

## ADDAIR AQMESH

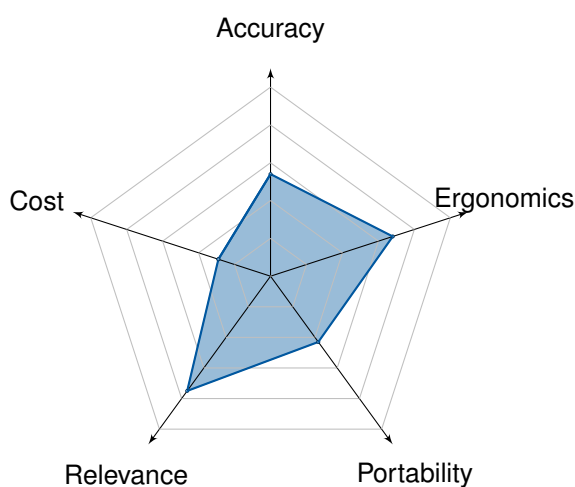
Best use : Regulatory Compliance for Fixed Outdoor locations

### Jury's opinion

Multi-pollutant station for measuring outdoor air quality. The measurement results for nitrogen dioxide and ozone are good, but they are average for particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>) regardless of the particle size cut-off. Easy to install and implement, however, data access via the cloud would benefit from improvement. Especially since this equipment is expensive.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                       |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

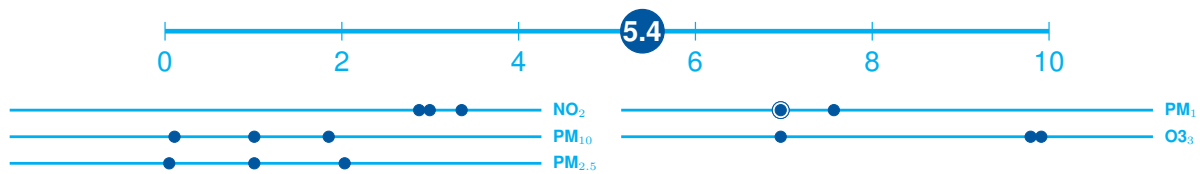
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity                      |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort                |

## Detailed test results

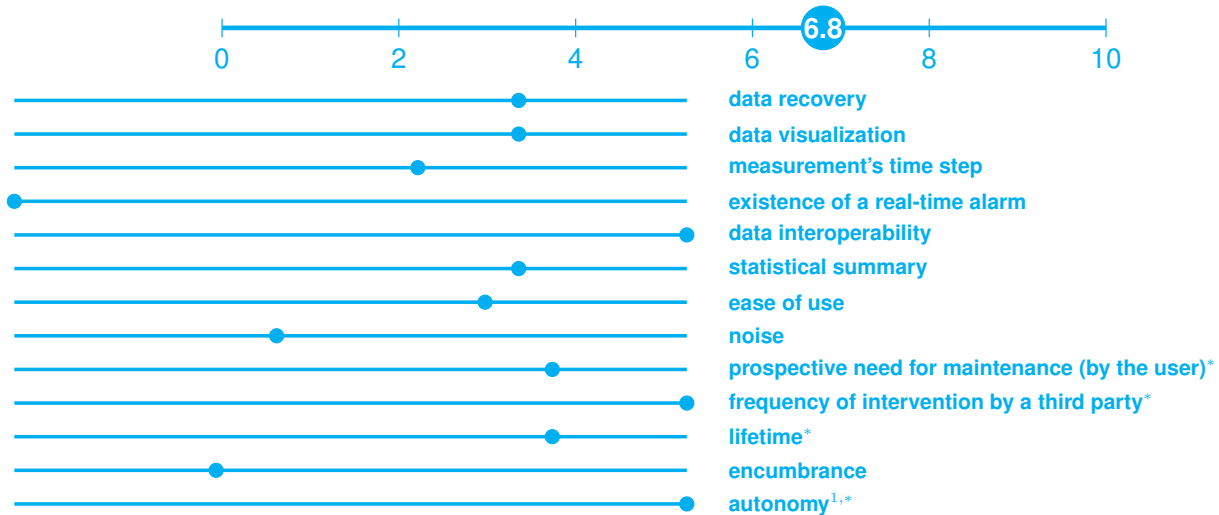
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



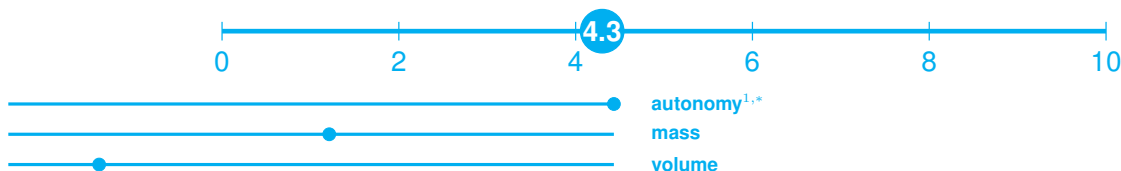
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**ADDAIR**

2014

189 rue Audemars  
78530 Buc

N° SIREN 807 494 638

[www.addair.fr](http://www.addair.fr)



### Partenaires du challenge/Challenge's partners



Materials Science and Technology





## AEROQUAL AQY-1

Best use : Regulatory Compliance for Fixed Outdoor locations

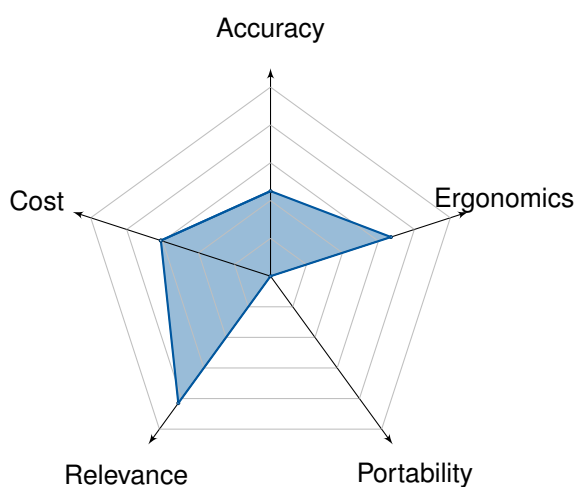
### Jury's opinion



This sensor is used in outdoor air. It presents fairly satisfactory results for PM<sub>2.5</sub> particles but average for nitrogen dioxide. It has a fairly good operating cost, but the operation would benefit from being made easier, particularly the data communication configuration and the anchoring system, as well as the date format on the data management dashboard (not adapted to France).



### Evaluation



### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                 |
| <input type="checkbox"/> TSP   | <input type="checkbox"/> Particles PM <sub>10</sub>      |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>       |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                    |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                 |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration) |

### Other measurements

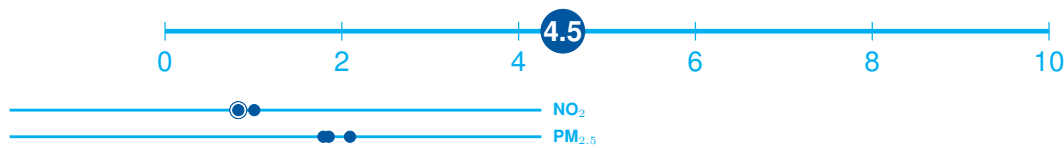
- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity           |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort     |

## Detailed test results

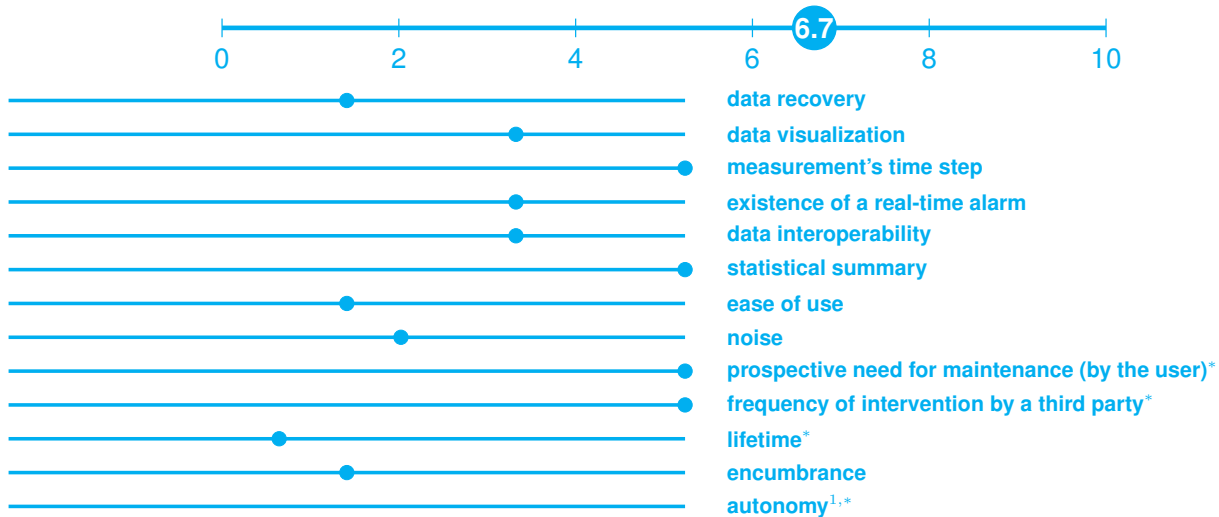
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**Aeroqual Ltd**

2001

460 Rosebank Rd,  
Avondale,  
Auckland 1026, NEW ZEALAND

[www.aeroqual.com](http://www.aeroqual.com)

[facebook.com/Aeroqual](https://www.facebook.com/Aeroqual)

[@aeroqual](https://twitter.com/aeroqual)

**aeroqual**

### Partenaires du challenge/Challenge's partners



Materials Science and Technology



## AGRISCOPE PM-SCOPE

Best use : Regulatory Compliance for Fixed Outdoor locations

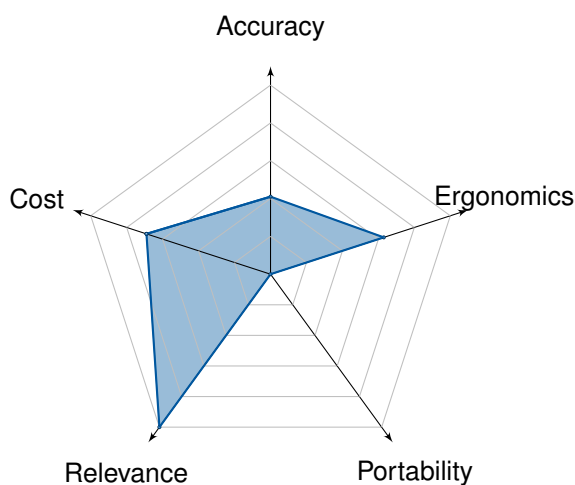
### Jury's opinion



This beautiful ambient air measuring station is used for awareness raising applications. The quality of the measurements is average for fine particles  $PM_{2.5}$  and unsatisfactory for  $PM_{10}$ . The device is inexpensive and easy to install. The environment and data management is pleasant to use. However, the recovery of temperature and ambient humidity data would be a plus.



### Evaluation



### Measured pollutants

- |   |   |
|---|---|
| <input type="radio"/> $NO_2$ ( $NO_x$ )               | <input type="radio"/> $CO_2$                          |
| <input type="radio"/> TSP                             | <input checked="" type="radio"/> Particles $PM_{10}$  |
| <input checked="" type="radio"/> Particles $PM_{2.5}$ | <input type="radio"/> Particles $PM_1$                |
| <input type="radio"/> $O_3$                           | <input type="radio"/> Formaldehyde                    |
| <input type="radio"/> VOC                             | <input type="radio"/> $SO_2$                          |
| <input type="radio"/> CO                              | <input type="radio"/> Particle number (concentration) |

### Other measurements

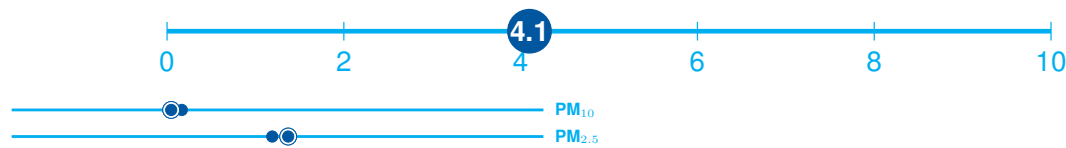
- |                                   |  |
|-----------------------------------|--|
| <input type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours      | <input type="radio"/> Acoustic comfort     |

## Detailed test results

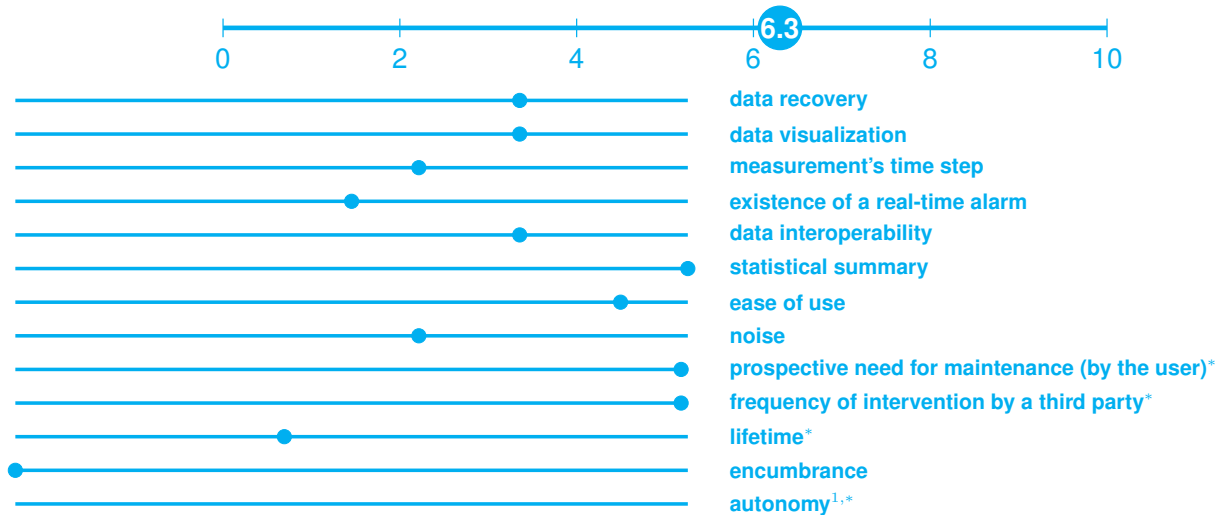
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**AGRISCOPE**

2008

404, rue St Exupery  
34130 Maugeio

N° SIREN 502824444

[www.agriscope.fr](http://www.agriscope.fr)

[facebook.com/Agroscope](https://www.facebook.com/Agroscope)

[@Agroscope](https://twitter.com/Agroscope)



### Partenaires du challenge/Challenge's partners



## AIRNATUREL BLUEAIR

Best use : Public or user Awareness for Fixed Indoor locations

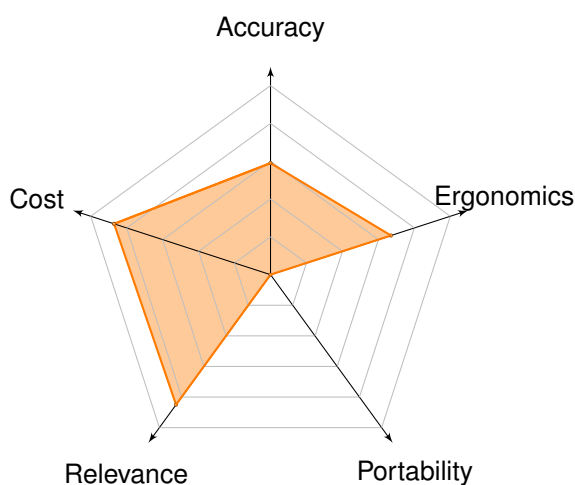
### Jury's opinion



A beautiful sensor for measuring indoor air, easy to install, with a visual indicator of pollutant levels. The measurement quality is good for particles and satisfactory for VOCs but not very satisfactory for CO<sub>2</sub>. However, if the number of measurement points increases, managing and retrieving data through a Gmail account can be quite tedious.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )     | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input type="radio"/> TSP                                    | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input checked="" type="radio"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                         | <input type="radio"/> Formaldehyde                    |
| <input checked="" type="radio"/> VOC                         | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                     | <input type="radio"/> Particle number (concentration) |

### Other measurements

- |  |  |
|--|--|
| <input checked="" type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort     |

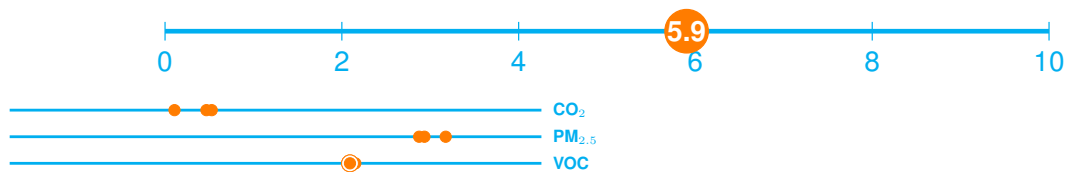


## Detailed test results

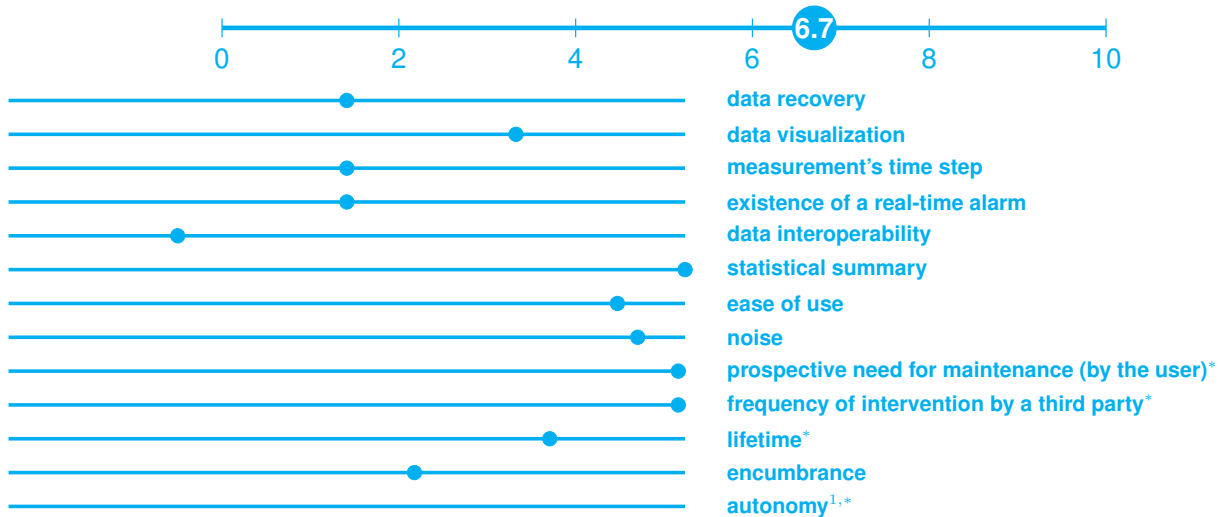
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



