PM2.5 µg / m³
2
39.4 %R.H
18.8 ℃
452 CO2 PPm
987.9 hPa
Health Index
1 00:08:30

AIR QUALITY DATA LOGGER
PCE-AQD 20 $C\epsilon$

User Manual

PCE-AQD 20 Particle Counter

Last change: 22 January 2020
v1.0

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Contents

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.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.

2   Technical specifications

Measurement function PM2.5	
Measuring range	**0 ... 250 µm / m³**
Resolution	1 µm / m³
Accuracy	± (10% of rdg. + 15 µm)
Measuring function humidity	
Measuring range	**5 ... 95% rh**
Resolution	0.1% RH
Accuracy	> 70% RH: ± (3% of the prev + 1% RH)
	<70% RH: ± 3% RH
Measuring function temperature	
Measuring range	**0 ... 50°C / 32 ... 122°F**
Resolution	0.1°C / 0.18°F
Accuracy	± 0.8°C / 1.44°F
Measurement function CO2	
Measuring range	**0 ... 10,000 ppm**
Resolution	1 ppm
Accuracy	< 1000 ppm: ± 40 ppm
	< 3000 ppm: ± (50 ppm + 3% of rdg.)
	> 3000 ppm: ± (50 ppm + 5% of rdg.)
Measuring function air pressure	
Measuring range	**10 ... 1100 hPa**
Resolution	0.1 hPa
Accuracy	± 1.5 hPa
Display	LCD display with backlight
Storage	SD card max. 32 GB
Sampling time	2 ... 3,600 s
Memory error	< 0.1% of the completely stored data
Display	Hold, Max, Min
Measuring rate	About 1 s
Interface	Serial for live visualization on computers
	(Data cable SOFT-LUT-USB sold separately)
Alarm output	OC output 24V / 70-mA DC
Power supply	6 x 1.5V AA battery
	9V / 1 A power adapter
Current consumption	230-mA without lighting
	approx. 250-mA with lighting
Operating conditions	0 ... 50°C / 32 ... 122°F, max. 80% rh
Weight	About 387 g / < 1 lb
Dimensions	164 x 93 x 72 mm / 6.5 x 3.7 x 2.8 in

3   Device description

No.	Designation	Description
1	POWER key	The meter can be turned on and off by pressing and holding this key. The backlight can be activated or deactivated by pressing this key for a short time.
2	HOLD key	This key is used to hold the displayed readings in the display. In settings mode, this key is used to leave the settings menu.
3	REC key	With the REC key, the Max and Min key can be displayed.
4	TIME/SET key	When this key is pressed in measuring mode, the meter will display the date and time. The settings can be opened by pressing and holding this key. In settings mode, this key can be used to make changes.
5	Up/FUNCTION key	In the settings menu, you can change the values with this key. A quicker selection can be made by pressing and holding this key. In measuring mode, this key can be pressed for approx. 2 seconds to view the TWA value.
6	ENTER/LOG key	In the settings menu, this key can be pressed to save the setting. In measuring mode, press and hold this key for approx. 2 seconds to activate the logger function.
7	Down/ALARM key	In the settings menu, the values can be changed with this key. Quicker changes are possible by pressing and holding this key.

8	Reset key	Meter reset – use a pointed object to press this key while turning on the meter to reset the meter.
9	Alarm interface	3.5 mm open collector interface for an alarm relay
10	RS232 interface	3.5 mm serial jack interface
11	DC 9 V mains adaptor	Power supply
12	LED status	Shows the current status of the meter; if the reading exceeds the measurement range, the LED will turn violet.

4   Display description

To turn on the meter, press and hold the POWER key for approx. 2 seconds. The meter will then initialise within 20 seconds and automatically enter measuring mode.

PM 2.5 measurement:
Dust concentrations between 0 and 250 µg/m³ are displayed. When a value exceeds 250 µg, "OL" is displayed. This means that the reading is not within the measurement range.

The health index shows the air pollution within a range of 0 … 9. If the value is or exceeds 5, it flashes.

TWA (Time Weighted Average) shows the weighted average value in relation to the set time. Press and hold the Up/FUNCTION key for approx. 3 seconds to view the TWA value.

Humidity measurement
The measured humidity is displayed in %RH.

Temperature measurement
The temperature value can be displayed in °C or °F.

CO2 measurement
The carbon dioxide concentration is displayed in ppm (parts per million).

Air pressure
The air pressure is displayed in hpa (hectopascal), mmHg (millimetres of mercury) or in inHG (inches of mercury).

