



# User Manual

PCE-MSM 4, PCE-322A, PCE-323 Sound Level Meter



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: [www.pce-instruments.com](http://www.pce-instruments.com)

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## 1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

## 2 Specifications

Sound level ranges	Low 30 ... 80 dB Medium 50 ... 100 dB High 80 ... 130 dB Auto 30 ... 130 dB
Dynamic range	50 dB
Resolution	0.1 dB
Accuracy	±1.4 dB (under reference conditions @ 94 dB, 1 KHz)
Accuracy class	IEC61672-1 Class 2
Frequency range	31.5 Hz ... 8 kHz
Time rating	FAST (125 ms) SLOW (1 s)
Frequency weighting	A and C
Microphone type	1/2" electret condenser
Display	4-digit LC display with backlight
Display update	2 Hz
Data memory	32700 measured values (only PCE-322A, PCE-323)
Memory interval	1 ... 59 s
Analogue output via 3.5 mm jack connection	1 Vrms/dB AC (impedance 100 Ω) 10 mV/dB DC (impedance 1 kΩ)
Data interface	USB, Bluetooth 4.0 (PCE-323 only)
Bracket	3/8" connection
Functions	MIN, MAX, HOLD display when exceeding or falling below the sound level after approx. 15 minutes of inactivity
Automatic power off	after approx. 15 minutes of inactivity
Power supply (battery)	9 V block battery (typically 30 operating hours)
Power supply (mains operation)	primary: 100 ... 240 V AC, 50 / 60 Hz, 0.2 A secondary: 9 V DC, 0.5 A
Operating conditions	0 ... +40 °C, 10 ... 90 % RH, non- condensing, altitude <2000 m
Storage conditions	-10 ... +60 °C, 10 ... 75 % RH, non- condensing
Dimensions	304 x 82 x 40 mm / 12.0 x 3.2 x 1.6 in
Weight	350 g / <1 lb (without battery)

## 3 Delivery scope

- 1 x sound level meter
- 1 x mini tripod
- 1 x screwdriver
- 1 x carrying case
- 1 x 9 V block battery
- 1 x user manual
- 1 x mains adaptor

The software can be downloaded here:

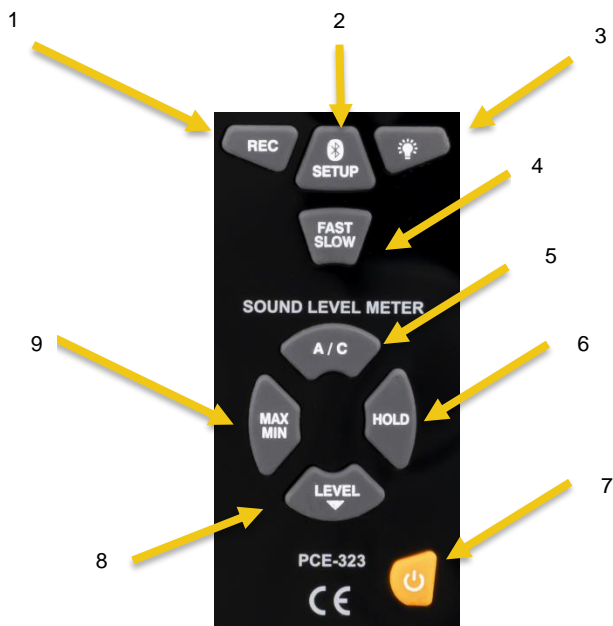
[https://www.pce-instruments.com/english/download-win\\_4.htm](https://www.pce-instruments.com/english/download-win_4.htm)

## 4 Device description



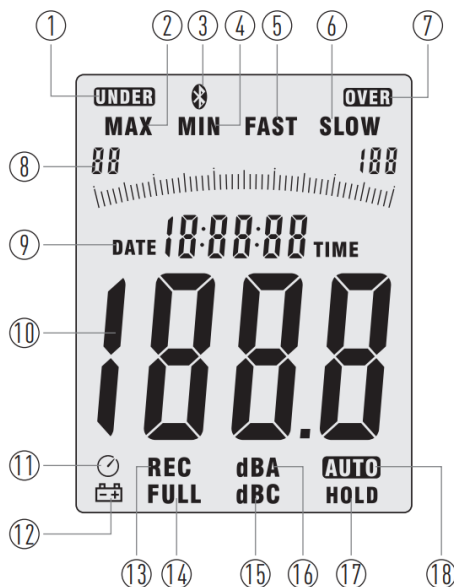
No.	Description
1	Microphone with windscreen
2	Connections for power supply, mini-USB, analogue outputs, calibration screw
3	Display
4	Keyboard
5	Battery compartment (rear)