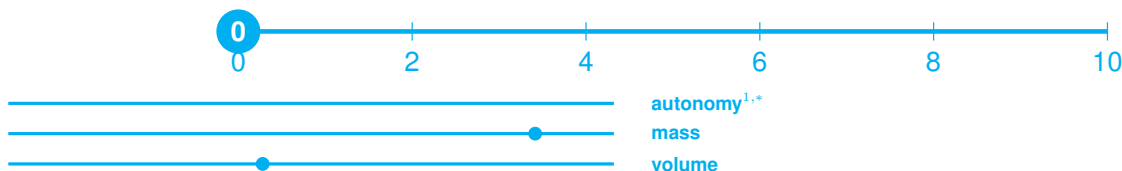
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

WAF DIRECT

2004

18-22 rue d'Arras

bât B13

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[facebook.com/profile.php?id=100012261373233](https://www.facebook.com/profile.php?id=100012261373233)

[@air\\_and\\_me](https://twitter.com/air_and_me)



### Partenaires du challenge/Challenge's partners



## IQAIR AIRVISUAL PRO

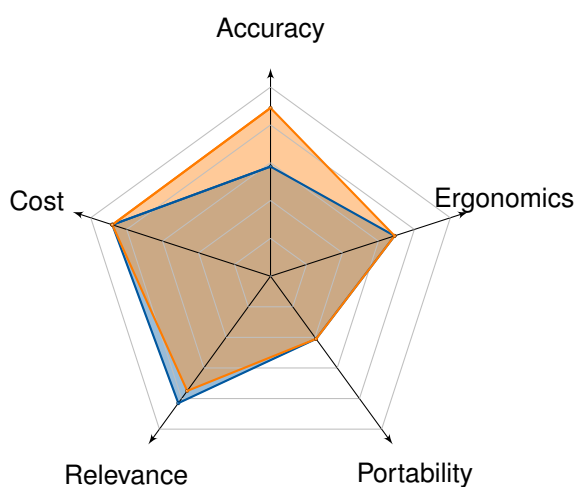
Best use : Public or user Awareness for Fixed Indoor locations

### Jury's opinion

This device is designed to measure indoor air quality, especially for the public. The quality of the CO<sub>2</sub> and particle measurement is respectively excellent and very good, with a good price-quality ratio, which makes this sensor ideal for awareness actions, with a static measurement. The sensor loses accuracy in ambient air. The price of the sensor is quite attractive. The ergonomics are satisfactory. Note that configuring the device before data recovery does, however, require some practice.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input checked="" type="checkbox"/> CO <sub>2</sub>            |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>                |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input type="radio"/> VOC                                       | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

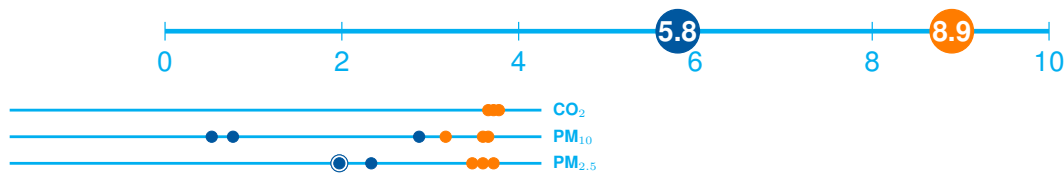
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort     |

## Detailed test results

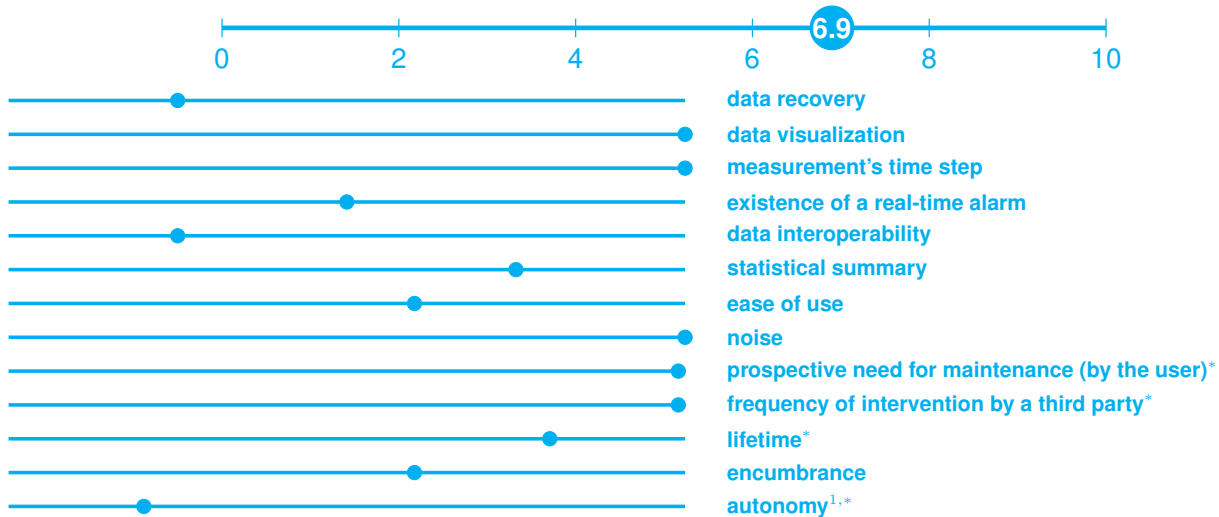
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



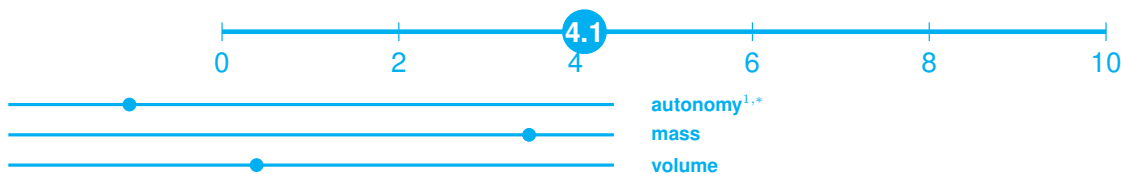
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**IQAir AG**

1963

Blumenfeldstrasse 10  
9403 Goldach, Switzerland



[www.airvisual.com](http://www.airvisual.com)

[facebook.com/AirQualityVisual](https://www.facebook.com/AirQualityVisual)

[@MyAirVisual](https://twitter.com/MyAirVisual)

### Partenaires du challenge/Challenge's partners



## ATMOTRACK

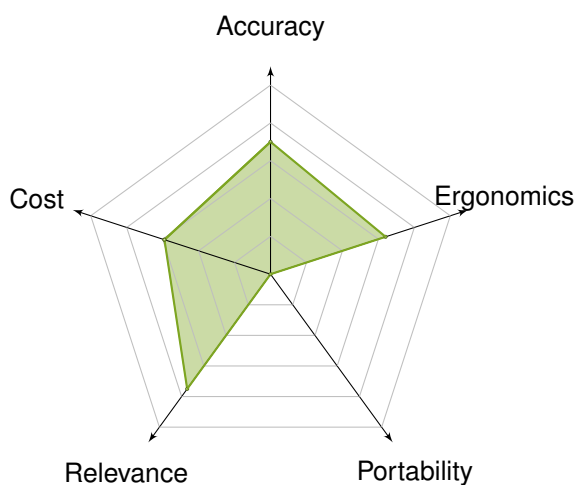
Best use : Public or user Awareness for Mobile settings

### Jury's opinion

This device is designed to be installed on the roof of a vehicle and measure particles (PM<sub>10</sub> and PM<sub>2.5</sub>). The quality of the measurements in mobility is good for PM<sub>2.5</sub> and satisfactory for PM<sub>10</sub>. The data can be viewed via a well-designed interface. 3G communication is of high quality and has not suffered any signal loss. The monitoring of temperature and humidity would be a plus and the representation of GPS coordinates would benefit from improvement.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input type="radio"/> CO <sub>2</sub>                          |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input type="radio"/> VOC                                       | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

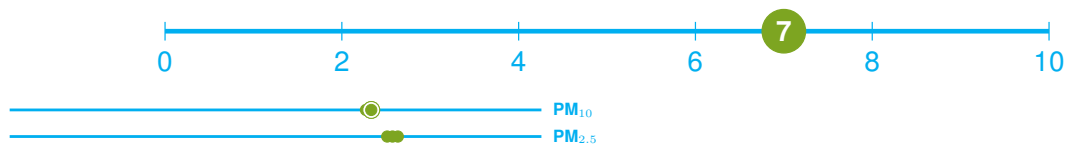
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort     |

## Detailed test results

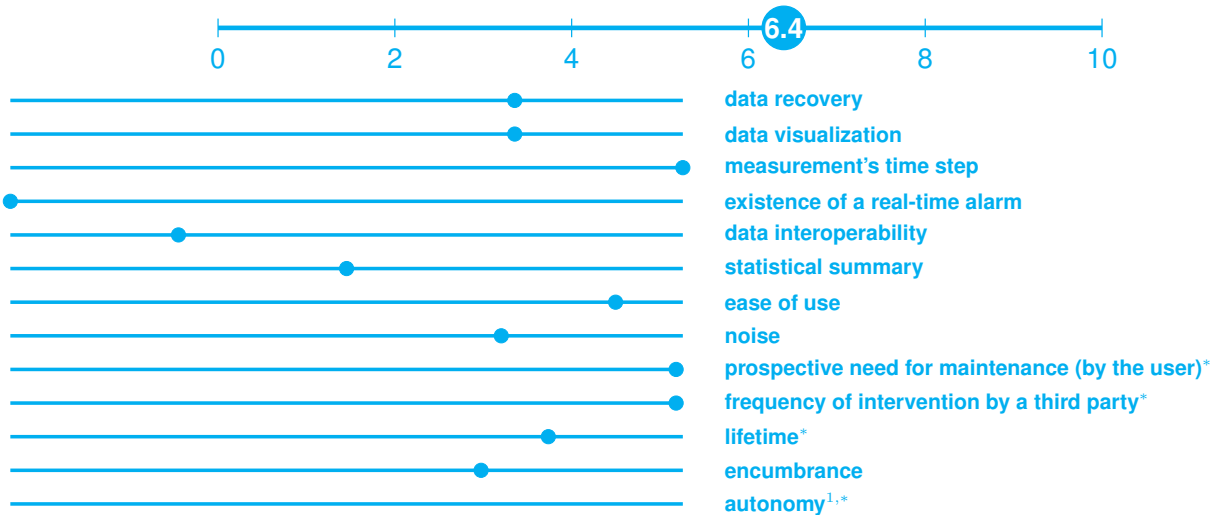
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**42 FACTORY**

2015

1 rue Julien Videment  
44200 Nantes



N° SIREN 810418798

[www.atmotrack.fr](http://www.atmotrack.fr)

[facebook.com/atmotrack](https://www.facebook.com/atmotrack)

[@atmotrack](https://twitter.com/atmotrack)

### Partenaires du challenge/Challenge's partners



Materials Science and Technology





## AZIMUT GREENBEE

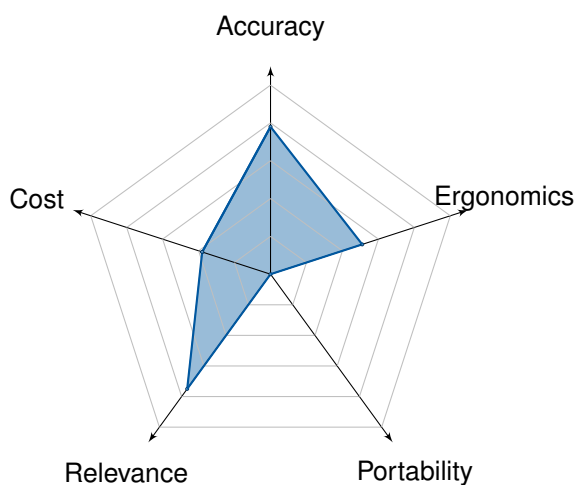
Best use : Public or user Awareness for Fixed Outdoor locations

### Jury's opinion

With its sophisticated design, this device is designed to measure the quality of outdoor ambient air, and more specifically in urban areas. The quality of the measurement is good for nitrogen dioxide and satisfactory for particulate matter (counting). Data recovery is done through an API or an ftp server, this second solution being more tedious. Some data losses were also observed. In addition, the lack of information on temperature and humidity can be a disadvantage depending on the use.



### Evaluation



### Measured pollutants

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                            |
| <input type="checkbox"/> TSP   | <input type="checkbox"/> Particles PM <sub>10</sub>                 |
| <input type="checkbox"/> Particles PM <sub>2.5</sub>                   | <input type="checkbox"/> Particles PM <sub>1</sub>                  |
| <input type="checkbox"/> O <sub>3</sub>                                | <input type="checkbox"/> Formaldehyde                               |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                            |
| <input type="checkbox"/> CO  | <input checked="" type="checkbox"/> Particle number (concentration) |

### Other measurements

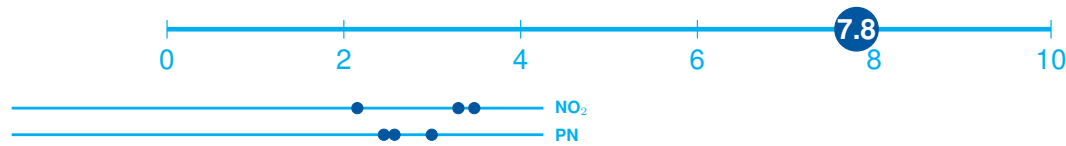
- |                                      |   |
|--------------------------------------|---|
| <input type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure |
| <input type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity           |
| <input type="checkbox"/> Odours      | <input type="checkbox"/> Acoustic comfort     |

## Detailed test results

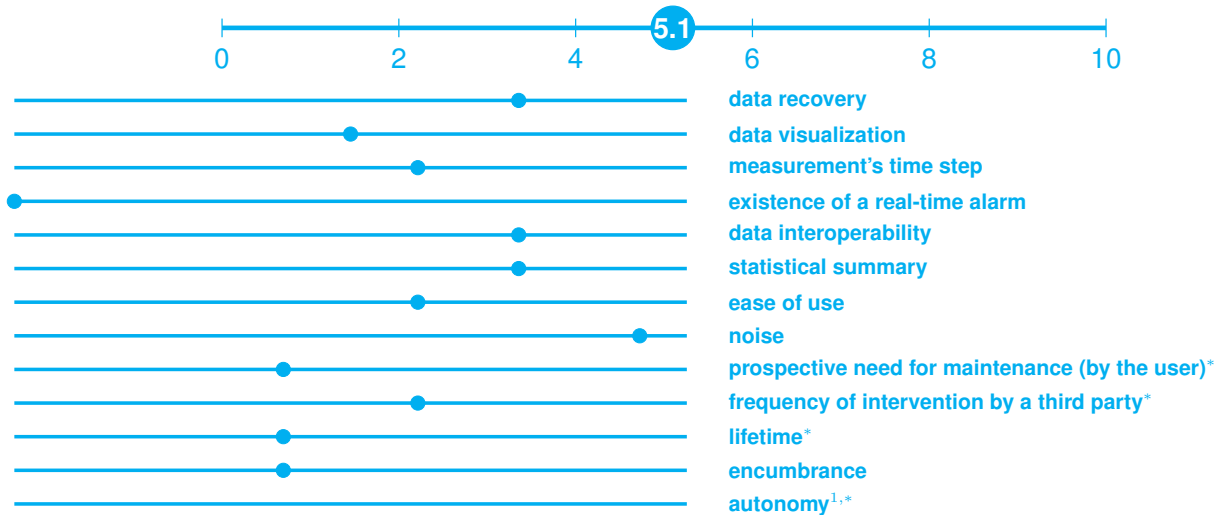
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

Azimet-Monitoring **hagerservices**

2006

140 rue du pré de l'Horme  
38926 Crolles

### Partenaires du challenge/Challenge's partners



## AZIMUT RAM000X

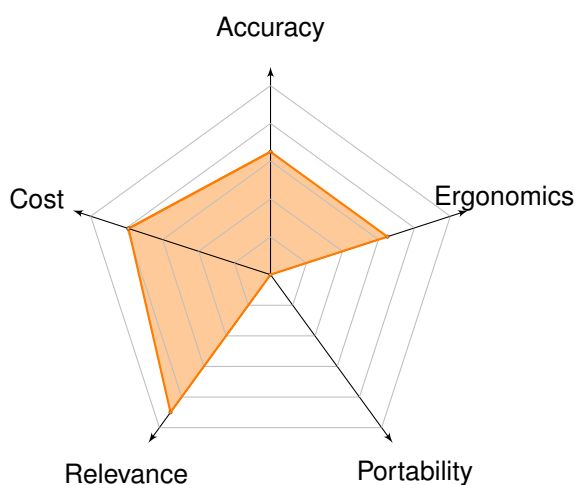
Best use : Indoor Air Quality Control

### Jury's opinion

This complete device is designed for measuring indoor air quality. The quality of the measurement is good for CO<sub>2</sub>, satisfactory for particles with the emphasis on counting rather than mass concentration. Some data losses were observed. Data recovery is done through an API or ftp server (more tedious). Communication can be done on the SIGFOX network (own closed network or based on partner operators with low throughput, low consumption and high range).



