GM700
In-Situ Laser Analyzer

Greater efficiency of process analysis by using TDLS technology.
Even under most difficult conditions.

High reliability and precision as well as minimal response times are the distinguishing features of the GM700 TDLS analyzer, made by SICK MAIHAK. Based on the principle of TDLS and by using specific light absorption the GM700 is able to measure several gas components, such as ammonia, oxygen or hydrogen fluoride. This technique is most advantageous in rapid in-situ measurement for gas concentrations in process control and emission monitoring.

Industries

- Power plants
- Cement industry
- Waste incineration plants
- Fertilizer production
- Plastics processing
- Glass making
- Automotive industry
- Chemical and petrochemical industry

Fields of application

- Process- and control optimization (FGD, DeNOx plants)
- Continuous monitoring of emissions
- Quality control
- Environmental protection

2 Versions of the GM700

- Probe: measuring system for single sided mounting at the measuring point
- Cross-Duct: measuring system designed for recording across the total diameter of the duct

An Evaluation unit (EVU) performs the processing and output of measuring values. It is possible to install the EVU up to 1,000 m (3,300 ft) from the measurement point, for example in a control room or a monitoring center.

GM700 Key Features

A distinguishing feature of the GM700 is the wide range of possible applications. Using probe and cross-duct design, this compact measuring device offers:

- Highly stable system operation as there are no moving parts
- High spectral resolution – high selectivity
- Short response time
- No calibration necessary
- Applicable in harsh conditions around the measuring point
- Very low maintenance requirements and long servicing intervals

SICK | MAIHAK
Analyzers and Process Instrumentation

Modern Gas Analysis

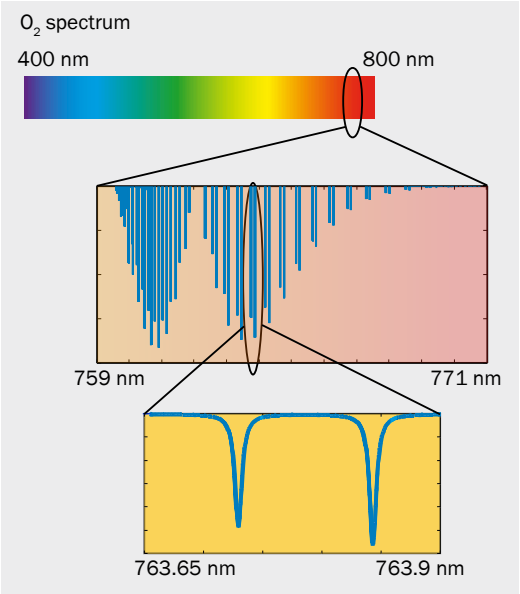
Tunable Diode Laser Spectroscopy (TDLS)

The sender/receiver (SR) unit is equipped with a sender and a highly sensitive detector, the photo diode. A laser beam is sent from the sender through the measuring gas on to the reflector, that aims the beam back to the photo diode. This means that the laser beam travels twice across the measuring path (double passing), providing a high measuring sensitivity.

The laser diode wavelength is tuned to one absorption line of the measuring gas component. This line is scanned by modulating the wavelength, and then the transmission signal is recorded by the photo diode. An appropiate signal evaluation delivers the size of the absorption line from which the gas concentration is calculated. The TDLS method allows for selective measurement of a component in a gas mixture.

Typical gas components measured by the GM700:

- NH_3 – ammonia
- HF – hydrogen fluoride
- HCl – hydrogen chloride
- O_2 –oxygen.



GM700 System

Probe version
with a sender/receiver unit and measuring probe:

- **Sender/receiver unit**, fitted with optical and electronic modules of the measuring system. Integrated are also all the available interfaces to the EVU (CAN), to the measuring probe, RS232 for servicing purposes.
- **Measuring probe** offered in two versions. One is a probe with an aperture (GMP) and the second is a gas diffusion probe (GPP) for greater adaptability to the measuring task. Both types come with a temperature and pressure sensor.

Cross-Duct version
with a sender/receiver unit and reflector unit:

- **Sender/receiver unit** fitted with optical and electronic modules of the measuring system. Integrated are also all available interfaces to the EVU (CAN), to the measuring probe, RS232 for servicing purposes. A purge air attachment is included to enable the mounting of the SR unit to a flange with tube.
- **Reflector unit** with the corresponding triple reflector and a purge air attachment with flange and tube

