A novel fast response, low level gas analyzer system for detection of SO_2 and CO_2, based on combined NDIR- and NDUV-technology

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Elemental Analyzer

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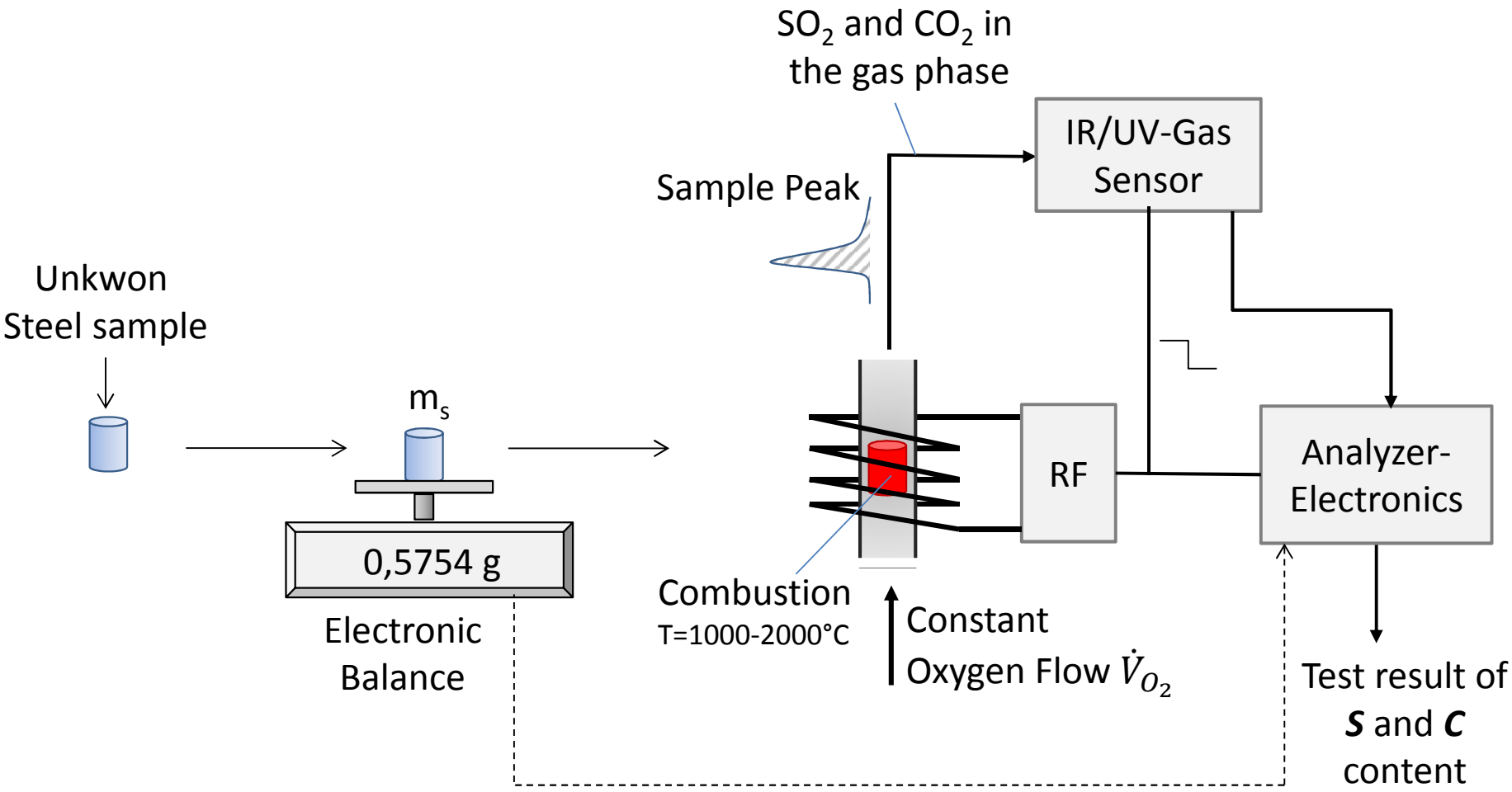

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Transient Gas Peak

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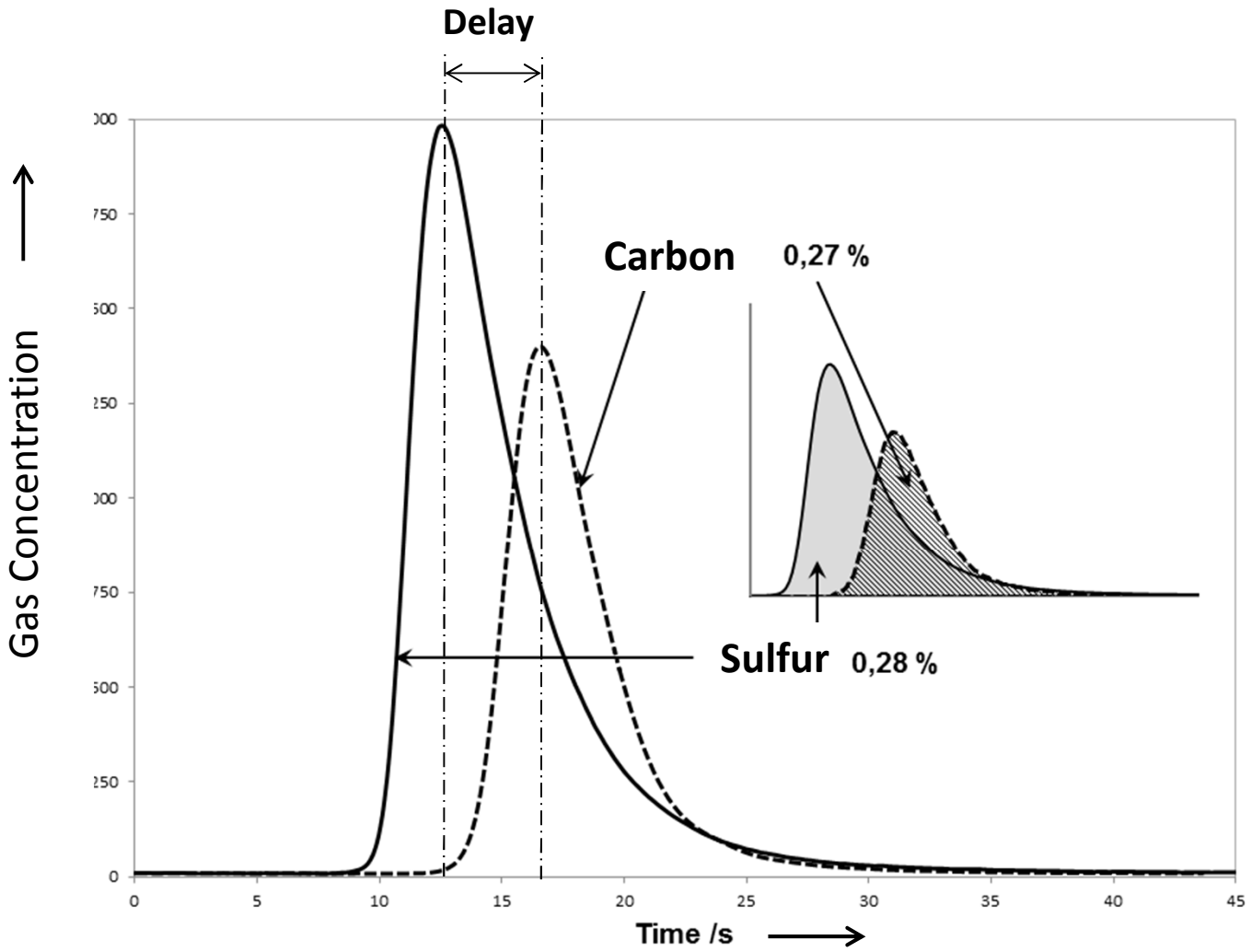

