Take a Deep Breath of **Fresh Air**

See how a strict continuous emission monitoring system can curb air pollution

AT A GLANCE BUSINESS CHALLENGE SOLUTIONS & RESULTS

The “New Tobacco” Is Causing Irrevocable Damage to the Earth’s Atmosphere

As was widely reported in the media, the head of WHO referred to air pollution as “the new tobacco.” And since humans cannot survive without breathing, reducing air pollution has been placed as a top priority globally to reduce the harmful effects caused by—just breathing. In fact, every breath you take could contain any number of harmful pollutants, including particulate matter (PM2.5) and nitrogen oxides (NOx). In their annual report on air pollution, the State of Global Air 2020 reported that air pollution was responsible for 6.67 million deaths worldwide in 2019.

It’s sad to say, but in cities across the globe, breathing "clean air" has become quite a luxury, with people in some areas of the world waking up to gray skies almost every day of the year. In an ironic twist to the 2020 coronavirus lockdown, skies in some of the most polluted parts of the world cleared up significantly due to the sudden cessation of most daily commutes. Citizens of many cities were treated to the sight of long-invisible skylines as well as the long-forgotten smell of fresh air. The public got a “pleasant” reminder of just how serious the global air pollution problem really is.

Industry and transportation are the leading sources of global air pollution. In most countries, industry accounts for more than half of the total emissions of some key air pollutants. Air pollution not only affects the health of human beings, it also does significant damage to the Global GDP. That’s why in recent years, governments around the world are taking a more active role in enacting policies that specifically address the need to improve air quality.

BUSINESS CHALLENGE

Tackling Industrial Air Pollution with Better Data

Europe, America, and Japan set stringent air quality policies decades ago to reduce smog issues, most of which was caused by industrial emissions from sources such as petrochemical and chemical usage. This issue is also being addressed by Asian countries, including China, India, Vietnam, and other countries that have enacted legislation and put exhaust gas detection as a primary concern. Governments often set a cap on the total amount of pollution emissions for companies operating in a certain area, and then use some method to distribute the emissions requirements among the different companies. Since the cap is usually reduced over time, industry and business must find ways to efficiently reduce the emissions from their factories. Governments require factories to submit emissions data to the Environmental Protection Agency (EPA) for monitoring purposes, and if a factory exceeds their emissions allowance, they can expect to be fined.

A crucial system used in many global manufacturing industries is a CEMS (Continuous Emission Monitoring System), which continuously monitors the total emission volume of gaseous pollutants, such as SO2 and NOx. A CEMS uses flow meters and sensors installed on factory smokestacks to collect data that is transmitted to the EPA to ensure that industry is following the mandatory restrictions.

Each country sets different requirements on the data. In America, for example, the government requires at least one data entry transmission every 15 minutes. Factories can be fined if they exceed the emissions limits, or if they send false or incomplete data. Considering the complexities of data transmission, manufacturers need a very reliable solution to ensure that data is not only complete, but that the network used to transmit the data is stable.

