What is Sensirion's NO_x Index?

Learn about the benefits of using the NO_x Index as Sensirion's standard output for NO_x measurements

Nose	NO_x Index
Reference = past few minutes /hours	Reference = past 24 hours
Relative intensity (weak, distinct, strong)	Relative intensity NO_x Index 1-500
Different odors distinguishable	Different odors not distinguishable
Sensitive to odors	Sensitive to oxidizing gasses

The NO_x Index is the optimal tool to monitor NO_x conditions

Instead of concentration output, which cannot be properly provided under field conditions, the NO_x Index much better exploits the capabilities of a MOX sensor by being sensitive towards oxidizing gases. For this, the raw signal of the SGP41's NO_x pixel is processed by Sensirion's powerful Gas Index Algorithm on an external microcontroller. The NO_x Index describes the current NO_x condition in a room relative to the sensor's recent history. In this way, the NO_x Index behaves like a human nose. Assuming that we are entering a room from outside, our nose will take the air composition outside the room as an offset (baseline) and provide us with feedback if it recognizes higher or lower levels of gases when entering the room. The NO_x Index performs similarly by applying a moving average over the past 24 hours (called the learning time).

The NO_x Index mimics the human nose's perception of odors with a relative intensity compared to recent history. In combination with the VOC Index, it helps to distinguish different events and user activities.

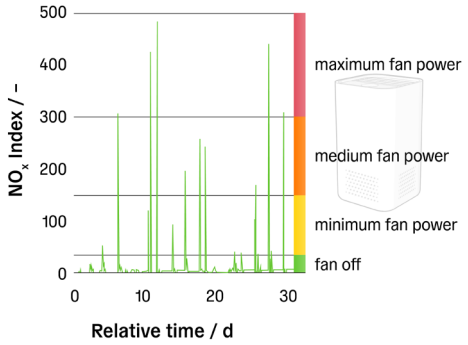
This is a very helpful feature because the NO_x Index thus works in any environment. On the NO_x Index scale, this offset is always mapped to the value of 1, making the readout as easy as possible: an NO_x Index above 1 means that there are more NO_x compounds compared to the average (e.g., induced by cooking on a gas stove), while an NO_x Index close to 1 means that there are (nearly) no NO_x gases present, which is the case most of the time (or induced by fresh air from an open window, using an air purifier, etc.).

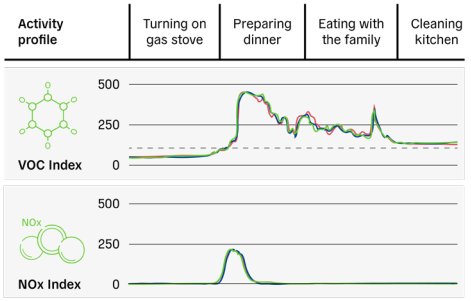
Also, our nose perceives odors on a scale of relative intensity (weak, distinct and strong), but it cannot tell us if the concentration of one odor is truly higher than the concentration of another. Therefore, all NO_x events are quantified on the same limited scale of the NO_x Index, ranging from 1 to 500. In contrast to the VOC Index, there is no gain adaptation for the NO_x Index because the gas composition of NO_x events usually does not vary as much as in VOC events. The NO_x Index scale enables a fixed mapping of the NO_x Index to an action that a device should execute (e.g., triggering an air purifier when the NO_x Index is above 20).

Further reading

What is Sensirion's NO_x Index?

More about Gas Index Algorithm and its tunability: *Sensirion's VOC and NO_x Indices for Indoor Air Applications* (upon request)





The figure at the top demonstrates a possible example implementation of the NO_x Index in an air purifier. At the bottom, one can see a typical activity profile in a kitchen for which the simultaneous monitoring of VOC and NO_x Indices helps distinguishing different types of events.

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