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Calculation of the Sulfur (or Carbon) content

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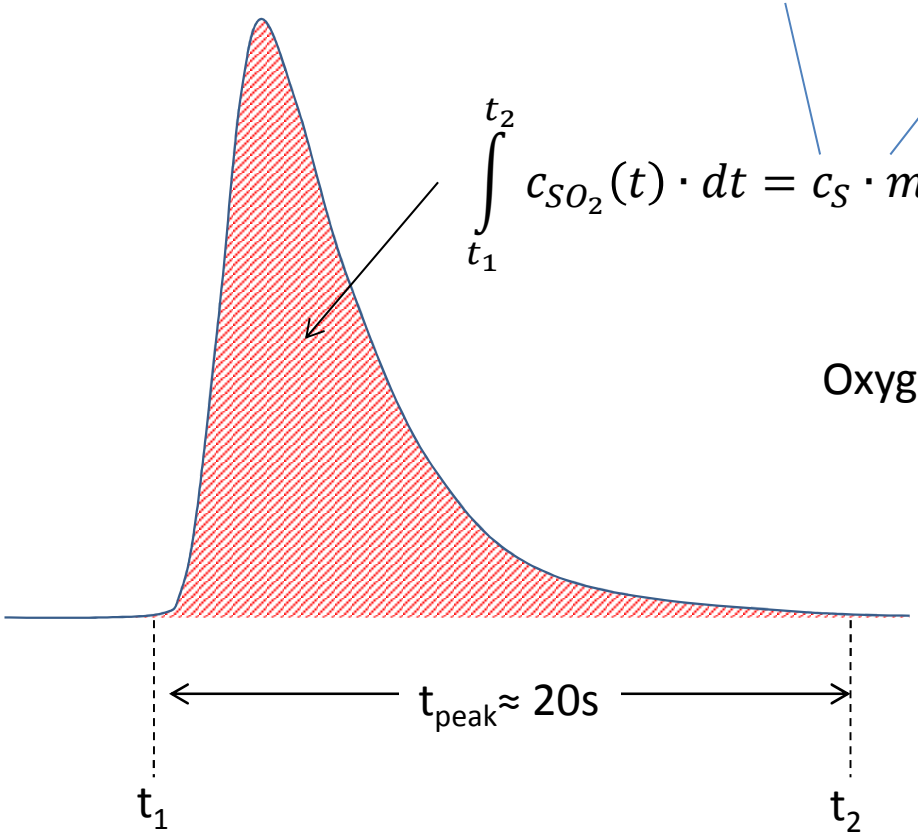

Sulfur content of the sample

Mass of the sample

Calibration Factor

Oxygen Flow

$$\int_{t_1}^{t_2} c_{SO_2}(t) \cdot dt = c_S \cdot m_s \cdot \frac{f}{\dot{V}_{O_2}}$$

$$c_S = \dot{V}_{O_2} \cdot \frac{\int_{t_1}^{t_2} \boldsymbol{c_{SO_2}(t)} \cdot dt}{f \cdot m_s}$$