- **Purge air unit** for GMP-measuring probe and for cross-duct version, offering protection against dirt and aggressive gases.
- **Evaluation unit (EVU)**
  For processing, control and output of measuring data. The following parts are included:
  - Display- and control components
  - Interfaces and signals: analog and binary in-/outputs
  - Possible remote servicing by installing the EVU up to 3,300ft (i. e. in a control room) from the analyzer.
- **Optional**
  - Weather proof cover (recommended for outdoor use) and differential pressure monitor for monitoring of purge air supply
  - Flange with tube for mounting of the device components
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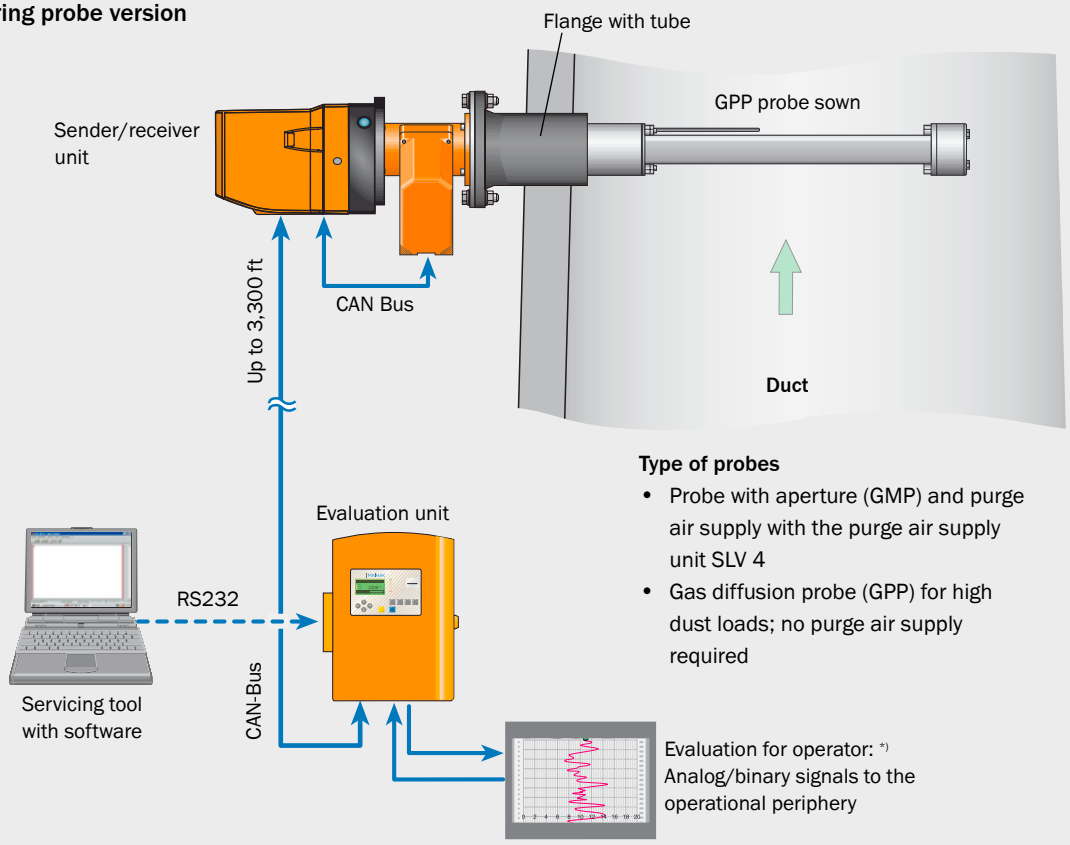
Measuring probe version

