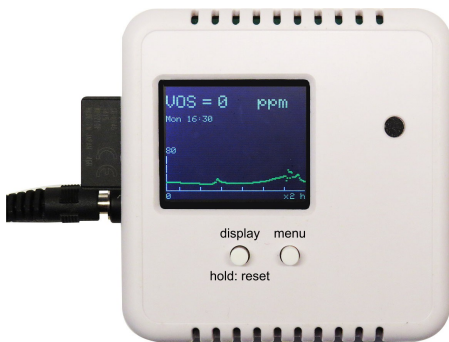# VOC Air Monitor

The VOC Air Monitor is developed by One Cue Systems for long term use in indoor environment. The monitor is designed to support a Volatile Organic Compound (VOC) sensor in order to determine the pollution by volatile organic compounds in schools, offices and other premises.

Operation

The Air Monitor is controlled by a micro-controller. Normally, the display will show the VOC value and a graph that shows the average value of the measurements after the choosen measuring period. Above the preset alarm value the display will show in flashing red "Ventilation on".

First time startup

- Place the Air Monitor in a place where unauthorized persons can not easily reach.
- Activate the Monitor by connecting to a 9 V DC power unit.
- Next, the Monitor starts up with the settings that are stored in the internal memory (Eeprom).
- If necessary, press the right button to activate the menu and perform a new zero calibration (in clean air!!).
- **The sensors need 5 days to stabilize!** Changing the sensitivity within 5 days will lead to erroneous readings.

Menu

Is activated when the right push button is pressed. At first the version of the installed firmware is shown, then a number of settings follows (random values):

- **VOC1 Null = 227 .**
  The start up value of canairy sensor 1 for the micro-controller after zero calibration.
  Max VOC = 18 ppm. The highest measured VOC level of the sensor. Is reset after zero calibration.
  F1 = 30 . The factor by which the deviation from VOC Null is multiplied (derived from the calibration with 100 ppm calibration gas).
  Reading = 255 = 1246 mV. The actual value of VOC sensor for the micro-controller (maximum 1023) and the sensor output in mV.

Subsequently, a number of possibilities are offered to set up the monitor.

- **New zero calibration?**
  After confirming the calibration takes place. The display says: "Wait a moment.."
  Once a constant value is measured for the VOC sensor the Monitor reports that the calibration is OK. For VOC 0 ppm is set as a benchmark.

- **Sensitivity set up?**
  This can only be performed by authorized personnel by placing the sensors in a cabinet or room where the air is 'polluted' with 100 ppm of test gas. Now you are

asked to enter a code (=17). Then press the right button to increase (left button to decrease) F1 and the corresponding VOC value. Release the button as soon as the VOC value reads 100 ppm.
The calibration will only be correct when the monitor was zero calibrated earlier in clean air!

- **Alarm value = 50 set up?**
  This is the VOC value above which the display shows "Ventilation on" whereby the relay switches to the 'on' state.

- **Interval graph update set up?**
  This is the time in minutes between the display of two subsequent data. The average value of the measurements is stored. Can be set from 1 to 60 minutes. The interval is also used to update the graph in the display. The graph will only show the last 160 measurements.

Specifications

VOC-sensor:	Metal oxide semiconductor (MOS) sensor.
Range:	0 – 250 ppm
Resolution:	1 ppm
Temperature range:	0–35°C
Lifetime sensor:	Minimum 3 years.
Response time (21°C):	From 0 to 10 ppm: max.20 seconds.
Power supply:	7–9 Volt.
Power consumption:	ca. 90 mA.
Temperature:	5–35°C.
Dimensions:	85mm × 85mm × 25mm
Weight:	ca. 100 g.
Reset:	Reset of the monitor takes place at power connection.
Eeprom:	Saves:

- Alarm value for VOC.
- Fresh air start value VOC Null.
- Sensitivity factor F1.
- Interval between storing data / graph update.

Terminals

DC power socket	Connection for the power supply. The voltage is minimum 7 and maximum 9 volt. Note proper connection! The monitor is **not** protected against wrong connection!
Internal terminal block:	
0V and OUT	Sensor output. 0 ppm corresponds to 0V, 250 ppm or higher corresponds to 5V.
Relay	OFF when VOC is lower than the alarm value. ON when VOC is higher than the alarm value. The relay will stay ON until VOC has dropped to less than half the alarm value.