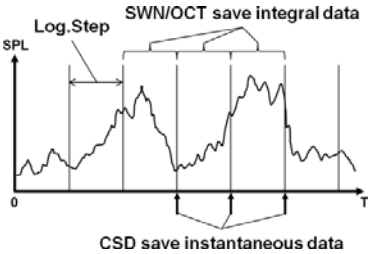
Protocol data: SWN/OCT and CSD
Sound level meter allows for saving data in SWN/OCT and CSD files. The file format and logging cycle may be set in **Pomiar–>Ustawienia pomiaru** menu.

SWN/OCT: Integration data saving. The sources of data are 1 - 3 profiles in the sound level measurement mode. In the octave-band mode these are all the octave data/LA_{eq}/LB_{eq}/LC_{eq}/LZ_{eq}. Logging cycle: 0.1 s~24 h.

CSD: Current data saving. The sources of data are 14 sets of measurements defined by the user, in the octave-band mode these are all octave data and LA_{eq}/LB_{eq}/LC_{eq}/LZ_{eq}. Logging cycle: from 1 minute to 24 h.

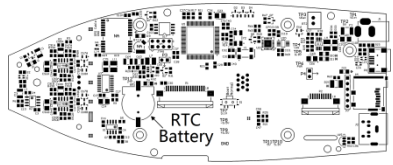


SWN/OCT data are integration data (the logging cycle is the integration time), CSD data are momentary data.



Measurement (Pomiar) –> Alarm threshold (Próg alarmu):
When the result exceeds the threshold value, LED status diode shall light red.

Buffer battery of the real time clock (RTC):
The RTC battery usually operates for about 2 years. When the time displayed by the RTC is mistaken, open the cover of the battery compartment and replace the batteries. The battery type is CR1220.



Additional information

1. The microphone is a delicate element which shall be protected from environmental impacts by means of storing it in the enclosed bag.
2. Observe instructions and operational guidelines. Do not allow for the device to fall down, avoid vibrations and impact loads. Operation above the limit values may lead to the damage of the product. Do not allow water or other liquids to penetrate into the device, it is not waterproof.
3. In order to extend the shelf-life of the device use high quality alkali batteries. Do not use old and new batteries at the same time. Take out the batteries if the device is not used. Batteries left for a longer period of time in the device may leak and damage the device.

Contact information

In the case of problems, please contact us at any time.

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