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Optical Design

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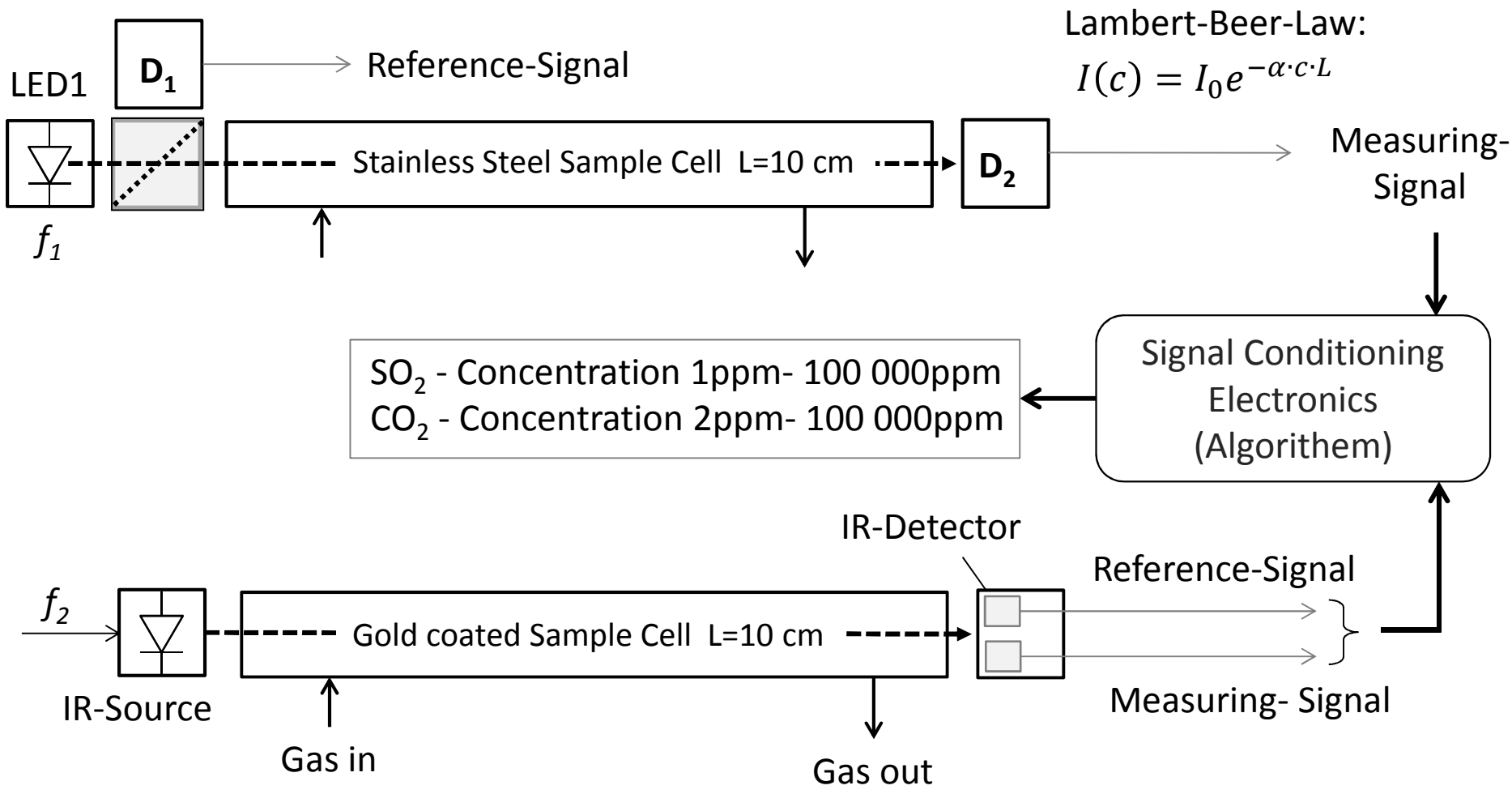

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UV- Sensor Modul Design

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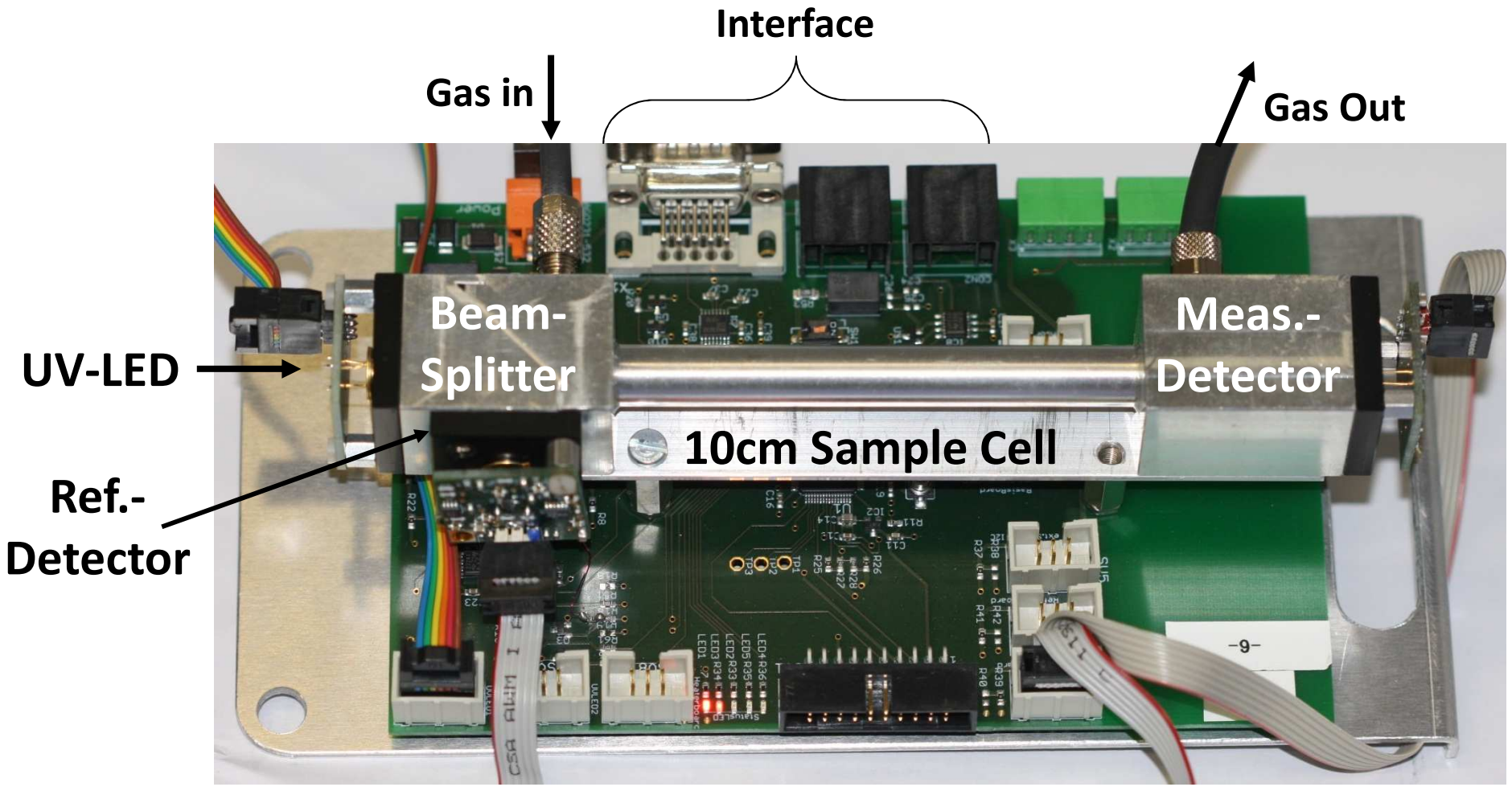

