Eltek
SPECIALIST DATA LOGGERS

Driesen + Kern

Case Study

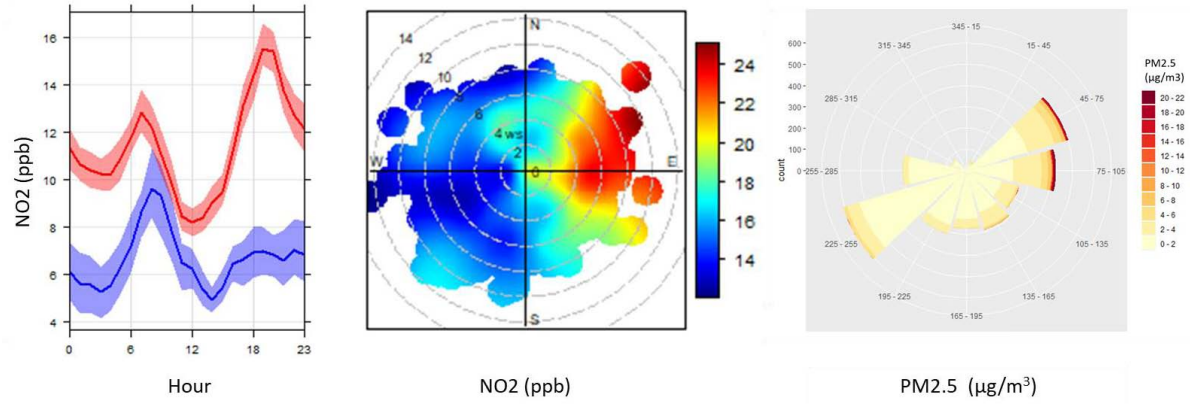
Advanced Air Quality Monitoring

June 2019

Background

Researchers at UCL's Institute of Environmental Design and Engineering have been conducting field measurements to explore how building design and operation could provide improved indoor air quality (IAQ) whilst delivering low energy and low carbon buildings. To support this work, and following a long history of collaboration with Eltek, the AQ110 advanced air quality monitor was developed. The integrated unit was designed to capture temperature, humidity, CO2, particulates (PM1, PM2.5, PM10), NO2, CO and TVOCs. This has allowed an understanding of both indoor and external pollutants, as well as their relationship to thermal comfort and ventilation rates. Initially developed under the TOP Project (Funded by EPSRC, Grant Code: EP/N009703/1), AQ110 Advanced air quality monitors have been used on a series of research projects, measuring indoor and outdoor air quality in residential apartments, hospitals, offices and schools.

Indoor and outdoor pollutant monitoring



Figures: (left) Morning and evening traffic related peaks in NO2 are seen by external and internal monitors. (Centre & Left) Pollution and wind roses helping to identify sources of NO2 and particulates.

With remote data capture (using networks of SRV250 data loggers) researchers have been able to mount long term monitoring campaigns, capturing seasonal trends and patterns. For example, this has allowed researchers to observe the impact of traffic pollution on both external and internal levels, indicating the importance of NO_2 filtration in high pollution sites. This work has been further aided by onsite weather stations, again provided by Eltek, helping to identify local sources of pollution and increases in both external and internal levels with certain wind directions.

Monitoring 'Total performance'

On a broader level, UCL have been developing methods to gather evidence to support reduced emissions from the building sector, coupled with improved Indoor Environmental Quality (IEQ), in the transition towards future Low Carbon Cities. Gathering this evidence on 'total performance' of low carbon buildings has been supported by Eltek solutions for measuring not only indoor air quality, but thermal comfort, illuminance and energy.

Further development – The AQ112

Following the success of initial projects, the AQ112 was developed to further add an Ozone sensor to the original AQ110 design. This provides a useful additional measurement in its own right, but also aids the measurement and interpretation of NO_2, particularly important for outdoor monitoring over the summer.

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For further information about Eltek dataloggers, please email: sales@eltekdataloggers.co.uk

or call +44 (0) 1223 872111