

## Introducing Axetris LGD F200P2-H Heating Control with PWM

### Improvements at a Glance

New integrated heating control of the whole LGD F200P2-H product family providing an increased measuring precision

Axetris AG (Switzerland) and its Laser Gas Detection (LGD) business line is pleased to announce an upgrade to their OEM gas sensing modules LGD F200P2-H product family. A new heating control will ensure a more stable temperature of the gas cell and lead to an increased measuring precision. The improved temperature control is being implemented on all LGD F200P2-H modules and market launch is scheduled for Q3 2020.

### Reason Why

Today the temperature of the gas cell of all LGD F200P2-H modules is controlled by a simple 2-point On/Off method. This control approach leads to a temperature fluctuation of the gas cell of about  $\pm 1^{\circ}\text{C}$ , resulting in a correlated fluctuation of the measured gas concentration. This phenomena is attributed to the absorption peak intensity of the target gas being temperature-dependent.

By considering specific LGD modules, for instance the LGD F200P2-H NH<sub>3</sub>, fluctuation of about 0.7% of reading can be observed. In case of applications where the measured concentrations remain below 100 ppm, the effect on measuring performance remains insignificant. But when measuring at higher gas concentrations, e.g. above 2'000 ppm, variations on NH<sub>3</sub> concentration of about 15 ppm can be seen.



LGD F200P2-H module

### Our Solution

We are replacing the On/Off temperature controller with a PI-controller paired with a pulse wide modulation (PWM) adapting the power duty cycle according the desired set temperature.

### Your Applications

Gas Analysis for:

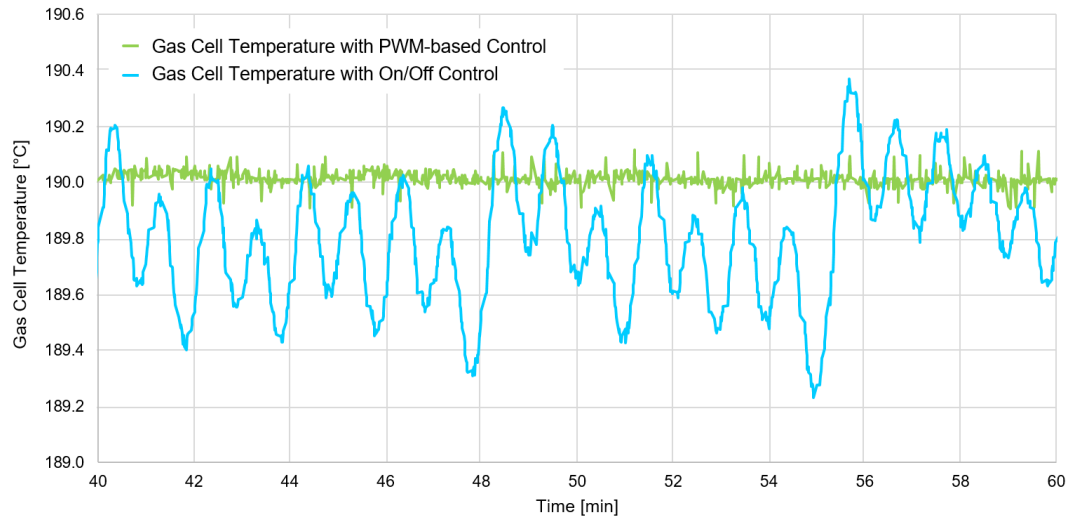
- environmental compliance / CEMS
- process control
- research

### Our Strengths

- laser spectroscopy (TDLS)
- high selectivity and precision
- hot-wet gas measurement

## Comparison 2-Point Control (On/Off) vs. PWM-based Control

The PWM-based control approach provides a significant improvement of temperature stability of the gas cell



## Your Benefit

The improved temperature stability of the gas cell reduces the deviation of the measured target gas concentration over time. The table below provides a comparison between the PWM-based and On/Off heating control, tested on our LGD F200P2-H NH<sub>3</sub> modules.

	PWM-based Temp. Control		On/Off-based Temp. Control	
	NH <sub>3</sub>	H <sub>2</sub> O	NH <sub>3</sub>	H <sub>2</sub> O
<b>Standard Deviation [ppm]</b>	0.43	0.15	0.91	0.21
<b>Peak-to-Peak Deviation [ppm]</b>	2.37	0.61	5.06	1.18

Test conditions:  
set concentration NH<sub>3</sub>: 30 ppm, set concentration H<sub>2</sub>O: 30 % Vol., operating temperature 50 °C

Improving the temperature control of the gas cell results in reduced deviations of the measured gas concentration. The benefits of this can be seen especially when measuring higher gas concentrations above 2'000 ppm where the fluctuation of the measured gas is substantially reduced.

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