ULTRA.*sens*®: UV LEDs in industrial gas sensing applications

G. Wiegleb*, S. Wiegleb[2]
[1]*University of Applied Sciences Dortmund, Sonnenstrasse 96, 44139 Dortmund, Germany*
[2]*Wi.Tec-Sensorik GmbH, Schepersweg 41-61 46485 Wesel, Germany*
*Email: Wiegleb@fh-dortmund.de

The detection of environmental relevant gases like sulfur dioxide SO_2 and nitrogen dioxide NO_2 is very important for many industrial applications. Especially for exhaust gas monitoring in power plants low power and small size gas detector are required for portable applications. NDIR[1] based gas detectors are very sensitive to water vapor content in the exhaust gas. High quality NDIR gas analyzers are mostly sensitive to shock/vibration and the size and power consumption is not suitable for portable purposes.

Based on the NDUV[2] principle we developed a novel low power gas detection system called ULTRA.*sens*® using deep UV LEDs. In 1985 this LED based technology was introduced by G. Wiegleb [1]. At this time LEDs were only available for the detection of NO_2. Today AlGaN-LEDs are commercial available down to 250 nm. Using this type of UV LEDs it is possible to measure SO_2 and NO_2 simultaneously down to a concentration level below 1ppm without any cross interference to other gases in the exhaust like water vapor and carbon dioxide [2]. Furthermore fast response gas analysis is feasible for applications in analytical instruments. Using UV LEDs in different spectral regions, very high dynamic measuring ranges between low ppm level and high Vol.-% level are manageable in one gas detector.

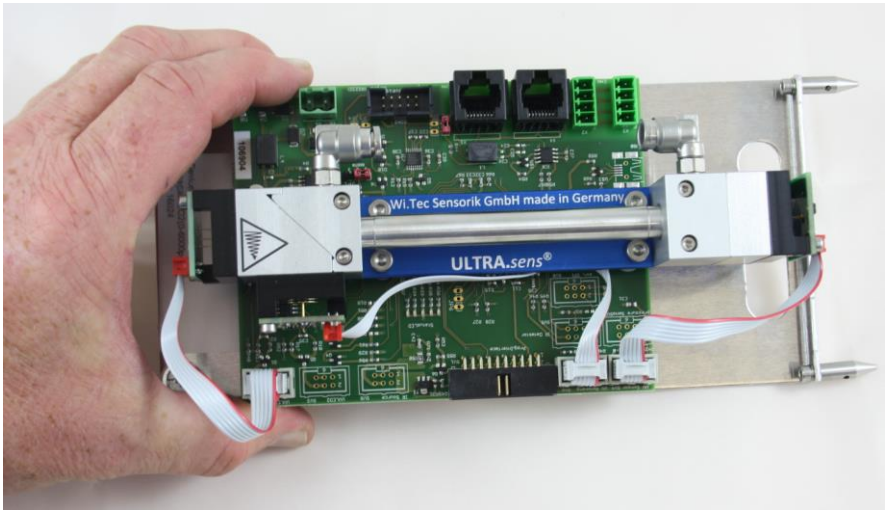

Fig. 1: ULTRA.*sens*® detector for simultaneous analysis of low level SO_2 and NO_2 concentration in flue gas

References:
[1] Wiegleb, G.: Einsatz von LED-Strahlungsquellen in Analysengeräten, Laser und Optoelektronik Nr. 3 (1985) 308-310
[2] G. Wiegleb, Gasmesstechnik in Theorie und Praxis, Springer-Vieweg Verlag 2016

[1] **N**on **D**ispersive **I**nfra **R**ed
[2] **N**on **D**ispersive **U**ltra **V**iolet