Time
During the measurement, the display will show the time. Press the TIME/SET key for a short time to view the date followed by the sampling time for about 2 seconds.

5   Functions

5.1   Data Hold
By pressing and holding the HOLD key once, you can hold the values in the display. This function can be deactivated by pressing the same key again.

5.2   Holding Min/Max values
Press the REC key for a short time. "REC" will be displayed and the Max and Min values are saved in the background.

Press the REC key for a short time. "REC MAX" will be shown and the maximum values since activation of the REC function are displayed.

Press the REC key again. "REC MIN" will appear and the minimum values since the start of recording will be displayed.

Again press the key for about 3 seconds to deactivate the REC function and return to normal measuring mode.

5.3   Backlight
The backlight is activated by default when the meter is turned on. During the measurement, you can enable or disable the backlight by short-pressing the POWER key.

5.4   Alarm function
Press the Down/ALARM key for approx. 3 seconds in order to enable the alarm function. When the reading reaches or exceeds the set value, the alarm output will be activated.

5.5   Auto data logger
Note: The sampling time must be at least 2 seconds.

Press the ENTER/LOG key for about 3 seconds. "Logger" will be displayed and the data are saved at the set interval.
The function can be paused by short-pressing the ENTER/LOG key.
To deactivate the log function, press and hold the ENTER/LOG key for approx. 3 seconds.

5.6   Manual data logger
Note: The sampling time must be 0 seconds.

Press and hold the ENTER/LOG key for approx. 3 seconds. "Logger Pause" will be displayed along with the number of currently saved values. To save the value currently displayed, press the ENTER/LOG key for a short time. You can also save a "position" along with the value. The position is displayed as "P x" and can be changed to a value between 1 and 99 with the arrow keys. This enables you, for example, to assign the measurements to different places.

5.7 SD card / memory structure

It is recommended to insert an SD card of max. 4 GB. The data will be saved to the card in the following structure:
Folder:
PAB01 The following files will be created in the folder:
PAB01001.XLS // After 30000 lines, the next file will be created
PAB01002.XLS
……………..
PAB01099.XLS

PAB02
PAB02001.XLS
PAB02002.XLS
……………..
PAB02099.XLS

PABXX // Maximum number of folders is10

To view and save the files to your computer, insert the SD card into your computer. The files can be opened and processed in a spreadsheet program.

5.8 Calibration

The meter has a calibration function to calibrate all measured parameters. Only use this function if you have a calibrated reference device. To open the calibration menu, press and hold the HOLD and REC keys at the same time for approx. 3 seconds. Press the TIME/SET key to get to the next measuring parameter.

5.8.1 PM 2.5 calibration

Press the ENTER/LOG key to view the lower calibration value (PML). The value can be changed with the Up and Down keys. To save the value, press the ENTER/LOG key again. You will now see the upper calibration value (PMH) which you can change.

Note: Wait for approx. 10 minutes until the measured values are the same as the set values.
Note: The lower calibration value should be below 15 µg/m³ and the upper calibration value should be above 60 µg/m³.

5.8.2 Humidity calibration

Press the ENTER/LOG key to calibrate the humidity value. You can change the value with the arrow keys. Press the ENTER/LOG key to save the value.

5.8.3 Temperature calibration

Press the ENTER/LOG key to calibrate the temperature value. You can change the value with the arrow keys. Press the ENTER/LOG key to save the value.

5.8.4 CO2 calibration

Press the ENTER/LOG key to calibrate the CO_2 value. You can change the value with the arrow keys. Press the ENTER/LOG key to save the value.

5.8.5 Air pressure calibration

Press the ENTER/LOG key to calibrate the measured air pressure. You can change the value with the arrow keys. Press the ENTER/LOG key to save the value.

To leave the calibration menu, press and hold both the HOLD and the REC keys at the same time for approx. 3 seconds.

To reset the calibration to the factory settings, press and hold the Down key when turning off the meter, then turn the meter back on and release the Down key when "User Cal Clear" appears in the lower part of the display.

6 Settings

To enter the settings menu, press and hold the TIME/SET key for about 5 seconds until "SET NO SD F" is displayed.

6.1 Formatting the SD card

Press the Up and Down keys to select "YES" or "NO". If you have selected "YES", press the ENTER/LOG key to start formatting. Press the TIME/SET key to go to the next setting.

6.2 Setting the date

Press the Up and Down keys to change the values. Press the ENTER/LOG key to save the entry and get to the next setting. The settings can be made in the following order: year/month/day/hour/minute/second. Go to the next setting by pressing the TIME/SET key.