### Evaluation



### Measured pollutants

- |  |  |
|--|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>                 |
| <input type="radio"/> TSP                                | <input type="radio"/> Particles PM <sub>10</sub>                 |
| <input type="radio"/> Particles PM <sub>2,5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>                  |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                               |
| <input checked="" type="radio"/> VOC                     | <input type="radio"/> SO <sub>2</sub>                            |
| <input type="radio"/> CO                                 | <input checked="" type="radio"/> Particle number (concentration) |

### Other measurements

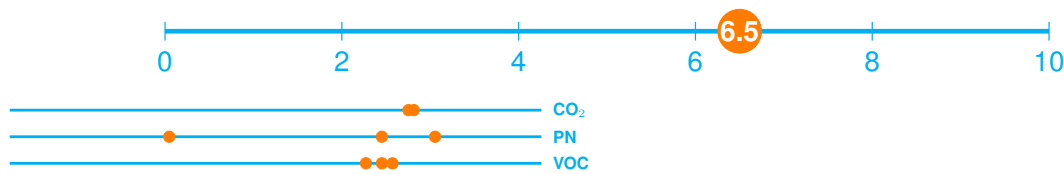
- |  |   |
|--|---|
| <input checked="" type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure  |
| <input checked="" type="radio"/> Humidity    | <input checked="" type="radio"/> Luminosity |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort      |

## Detailed test results

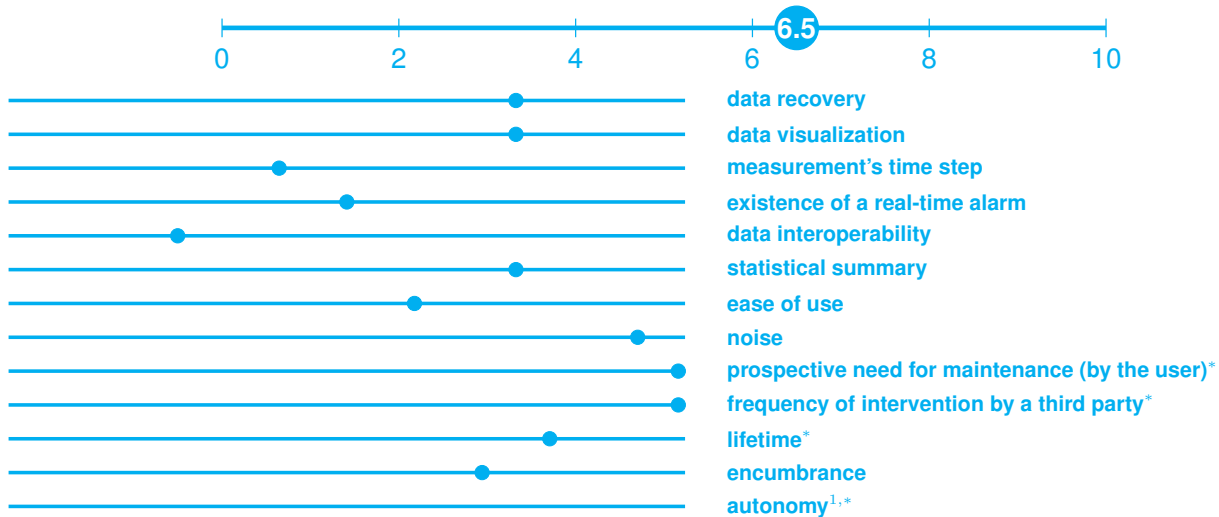
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



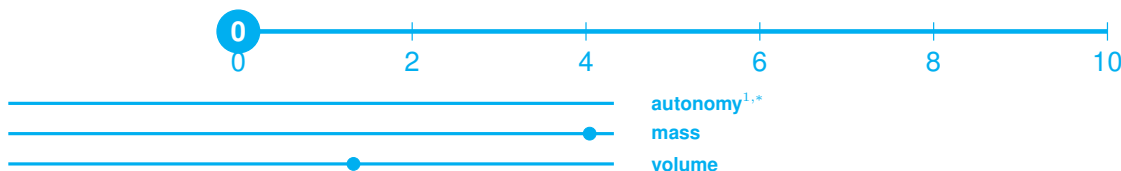
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

Azimet-Monitoring **hagerservices**

2006

140 rue du pré de l'Horme  
38926 Crolles

### Partenaires du challenge/Challenge's partners





## CAIRPOL CAIRNET

Best use : Regulatory Compliance for Fixed Outdoor locations

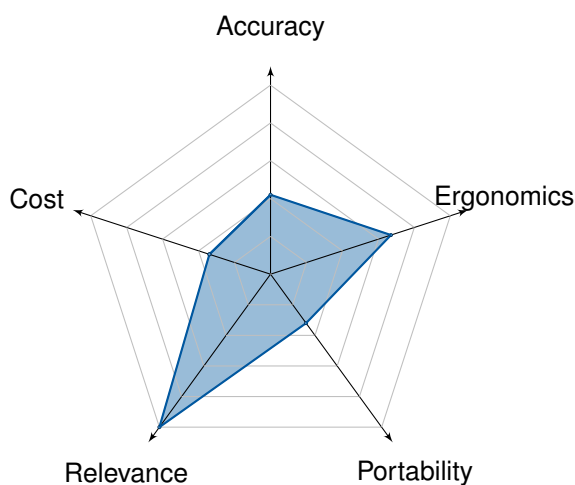


### Jury's opinion

This device is to be used to monitor the quality of outdoor ambient air. The quality of the measurement for nitrogen dioxide is good but has shown variations depending on the sensors. The installation is easy with the option of a solar panel power supply. The website is complete with easy data extraction. However, particle measurement is not very satisfactory. Malfunctions have led to data loss, and the cost of the device is rather high. An evolution of design could be a plus.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2,5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>             |
| <input type="checkbox"/> O <sub>3</sub>                                | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                       |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity                      |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort                |

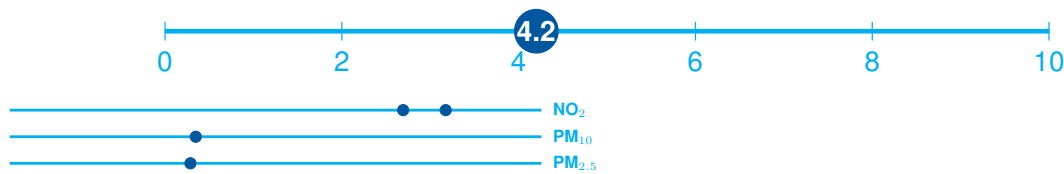


## Detailed test results

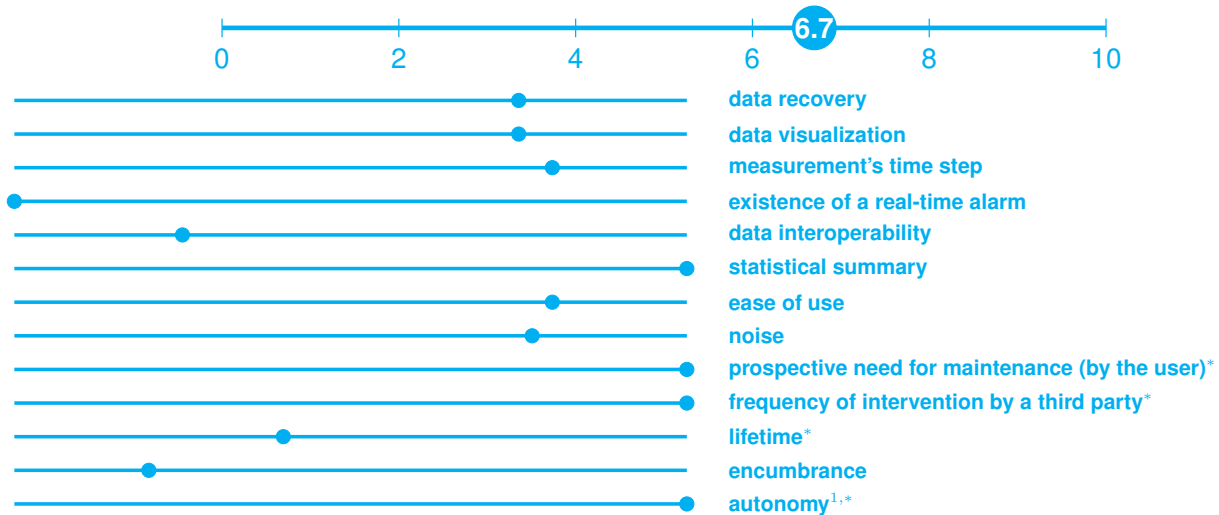
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



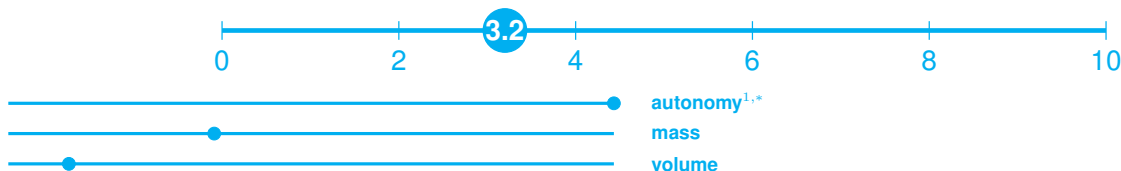
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

#### Environnement - Cairpol

1978

111 boulevard Robespierre

CS 80004

78304 Poissy Cedex 4

N° SIREN 313 997 223

cairpol.com



### Partenaires du challenge/Challenge's partners



Materials Science and Technology



## CLARITY NODE-S

Best use : Regulatory Compliance for Fixed Outdoor locations

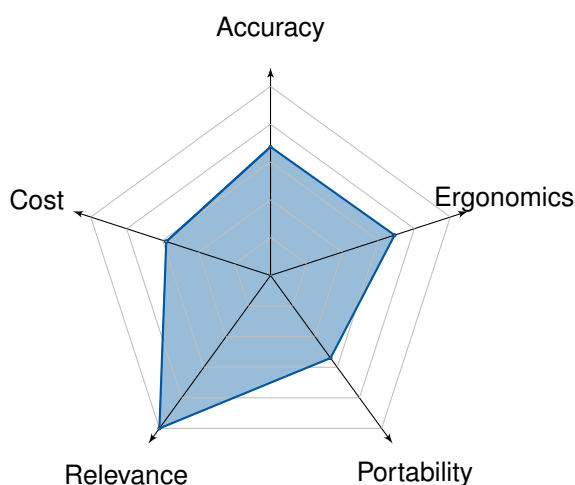
### Jury's opinion



This multi-pollutant sensor is designed to measure outdoor air quality. Data quality is satisfactory for NO<sub>2</sub> and PM<sub>2.5</sub>. A Smart Calibration algorithm is available, developed from the reference monitoring network. However, PM<sub>10</sub> and ozone are missing for more comprehensive outdoor air monitoring. The device is easy to install, discreet but with a pleasant design, and the possibility of installing a solar panel is a plus. However, it is important to read the instructions carefully before configuring and starting the measurement. Some data losses were observed at one of the stations.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                 |
| <input type="checkbox"/> TSP   | <input type="checkbox"/> Particles PM <sub>10</sub>      |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>       |
| <input type="checkbox"/> O <sub>3</sub>                                | <input type="checkbox"/> Formaldehyde                    |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                 |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration) |

### Other measurements

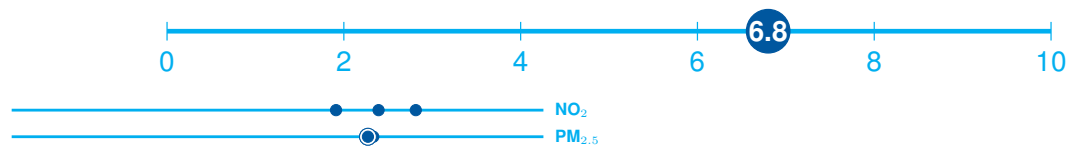
- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity           |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort     |

## Detailed test results

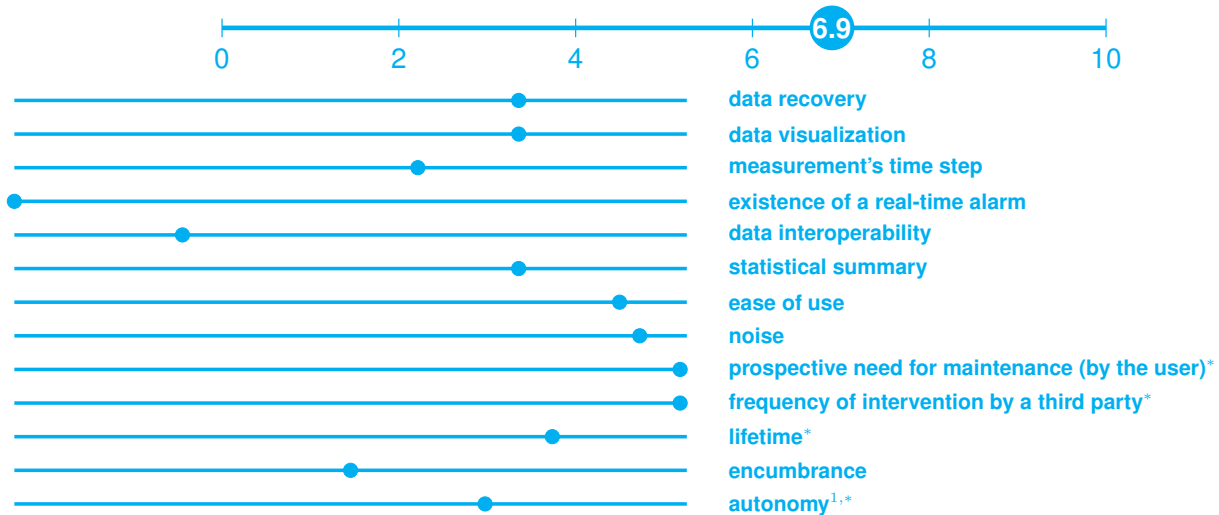
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**Clarity Movement Co.**

2014

2087 Addison St,  
2nd Floor, Berkeley, CA  
94704, United States



clarity.io

facebook.com/claritymovement

@JoinClarity

### Partenaires du challenge/Challenge's partners



Materials Science and Technology



## DECENTLAB DLR1.3

Best use : Public or user Awareness for Fixed Indoor locations

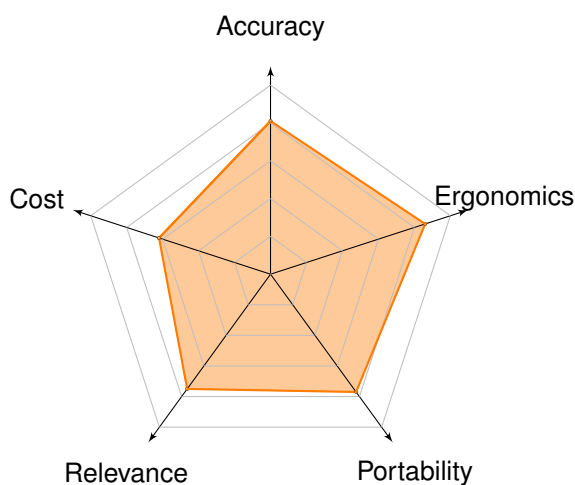
### Jury's opinion



This sensor is intended for indoor use for CO<sub>2</sub> measurement. The measurement quality is very good for this pollutant. The sensor has very good ergonomics with an excellent autonomy. The box is easy to install on a wall, in a workplace or at home. The API is functional and the sensor is easy to use. However, this sensor would benefit from measuring several pollutants.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input type="radio"/> TSP                                | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input type="radio"/> Particles PM <sub>2.5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                    |
| <input type="radio"/> VOC                                | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                 | <input type="radio"/> Particle number (concentration) |

### Other measurements

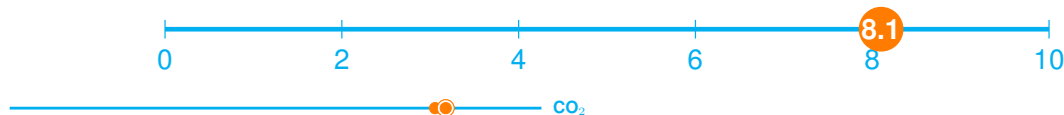
- |  |   |
|--|---|
| <input checked="" type="radio"/> Temperature | <input checked="" type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity                      |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort                |

## Detailed test results

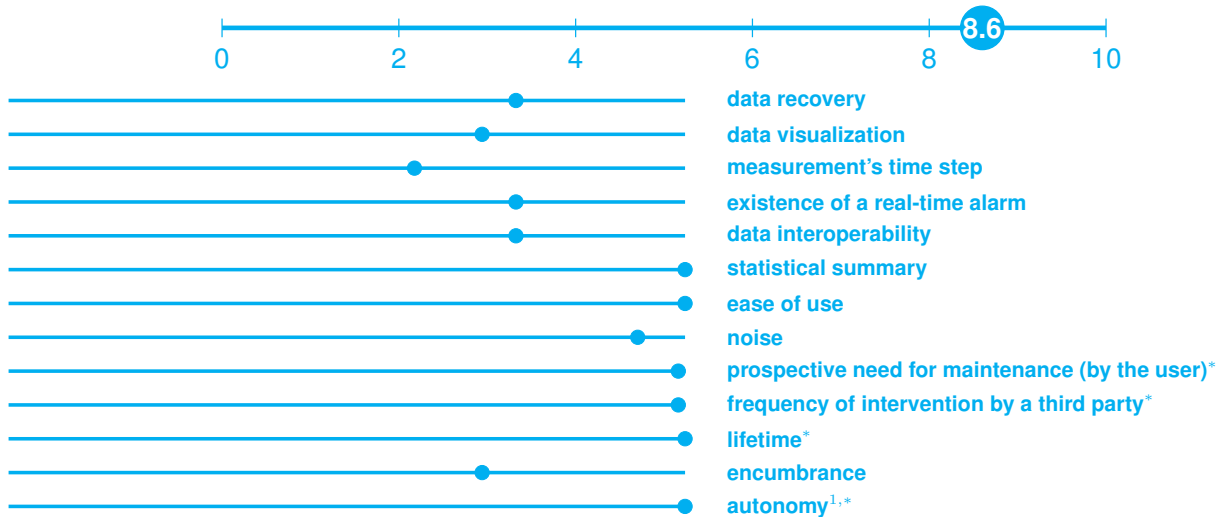
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**Decentlab GmbH**  **decentlab**

2008

Überlandstrasse 129, 8600  
Dübendorf, Switzerland

N° SIREN CH-020.4.038.740-1, CHE-114.538.080

[www.decentlab.com](http://www.decentlab.com)

