



# Air Quality and Pollution

Measurement Instrumentation for Air Quality Monitoring



RELIABLE  
SINCE 1974  
MONITORING

Campbell Scientific provides air quality and pollution monitoring systems built around rugged, low-power meteorological stations. These are in use at refineries, landfills, construction and remediation sites, and in many other locations where particulates, gases, or even

odors need to be monitored. Measurements and data acquired by these systems can be used for compliance monitoring, alarming or notification, and air-quality and dispersion modeling.

## MAJOR SYSTEMS

**AQMS** | Air Quality Monitoring  
Meteorological Station for Regulatory Modeling Application



Measurements	Datalogger	Power	Communications
Wind speed Wind direction Delta temperature Air temperature Relative humidity Barometric pressure Solar radiation (sun plus sky radiation)	CR3000	Rechargeable battery and 90 W solar panel	cellular DNP3 email fiber optic field display FTP Modbus NTCIP radio satellite serial TCP/IP Wi-Fi

## Custom Systems

We offer a variety of products that can be used to create custom Air Quality and Pollution systems. Please don't hesitate to let us help you configure a full system that meets your exact needs.

We've listed many of the major components relevant to Air Quality and Pollution below.

### Dataloggers Used in Air Quality Monitoring

Our monitoring stations are based around a programmable datalogger that measures the sensors, then processes, stores, and transmits the data. Our low-power dataloggers have wide operating temperature ranges, programmable execution intervals, onboard instructions, and ample input channels for commonly used sensors. Wind processing algorithms, including the Yamartino method of computing standard deviation of wind direction, are standard in the datalogger instruction sets. Our dataloggers interface directly to most sensors, eliminating external signal conditioning.

Data are typically output in the units of your choice (e.g., wind speed in mph, knots, m/s). Measurement rates and data recording intervals are independently programmable, allowing calculation of 15-minute, hourly, and daily data values from 1-minute or 1-second measurements. Atypical events can trigger alarms and cause additional data to be recorded. Channel capacity can be expanded using multiplexers.



More info: 435.227.9120  
[campbellsci.com/air-quality](http://campbellsci.com/air-quality)



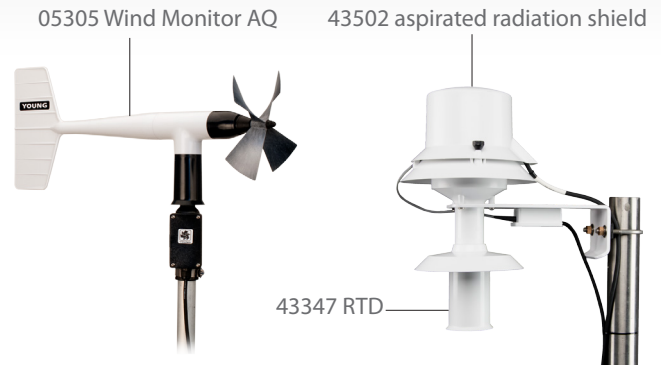
## Sensors, Analyzers, and Monitors

Almost any meteorological sensor can be measured by our dataloggers, allowing stations to be customized for each site. Typical sensors used on our stations include, but are not limited to: wind speed, wind direction, solar radiation, delta temperature (SRDT), air temperature, water temperature, soil temperature, relative humidity, precipitation, and barometric pressure. In some locations, hydrological sensors provide additional measurements, such as water quality of a nearby stream.

A wide range of gas analyzers can be used with our systems. Many gas analyzers output a user selectable 1, 5, or 10 Vdc signal proportional to the concentration of the gas being measured or have a means to output a serial data string that can be received and stored by the datalogger. The datalogger measures the voltage directly and then scales the voltage into the appropriate concentrations, in ppm or ppb. Control ports on the datalogger are programmed to open and close solenoids to complete self-calibration routines on a user-specified schedule. Commercially available gas analyzers measure concentrations of SO<sub>2</sub>, H<sub>2</sub>S, O<sub>3</sub>, NO<sub>x</sub>, NO, NO<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, and THC (total hydrocarbon).

The beta-gage type of particle sampler (PM10 or PM2.5) typically has a voltage output that our dataloggers can measure directly. Our dataloggers can also measure most flow sensors and opacity meters. On-board processing instructions use concentration and flow data to compute stack emissions.

Sensors we offer include, but not limited to, the 05305 for wind speed and wind direction, the LI200RX or CMP3 for solar radiation, and the 43347 for air temperature.



## Data Retrieval

We offer multiple communications options for data retrieval, which can be mixed within the same network. Telecommunications options include short-haul, telephone (land line, voice-synthesized, cellular), radio frequency, multidrop, and satellite. On-site options include storage module and laptop computer.

## Software

Our PC-based support software simplifies the entire monitoring process, from programming to data retrieval to data display and analysis. Our software automatically manages data retrieval from networks or single stations. Robust error-checking ensures data integrity. We can even help you post your data to the Internet.

## Instrumentation Towers and Masts

Our UT30 Instrumentation Tower (30 foot) meets PSD requirements. Campbell Scientific also offers the CM375 30 ft Mast.

## Air Quality Case Studies



This station in Pennsylvania allows landfill managers to collect and analyze data that helps them optimize operations while minimizing impacts on the community.

Our air quality systems have helped a variety of organizations reach their goals. The following are just a few of these:

The Community Environmental Monitoring Program (CEMP) uses Campbell Scientific equipment to monitor radiation near the Nevada Test Site (NTS).

[www.campbellsci.com/nevada-cemp](http://www.campbellsci.com/nevada-cemp)

The Cujajone Copper Mining Company's air-quality station, located at the Villa Botiflaca Camp in Peru, has collected about 13 years of valid data.

[www.campbellsci.com/peru-cujajone-copper-mine](http://www.campbellsci.com/peru-cujajone-copper-mine)

Campbell gear is used to record baseline air quality and meteorological data at proposed or existing power plant locations in Utah.

[www.campbellsci.com/utah-air](http://www.campbellsci.com/utah-air)

Ambient Air Quality Service (AAQS), a Campbell Scientific consultant and integrator, has installed and maintains multiple landfill monitoring stations in Pennsylvania.

[www.campbellsci.com/utah-air](http://www.campbellsci.com/utah-air)

