

Application Notes – RF Network Paper Machinery

At Sintrol, we are committed to implementing solutions for our customer's problems. Our products are based on our unique Inductive Electrification technology and developed using a flexible modular based platform that allows us to tailor our products for the customer. While many dust monitoring systems are tailored towards the government regulated emissions limits, there are intermediary measurement points that can be just as critical to the costs and regulatory compliance of the end user. Managing the filtration systems is not only good for emissions, but also a strong indicator to help with maintenance and overall plant costs.

Objective

Measure dust concentration after filter units for early detection of broken bags. Due to heavy cabling costs, plant requested a wireless system of monitors.



Problem

A Finnish paper machinery plant did not have dust monitors installed in its plant and only used differential pressure gauges. After a large dust explosion in the factory causing large amounts of damage to the plant and the neighboring residential community, all filtration systems needed to be equipped with dust monitoring systems. Due to the difficult location of the installation points and the potentially heavy cost of cabling, the customer requested all monitors be connected wirelessly, if possible. The output from all of the monitors needed to be centrally routed to the control room and managed from there.

Solution

Using a combination of Sniffers and S303 monitors, ten different devices were placed across four buildings spanning an area roughly 500 meters in diameter. All of the monitors were connected wirelessly using a RF network and the results displayed in the control room using our Dust Log software. Using the easy auto setup feature, the monitors were able to identify the normal dust concentrations within 30 minutes of installation and were up and running. Due to the wireless installation, the plant saved on cabling costs and reduced the installation and commissioning times. Since the monitors are able to route themselves during setup, the commissioning time is minimized. With a range of over 1 km for the RF monitors, each monitor was able to independently reach the control room without the need for any repeaters. If needed, the monitors can also route data onwards within the network if greater geographical coverage is needed.

Principle of Operation

Sintrol dust monitors are based on a unique Inductive Electrification technology. The measurement is based on particles interacting with an isolated probe mounted into the duct or stack. When moving particles pass nearby or hit the probe a signal is induced. This signal is then processed through a series of Sintrol's advanced algorithms to filter out the noise and provide the most accurate dust measurement output.

Classic triboelectric technology is based on the DC signal, which is caused by particles making contact with the sensor to transfer charges. Compared to DC based measurements, the Inductive Electrification technology is more sensitive and minimizes the influence of sensor contamination, temperature drift and velocity changes. By using the Inductive Electrification technology, it is possible to reach dust concentration measurement thresholds as low as 0.01 mg/m³.

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