 @decentlab

### Partenaires du challenge/Challenge's partners



Materials Science and Technology





## DECENTLAB Multisensor

Best use : Public or user Awareness for Fixed Indoor locations

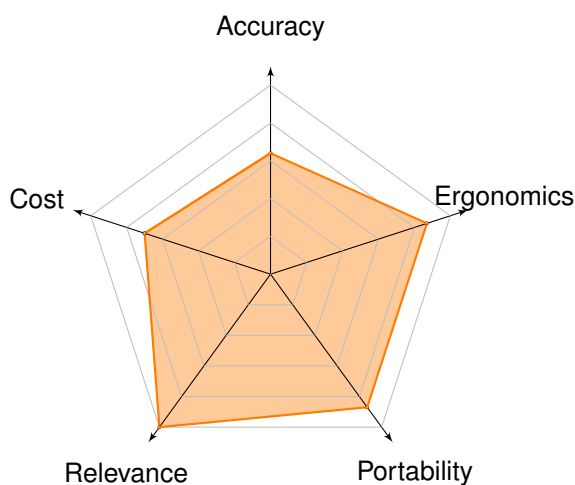


### Jury's opinion

This device is intended for measuring air quality inside buildings. For a rather attractive price, it measures CO<sub>2</sub> and VOCs. It comes in the form of a wall box that can be easily integrated into different indoor environments. Operating on batteries, it has an excellent autonomy (3 years) and its API is functional. While the quality of measurements is very good for CO<sub>2</sub>, it is average for VOCs. However, only one prototype could be tested within the framework of this challenge, its commercialization is planned for the end of 2018.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input type="radio"/> TSP                                | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input type="radio"/> Particles PM <sub>2.5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                    |
| <input checked="" type="radio"/> VOC                     | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                 | <input type="radio"/> Particle number (concentration) |

### Other measurements

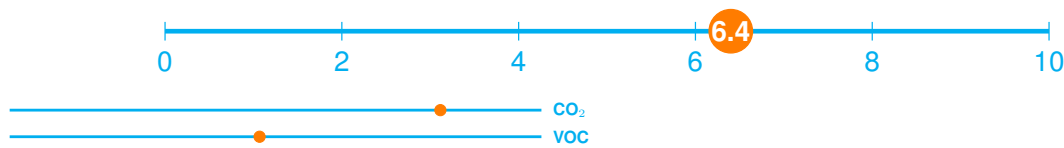
- |  |   |
|--|---|
| <input checked="" type="radio"/> Temperature | <input checked="" type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input checked="" type="radio"/> Luminosity           |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort                |

## Detailed test results

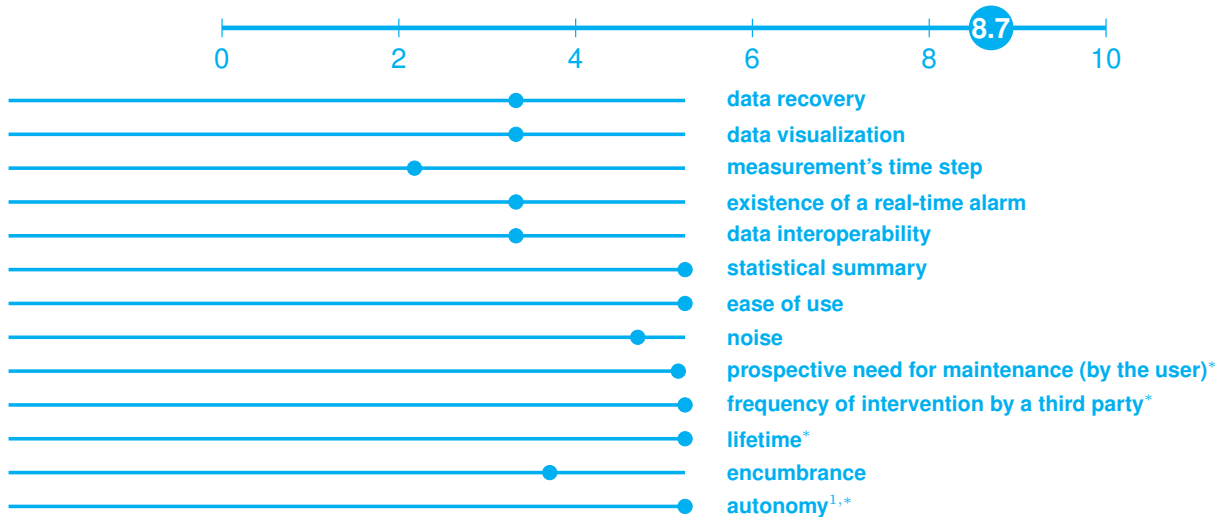
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



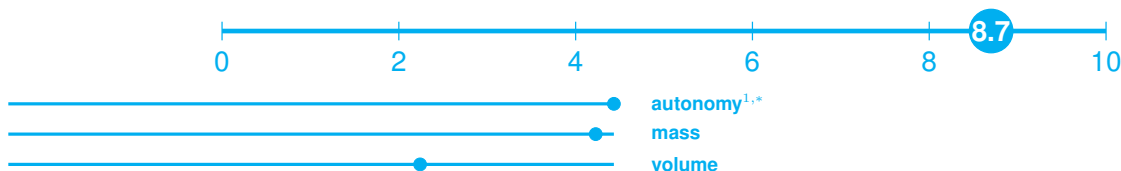
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**Decentlab GmbH**  **decentlab**

2008  
Überlandstrasse 129, 8600  
Dübendorf, Switzerland

N° SIREN CH-020.4.038.740-1, CHE-114.538.080  
[www.decentlab.com](http://www.decentlab.com)

 @decentlab

### Partenaires du challenge/Challenge's partners



## ECOMESURE ECOMSMART

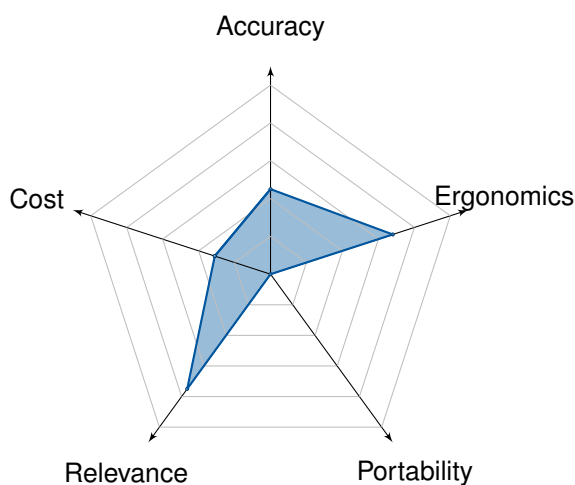
Best use : Public or user Awareness for Fixed Outdoor locations

### Jury's opinion

This device is designed to measure ambient air quality. The quality of the measurement is satisfactory for nitrogen dioxide but the quality of the particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>) is less so. Malfunctions could be observed with a blockage of the equipment. The data recovery platform would also need to be improved in terms of acquisition speed (several hours to recover two weeks of data) and by facilitating extraction for several results with the same time stamp.



### Evaluation



### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                       |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

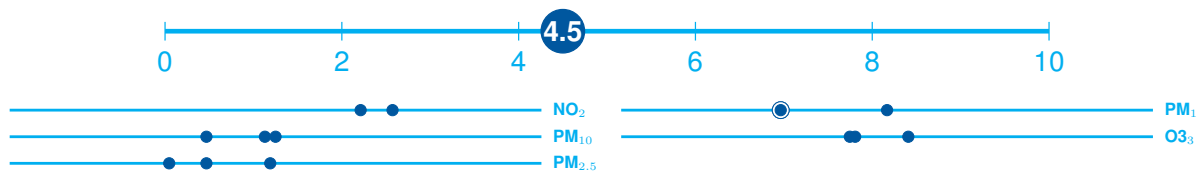
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity                      |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort                |

## Detailed test results

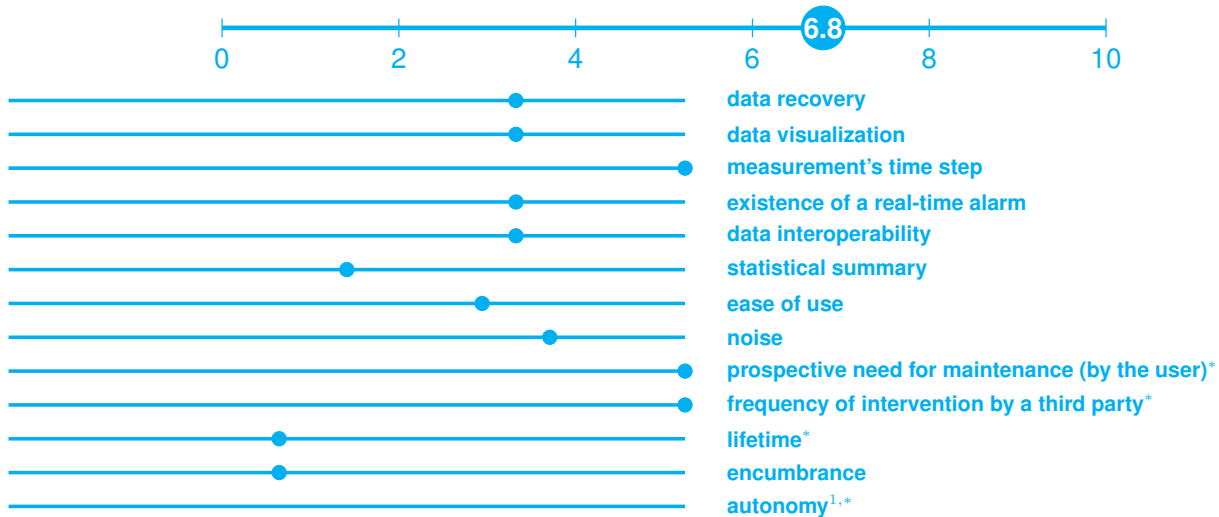
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

#### ECOMESURE

1993

4 rue René Razel  
Immeuble Hermès  
94100 Saclay

N° SIREN 392782728

[www.ecomesure.com](http://www.ecomesure.com)

[facebook.com/Ecomesure-391354861044112](https://www.facebook.com/Ecomesure-391354861044112)

[@ecomesure](https://twitter.com/ecomesure)



### Partenaires du challenge/Challenge's partners



## ECOMESURE ECOMZEN

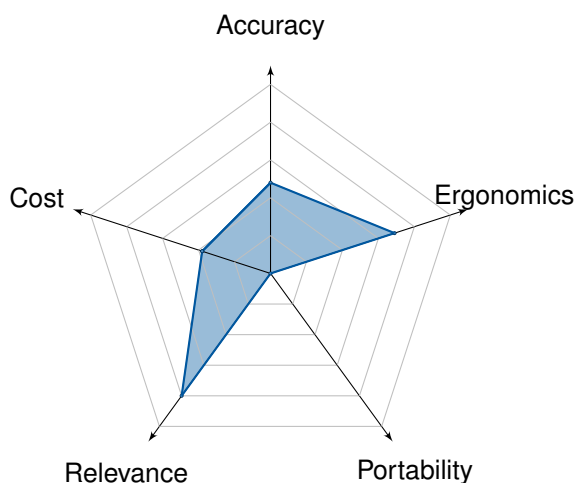
Best use : Indoor Air Quality Control

### Jury's opinion

This sensor is used in indoor air. It comes in the form of a box whose design allows easy integration into different indoor environments and has the advantage of measuring several pollutants (CO<sub>2</sub>, total VOCs and TSP particles). The quality of the measurement is satisfactory for CO<sub>2</sub> but not very satisfactory for VOCs and particulate matter. The data recovery platform could also be improved in terms of the speed of data acquisition (6 hours to recover two weeks of data) and by facilitating extraction for several results with the same time stamp.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input checked="" type="radio"/> TSP                     | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input type="radio"/> Particles PM <sub>2,5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                    |
| <input checked="" type="radio"/> VOC                     | <input type="radio"/> SO <sub>2</sub>                 |
| <input checked="" type="radio"/> CO                      | <input type="radio"/> Particle number (concentration) |

### Other measurements

- |  |   |
|--|---|
| <input checked="" type="radio"/> Temperature | <input checked="" type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity                      |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort                |

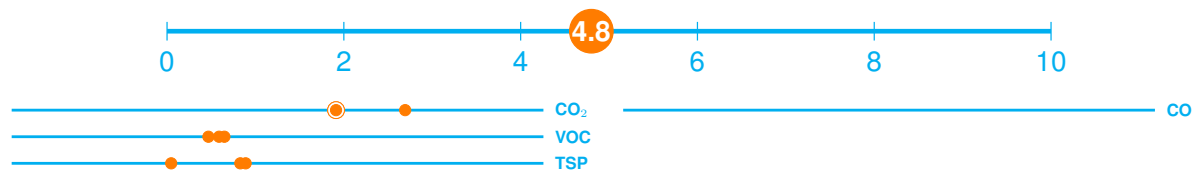


## Detailed test results

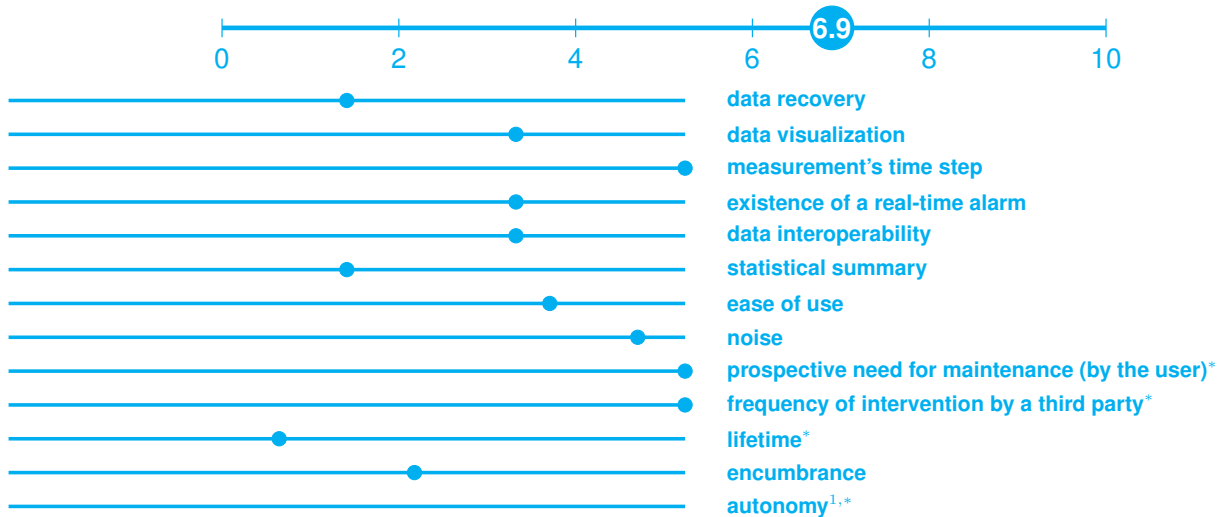
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

### # ACCURACY on 3 microsensors based on the SET method (Fishbain & al. 2017)



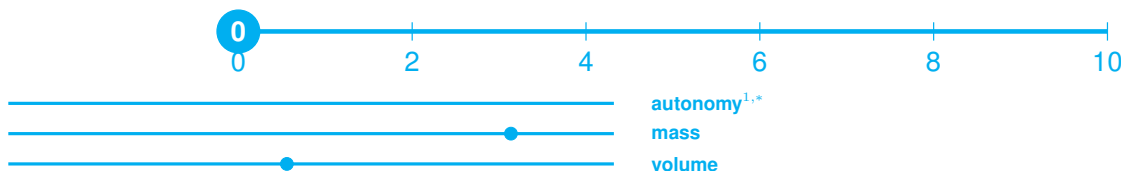
### # ERGONOMICS based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



### # RELEVANCE of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



### # PORTABILITY<sup>1,\*</sup>



### # COST investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

#### Entreprise/Company

##### ECOMESURE

1993

4 rue René Razel  
Immeuble Hermès  
94100 Saclay

N° SIREN 392782728

[www.ecomesure.com](http://www.ecomesure.com)

[facebook.com/Ecomesure-391354861044112](https://www.facebook.com/Ecomesure-391354861044112)

[@ecomasure](https://twitter.com/ecomasure)



#### Partenaires du challenge/Challenge's partners



## ETHERA NEMO-XT

Best use : Regulatory Compliance for Fixed Indoor locations

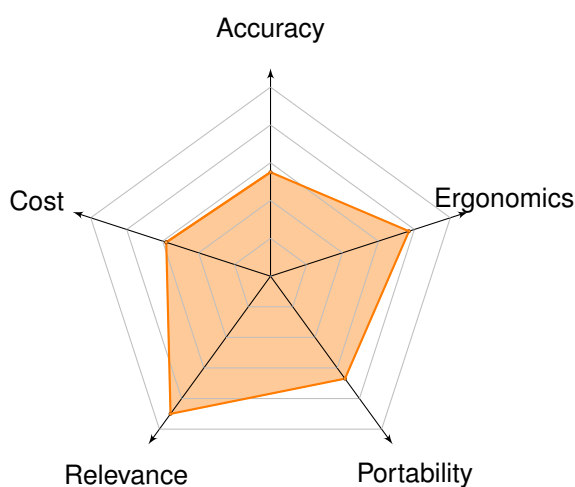
### Jury's opinion



Designed for monitoring indoor air for professional use, this device has the advantage of being multi-pollutant (VOC, CO<sub>2</sub>, particles, and formaldehyde as an option). The device is easy to install. The optional measurement of formaldehyde is an advantage, even if it is punctual (by means of optical tongues) and can have a significant impact on the operating cost. The measurement of CO<sub>2</sub> and particulate matter is satisfactory, but the measurement of VOCs is unsatisfactory.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input checked="" type="checkbox"/> CO <sub>2</sub>            |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>                |
| <input type="radio"/> O <sub>3</sub>                            | <input checked="" type="checkbox"/> Formaldehyde               |
| <input checked="" type="checkbox"/> VOC                         | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

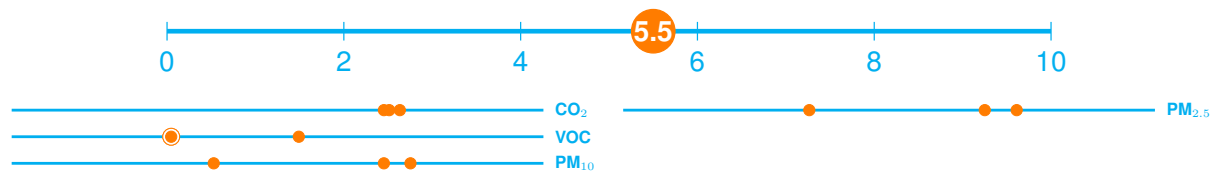
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="radio"/> Luminosity                         |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort                   |