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IR- Sensor Modul Design

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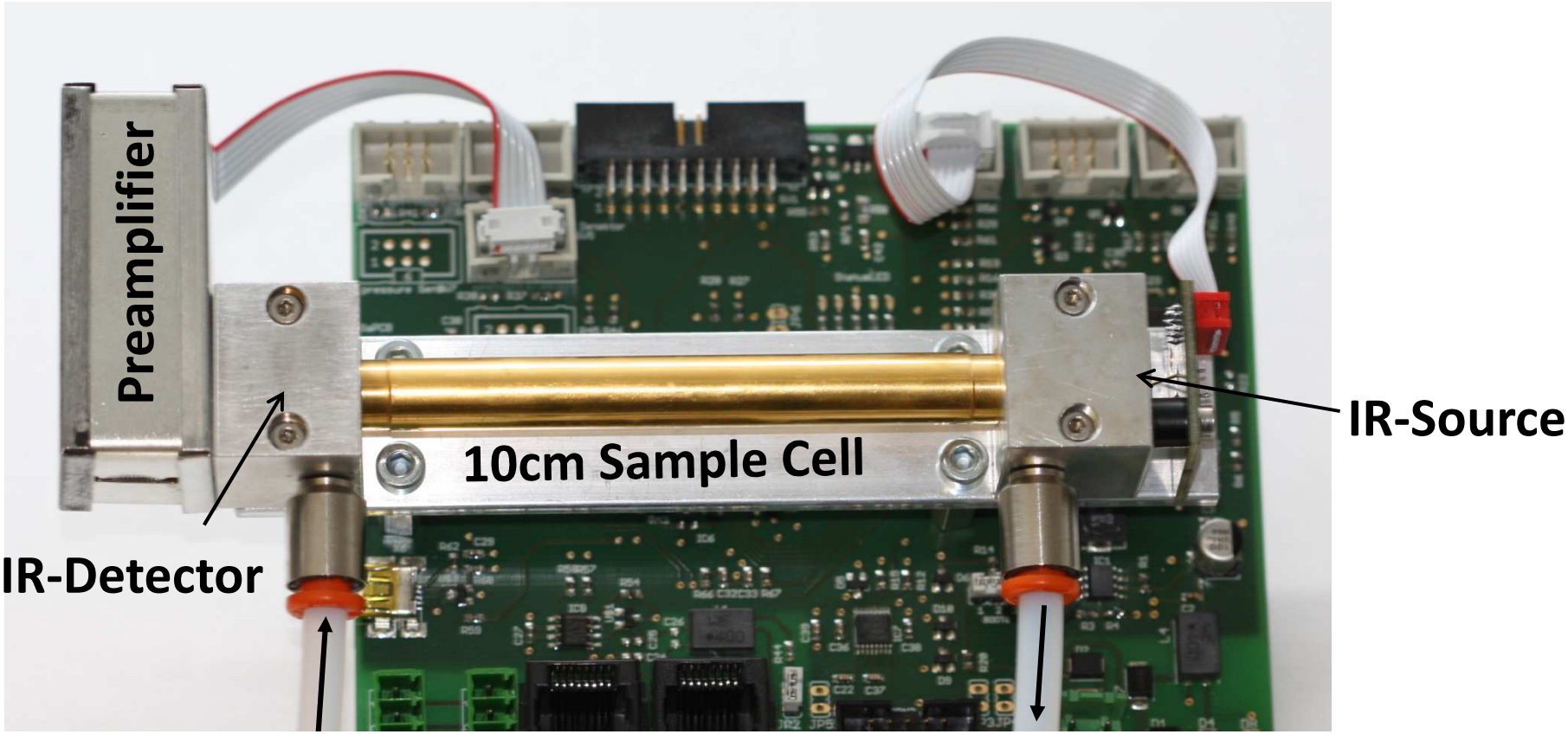

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Sensitivity Behaviour

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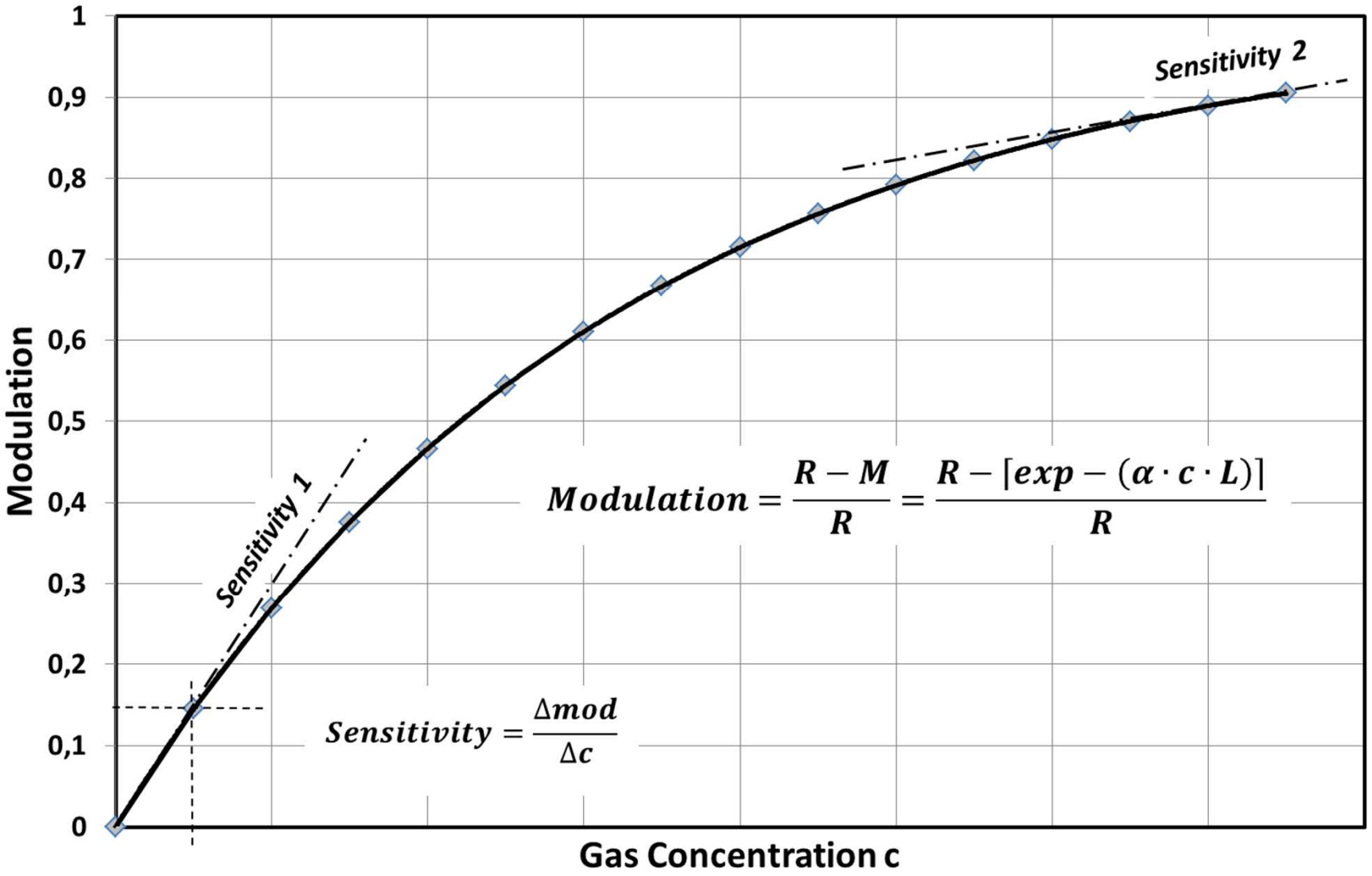