#### 4.1 Keyboard description



No.	Description
1	"REC" key to start recording
2	"SETUP" key to open the settings, to activate the PC interface, to disable and enable automatic power off and to start the Bluetooth connection (PCE-323 only)
3	Switching the backlight on and off
4	"FAST SLOW" key to switch between fast and slow time rating
5	"A / C" key for switching between frequency weightings A and C
6	"HOLD" key to freeze the display
7	On / off key
8	"LEVEL" key for setting the sound level range
9	"MAX MIN" key to activate the "MIN / MAX" function

## 4.2 Display description



No.	Description
1	Current measured value is below the set measurement range
2	Currently displayed measured value is the highest measured value
3	Bluetooth connection active (PCE-323 only)
4	Currently displayed measured value is the lowest measured value
5	Time rating "Fast" - fast (125 ms)
6	Time rating "Slow" - slow (1 s)
7	Current measured value is above the set measurement range
8	Measurement range scale
9	Date and time
10	Measured value
11	Automatic power off is active
12	Battery is discharged and must be replaced
13	File recording is started (PCE-322A, PCE-323 only)
14	Data memory is full (PCE-322A, PCE-323 only)
15	Frequency weighting A
16	Frequency weighting B
17	Display is frozen
18	Level range is set automatically



## **5 Switching the meter on and off**

To switch on the meter, press and release the on/off key once. To turn off the meter, press and hold this key until the display turns off.

### **5.1 Making a measurement**

Before you can carry out a measurement, the meter must be set according to the respective measuring task.

#### **5.1.1 Setting the frequency weighting**

To set the frequency weighting of a measurement, press the "A/C" key to select between frequency weighting A and C. The respective frequency weighting is shown by "dBA" and "dBC" on the display.

#### **5.1.2 Selecting the sound level range**

Press the "LEVEL" key repeatedly to select between the sound level ranges 50 ... 100, 80 ... 130, 30 ... 80 and automatic. The selected sound level range is displayed on the scale. If a range is exceeded or undercut, this is indicated by "Over" or "Under".

#### **5.1.3 Setting the time rating**

To set the time rating, press the "FAST SLOW" key. With the "Fast" setting, the time weighting is 125 ms and with "Slow", it is 1 s. The setting is shown directly on the display.

#### **5.1.4 Lowest and highest measured value**

To display the highest or lowest measured value, press the "MAX MIN" key. Either the highest or the lowest reading is now displayed. To resume the normal measurement, press the key repeatedly until "Max" and "Min" are no longer shown on the display.

**Note:** Only one function is active at a time. If you switch between the individual functions, the last value is reset.

#### **5.1.5 Freezing the measured value**

To freeze the displayed reading, press the "HOLD" key. HOLD" appears on the display. To resume the measurement, press this key again.

#### **5.1.6 Backlight**

To switch on the backlight, press the backlight key. To switch off the backlight, press the key again.



### 5.1.7 Setting the date and time

To set the date and time, first switch off the meter. Then press and hold the "SETUP" key and switch on the meter. As soon as "TIME" is flashing, you can release the "SETUP" key. The currently set date is now displayed. You can then select the minute, hour, day, month and year one after the other using the "SETUP" key and set them with the "LEVEL" key. When setting the hours, h-P stands for PM and h-A for AM.



Home view



Setting the minute



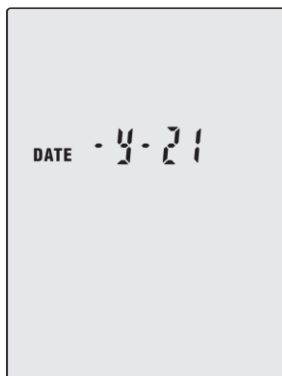
Setting the hour



Setting the day



Setting the month




Setting the year

When all settings have been made, press the "HOLD" button to apply the settings. If it is not possible to apply the settings, you must reset the date and time. To do this, go one function further. rSt" (Reset) is displayed for resetting. Now press the "HOLD" key and the date and time will be reset. Now you can set the date and time.