## Detailed test results

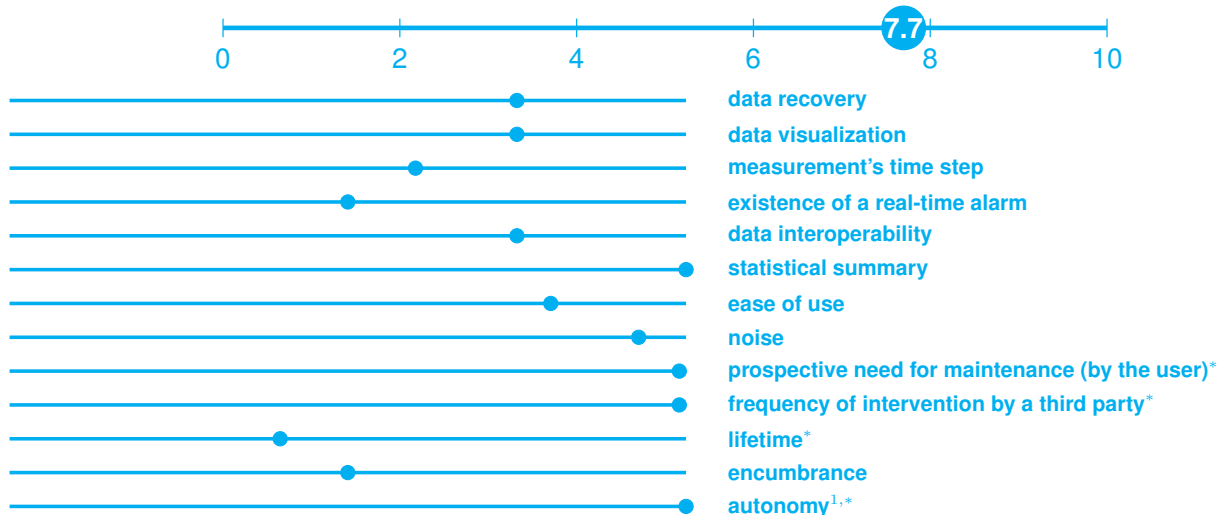
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

### # ACCURACY on 3 microsensors based on the SET method (Fishbain & al. 2017)



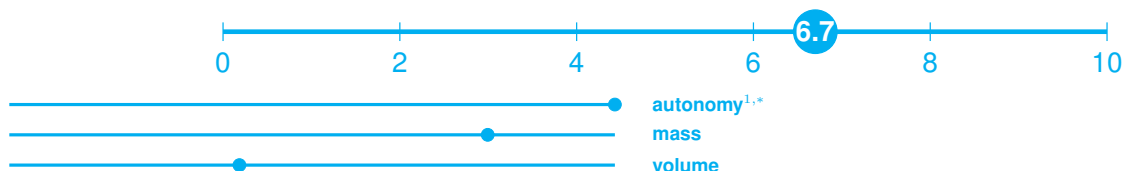
### # ERGONOMICS based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



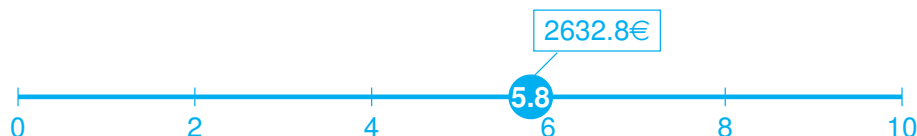
### # RELEVANCE of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



### # PORTABILITY<sup>1,\*</sup>



### # COST investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

#### Entreprise/Company

**ETHERA**

2011

628 rue Charles de Gaulle  
38920 Crolles

N° SIREN 520944182

[www.etheralabs.com](http://www.etheralabs.com)

[facebook.com/etheralabs](https://www.facebook.com/etheralabs)

[@EtheraLabs](https://twitter.com/EtheraLabs)



#### Partenaires du challenge/Challenge's partners



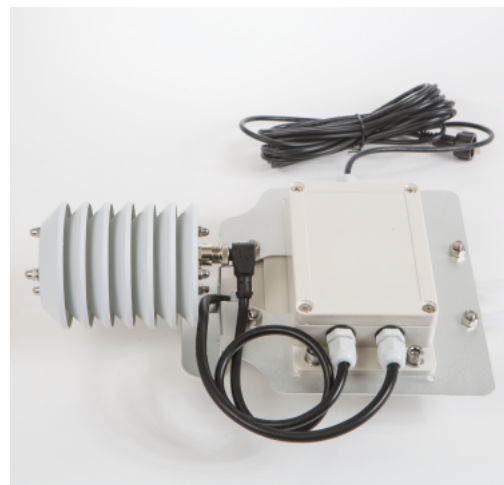
## EYNIX SenseInAIR

Best use : Public or user Awareness for Fixed Outdoor locations

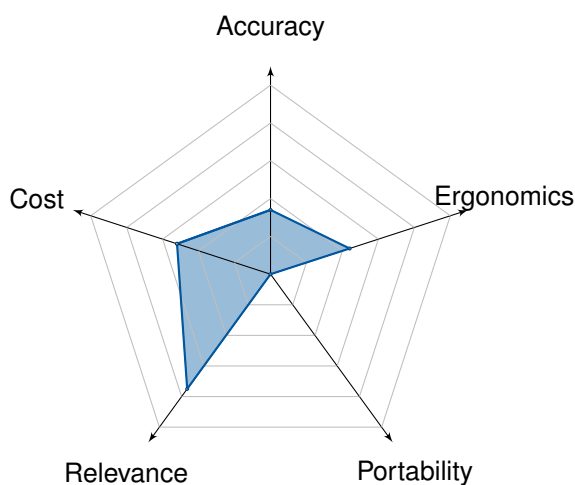


### Jury's opinion

This device is designed to measure ambient air quality. Its cost is reasonable and it makes it possible to monitor the main outdoor air pollutants (NO<sub>2</sub>, particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>, and ozone). However, the quality of the measurement is not very satisfactory for all pollutants. Despite a change of initial cells, only data from one station could be recovered. No interface could be tested. Communication is via LoRA (open network based on a collaborative model with low throughput, low power and high range).



### Evaluation



### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>             |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input type="checkbox"/> SO <sub>2</sub>                       |
| <input checked="" type="checkbox"/> CO                                 | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

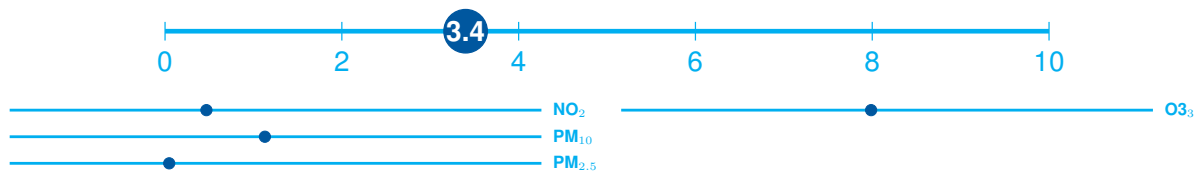
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity                      |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort                |

## Detailed test results

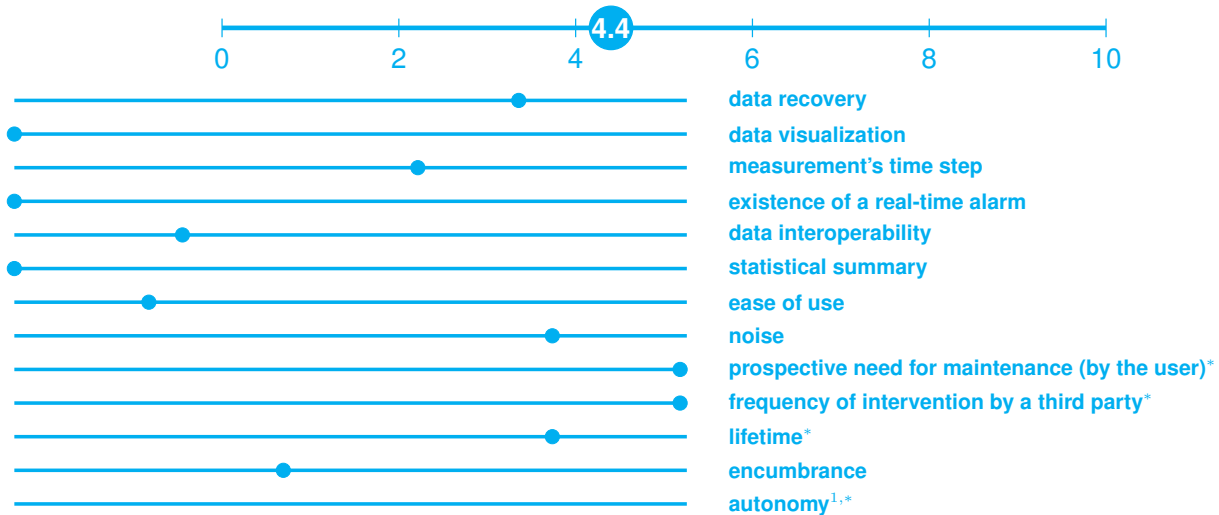
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



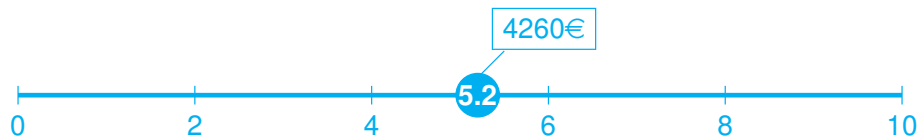
# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**EYNIX**

2003

17 Rue des Tilleuls  
78960 Voisins Le Bretonneux

N° SIREN 449769447

sensmycity.com



### Partenaires du challenge/Challenge's partners



Materials Science and Technology





## HABITATMAP AIRBEAM-1

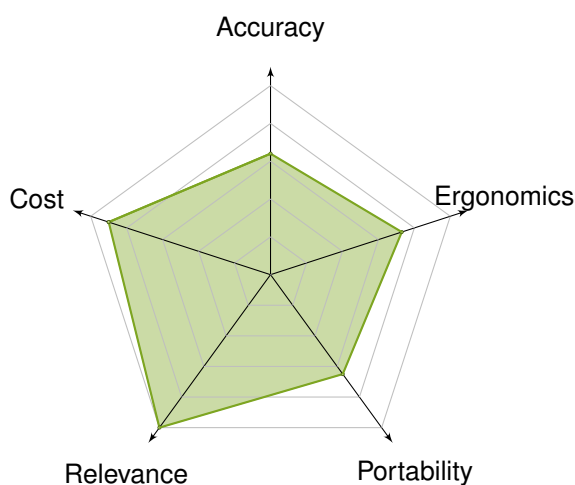
Best use : Personal Awareness of Pollution

### Jury's opinion

This sensor has been designed to raise public awareness of pollution. It is a very good pedagogical tool, with a participative platform, but it is no longer for sale. Nevertheless, given its use by a large community, it seemed interesting to include it in this challenge. The measurement of PM<sub>2.5</sub> particles is satisfactory. It is quite attractive in relation to its cost and it is open source. However, a smartphone (under Android) and Bluetooth communication are required for data measurement and recovery via e-mail.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )     | <input type="radio"/> CO <sub>2</sub>                 |
| <input type="radio"/> TSP                                    | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input checked="" type="radio"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                         | <input type="radio"/> Formaldehyde                    |
| <input type="radio"/> VOC                                    | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                     | <input type="radio"/> Particle number (concentration) |

### Other measurements

- |  |  |
|--|--|
| <input checked="" type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort     |

## Detailed test results

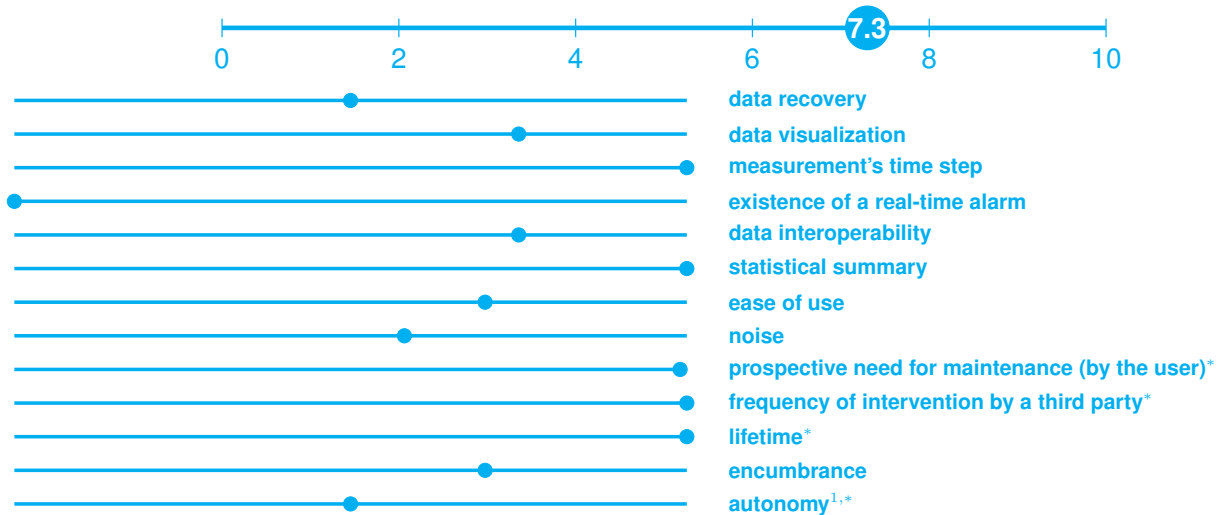
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



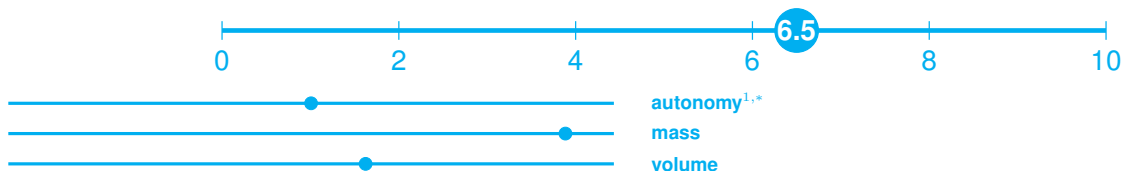
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

#### HabitatMap

2007

34A St Marks Ave,  
Brooklyn, NY 11217, USA



[aircasting.org](http://aircasting.org)

[facebook.com/HabitatMap](https://facebook.com/HabitatMap)

[@HabitatMap](https://twitter.com/HabitatMap)

### Partenaires du challenge/Challenge's partners



Materials Science and Technology



## HABITATMAP AIRBEAM-2

Best use : Personal Awareness of Pollution

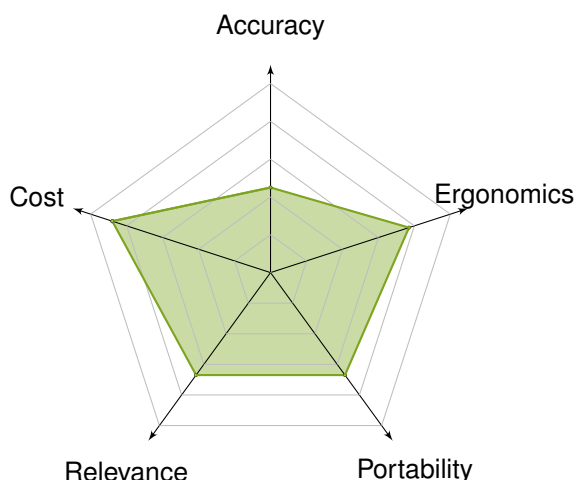
### Jury's opinion



This device is designed for raising public awareness of pollution. This second version presents new functionalities (3G, Wifi...) as well as the measurement of PM<sub>10</sub> and PM<sub>1</sub> particles, in addition to fine particles PM<sub>2.5</sub>. The quality of the PM<sub>10</sub> measurements is satisfactory, that of the fine particles PM<sub>2.5</sub> a little less than for its first version, and that of the PM<sub>1</sub> could be improved. The sensor has an interesting design. It is quite attractive in relation to its cost and is open source. However, it only works on Android and some older versions of smartphones may have compatibility issues.