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Inverse Function
Linearization Curve

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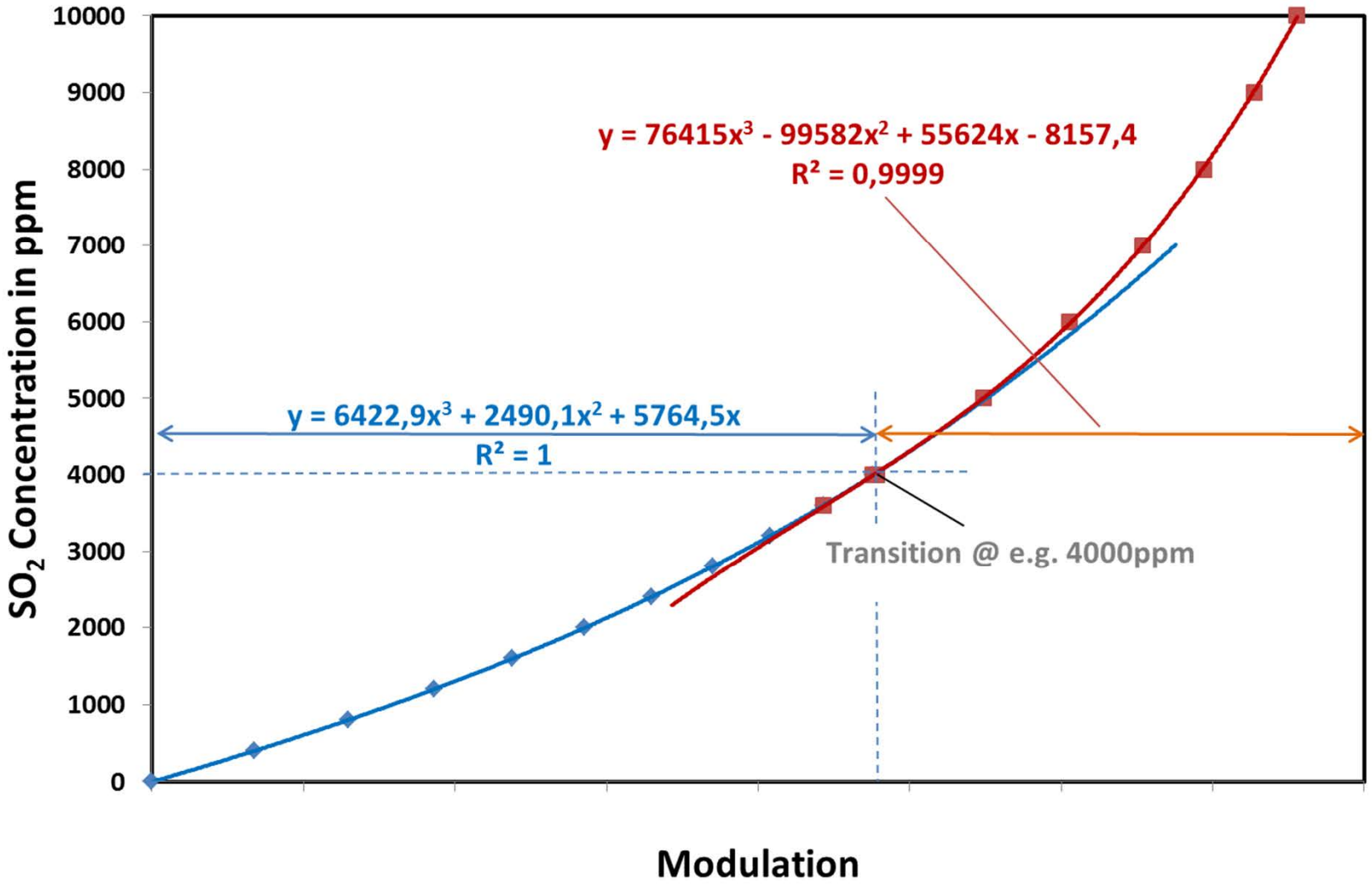

