

# IAQ and ambiances EP5000 Multi-sensors probe

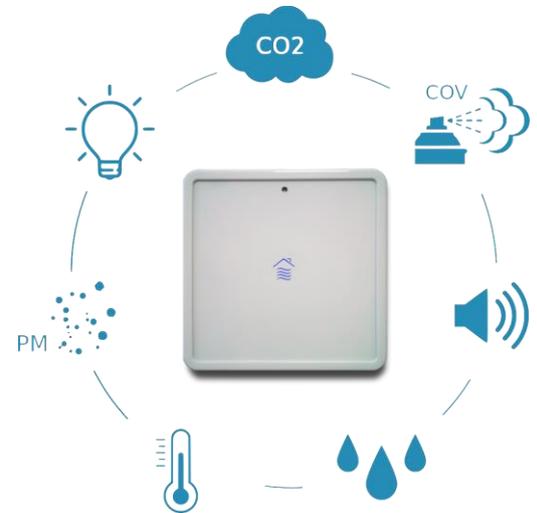
Monitoring, T° Control, On demand ventilation for QWL\* and energy savings

QWL\* : Quality of Working Life.

## Multi sensors probe

This probe is the most comprehensive on the market. It combines the following measurements:

- CO2
- Total VOC
- Sulphurous Odors
- Particulate Matter – PM1, PM2.5, PM10
- Humidity
- Temperature
- Light intensity
- Light color temperature (in °K)
- Noise pic and average
- Atmospheric pressure
- NOx (Optional)
- Ozone (Optional)



## Measuring indoor Air quality for HVAC control

Energy losses by air renewal in a conventional building are estimated to 30% of the heating and air conditioning cost. To comply with regulations on buildings' energy efficiency, ventilation must be on demand controlled. The EP5000 probe allows ventilation control while providing IAQ and ambiances supervision. By controlling ventilation on measured IAQ and ambiances, significant energy savings can be achieved.

## Maintenance free

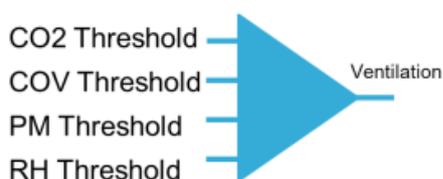
Sensors of the IAQ probe have been selected and are managed in order to achieve at least 10 years' life span without any maintenance or recalibration.

## Remediation control

The probe can control means of remediation (primary ventilation) via EnOcean or ModBus according to the IAQ setpoints (for each pollutant or each physiological effect). Setpoints are settable by smartphone via NFC (free App).

Two types of **remediation** control to choose from:

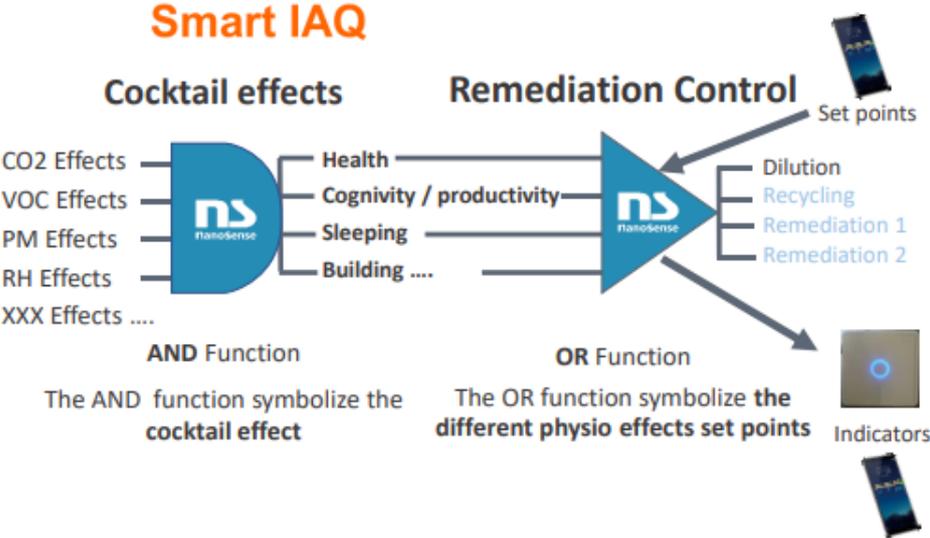
### Conventional System



**OR** Function

Doesn't take into account the combination of effects

In a conventional system, a setpoint is determined for each pollutant. PI (proportional integral) control loops commands associated with each pollutant are compared and the strongest is applied. It is an OR function because the pollutant generating the strongest command is applied. Therefore there is no cumulative effect of the pollutants taken into account.



Some air pollutants enter the bloodstream through breathing and impact the brain, affecting cognitive function and productivity. Environments such as light, noise and temperature also affect productivity. These combined effects (cocktail effect), pollutants and environments, are computed by the EP5000 probe to provide various physiological effects indexes.

The below table summarizes contributors on the different physiological impacts.

	CO2	COVt	PM	Formaldehyde, Benzene	Radon	Noise	Odors	T°	RH	NOX O3	Lux	Light color
Cognitivity / Productivity	✓	✓	✓			✓	✓	✓			✓	✓
Health		✓	✓	✓	✓	✓		✓		✓		
Quality of sleep	✓					✓		✓			✓	✓
Asthma crisis		✓	✓				✓	✓	✓	✓		
Olfactory Comfort		✓					✓					
Thermal Comfort								✓				
Sound comfort						✓						
Respiratory tract irritation			✓						✓	✓		
Building health			✓						✓			

For each physiological setpoint, an index is calculated then a PI control is computed according to the setpoint. The applied control is the most important value of all computed PI controls (Or function).

**Modes**

There are 3 operating modes with specific setpoints for each one.

- **Comfort mode** corresponds to the occupation of the premises
- **Eco mode** corresponds to an unoccupied room with less constraining setpoints.
- **Night mode** allow setpoint to focus on quality of sleep in bedrooms.

## Easy commissioning via smartphone

Parameter settings and data reading is compatible with Android smartphones (not IOS because Apple does not authorize the use of their smartphone's embedded NFC for purposes other than payment). The "NanoSense" Application for managing the probe is available in the Android Play Store.

## Ecosystem

Since the QAI probe is powered, it constantly monitors to the EnOcean ecosystem. Occupancy sensors thus make it possible to switch from Comfort mode to Eco mode. The night sensor allows to switch to night mode.

Window opening sensors allow, in the event of opening, to cut off the heating, air conditioning and ventilation.

The outdoor air quality information is used to manage the window opening indication pictograms on the EP5000 front panel. There are two pictograms, in case the room overlooks two facades equipped with separate outdoor air quality probes (street, backyard). It is therefore possible to pair two outdoor probes.