### Evaluation



### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input type="radio"/> CO <sub>2</sub>                          |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input type="radio"/> VOC                                       | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

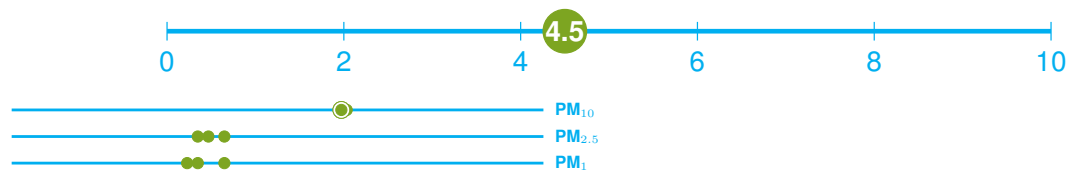
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort     |

## Detailed test results

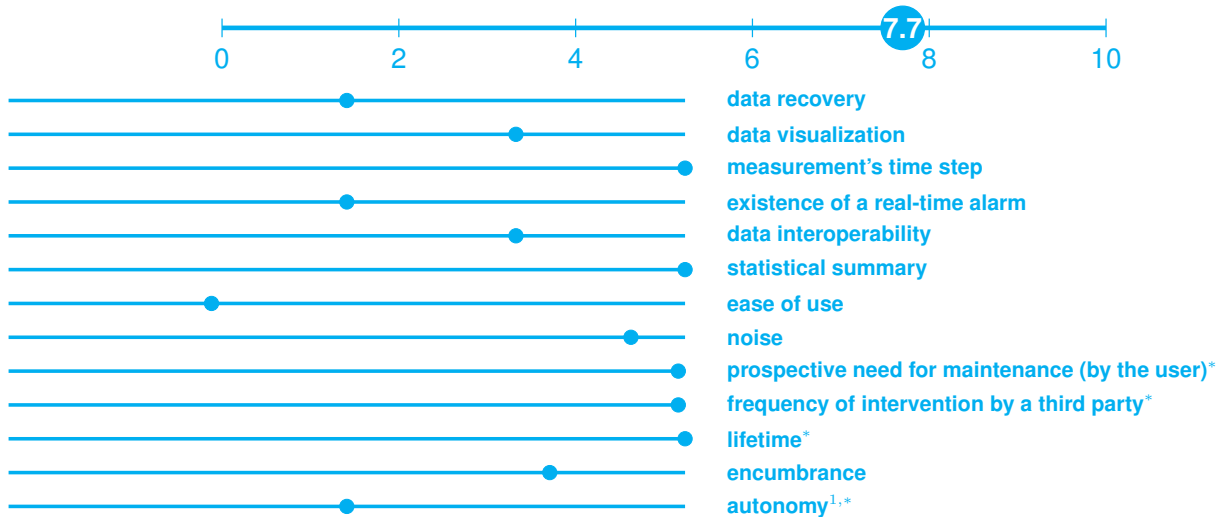
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



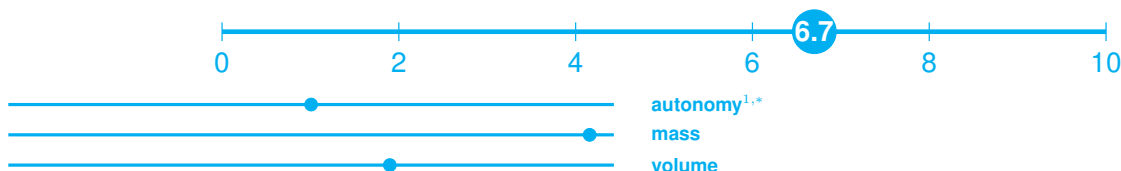
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**HabitatMap**

2007

34A St Marks Ave,  
Brooklyn, NY 11217, USA



aircasting.org

facebook.com/HabitatMap

@HabitatMap

### Partenaires du challenge/Challenge's partners





## MANN+HUMMEL OURAIR

Best use : Public or user Awareness for Fixed Indoor locations

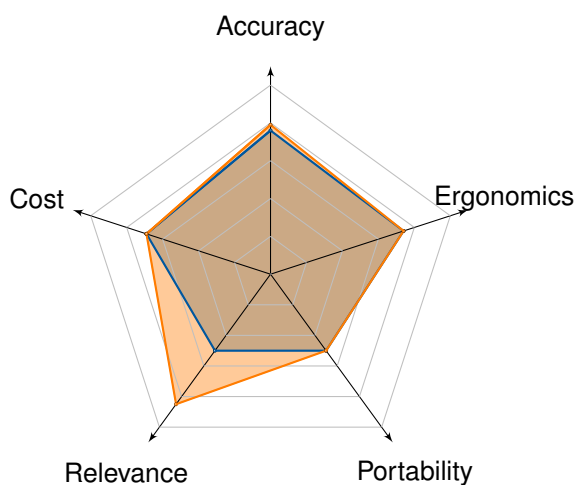
### Jury's opinion



This device is mainly intended for monitoring indoor air for particles, VOCs and CO<sub>2</sub>. The measurement quality is excellent for CO<sub>2</sub>, satisfactory for VOCs and very good for particulate matter. Its large touch screen and design are undeniable assets. A high quality is found in the ergonomics of data visualization, the data recovery platform and the user experience. The possibility of setting up a local index would be a plus.



### Evaluation



### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input checked="" type="checkbox"/> CO <sub>2</sub>            |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>                |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input checked="" type="checkbox"/> VOC                         | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort     |

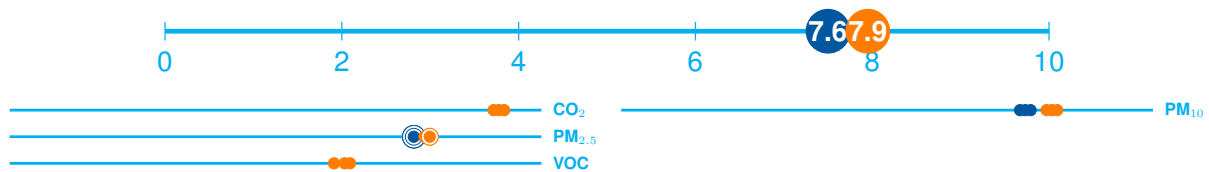


## Detailed test results

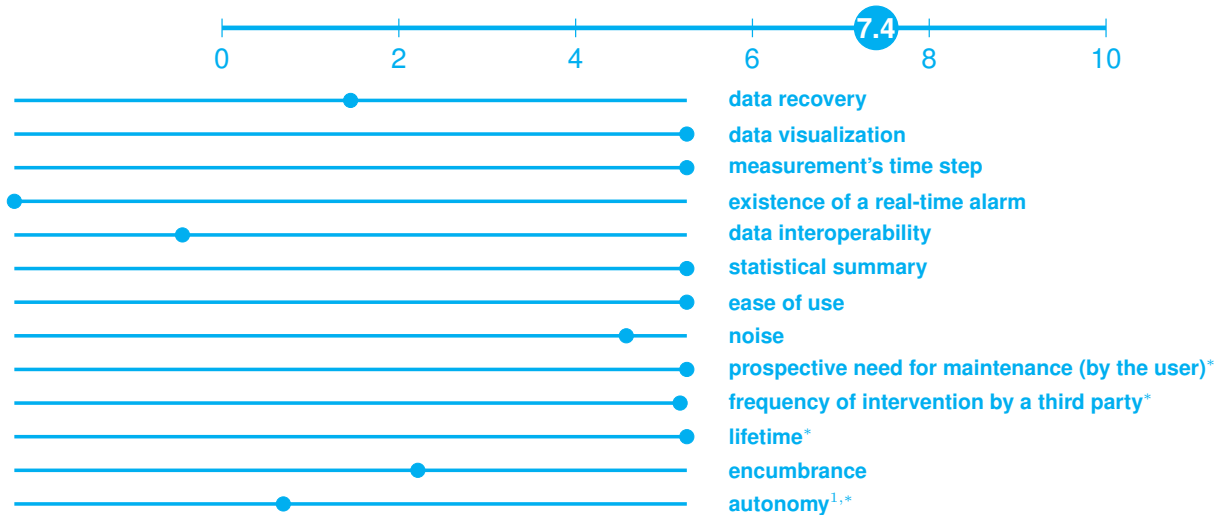
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY<sup>1,\*</sup>**



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**MANN + HUMMEL**

1941

Boulevard de la communication  
53061 Laval cedex 9

N° SIREN 428610547

airfiltration.mann-hummel.com

**MANN +  
HUMMEL**

### Partenaires du challenge/Challenge's partners



Materials Science and Technology



## MEO BLUE

Best use : Public or user Awareness for Fixed Indoor locations

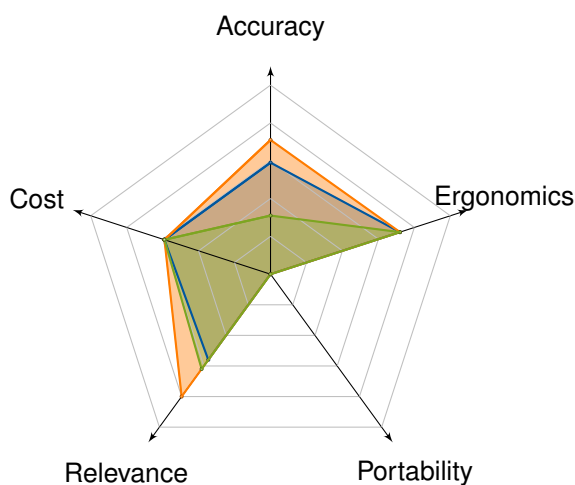


### Jury's opinion

Station initially designed for indoor air but tested in different environments and in mobility. In fixed positioning, the data quality is good for particles, for measurements in indoor and outdoor air (preferably sheltered), and even very good for VOCs. Moreover, data extraction is not easy even if the Dashboards can be customized according to needs. For indoor air measurements, the absence of CO<sub>2</sub> measurement is a limiting parameter. For mobile use, the sensor is clearly not accurate.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input type="radio"/> CO <sub>2</sub>                          |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input checked="" type="checkbox"/> VOC                         | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

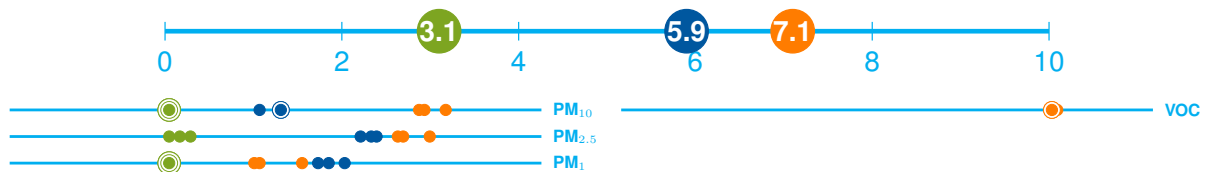
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input type="radio"/> Humidity                  | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                    | <input type="radio"/> Acoustic comfort     |

## Detailed test results

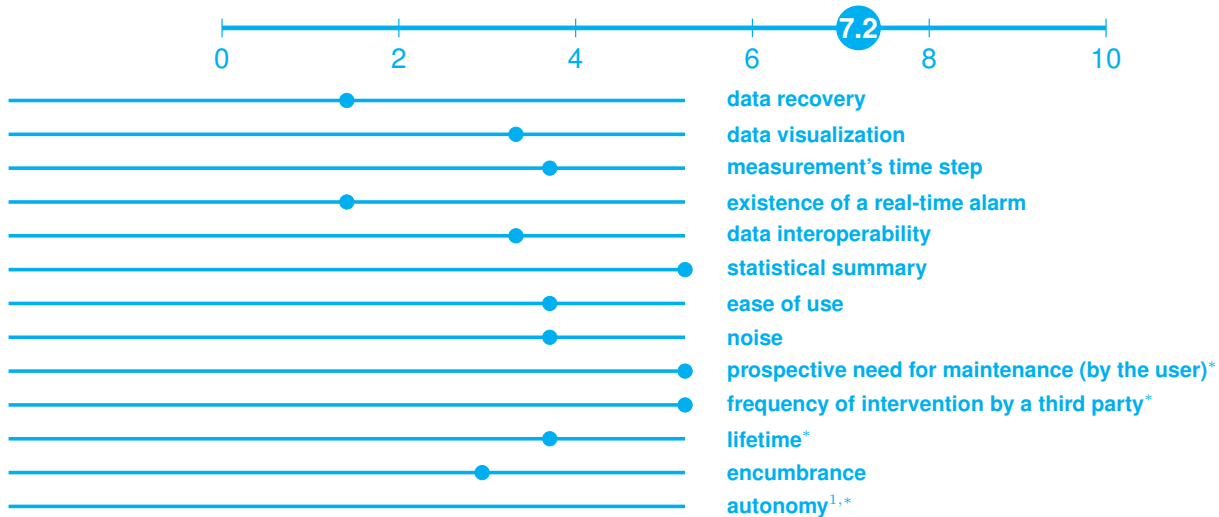
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



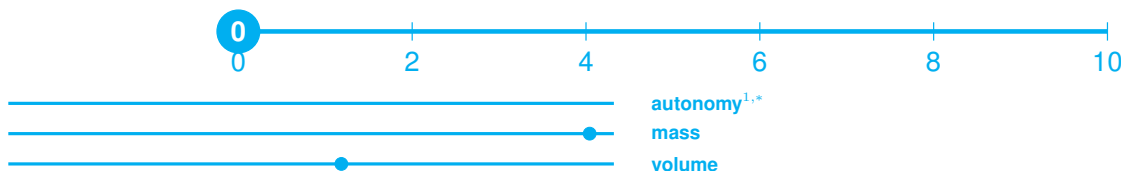
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

meo

2012

4/F, 12 Lan Kwai Fong,  
Central, Hong Kong



www.meo.life

facebook.com/meoldt

@meo\_life

### Partenaires du challenge/Challenge's partners



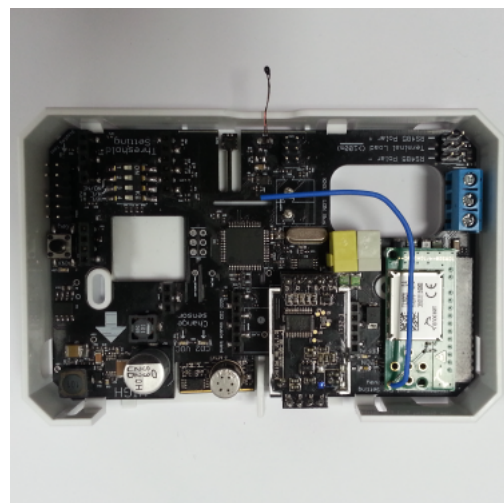
## NANOSENSE E4000NG

Best use : Indoor Air Quality Control

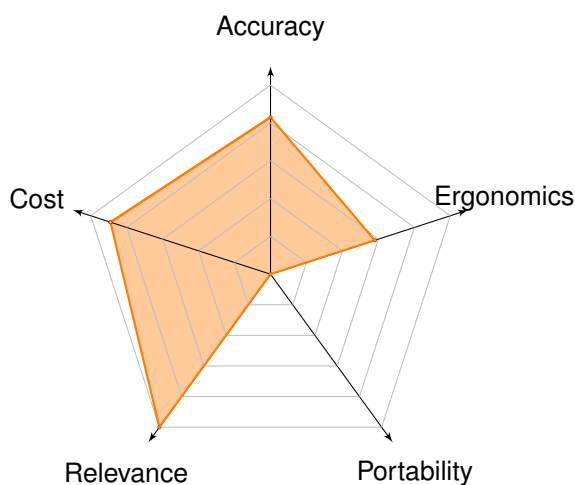


### Jury's opinion

This device is to be used for indoor air quality monitoring and can be supplemented with other Nanosense sensors. The quality of the CO<sub>2</sub> measurement is excellent and the VOC measurement is good. It is a material whose price is quite attractive, intended for professional use, and not targeting the general public. Especially since installation and handling require specific equipment and skills. Note : the acquisition and control hubs have not been tested as part of this challenge.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input type="radio"/> TSP                                | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input type="radio"/> Particles PM <sub>2.5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                    |
| <input checked="" type="radio"/> VOC                     | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                 | <input type="radio"/> Particle number (concentration) |

### Other measurements

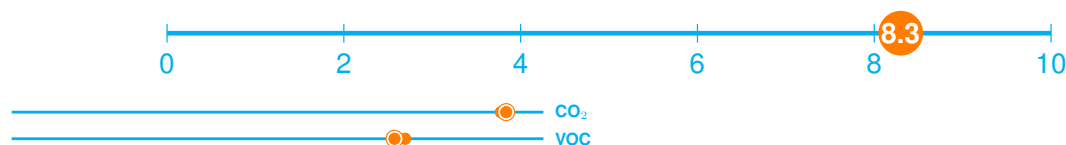
- |  |  |
|--|--|
| <input checked="" type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort     |

## Detailed test results

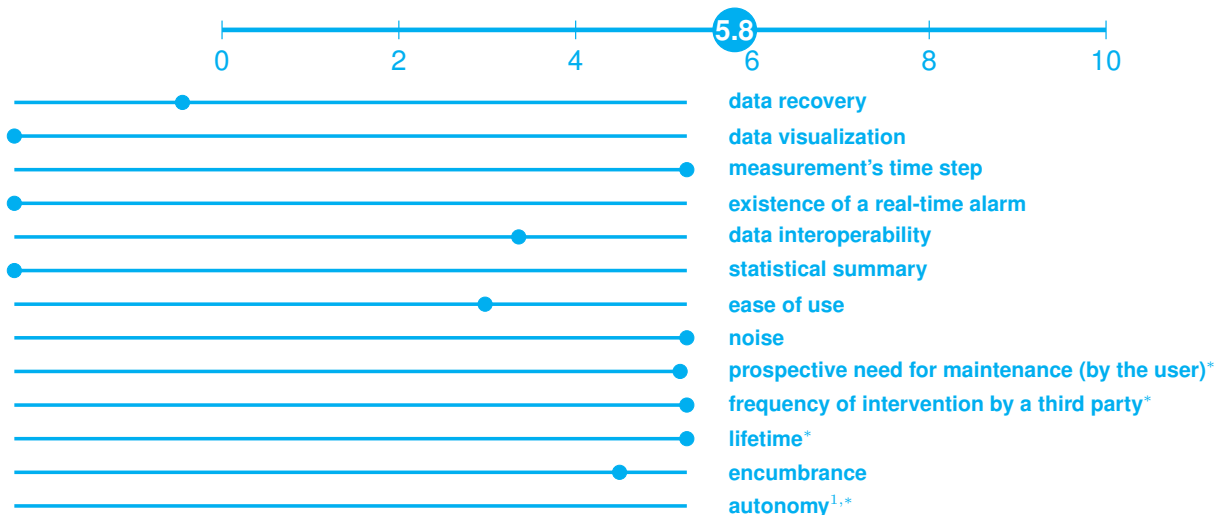
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**NanoSense**

2002

123 rue de Bellevue  
92100 Boulogne Billancourt



N° SIREN 444396519

[www.nano-sense.com](http://www.nano-sense.com)

[facebook.com/Nanosensefr](https://www.facebook.com/Nanosensefr)

[@NanoSense](https://twitter.com/NanoSense)

### Partenaires du challenge/Challenge's partners





## NANOSENSE E5000M

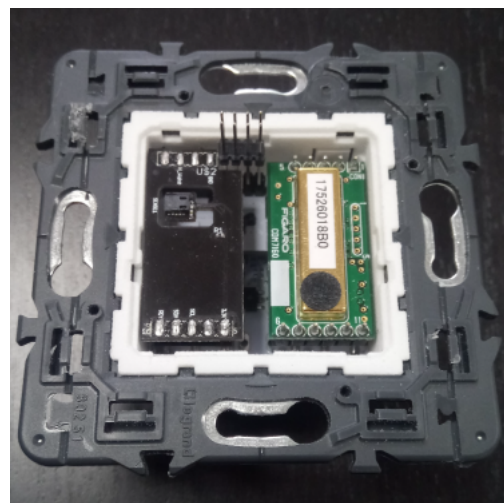
Best use : Indoor Air Quality Control

### Jury's opinion

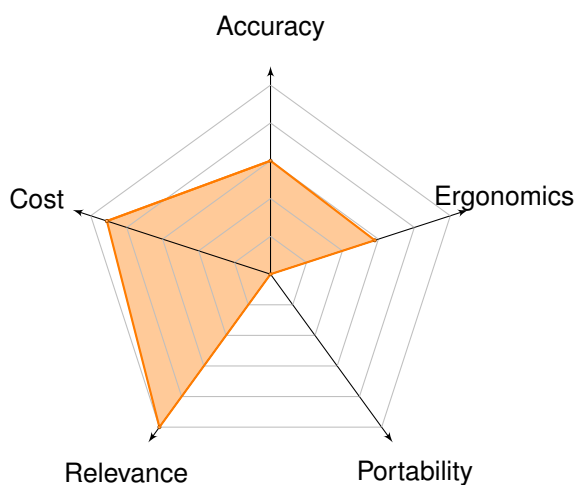


This device is to be used for indoor air quality monitoring and can be supplemented with other Nanosense sensors. The quality of the CO<sub>2</sub> measurement is very good but the tests were disrupted by some blockages of the acquisition (1 to 2 per week). It is an attractive material in relation to its price. It is intended for professional use and is not intended for the general public. Especially since installation and handling require specific equipment and skills.