6.3 Setting the sampling time

Use the Up and Down keys to set the sampling time. If the value is 0 s, manual saving via the REC key is activated. Otherwise, the value can be changed to a value between 2 and 3600 s; the date will then be saved at the set interval. You can go to the next setting with the SET key.

6.4 Auto Power Off

Press the Up and Down keys to select "YES" or "NO". If you have selected "YES", press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.
Note: When the meter is powered by the mains adaptor, Auto Power Off will be deactivated.

6.5 Key sound

Press the Up and Down keys to select "YES" or "NO". If you have selected "YES", press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.

6.6 Decimal setting

To set the decimal character for the data which will be saved to the SD card, select "Euro" or "USA" with the Up and Down keys. Press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.

6.7 Selecting the temperature unit

Press the Up and Down keys to select "°C" or "°F". Press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.

6.8 Selecting the air pressure unit

Press the Up and Down keys to select "mmHg" or "inHg". Press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.

6.9 Setting the alarm

Press the Up and Down keys to select "µg/m³", "%RH", "°C", "hPa" or "CO²-ppm". Press the ENTER/LOG key to open the alarm value. Set the desired value with the Up and Down keys. Press the ENTER/LOG key to save the value automatically enter the lower alarm value setting. You can go to the next setting with the SET key.

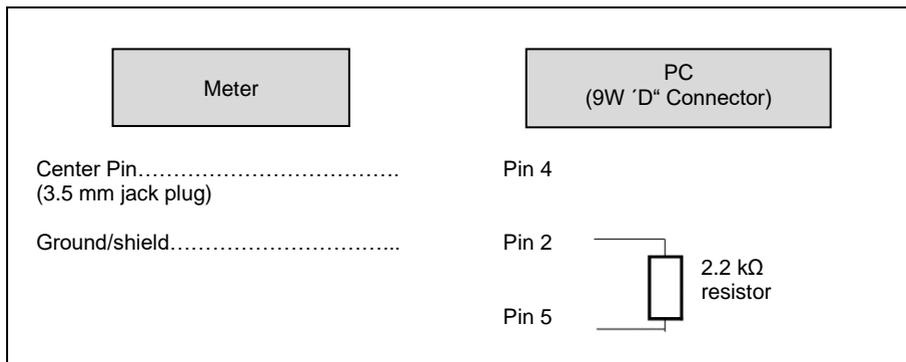## 6.10 Setting TWA for PM2.5

Press the Up and Down keys to set a time between 1 and 24 h. Press the ENTER/LOG key to save the setting. You can go to the next setting with the SET key.

6.11 Setting the sea level (for CO2 measurement)

Press the Up and Down keys to select "Meter" or "Feet". Confirm your selection with the ENTER/LOG key. This will lead you directly to the window for the level entry. Use the Up and Down keys to select the level of your current environment. Save this value by pressing the ENTER/LOG key. To go to "SET ESC" (leave settings), press the SET key. Press the same key again to leave the settings and return to measurement mode.

7   RS232 interface

The instrument has a serial RS232 interface with a 3.5 mm output. Data are output via 16 digits which can be used for your special applications. To connect the meter to a computer, the RS232 cable must be structured as follows:

Meter		PC (9W ´D" Connector)
Center Pin……………………………….
(3.5 mm jack plug)		Pin 4
Ground/shield…………………………...		Pin 2
		Pin 5

2.2 kΩ resistor

Baud rate	9600
Parity	No parity
Data bits	8 data bits
Stop bits	1 stop bit

The data stream is displayed as follows:
D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

The individual digits mean the following:

D15	Start word		
D14	4		
D13	When PM2.5 data are sent = 1
When %RH data are sent = 2
When Temp. data are sent = 3		
D12, D11	Annunciator for Display		
	$\mu g/m^3$ = H0	% RH = 04	℃ = 01
	°F = 02	CO2 = 19	hPa = 91
	mmHg = 78	inHg = 80	
D10	Polarity
0 = Positive 1 = Negative		
D9	Decimal Point (DP), position from right to left
0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D8 … D1	Display reading, D1 = LSD, D8 = MSD
For example:
If the display reading is 1234, then D8 … D1 is: 00001234		
D0	End word		

8 Battery

When the battery icon is displayed, the batteries should be replaced soon. To do so, slide the battery compartment out to the rear and replace the 6 x 1.5 V AA batteries. Close the battery compartment.

9 System Reset

If the meter got stuck or does not respond when keys are pressed, reset it by pressing the reset key with a thin object while switching on the meter.

10 Warranty

You can read our warranty terms in our General Business Terms which you can find here: https://www.pce-instruments.com/english/terms.

11 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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