

CASE STUDY

Bristol University - Boundary Layer Project

SUMMARY

Problem:

Bristol University partnered with the Met Office to provide the UK Government with estimates of UK greenhouse gas emissions. They currently measure carbon dioxide, methane, nitrous oxide, and sulphur hexafluoride, but rely on a modelled simulation of meteorology to determine where that pollution has come from.

Solution:

Campbell Scientific supplied the custom meteorological measurement gear to determine the source of the greenhouse gases.

Realised benefits:

The measurement system complimented the existing infrastructure and allowed Bristol University to better understand local meteorology and the origin of the pollution.

Location:

Bristol, UK

Customer:

University of Bristol

UNDERSTANDING THE ORIGIN OF POLLUTION TO SUPPLY CRITICAL DATA TO THE UK GOVERNMENT

Bristol University required a solution to better understand the source of local pollution, rather than rely on an existing model simulation. Campbell Scientific supplied Bristol University with two bespoke systems to measure a range of parameters to help calculate the source, including temperature, humidity, and pressure. The distances between the logger and sensors, and the two towers themselves, made the project particularly challenging, but this was overcome through the use of powerful Campbell Scientific components and custom engineering.

The setup has provided Bristol University with valuable data to better understand the local meteorology and origin of the pollution observed, which will be sent to the UK Government and ultimately the United Nations (UN).

CASE STUDY

DELIVERING DATA – UNDERSTANDING THE ORIGIN OF UK POLLUTION

Problem

Bristol University worked with the Met Office to provide the UK Government with estimates of greenhouse gas emissions based on atmospheric measurements. A solution was needed to help them better understand the origin of the pollution and local meteorology observed. Currently, these parameters are simulated using a model, so the data provided from our equipment will be useful in assessing how accurate the model is. The project itself would be challenging due to the extreme environment and the distance from the sensors to the logging equipment. There was also a very high amount of radio frequency on the site.

The Solution

Following two years of careful planning, Campbell Scientific supplied meteorological measurement systems to Bristol University. These systems involved installing temperature and humidity, wind speed and direction, and pressure sensors on two large communications towers measuring 90 m and 120 m tall. The data logger had to be placed over 200 m from the top sensors, and a large amount of custom parts were used to overcome the distances involved and high levels of interference.

About the System

Due to the large distance from the sensors to the logger enclosure, all sensors used RS485 output. The **CR6** was the perfect data logger for the application as it combines many of the best features of the Campbell Scientific data loggers. The CR6 features faster digital communication to sensors, low power requirements, compact size, MicroSD memory expansion, and Ethernet as standard. The data logger was combined with SDM-SIO1A digital expansion modules so sensors could be kept on separate RS485 interfaces. Data collection was performed over TCP/IP to a **Loggernet** server.

The **WindSonic 75** used is a robust, low-cost, ultrasonic wind sensor with no moving parts. This two-axis ultrasonic wind sensor offers maintenance-free wind speed and direction monitoring for true “fit and forget” wind sensing, which was ideal due to the height of the tower. The HMP155 humidity and temperature sensor and the PTB210 digital barometer were also selected.

Deliverables

Campbell Scientific’s bespoke systems are supplying Bristol University with real-time meteorological data readings. These parameters were previously simulated using a model, so the data provided from the Campbell Scientific system is useful in determining the source of the pollution and assessing the accuracy of the model. This will facilitate Bristol University and the Met Office in delivering an annual estimate of UK greenhouse gas emissions to the UK Government, which will ultimately be submitted to the UN.



For more information, email sales@campbellsci.co.uk or call **+44(0) 1509 828888**.