Note : the acquisition and control hubs have not been tested as part of this challenge.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input checked="" type="radio"/> CO <sub>2</sub>      |
| <input type="radio"/> TSP                                | <input type="radio"/> Particles PM <sub>10</sub>      |
| <input type="radio"/> Particles PM <sub>2.5</sub>        | <input type="radio"/> Particles PM <sub>1</sub>       |
| <input type="radio"/> O <sub>3</sub>                     | <input type="radio"/> Formaldehyde                    |
| <input checked="" type="radio"/> VOC                     | <input type="radio"/> SO <sub>2</sub>                 |
| <input type="radio"/> CO                                 | <input type="radio"/> Particle number (concentration) |

### Other measurements

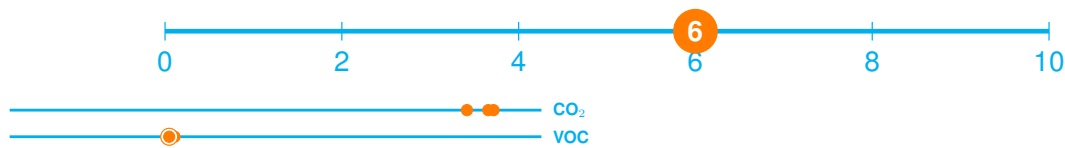
- |  |  |
|--|--|
| <input checked="" type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input checked="" type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours                 | <input type="radio"/> Acoustic comfort     |

## Detailed test results

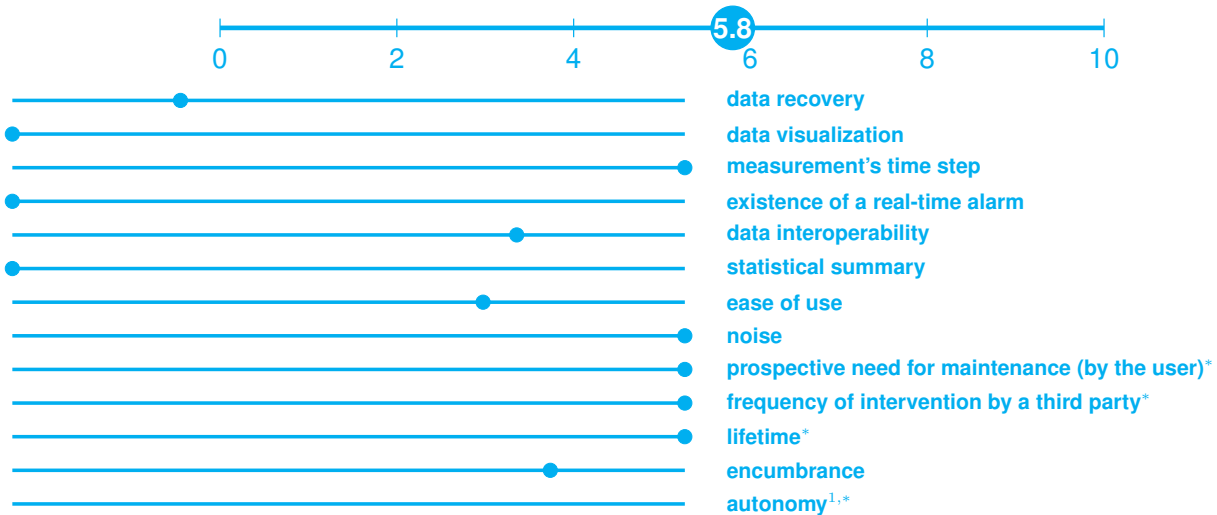
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

**NanoSense**

2002

123 rue de Bellevue  
92100 Boulogne Billancourt



N° SIREN 444396519

[www.nano-sense.com](http://www.nano-sense.com)

[facebook.com/Nanosensefr](https://www.facebook.com/Nanosensefr)

[@NanoSense](https://twitter.com/NanoSense)

### Partenaires du challenge/Challenge's partners



## NANOSENSE P4000

Best use : Indoor Air Quality Control

### Jury's opinion

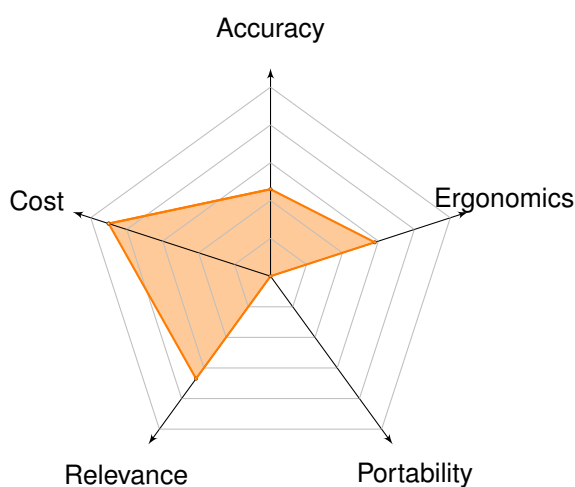


This device is to be used in indoor air and can be supplemented with other Nanosense sensors. The quality of the PM<sub>10</sub> measurement is good, but it needs to be reviewed for smaller particles (PM<sub>2.5</sub> and PM<sub>1</sub>). It is a material with a rather attractive price, intended for professional use, which does not target the general public. Especially since installation and handling require specific equipment and skills.

Note : the acquisition and control hubs have not been tested as part of this challenge.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input type="radio"/> CO <sub>2</sub>                          |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input type="radio"/> O <sub>3</sub>                            | <input type="radio"/> Formaldehyde                             |
| <input type="radio"/> VOC                                       | <input type="radio"/> SO <sub>2</sub>                          |
| <input type="radio"/> CO  | <input type="radio"/> Particle number (concentration)          |

### Other measurements

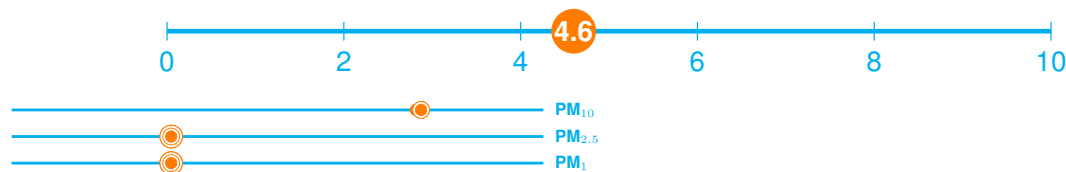
- |                                   |  |
|-----------------------------------|--|
| <input type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours      | <input type="radio"/> Acoustic comfort     |

## Detailed test results

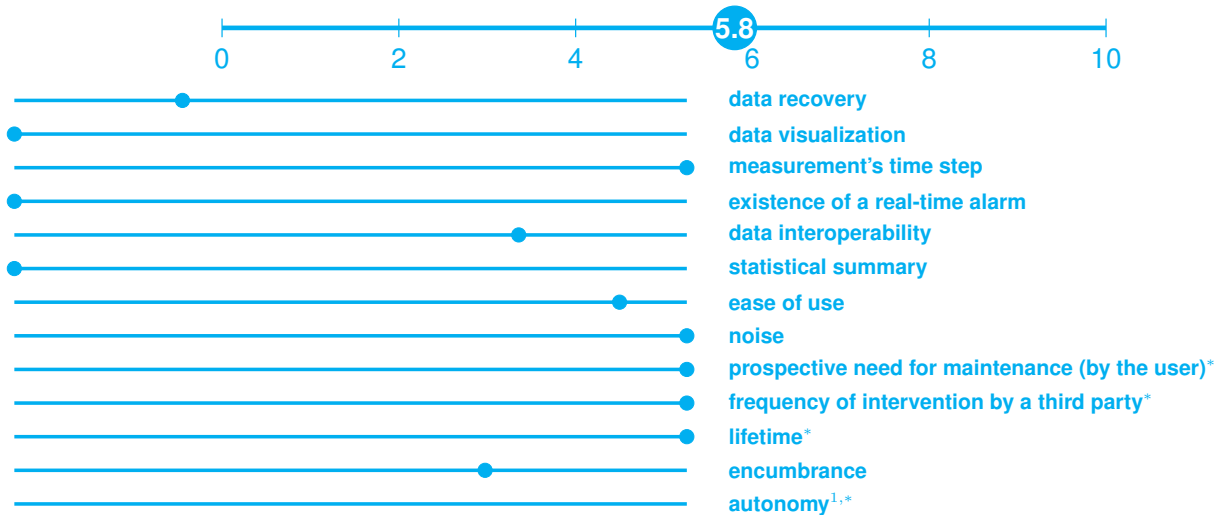
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

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### Partenaires du challenge/Challenge's partners



Materials Science and Technology





## NANOSENSE P5000

Best use : Indoor Air Quality Control

### Jury's opinion

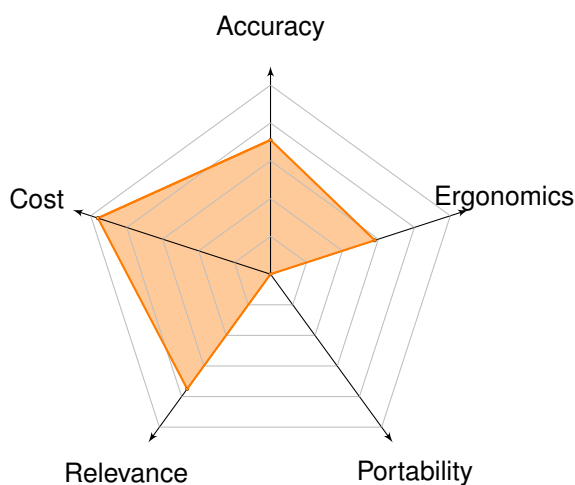


This device is for indoor use and can be supplemented with other Nanosense sensors. The quality of particle measurement (PM<sub>10</sub> and PM<sub>2.5</sub>) is good. It is an attractive material in relation to its price. It is intended for professional use, and does not target the general public. Especially since installation and handling require specific equipment and skills.

Note : the acquisition and control hubs have not been tested as part of this challenge.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |   |
|--|---|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )     | <input type="radio"/> CO <sub>2</sub>                       |
| <input type="radio"/> TSP                                    | <input checked="" type="radio"/> Particles PM <sub>10</sub> |
| <input checked="" type="radio"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>             |
| <input type="radio"/> O <sub>3</sub>                         | <input type="radio"/> Formaldehyde                          |
| <input type="radio"/> VOC                                    | <input type="radio"/> SO <sub>2</sub>                       |
| <input type="radio"/> CO                                     | <input type="radio"/> Particle number (concentration)       |

### Other measurements

- |                                   |  |
|-----------------------------------|--|
| <input type="radio"/> Temperature | <input type="radio"/> Atmospheric pressure |
| <input type="radio"/> Humidity    | <input type="radio"/> Luminosity           |
| <input type="radio"/> Odours      | <input type="radio"/> Acoustic comfort     |

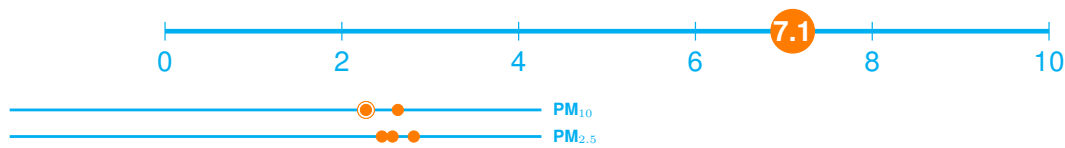


## Detailed test results

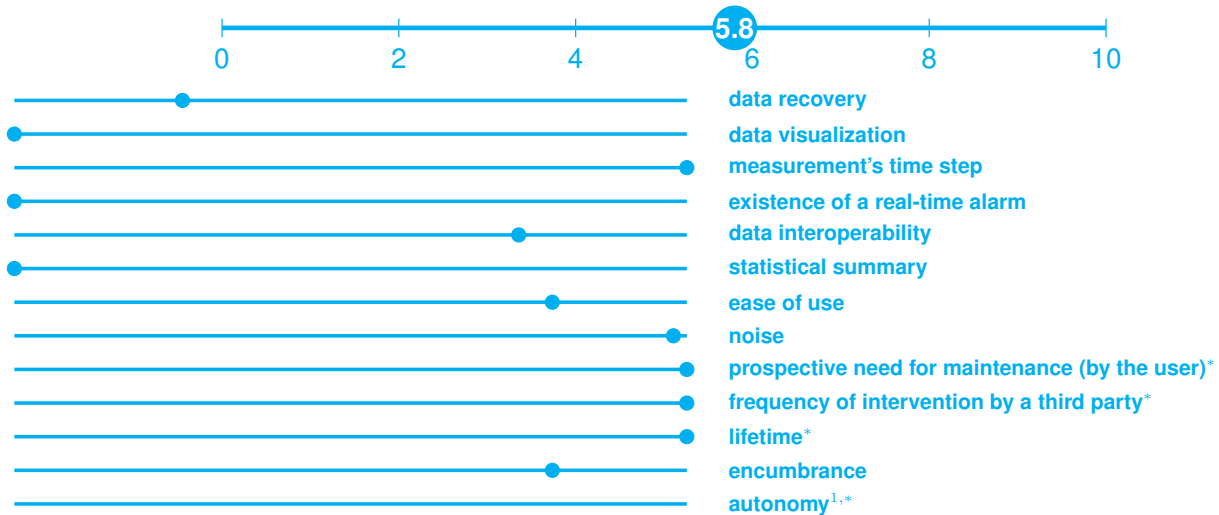
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



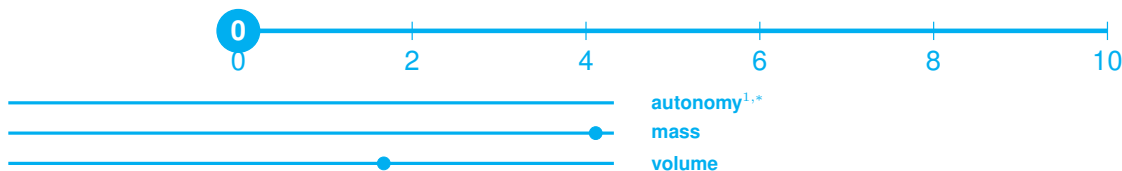
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



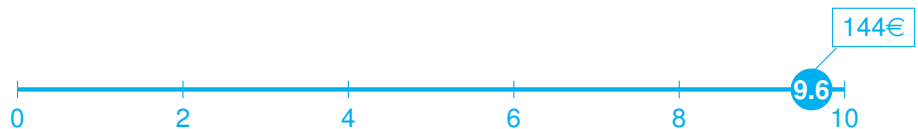
# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

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## NANOSENSE QAA-M

Best use : Indoor Air Quality Control

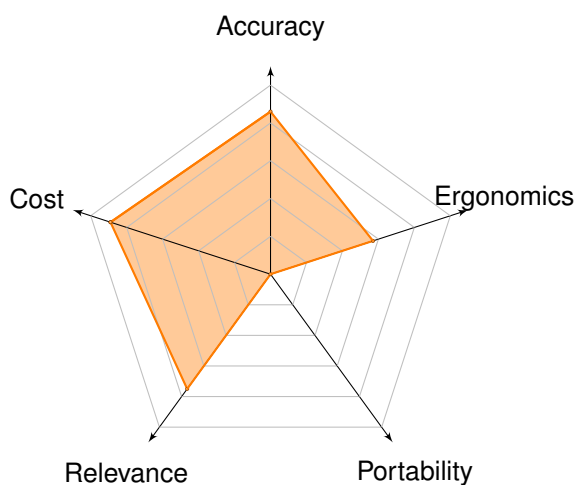


### Jury's opinion

This unit is to be used for outdoor air to provide reference information to indoor air sensors. The quality of the measurement of PM<sub>10</sub> and PM<sub>2.5</sub> particles is very good. It is a material with a rather attractive cost, intended for professional use. Especially since installation and handling require specific equipment and skills. Direct application for outdoor air measurements could be interesting to study.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>             |
| <input type="checkbox"/> O <sub>3</sub>                                | <input type="checkbox"/> Formaldehyde                          |
| <input checked="" type="checkbox"/> VOC                                | <input type="checkbox"/> SO <sub>2</sub>                       |
| <input type="checkbox"/> CO  | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

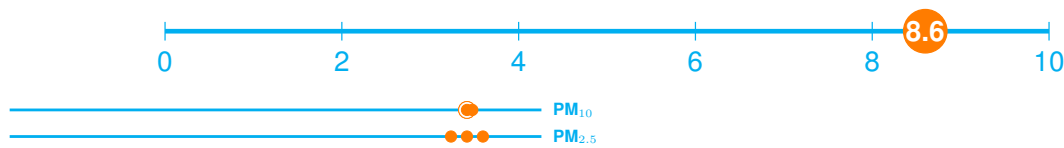
- |                                      |   |
|--------------------------------------|---|
| <input type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure |
| <input type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity           |
| <input type="checkbox"/> Odours      | <input type="checkbox"/> Acoustic comfort     |

## Detailed test results

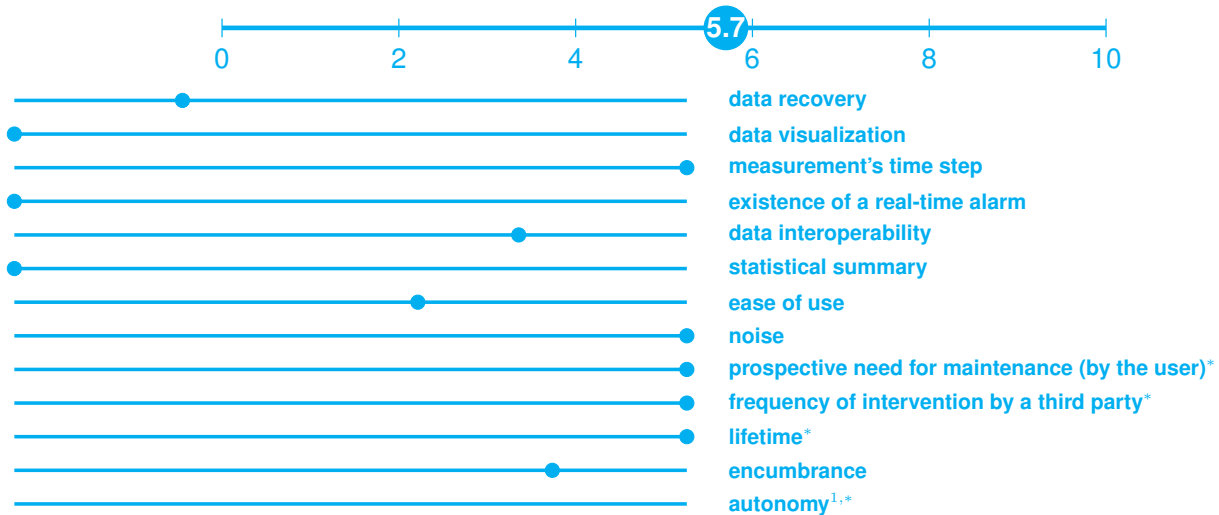
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