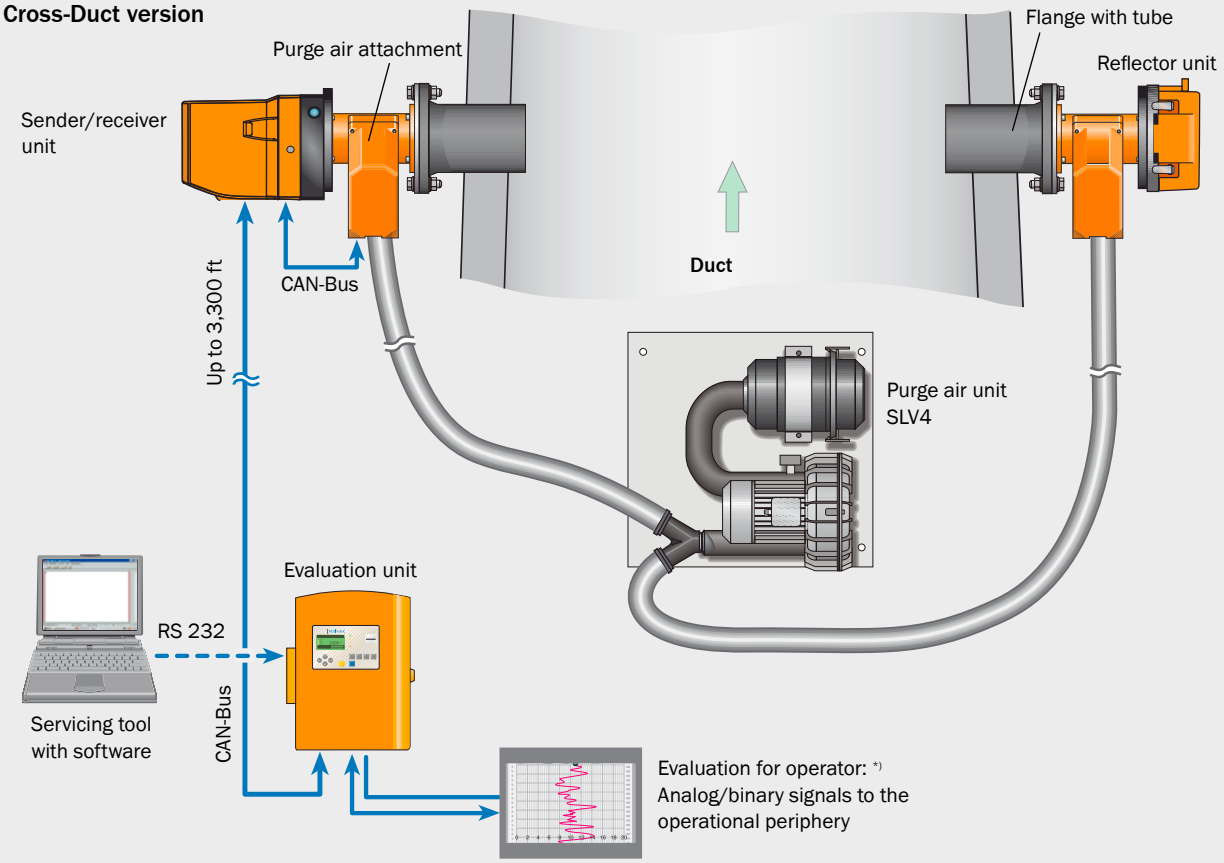


Type of probes

- Probe with aperture (GMP) and purge air supply with the purge air supply unit SLV 4
- Gas diffusion probe (GPP) for high dust loads; no purge air supply required

*) Notebook PC and strip-chart recorder are depicted for the purpose of illustrating the application and are not part of the standard delivery

Cross-Duct version



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GM700 Technical Data				
Measurement Data				
Measuring range (at 20 °C/68 °F; 1000 hPa/14.5 psi; 1 m/3.3 ft measuring path) • Smallest recommended range • Largest recommended range • Minimum detection limit • Physical units	NH_3 0 ... 10 ppm 0 ... 5000 ppm 0.3 ppm ppm, mg/m³, Vol%	HF 0 ... 2 ppm 0 ... 2500 ppm 0.1 ppm ppm, mg/m³	HCl 0 ... 10 ppm 0 ... 3000 ppm 0.3 ppm ppm, mg/m³	O_2 0 ... 3 vol.% 0 ... 100 vol.% 2000 ppm vol%
Measurement conditions	The measuring ranges are subject to conditions on-site and on the individual configuration.			
Response time	0.2 ... 360 sec; adjustable			
Accuracy	<2 % ... <5 % of measuring value, subject to application			
Linearity • Linearity deviation	<1 % <1 % of measuring value			
Plant Conditions	**GM700 Probe**		**GM700 Cross-Duct**	
Measuring gas temperature	0 ... +430 °C (32 ... 800 °F)			
Measuring gas pressure	GMP probe: depends on purge air supply GPP probe: < ±120 hPa (< ±250 psft)		depends on purge air supply	
Ambient conditions • Ambient temperature • Ambient humidity	 –40 ... +50 °C (–40 ... +122 °F); in 4 ranges adjustable <85 % rel. humidity (above dew point)			
Dust concentration	GMP: <1g/m³ operating conditions GPP: <30g/m³ operating conditions		depends on the measuring path	
Influential variables • Measuring gas temperature • Measuring gas pressure • Ambient temperature • Ambient pressure	 <2% <2 % at 50 hPa (104 psft)/deviation <1 % per 10 K of measuring value <1 % per 50 hPa (104 psft)			
Device Data	**GM700 Probe**		**GM700 Cross-Duct**	
Power supply	115/230 V AC; +10/–6%, 50/60 Hz for evaluation unit; power consumption 50 VA max.			
Storage temperature	–40...+70 °C (–40 ... +160 °F)			
Dimensions	SR unit: 239 x 272 x 330 mm³ 9.5 x 10.7 x 13 in³ Probe: length 0.9/1.5/2.0/2.5 m 3/5/6.6 ft aperture 0.25/0.5/0.75/1,0 m 0.8/1.6/2.5/3.3 ft		SR unit: 239 x 272 x 330 mm³ 9.5 x 10.7 x 13 in³ Reflector unit: 250 x 250 x 155 mm³ 10 x 10 x 6 in³ Evaluation unit: 289 x 330 x 140 mm³ 11.4 x 13 x 5.5 in³	
Weight	SR unit: 13 kg (29 lb) GMP probe: max. 25 kg (55 lb) GPP probe: max. 45 kg (100 lb)		SR unit incl. purge air att.: 25 kg (55 lb) refl. unit purge air att.: 25 kg (55 lb)	
	Evaluation unit: 4 kg (9 lb)			
Purge air unit SLV 4	Refer to separate data sheet; order no. 8008088			
Protection class	IP 65/NEMA 4x			
Compliance	CE, EMV according EN 61326,			
Signals and Interfaces (via evaluation unit)				
Signals	3 analog outputs/1 analog input: 0 ... 20 mA 3 relay: 48 V AC/DC, 1 A 3 status inputs: 24 V, electrically isolated			
Interfaces	RS232; CAN bus (for GM700 components)			

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