![Akenza — IoT made simple]

A Smart Light Solution for Indoor Air Monitoring

Air quality monitoring and people's well-being

Proper lighting and indoor air quality go hand in hand when it comes to productivity and people's well-being. Indeed, both factors have a direct impact on the way we feel and interact at work or learn in the classroom. It is usually quite straightforward to identify situations where lighting needs improvement. However, it is much more difficult for people to assess the quality of the air inside a room. It is hence not uncommon to see meeting rooms and classrooms with poor ventilation, especially during the heating period.

According to studies[1], the level of carbon dioxide (CO_2) in indoor spaces can directly affect people's well-being. Poor air quality due to high levels of CO_2 is linked to poor decision making, lack of focus, and drowsiness.
Usually, people start experiencing some physical effects at 900 ppm but it is not rare to measure levels higher than 1000 ppm with peaks above 2000 ppm.

Good ventilation of schools and office spaces has also become a global concern with the recent COVID-19 outbreak. In this post-pandemic area, facility managers need to be able to measure the air quality on their premises and take appropriate measures in order to ensure a healthy environment for everyone.

An innovative smart lighting solution

To provide a viable solution to this situation, Astra LED and Akenza have joined forces and developed an air monitoring smart lighting solution. The system can be split into two main building blocks: a lamp with an embedded sensor, and an Internet Of Things Connectivity Platform.

First, a sensor embedded in the lamp measures the air quality parameters of the room. These are typically the Carbon Dioxide (CO_2) and Volatile Organic Compounds (VOC) levels, the temperature and the humidity. These parameters are then transmitted to the IoT platform via a low-power, long-range radio communication protocol (LoRaWAN connectivity). The IoT platform then monitors the air quality levels continuously and displays the data on a dedicated dashboard.

If the measured levels reach a predefined threshold, the lamp changes color and intensity accordingly (green: acceptable, orange: high levels, red: critical levels). This visual notification indicates that the room needs to be ventilated. In the case of schools, this is used as a playful approach to raise awareness about the topic and lead students to act.

Smart Light installed in an office space
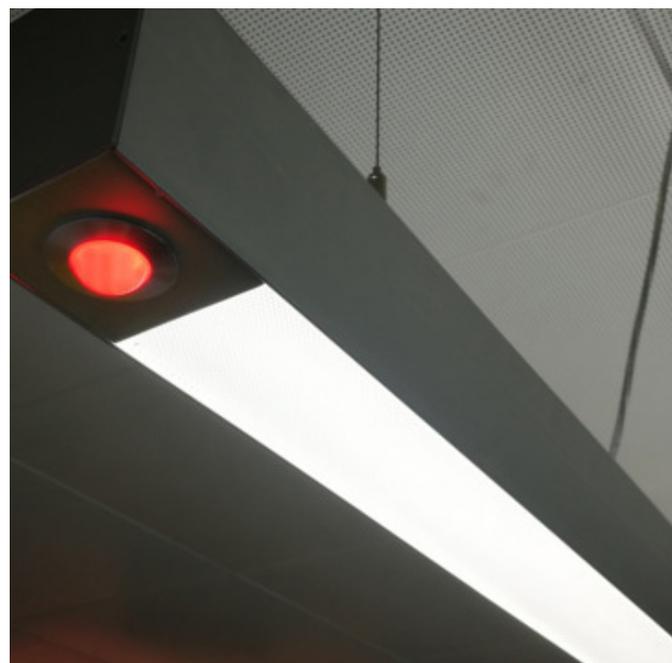
The smart lamp and sensors have been developed by Astra LED. The company develops and produces integrated and adaptive lighting and sensor solutions that increase well-being and reduce operating and maintenance costs.

The IoT software infrastructure is provided by Akenza. The platform makes it possible to connect to the cloud any type of sensor via different connectivity technologies (e.g. LoRaWAN, Sigfox, NB-IoT, LTE-M, 5G). The device can hence be managed in one place, and the sensor's data made available to the cloud in a dedicated application or ERP system.

The case of the city of Zug

One of the first implementations of the system has been made in the city of Zug. The depicted solution has been put in service in several schools of the city to monitor the air quality inside the classrooms.

The smart light solution is also in service in the townhouse of the city, to monitor the air quality in meeting rooms as depicted in *figures 1* and *2*.

Towards a healthier indoor environment

Fostering a healthy environment in schools and workplaces is a critical precondition to ensure the well-being of students and the workforce as well as to ensure high productivity levels. With the current solution, school and facility managers have a viable tool to track and monitor the air quality in their premises.

➜ To learn more about the smart lighting system of Astra LED, visit http://www.hsi-astra.ch.

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[1] https://eartharxiv.org/repository/view/527

About Akenza
IoT made simple

Akenza is a Swiss technology provider offering an IoT platform with a wide range of integrated services helping businesses and cities with their digital transformation. Akenza was born in 2017 to deliver fast, easy and cost effective IoT solutions. Akenza is headquartered in the financial capital of Switzerland, Zurich, from where it helps companies from all around Europe to develop their own smart IoT solutions.

About the Akenza Core

The Akenza platform is an easy-to-use agnostic IoT software infrastructure designed to help companies and cities build real-time connected solutions. With a simple and secure management of smart devices, connectivity and data, the Akenza IoT platform enables rapid market introduction of innovative, digital technologies.

It connects millions of IoT devices, delivers commands and collects data. It simplifies device management, data integration and data analysis, enabling device connectivity over industry-standard IoT protocols and supporting both Software as a Service (SaaS) and Platform as a Service (PaaS) implementations.

➜ **Self Service Capabilities for your departments**

➜ **Easy to use / Plug and Play**

➜ **Cost efficient**

➜ **Open and flexible**

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