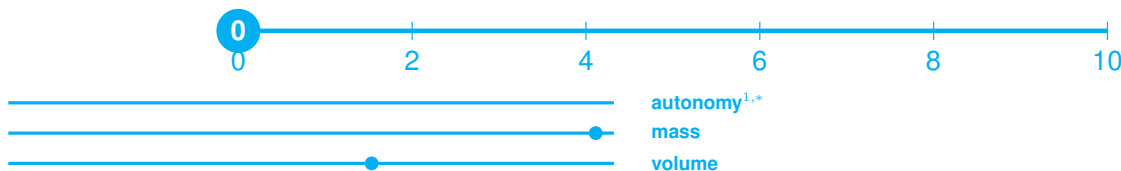
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

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### Partenaires du challenge/Challenge's partners



## RUBIX POD

Best use : Public or user Awareness for Fixed Indoor locations

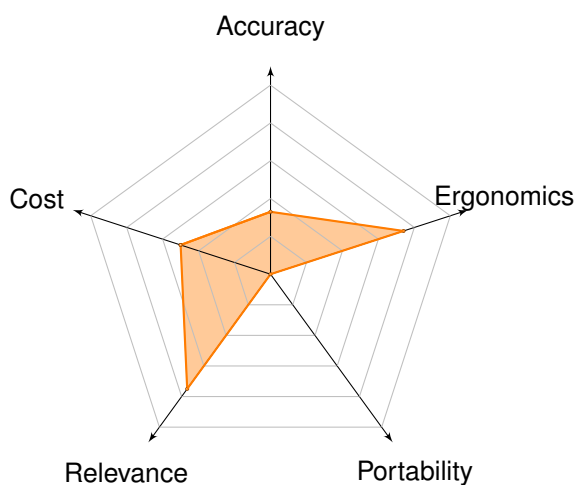


### Jury's opinion

Connected station intended for use in indoor air quality monitoring. A design that indicates the level of pollution with LEDs. It is well designed in terms of ergonomics and has the ability to recover data every 10 seconds. The measurement quality is at best quite satisfactory (CO<sub>2</sub>), but needs to be reviewed for particles.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |   |  |
|---|--|
| <input type="radio"/> NO <sub>2</sub> (NO <sub>x</sub> )        | <input checked="" type="checkbox"/> CO <sub>2</sub>            |
| <input type="radio"/> TSP                                       | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub> | <input type="radio"/> Particles PM <sub>1</sub>                |
| <input type="radio"/> O <sub>3</sub>                            | <input checked="" type="checkbox"/> Formaldehyde               |
| <input type="radio"/> VOC                                       | <input type="radio"/> SO <sub>2</sub>                          |
| <input checked="" type="checkbox"/> CO                          | <input type="radio"/> Particle number (concentration)          |

### Other measurements

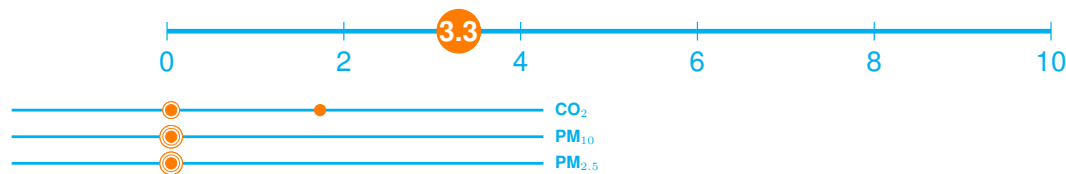
- |  |  |
|--|--|
| <input type="radio"/> Temperature            | <input checked="" type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity | <input checked="" type="checkbox"/> Luminosity           |
| <input checked="" type="checkbox"/> Odours   | <input type="radio"/> Acoustic comfort                   |

## Detailed test results

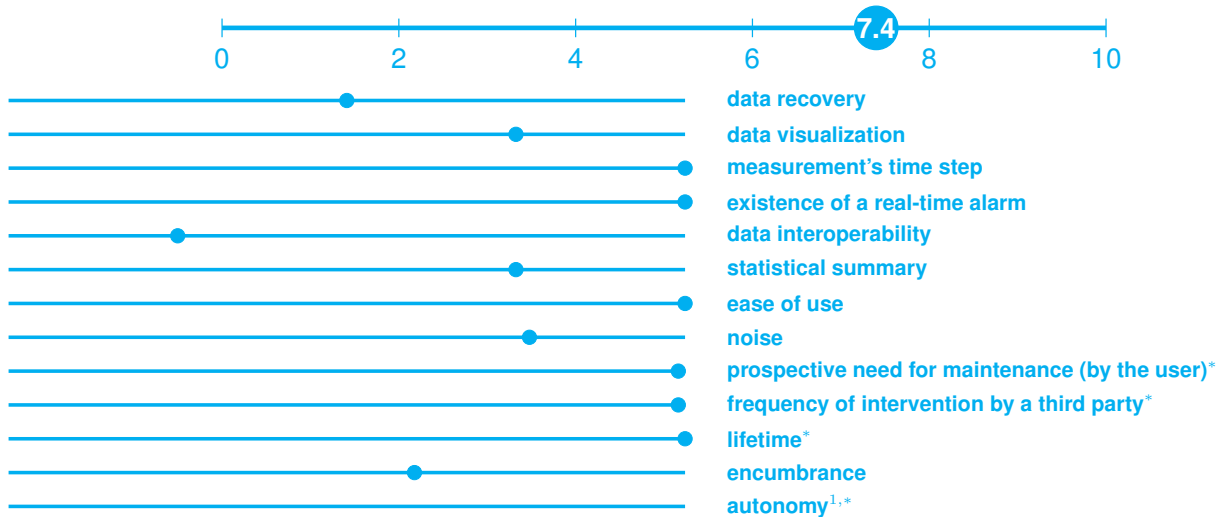
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



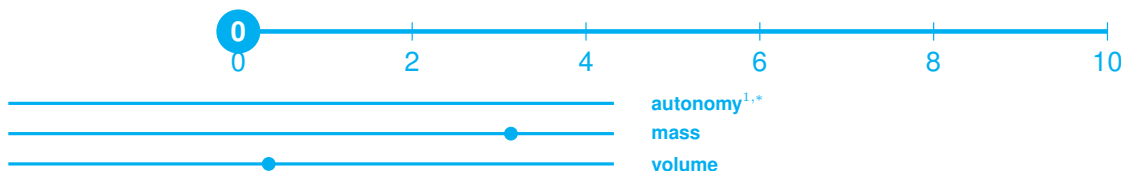
# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



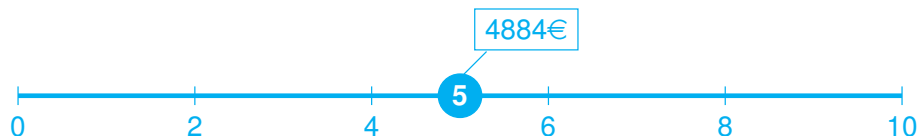
# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

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[@RUBIXSI](https://twitter.com/RUBIXSI)

### Partenaires du challenge/Challenge's partners





### RUBIX WT1

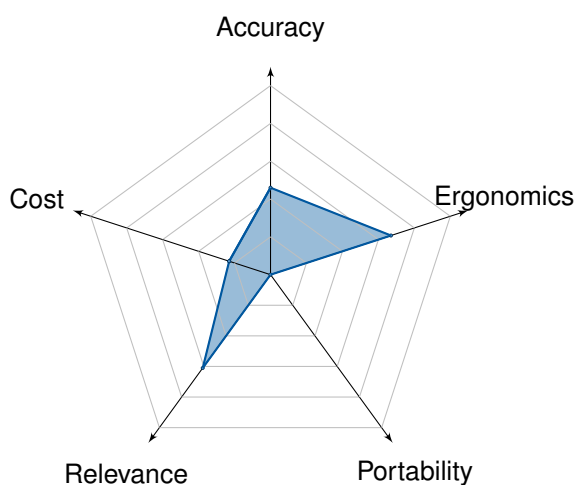
Best use : Public or user Awareness for Fixed Outdoor locations

#### Jury's opinion

This sensor is intended for outdoor air measurement. It is a beautiful device, well designed in terms of ergonomics, which has the ability to recover data every 10 seconds. It has the advantage of offering the monitoring of many pollutants. The measurement of nitrogen dioxide is good, but the quality of measurements of other pollutants needs to be improved or even revised (PM<sub>10</sub>), especially since this sensor is expensive.



#### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

#### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2,5</sub>        | <input checked="" type="checkbox"/> Particles PM <sub>1</sub>  |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input checked="" type="checkbox"/> SO <sub>2</sub>            |
| <input checked="" type="checkbox"/> CO                                 | <input type="checkbox"/> Particle number (concentration)       |

#### Other measurements

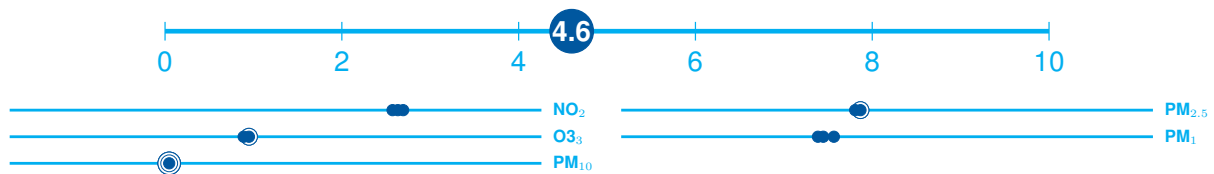
- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure        |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity                  |
| <input checked="" type="checkbox"/> Odours      | <input checked="" type="checkbox"/> Acoustic comfort |

## Detailed test results

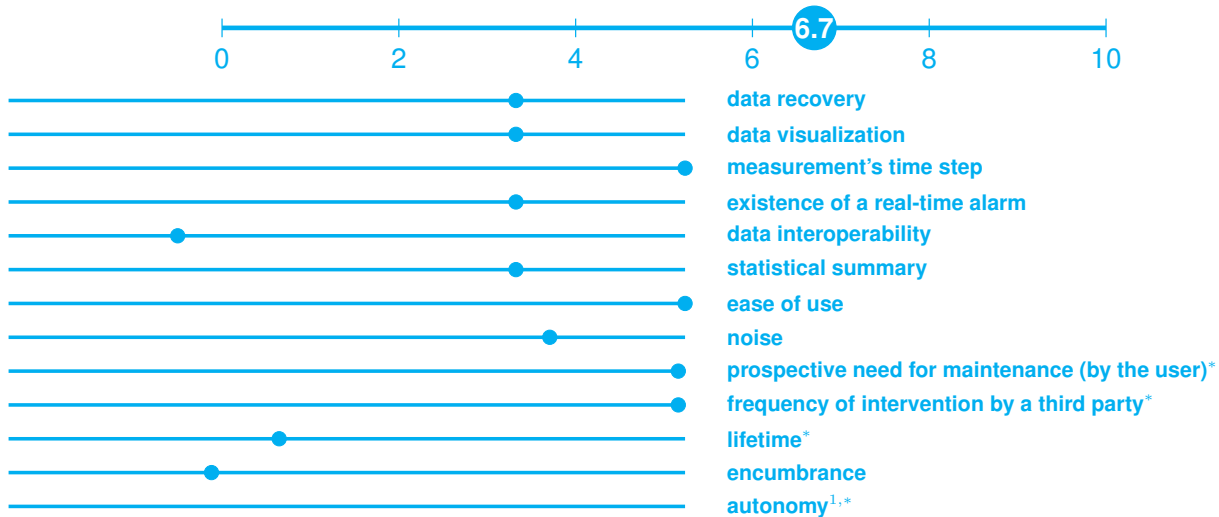
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY**<sup>1,\*</sup>



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

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### Partenaires du challenge/Challenge's partners



## VAISALA AQT-420

Best use : Public or user Awareness for Fixed Outdoor locations

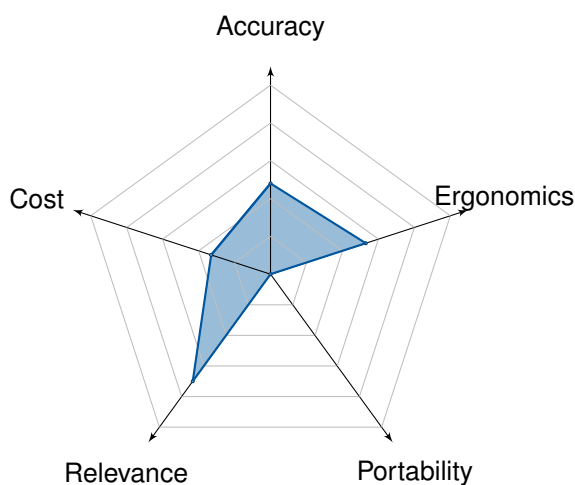


### Jury's opinion

This device is intended for measuring outdoor air. It is easy to install despite the need to separate the measurement module from the communication module. This complete station has very good nitrogen dioxide results but the quality of measurements for particulate matter is generally unsatisfactory, especially since its price is high. The ergonomics for data recovery would also be perfectible since only one day at a time can be recovered.



### Evaluation



Evaluated uses :

- outdoor air
- indoor air
- mobility

### Measured pollutants

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> NO <sub>2</sub> (NO <sub>x</sub> ) | <input type="checkbox"/> CO <sub>2</sub>                       |
| <input type="checkbox"/> TSP   | <input checked="" type="checkbox"/> Particles PM <sub>10</sub> |
| <input checked="" type="checkbox"/> Particles PM <sub>2.5</sub>        | <input type="checkbox"/> Particles PM <sub>1</sub>             |
| <input checked="" type="checkbox"/> O <sub>3</sub>                     | <input type="checkbox"/> Formaldehyde                          |
| <input type="checkbox"/> VOC   | <input checked="" type="checkbox"/> SO <sub>2</sub>            |
| <input checked="" type="checkbox"/> CO                                 | <input type="checkbox"/> Particle number (concentration)       |

### Other measurements

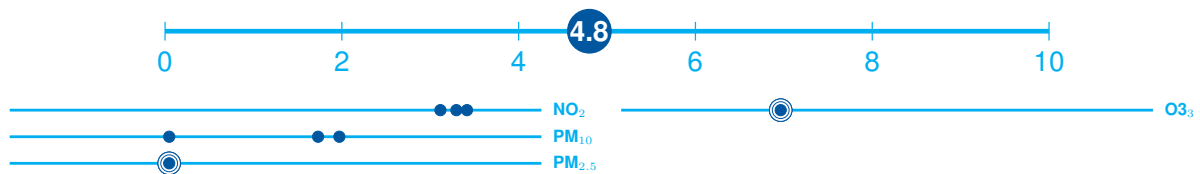
- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Temperature | <input type="checkbox"/> Atmospheric pressure |
| <input checked="" type="checkbox"/> Humidity    | <input type="checkbox"/> Luminosity           |
| <input type="checkbox"/> Odours                 | <input type="checkbox"/> Acoustic comfort     |

## Detailed test results

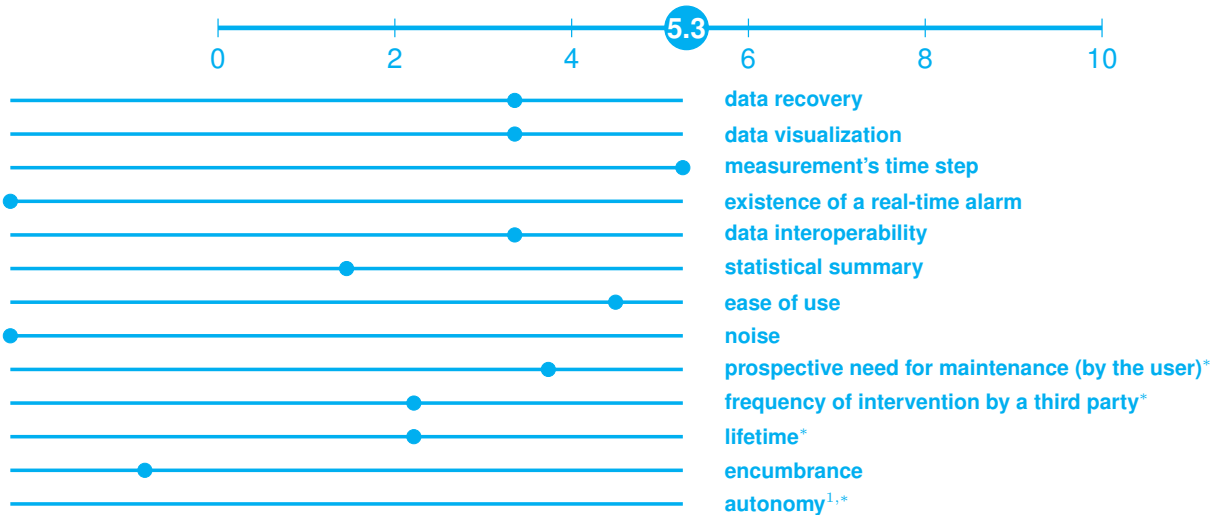
Evaluated uses :

- outdoor air
- indoor air
- mobility
- all uses

# **ACCURACY** on 3 microsensors based on the SET method (Fishbain & al. 2017)



# **ERGONOMICS** based on several sub-criteria (data visualisation, ease of use, autonomy, ...)



# **RELEVANCE** of the measured pollutants : number and stake of the sensor's measured pollutants in view of its competitive categories



# **PORTABILITY<sup>1,\*</sup>**



# **COST** investment and running costs over 3 years



<sup>1</sup> Regarding mains-operated sensors, autonomy is **only** taken into account for portability

\* This parameter was not directly evaluated : it was graded based on the manufacturer declaration

### Entreprise/Company

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**VAISALA**

### Partenaires du challenge/Challenge's partners

