Prolojik Extends DALI to CO_2 Monitoring

Asela Rodrigo, November 2019

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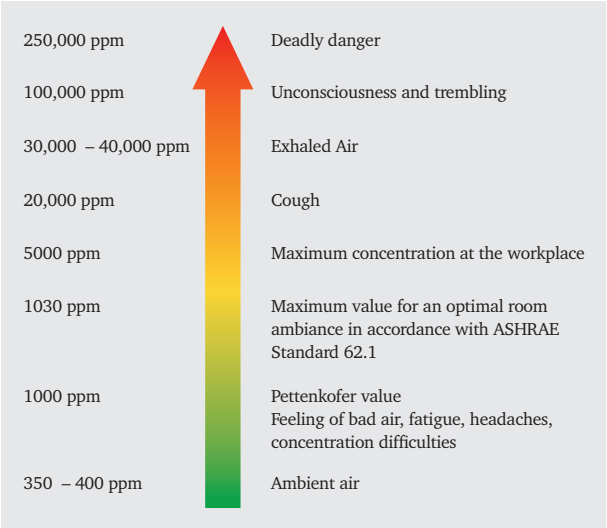
The media has focused on nitrogen oxide from vehicles as a particular target of air pollution, but the impact of carbon dioxide (CO_2) should also be taken into consideration, especially in office, education and healthcare environments when defining metrics for quality of space.

During human respiration, oxygen is absorbed from the air and CO_2 is exhaled. The CO_2 content in the air is measured in parts per million (ppm). Ambient air has a CO_2 concentration of about 400 ppm.



Traditional thinking has considered that CO_2 measurements above 5,000ppm to be the levels at which human health would be affected, but there is a growing body of research that suggests CO_2 levels as low as 1,000ppm (Petternkofer value) could cause health problems, even if exposure only lasts for a few hours.

In many poorly ventilated buildings, the CO_2 levels could often exceed 1,000ppm; consider for example a classroom on a cold wet day or an over-crowded meeting room during a team briefing to name just a couple of examples. A recent study published in Nature Sustainability by Dr Michael Hernke suggested that people exposed to higher levels of CO_2 could suffer performance and health impacts.

Whether in an office, a hospital or a school, cognitive performance is critical for users of the building. In a recent study of 24 employees, it was found that cognitive scores were 50% lower when participants were exposed to 1,400ppm of CO_2 compared with 550ppm during the working day.

Prolojik has positioned its network solutions as “neural network” of buildings and the addition of the PS632, our DALI CO_2 and temp sensor, extends this functionality to allow customers to monitor and manage the impact of CO_2 within their spaces. The sensor measures CO_2 to an accuracy of 50ppm along with temperature at 0.5°C resolution whilst only consuming 4mA from the DALI network.

PS632, DALI CO_2 and temp sensor

The PS632 uses NDIRS technology (No-Dispersive Infrared Spectrometry) and deploys a design optimised to address a number of key requirements:

Requirements	Benefits of our PS632
Reliable measurements over long - periods of time	Continuous readjustment using the reference channel
Long-term stability	100% final inspection after production
Permanent drift compensation	Temperature compensation and calibration of pressure
Low maintenance requirements	No recalibration necessary

Prolojik's PS632 can be added to any new or existing DALI installation to collect and share CO_2 and temperature data to our Perspective supervisor or via BACnet/IP to a wide variety of building management systems. PS632 sensors work with Prolojik's Modular, Plexus and Lightmatrix product families.

Contact us to discuss how PS632 can be added to your building.

PERFORMANCE

Power consumption	4.2mA
Measurement Accuracy	300 - 5000 ppm >> Accuracy CO_2 0-1000 +/- (50 ppm + 3%) of Measured Value 1001-2000 +/- (50 ppm + 5%) of Measured Value CO_2 > 2000 +/- (100 ppm + 5%) of Measured Value
Operating Temperature	0 to 50°C
Temperature Accuracy	+/- 0,5°C
Operational Humidity	5 to 95% non-condensing
Measuring Cycle	15s
Temperature Dependence	Typ.5ppm/K (Reference Temperature 21°C)
Environmental Influence	For internal use. Vibration free-installation Install between 900 and 15000mm from finished floor level.
Air pressure Dependence	+/- 0,15% v. Mw. / hPa Reference Air Pressure 1013 hPa

* *Direct human health risks of increased atmospheric carbon dioxide, Tyler A. Jacobson, Jasdeep S. Kler, Michael T. Hernke, Rudolf K. Braun, Keith C. Meyer & William E. Funk, Nature Sustainability 8th July 2019*

Indoor carbon dioxide levels could be a health hazard, scientists warn, Nicolas Davis The Guardian, 8th July 2019

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