Fall 2021 Newsletter

2B Technologies

2B Buzz

2B Tech Product Launch:

Our New AQSync Air Quality Monitoring Station Does It All

Revolutionize Your Air Quality Monitoring

Our new AQSync Air Quality Monitoring Station combines the "Best of the Best" instruments for measuring air pollution gases and particulate matter:

- FEM-quality absorbance measurements for O_3, NO_2, and NO
- NDIR absorbance for CO_2
- Optical particle counter with sheath flow and heated inlet for PM_1, $PM_{2.5}$, and PM_{10}
- Amperometry for CO
- Sonic anemometry and weather data
- Data access and instrument control via the Cloud
- Power-stingy requirements enable options for powering with battery or solar panel

We are taking orders for delivery later this year. Visit the **AQSync website** to watch a more in-depth webinar and view more detail about the instrument specifications.

Take your air quality monitoring to the next level with the AQSync!

Request a Quote

Visit the AQSync Website

Air Pollution News

Wildfires Sparking More COVID Cases

Particulate Matter Erodes Immune System, Increases Vulnerability

In 2020 and again in 2021, many people have been facing not only a global pandemic, but also a world that is literally on fire, with pervasive and persistent smoke from wildfires impacting many regions of the globe. A few studies have begun to show that there's a connection between the two -- and that the fine particulate matter ($PM_{2.5}$) from wildfire smoke makes a bad situation worse with COVID.

In August, researchers at the Environmental Systems Research Institute and Harvard University **published a study** that looked at 92 counties in California, Oregon, and Washington impacted by the western U.S. wildfires from March to December 2020. Satellite data were used to identify smoke-impacted counties, and publicly available data on COVID cases and deaths were analyzed for those counties. Unlike previous work, this study went a little deeper into investigating the lag time between fires and the COVID response (because of the delay between COVID exposure and symptom onset), and also investigated more confounding factors such as weather, seasonality, mobility, and population size.

Bottom line, the findings were that wildfires led to more COVID cases and deaths for some--but not all--counties. The study suggests that about 20,000 additional COVID cases and 750 additional COVID deaths occurred across the 3 states. It's the first study to show that the actual COVID caseload is increased by wildfire-associated $PM_{2.5}$, not just the severity of symptoms. It also represented the largest area studied to date, representing 95% of the population of these 3 western states.

Several mechanisms for the role of PM2.5 in COVID and other health problems have been suggested and/or investigated, including that PM overworks the immune system and weakens its ability to respond to COVID, and that the PM causes tissue inflammation and damage that increases vulnerability to COVID.

With COVID projected to persist and climate change increasing the occurrence of wildfires, the convergence of increased risk appears to be a new fact of life.

Excess of COVID-19 Cases and Deaths Due to Fine Particulate Matter Exposure During the 2020 Wildfires in the United States, X. Zhou, K. Josey, L. Kamareddine, M.C. Caine, T. Jiu, L.J. Mickley, M. Cooper and F. Dominici, *Science Advances* (2021), **7**, eabi8789.

Case Study: The Model 714 NO_2/NO/O_3 Calibration Source

First Published Studies Show Versatility of Our Model 714

One Convenient Instrument for Calibrating Three Gases

We're always on the lookout for the first published papers citing the use of one of our new instruments. We recently noted this milestone for our Model 714 NO_2/NO/O_3 Calibration Source, which was added to our lineup in December 2018.

In one paper, researchers at several universities in China used the Model 714 in their tests of a sensor-based Personal Exposure Kit (PEK). The Model 714 provided known concentrations of both O_3 and NO_2 over a wide range to calibrate the PEK's electrochemical sensors in the laboratory. They then performed several tests of the PEK's performance under varying T and RH conditions, and in field settings (Zong et

al., **Reducing the Influence of Environmental Factors on Performance of a Diffusion-Based Personal Exposure Kit**, *Sensors* (2021), **21**, 4637).

In another paper, the Model 714 was used at the University of Extremadura in Spain to generate calibrated NO_2 concentrations for use in evaluating a colorimetric method for detecting NO_2 (Cerrado-Alvarez et al., **A Portable, Low-Cost, Smartphone Assisted Methodology for On-Site Measurement of NO2 Levels in Ambient Air by Selective Chemical Reactivity and Digital Image Analysis**, *Sensors and Actuators: B. Chemical* (2021), **338**, 129867).

In the Model 714, calibrated concentrations of O_3 are produced by photolysis of oxygen, and calibrated concentrations of NO are produced by photolysis of nitrous oxide supplied by a small "Whippit" cartridge. In addition, calibrated concentrations of NO_2 are produced by gas-phase titration of NO with O_3. Calibrations sequences can be programmed in internal memory via a user-friendly touch screen interface.

Check out our website and our published paper to see if this versatile, portable calibration source can simplify your research projects!

The Model 714 NO2/NO/O3 Calibration Source

Published Paper on the Model 714

Employee Spotlight
Austin Bailly: Expert Engineering for 2B Tech's Instruments

As 2B Tech's Software Engineer, Austin Bailly has a multitude of skills. Of course there's the technical knowledge and abilities he gained while earning his bachelor's degree in computer science at the University of Colorado Boulder in 2019. These come into play every day as Austin engineers the "brains" of the 2B Tech instruments, especially the newcomers to our lineup such as the AQLite and AQSync.

But then… there's also the talent he shows for dealing with a multitude of requests from others in 2B Tech for help with diagnosing technical issues or fixing problems that crop up in the normal day-to-day operations of building and repairing instruments at 2B Tech. He calmly "keeps the wheels on track" – always with a smile and a can-do attitude. In this regard, Austin seems more like a seasoned pro than a person in their first job out of college.

Austin grew up in the Phoenix area and always knew he wanted to study computer science in school. He enjoys card games and board games in his spare time, which no doubt capitalizes on his abilities to focus, solve problems, and strategize – just like his job at 2B Tech!

Explore Our Website

Check Out Our Team

Explore Helpful Downloads

Request a Quote

View Newsletter Archive

2B Technologies
2100 Central Ave, Suite 104
Boulder, CO 80301
+1 (303) 273-0559