## 6 Automatic power off

To disable the automatic power off, press the "SETUP" key. If the  icon is no longer displayed, the automatic power off is deactivated. Press this key again to reactivate automatic power off.



## 7 Data logging (PCE-322A, PCE-323 only)

To record the measurement data, press the "REC" key. REC" appears on the display. To interrupt the recording, press the "REC" key again.

### 7.1 Clearing the memory

As soon as "Full" is shown on the display, the memory must be cleared for further recording. To do this, switch off the meter. Now press and hold the "REC" key and switch the meter back on. As soon as "CLA" is displayed flashing, release the "REC" key. The measurement is resumed and the memory is cleared.



### 7.2 Setting the memory interval

To set the memory interval, first switch off the meter. Press and hold the backlight key and switch the meter back on. As soon as "Int" is displayed, you can release the backlight key. Use the "LEVEL" key to adjust the displayed value. A memory interval between 1 ... 59 seconds is available for selection. When the memory interval has been set, you can accept this value by pressing the "HOLD" key.



## 8 Replacing the battery

As soon as the battery indicator appears on the display, the battery must be replaced. To replace the battery, first switch off the meter and disconnect all cables. The battery compartment is located on the back. Open the battery compartment by first unscrewing the screw with a screwdriver. Remove the battery and insert a new 9 V block battery. Then screw the battery compartment back in place. Now you can resume the measurement.

## 9 Bluetooth connection (PCE-323 only)

To establish a Bluetooth connection, first download the free app "PCE-323" from the Apple Store or Play Store. Activate Bluetooth and the location function on your mobile device. Press the "SETUP" key to activate the Bluetooth function on your PCE-323.

Then open the app and connect to the meter via the app. Select "Environment Meter" as the instrument type.

**Note:** The connection must not be established via the Bluetooth setting of your mobile end device.

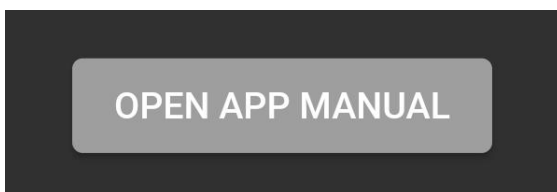
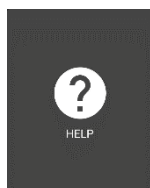


Android



iOS

Within the app, you can open the manual by tapping on "HELP" and then on "OPEN APP MANUAL".



## 10 PC connection

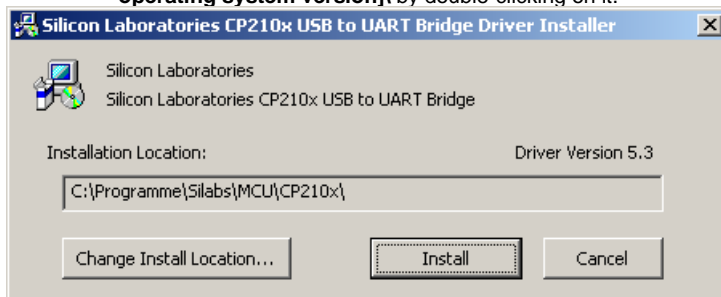
To establish a PC connection, first disable automatic power off using the "SETUP" key.

Download the latest version from the following website:

[https://www.pce-instruments.com/english/download-win\\_4.htm](https://www.pce-instruments.com/english/download-win_4.htm)

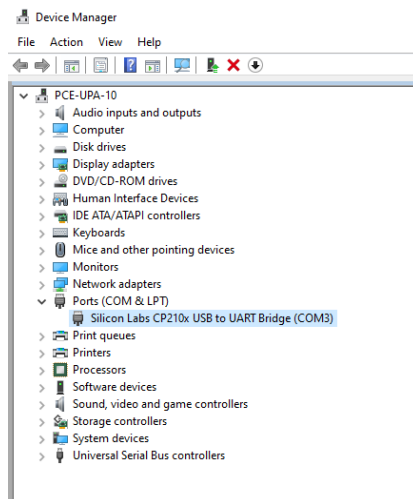
First install the device drivers and then connect the meter to the computer via USB.

1. Start Windows.
2. Execute the file "**CP210xVCPInstaller.exe**" in the directory ... \driver\Windows[**your operating system version**] by double-clicking on it.



3. Then click on "Install" to install the driver.
4. Restart the PC after the driver installation has been completed!
5. Once the PC has restarted, you can switch on the meter and connect it to a free USB port on the computer.

