

Air quality insights from the Eiffel Tower

Case Study



The client:

Airparif

Vaisala solution:

WXT534 weather transmitter

WMT700 weather transmitter

HMP155 HUMICAP® humidity
and temperature probe

THE CHALLENGE:

Monitoring air quality through layers

With a population of 2.24 million residents plus millions of annual tourists, Paris is one of the busiest cities in the world. The city also experiences air pollution which authorities consistently measure and mitigate.

Airparif is a Paris-based organization that measures and maps pollution throughout the Île-de-France, from the coastal city of Bobigny to Versailles. As the premier provider of air quality information, Airparif tracks pollution locations and amounts, and disseminates data and forecasting information to the public and local meteorological organizations.

Weather and air quality are closely linked: For example, the rise and fall of the atmospheric mixing layer or inversion layer directly impacts air pollution concentrations. The Eiffel Tower—with

its tall, narrow and largely hollow structure—is a natural choice for tracking air quality conditions. The building does not affect the movement of air and pollutants.

Although Airparif had been using some sensors at the Tower, the organization decided to implement a comprehensive air quality management solution with the best quality sensors available. As one of the world's most visited monuments, there are constraints to installing anything on the Eiffel Tower. The solution must meet stringent requirements, and be unobtrusive to viewers while not impacting the Tower's construction in any way.

"The air conditions on the ground can vary quite a lot from the top of the Eiffel Tower, and we need to understand how the daily rise and fall of the inversion layer affects pollution concentration. These sensors do exactly what we need them to do, all while operating dependably even in very tough rain, wind and snow conditions."

Airparif

THE APPROACH:

Comprehensive, reliable insights

Working with local Vaisala partner SerWIS, Airparif upgraded the Tower with world-class Vaisala weather and air quality sensors. Located at three different altitudes, the solution provides the inversion layer data Airparif needs to track conditions in real time.

To meet installation requirements, the wind sensors and temperature and humidity measurement sensors are positioned on the 6th floor at the level of the East and West pillars. Two sets of Vaisala WMT700 weather transmitters and Vaisala HMP155 HUMICAP® humidity and temperature probes are installed on the east and west points of the 6th floor of the Tower at 300 m – an approach that gives them the most accurate wind measurements depending on whether the wind blows from the east or the west. Two Vaisala WXT534 weather transmitters are installed at altitudes of 140 m and 220 m.

The Vaisala sensors are connected to a data acquisition and analysis system provided by SerWIS, which transmits the data to Airparif.

THE RESULTS:

Accurate data that's easy to understand and share

Airparif is successfully measuring temperature, humidity, and wind speed and direction at three different altitudes on the Eiffel Tower. The comprehensive solution with a centralized data source gives them the insight they need to quickly track air quality conditions, now and over time for current and historical data.

The Vaisala sensors provide accurate, reliable data on a wide range of weather and pollutant conditions for easy dissemination and effective decision-making. Their rugged design stands up to the weather for low lifetime costs and dependable operation.

The fluctuations of the mixing layer and its impact on local air quality conditions are easy to understand. Airparif feeds the data into their forecasting models for more accurate air quality predictions – information that everyone can use for greater awareness.

Why Vaisala?

As the global leader in weather and environmental measurements, Vaisala empowers businesses and community leaders to build resilience to climate change and extreme weather events. Our 85+ years of expertise is grounded in science, innovation and our unwavering commitment to constantly evolving.

We boldly demonstrate that a culture of resilience and a connection to nature can create new ways of smarter, resilient living. We are champions for smarter, safer and more sustainable urban communities.