One Thing We Can Do Is Be Smart About Emissions Monitoring

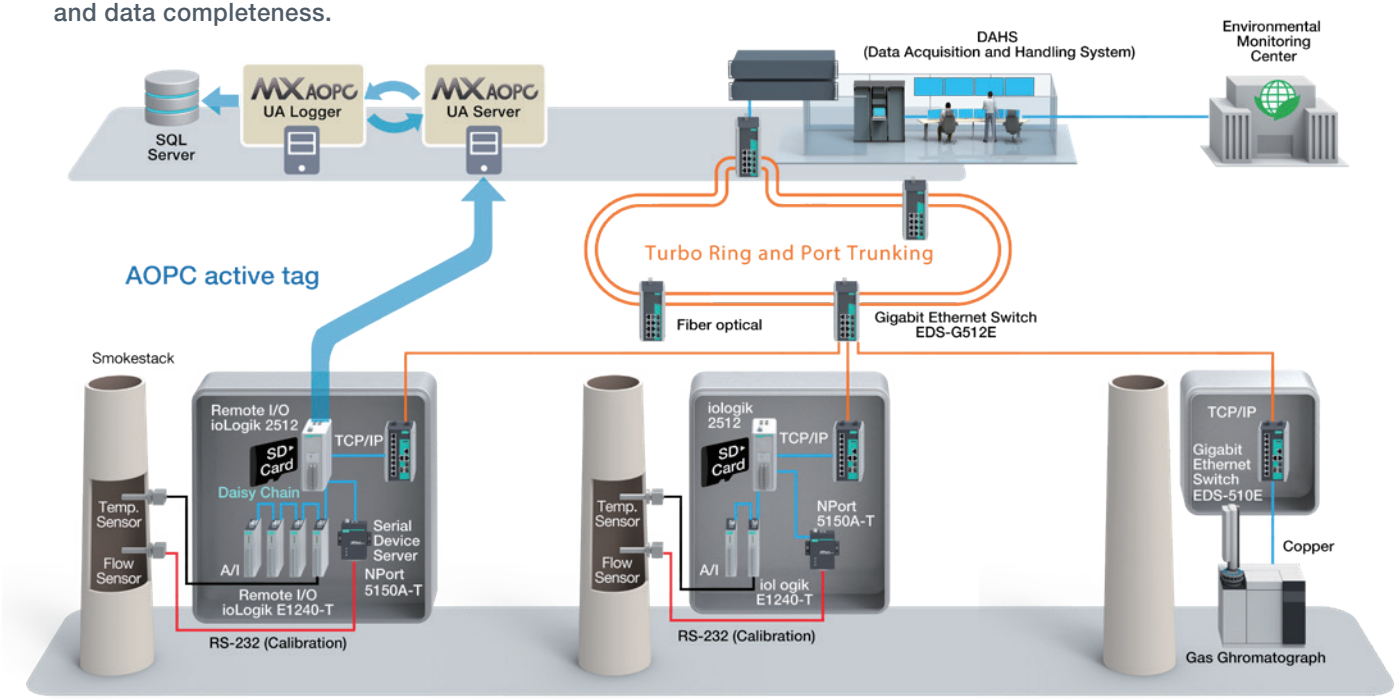
Moxa is a world-class leader and a trusted partner in industrial-grade devices with more than 30 years of experience enabling automation solutions. Moxa offers a winning combination of technology and market expertise. Considering manufacturers' strict requirements on data transmission and accuracy, Moxa provides products and solutions for building both a reliable network infrastructure and ensuring data completeness.

Since factories are required to transmit data to the EPA with a guaranteed level of accuracy, they need to ensure that they collect all of the required data at the emissions site. Moxa's managed Ethernet switches are paired with a ring and port trunking topologies to ensure network redundancy between local sites and a factory's central Data Acquisition and Handling System (DAHS), which collects and then transmits the data to the EPA. Redundancy ensures that even when a network device or path becomes unavailable, the network can still transmit the required data packets back to DAHS.

To preserve data in the unlikely event that a network server is disconnected or malfunctions, Moxa provides a solution that allows customers to back up 100% of their data locally, at the original point of transmission. For example, data can be stored on the SD card in a Moxa ioLogik 2500 I/O Series, which transmits data from flow sensors, temperature sensors, and humidity sensors installed on each smokestack, to a remote SQL server database. If the network goes offline unexpectedly, when it is reconnected, the value-added MX-AOPC UA software uses its Logger feature to compare the data stored on the SD card with the data stored on the remote database, and then supplements any missing data by requesting retransmission of the lost data. In other words, it ensures the complete transfer of the local data as the system uploads the data stored onsite, or keeps it stored locally as a backup copy.

This point solution provided by Moxa eliminates factory owners' worry about local data loss with double protection, ensuring higher system availability and data completeness around the clock.

■ Moxa solutions ensure the network redundancy and data completeness.



Turning Skies From Gray to Blue

On a broader note, one of Moxa's long-term goals is to use its technical expertise to help corporations around the world fulfill their corporate social responsibility (CSR) efforts, one of which is to help tackle the global air pollution problem. When working with advanced technology, fulfilling one's CSR goes hand-in-hand with maintaining a healthy economic growth.