The driver is now automatically installed and the device appears in the device manager of the computer. Open the device manager via Start -> Control Panel -> System -> Device Manager.










6. If the driver has been installed correctly, the entry "Silicon Labs CP210x USB to UART Bridge (COMX)" appears below the item "Ports (COM & LPT)". Remember the COM port number, in this case COM3. This must be set in the software. (In the rare case that the assigned port number is higher than 9, change it manually to a number between 1 and 9. To do this, go to the properties of the "Silicon Labs CP210x USB to UART Bridge (COMX)", then to Port Settings and Advanced Port Settings.
7. Now start the software installation by executing the "Setup.exe" in the root directory and following the information on the screen.

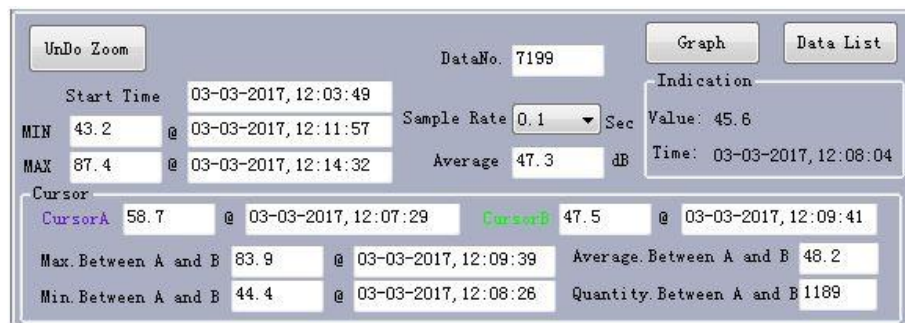
After the software installation is completed, start the application "Sound Level Meter" where you have to select the port number in the menu under "Com Port(C)" that was previously displayed in the device manager. By default, the automatic assignment is active, so you do not have to make any settings here. If you have connected several measuring instruments, you can set the COM port via manual mode.

## 10.2 Software operation

### 10.2.1 Toolbar

	Open file
	Save measurement recording in .txt format
	Save measurement recording in .xls format
	Start real-time measurement
	Stop real-time measurement
	Print measurement results
	Information on the version of the software