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Calibration Curve

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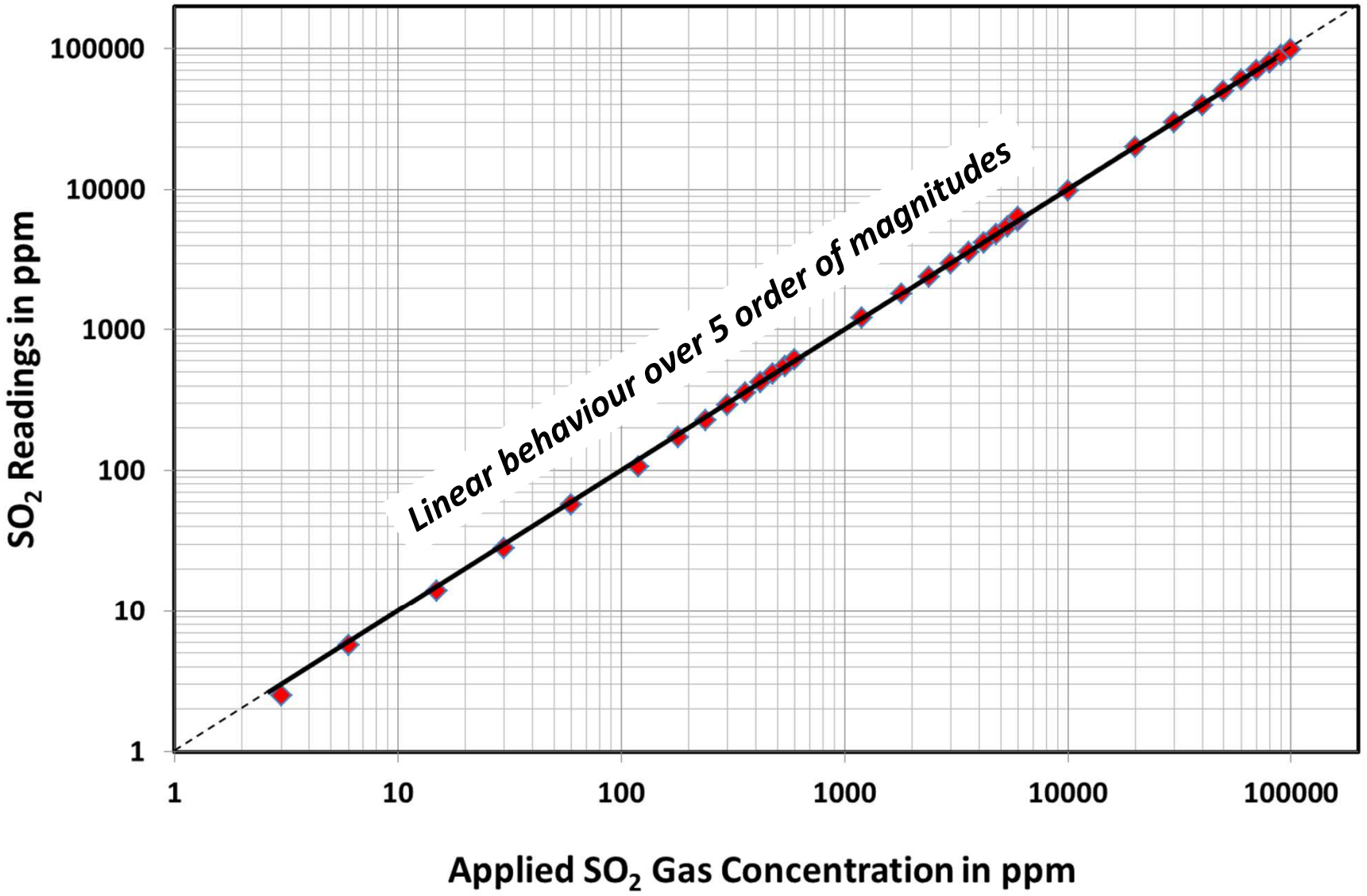

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Zero Point Noise (SO_2-Detection Limit)

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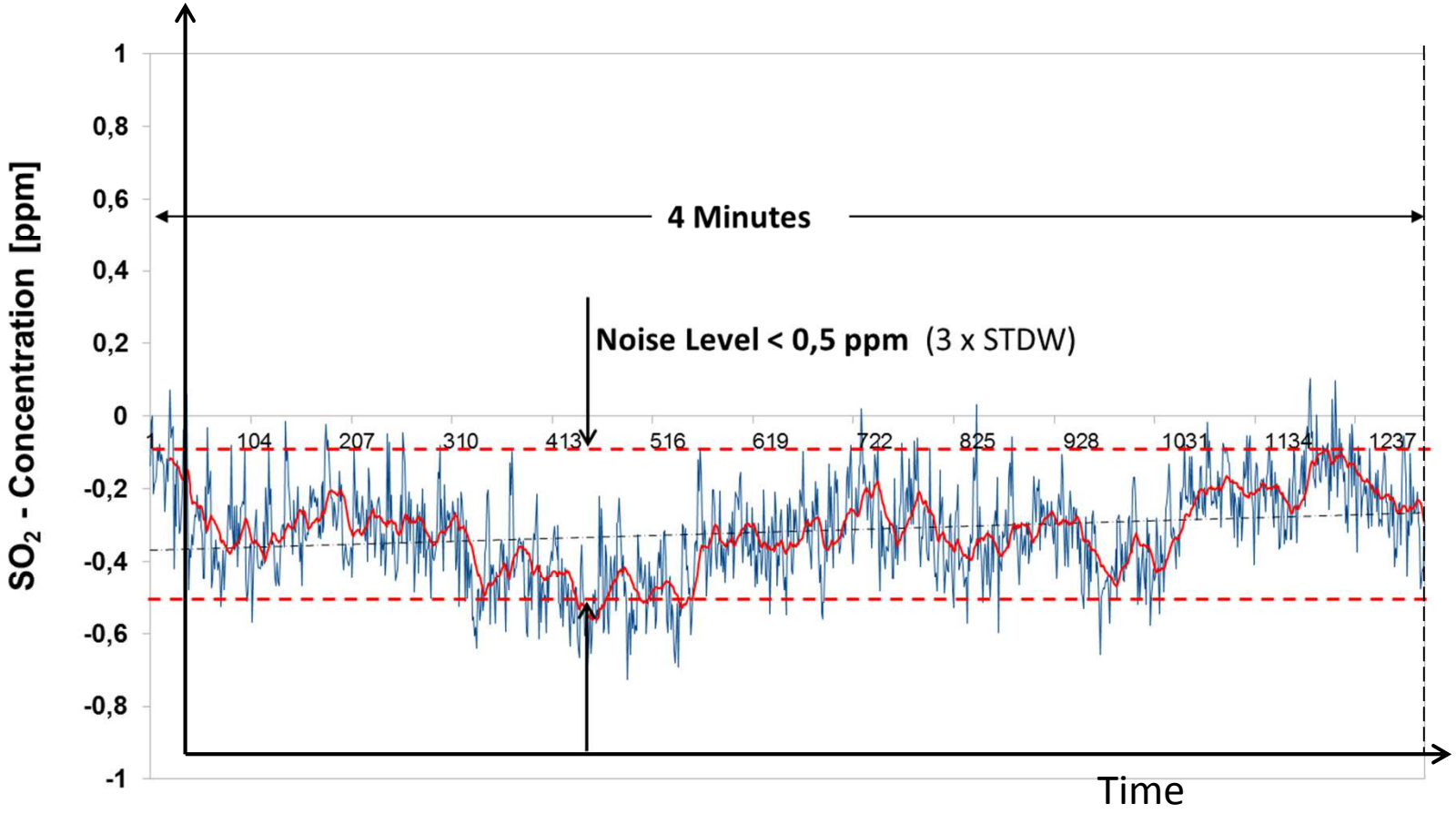

