



APPLICATION NOTE CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS)



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CONTINUOUS EMISSION MONITORING SYSTEMS

Industrial gas emissions have contributed enormously to the air pollution and must be monitored continuously. In China, there are several companies that develop and manufacture CEMS, or continuous emission monitoring systems. These systems are often used to perform air pollution measurements.

Environmental preservation in China has been closely examined in recent times, and there is increasing concern about reducing environmental pollution. This is why the popularity of environmental monitoring systems has increased over the past couple of years.

CONFIGURING A CEMS SETUP

These systems monitor the concentration of industrial gases and suspended particles emitted from air pollution sources. UV spectrometers are integrated to the CEMS used for calculating the absorption of SO_x/NO_x.

Avantes' spectrometers have high demands regarding stray light levels, optical resolution, stability and sensitivity, which makes them perfect for integration into CEMS.

Differential optical absorption spectroscopy or DOAS is often used in these monitoring systems. Because of their high stability requirements, cooled spectrometers like the [AvaSpec-ULS2048x64TEC-EVO](#) is an ideal choice for DOAS applications.

For less demanding applications, our [AvaSpec-ULS2048x64-EVO](#) and [AvaSpec-ULS2048XL-EVO](#) are great lower-cost candidates.

Below is a schematic overview of an emission monitoring system using DOAS to measure pollution.

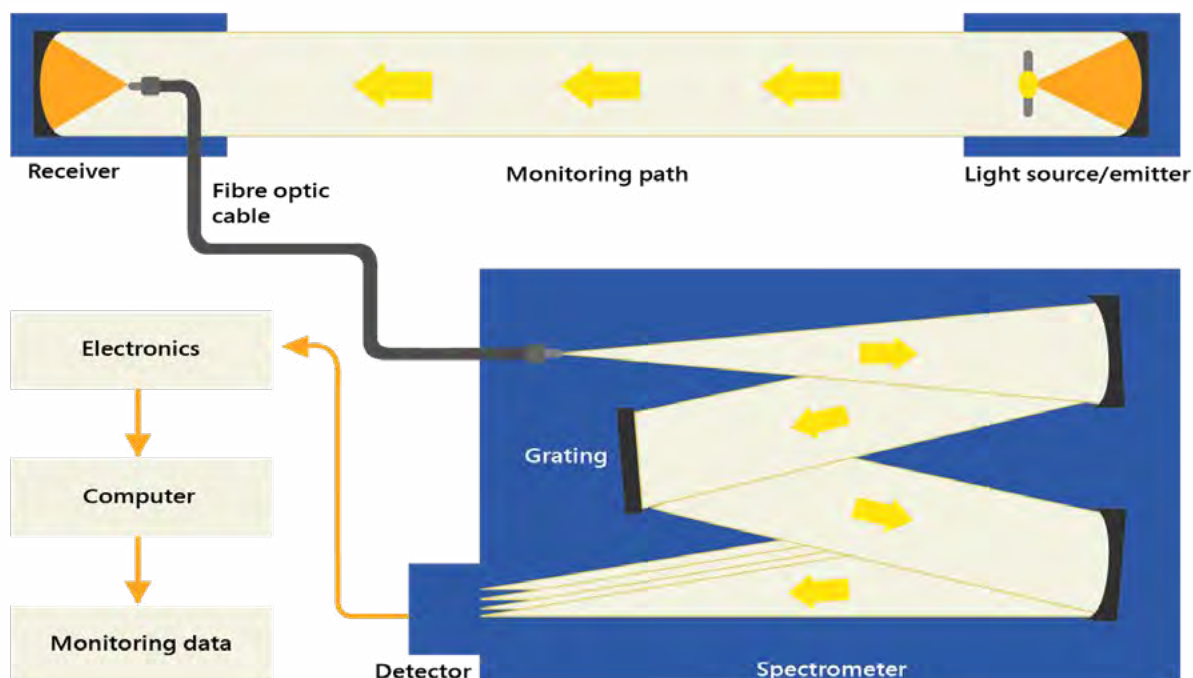


FIGURE 1

Schematic example of a CEMS using DOAS



PRODUCT

HIGHLIGHT

The [AvaSpec-ULS2048x64TEC-EVO](#) enhances the Sensline series with its cooled, back-thinned detector. The back-thinned detector has good sensitivity in the UV and IR region. The 64-pixel height (0.89 mm) enables catching as many photons as possible while the cooling enables long integration times up to 120 seconds with low-noise levels. The instrument features Peltier cooling device integrated into the exclusive ultra-low stray light optical bench. This can reduce the temperature of the CCD chip to -30°C against ambient, improving the dark baseline and PRNU level significantly. The detector cooling also reduces dark noise by a factor of 2-3. The AvaSpec-ULS2048x64TEC-EVO uses a special low-noise version of the 2048 \times 64 detector with integrated cooling. All the mentioned features make this instrument ideally suited for measuring low-light applications, such as DOAS measurements.

CONTACT

WE'RE HAPPY TO HELP

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