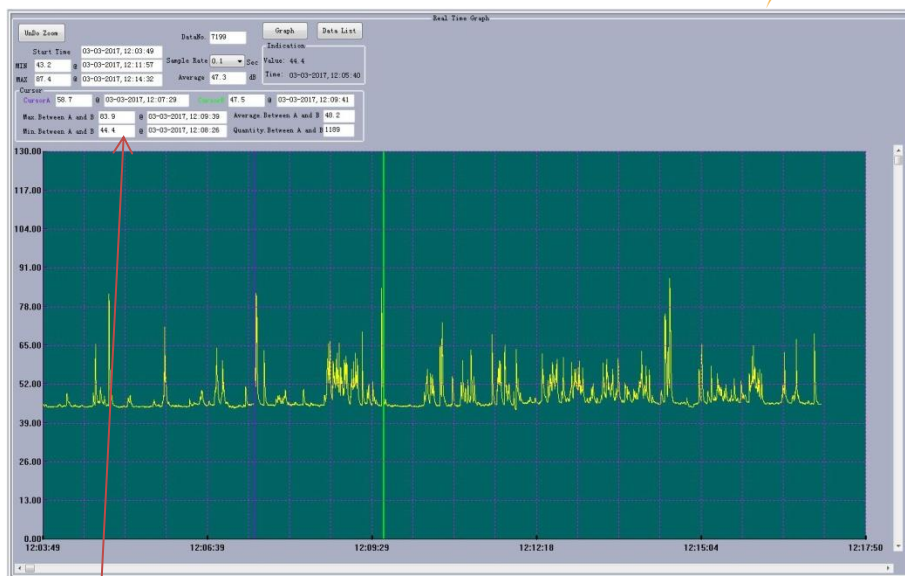
### 10.2.2 Real-time measurement



The screenshot shows the real-time measurement interface. At the top, there are buttons for 'Undo Zoom', 'Graph', and 'Data List'. The 'DataNo.' is 7199. The 'Start Time' is 03-03-2017, 12:03:49. The 'MIN' value is 43.2 at 03-03-2017, 12:11:57. The 'MAX' value is 87.4 at 03-03-2017, 12:14:32. The 'Sample Rate' is 0.1 Sec. The 'Average' is 47.3 dB. The 'Indication' box shows 'Value: 45.6' and 'Time: 03-03-2017, 12:08:04'. The 'Cursor' section shows 'CursorA' at 58.7 at 03-03-2017, 12:07:29 and 'CursorB' at 47.5 at 03-03-2017, 12:09:41. Below the cursor section, there are four summary statistics: 'Max. Between A and B' (83.9 at 03-03-2017, 12:09:39), 'Average. Between A and B' (48.2), 'Min. Between A and B' (44.4 at 03-03-2017, 12:08:26), and 'Quantity. Between A and B' (1189).

Start Time	Time from the start of the measurement
MIN	Lowest volume of the measurement series with point in time
MAX	Highest volume of the measurement series with point in time
DataNo.	Number of points measured
Sample Rate	Sampling rate
Average	Average sound level of the measurement series
Graph	Representation as a graph
Data List	Display as data list
Undo Zoom	Zoom out





Cursor					
CursorA	53.8	@	03-03-2017, 12:04:43	CursorB	51.0 @ 03-03-2017, 12:09:11
Max. Between A and B	82.3	@	03-03-2017, 12:07:30	Average. Between A and B	46.7
Min. Between A and B	43.8	@	03-03-2017, 12:07:06	Quantity. Between A and B	2388

To compare two measuring points or the intervals between the measuring points, two different cursors can be set. The data is evaluated as shown in the figure above:

Cursor A	Value cursor A
Max. Between A and B	Maximum determined value between A and B
Min. Between A and B	Minimum determined value between A and B
Cursor B	Value cursor B
Average. Between A and B	Measured average value between A and B
Quantity. Between A and B	Measured values between A and B

You can enlarge individual points within the graph by clicking on the desired area with the left mouse button and holding it down. Now enlarge the desired observation field with the mouse until the desired area is reached. Then release the mouse button and the area is enlarged accordingly.

### 10.2.3 Function tab

Further actions can be carried out in the function tabs. In addition to the toolbar already described above, these tabs help in the evaluation of the measurement data. Below you will find a brief description of the functions that you can select in the tabs:

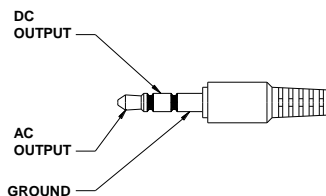
<b>File(F)</b>	<p>Open: Open file</p> <p>Save as: Save measurement recording in .txt. format</p> <p>Export To Excel: Save measurement recording in .xls. format</p> <p>Print Graph: Print Graph</p> <p>Print Data: Print measurement data chart</p> <p>Exit: Close software</p>
<b>Real Time(R)</b>	<p>Run: Start real-time measurement</p> <p>Stop: Stop real-time measurement</p> <p>Clear Data: Clear data</p> <p>Setup: Setting the sampling rate and maximum measured values</p>
<b>DataLogger(D)</b>	<p>Read out the internal data logger of the meter</p>
<b>Com Port(C)</b>	<p>Manual: Select communication interface manually</p> <p>Auto: Have the communication interface selected automatically</p>
<b>View(V)</b>	<p>ToolBar: Activate / deactivate toolbar</p> <p>StatusBar: Activate / deactivate status bar</p> <p>Colour Setting: Change colour of graph, background or grid</p>
<b>Help(H)</b>	<p>Contents: Open help</p> <p>About: Show information about the software version</p>

## 11 Mains adaptor

If you are using the mains adaptor, connect it to the 9 VDC connector on the side of the meter.

**Note:** Do not connect the mains adaptor to the meter during a measurement in battery mode, otherwise the meter will switch off.

## 12 Analogue output



- AC: Output voltage: 1 V RMS (referred to the maximum value of the selected measurement range)  
Resistor: 100  $\Omega$
- DC: Output voltage: 10 mV/dB  
Resistor: 1 k $\Omega$

## 13 Calibration

To perform a calibration, connect the meter to a class 2 or better sound calibrator. Set the meter as follows:

- Frequency rating: A
- Time rating: Almost
- Level range: 50 ... 100 dB

Now switch on both devices and check the displayed measured value. If it is outside the specifications, it can be adjusted using the adjustment screw.



## 14 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

## 15 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.



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