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Zero Point Noise (CO_2-Detection Limit)

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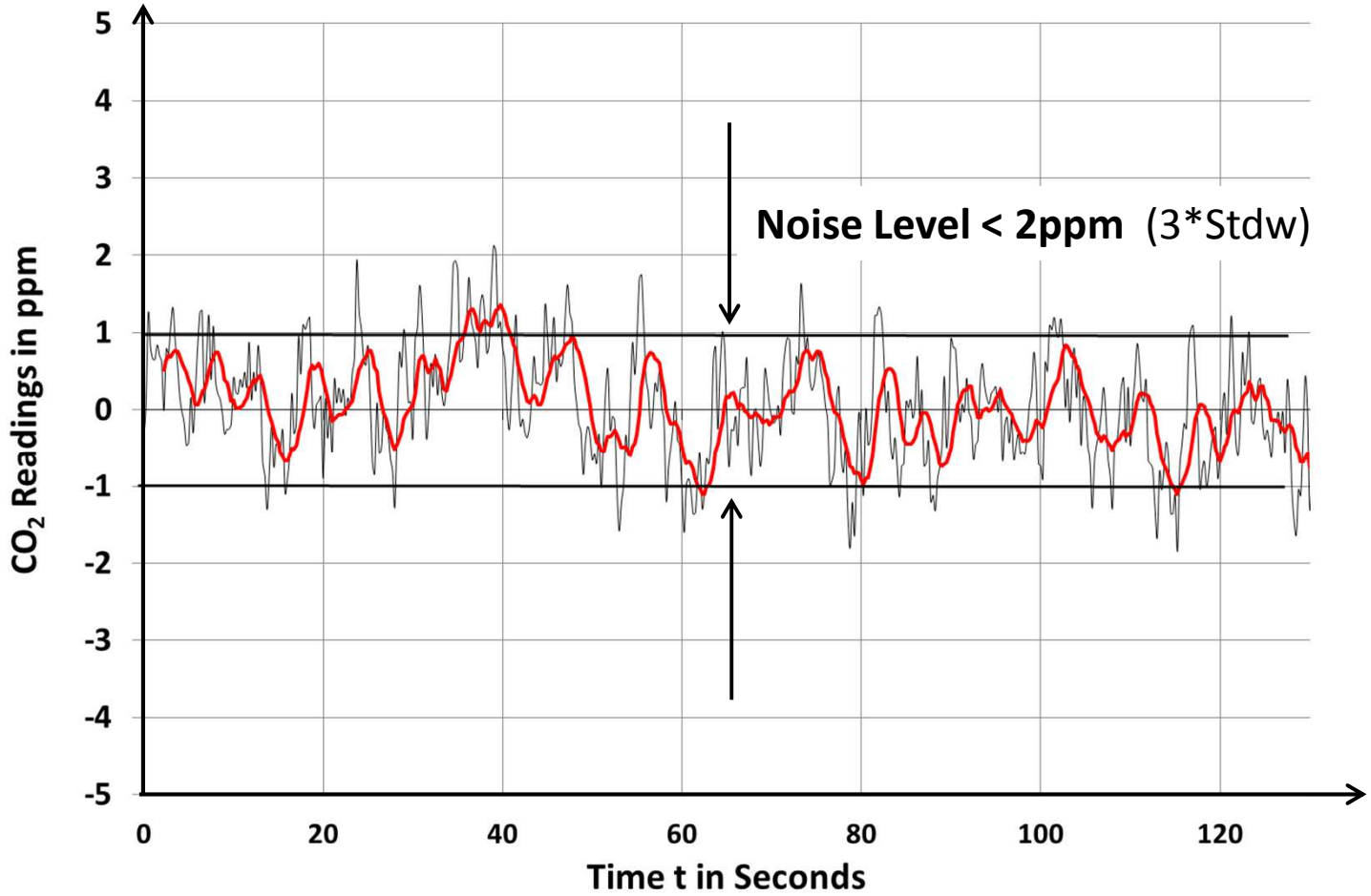

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Response Time Determination

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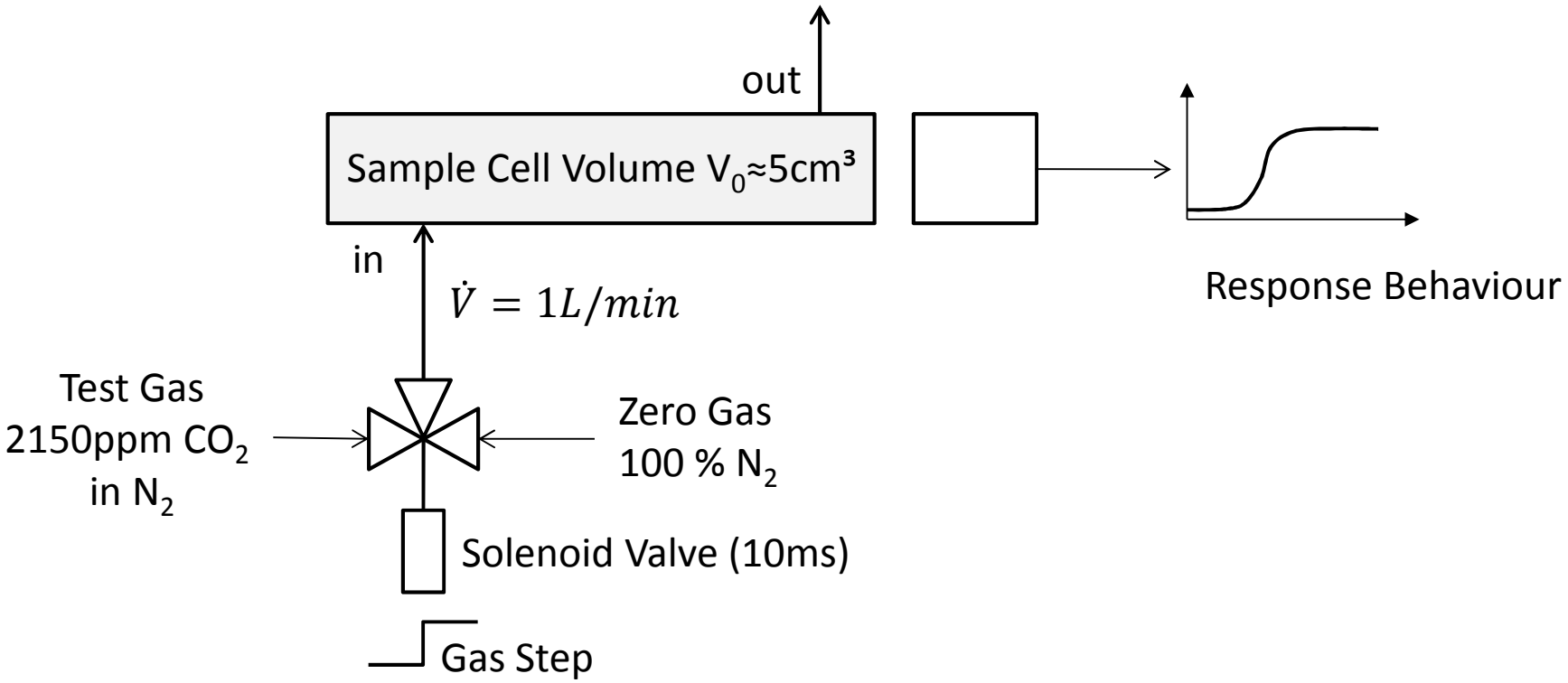

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Response Time Comparison

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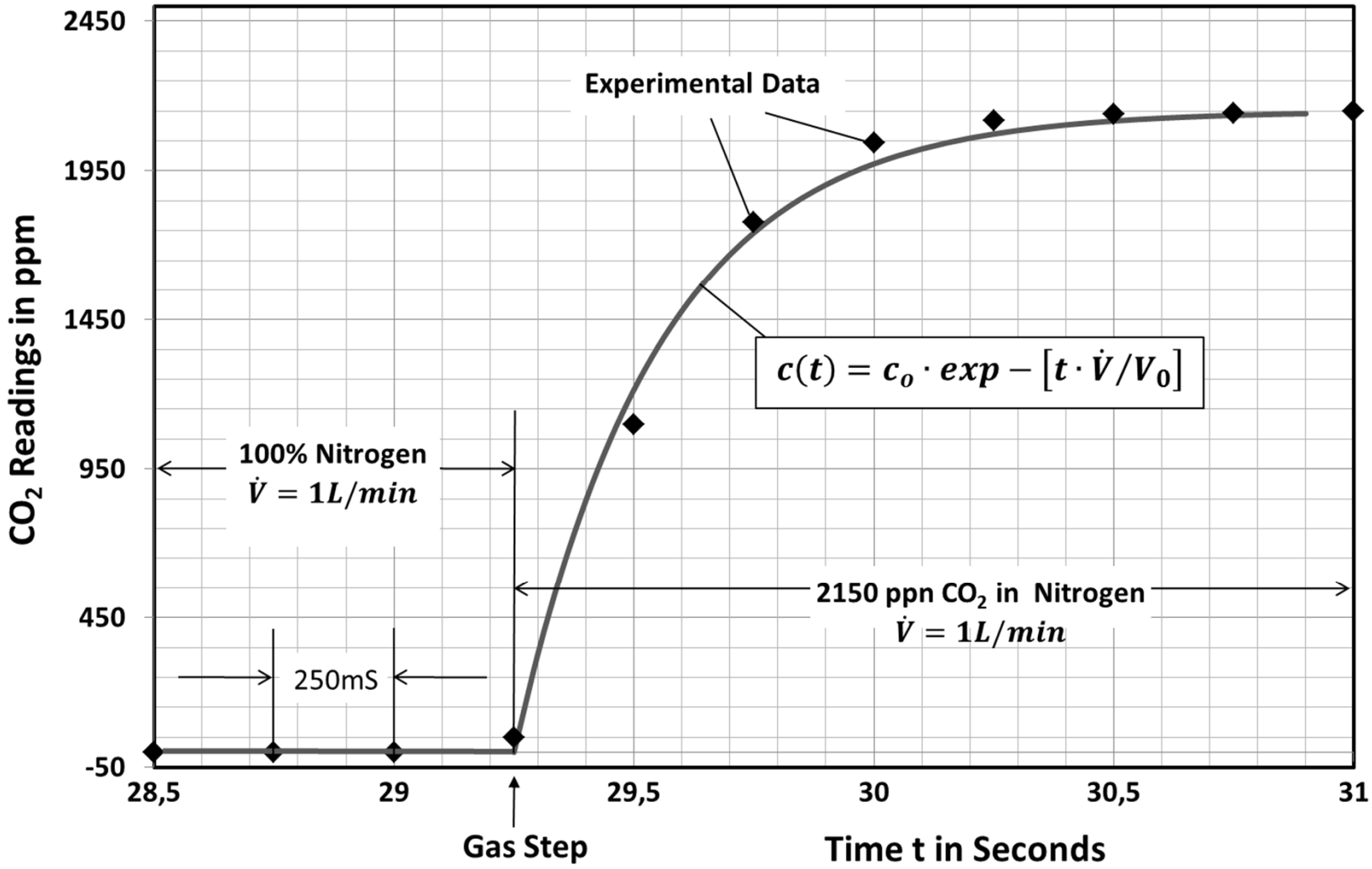

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Specification

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	SO_2-Module	CO_2-Module
Range	1ppm-100 000ppm	2ppm-100 000ppm
Detection Limit	0.5ppm	2.0ppm
Physical Response Time Purge Time	650ms @ 1L/min 160ms@4L/min	650ms @ 1L/min 160ms@4L/min
Electronic Response Time	< 100 ms	< 200ms
Power Consumption	<1 W	<1,5 W
Cross Talk	Negligible < 10ppm	Negligible < 10 ppm
Interface	CAN, RS 232, USB*	CAN, RS 232, USB*

**provided*