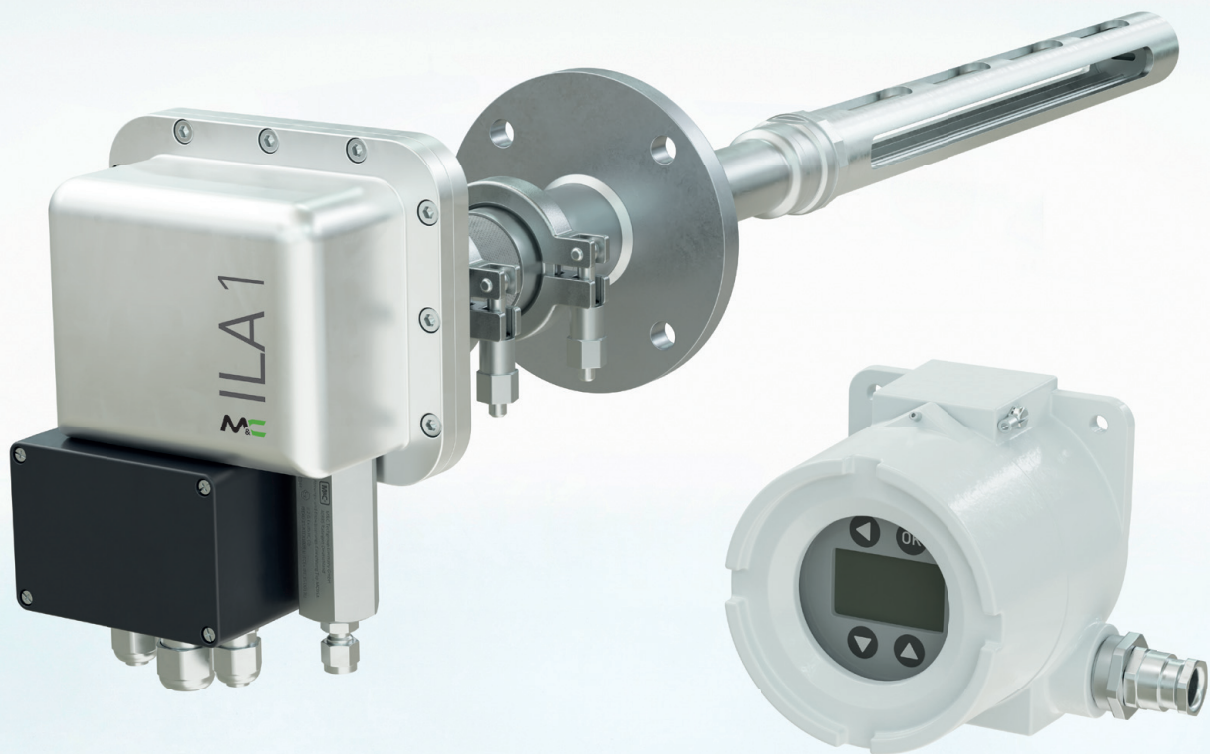


In-situ Gas Analysis using the ILA1 Laser Analyzer.

Robust and Precise.



In-situ Laser Analyzer ILA1-X000-EX for Use in Hazardous Areas.

Low Installation and Alignment Effort.

The ILA1-X000-EX In-situ Laser Analyzer is an in-house development by M&C TechGroup. Our know-how in the field of analytics and our many years of experience in probe design have been incorporated into its development. The result is a robust In-situ Laser Analyzer for particularly demanding applications with an easy-to-adjust design that requires just a single flange.

The modular design of the analyzer enables flexible configuration and adaptation to a wide range of process conditions. By selecting suitable materials, the analyzer can also be used at high process temperatures and with corrosive gas mixtures.



▼ Laser Technology by M&C

The "Tunable Diode Lasers" (TDL) that we use allow for simple variation of the emission wavelength and thus offer outstanding possibilities for spectroscopic measurement methods in the gas analysis of industrial processes and in environmental measurement technology.

The 2f method applied enables a particularly good signal-to-noise ratio due to the modulation of the wavelength and complex evaluation methods, thus offering several advantages compared to other spectroscopic methods.

The advantages of TDL laser measurement, especially the 2f method

- **High sensitivity:** The 2f method enables the measurement of very low concentrations, even with high dust loads.
- **Selectivity:** By selecting the right absorption frequency, TDL laser technology can selectively identify and measure specific gases. Even in complex mixtures, the measurement method is free of cross-sensitivities.
- **Fast response time:** The response time of the TDL laser measurement is very fast, which enables real-time monitoring and control.
- **Robustness:** Low influence of dust load in the process gas.
- **Precision:** Precise control of the laser frequency and accurate measurement of light absorption enable precise and reliable measurements.

▼ Key Data at a Glance

- Measurement of O₂ or SO₂ possible
- Simple installation and commissioning
- Measuring at high temperatures (up to 900 °C)
- Measuring in highly corrosive process gases
- Modular probe design to adapt to different process conditions
- 2 x 4–20 mA – analog outputs
- Digital interfaces: CAN, RS485 and Modbus TCP/IP
- Web interface for easy communication with the analyzer
- ATEX certified

- O₂**
- 20 cm optical path length: 0–100 vol%, LOD 500 ppm
 - 80 cm optical path length: 0–100 vol%, LOD 125 ppm

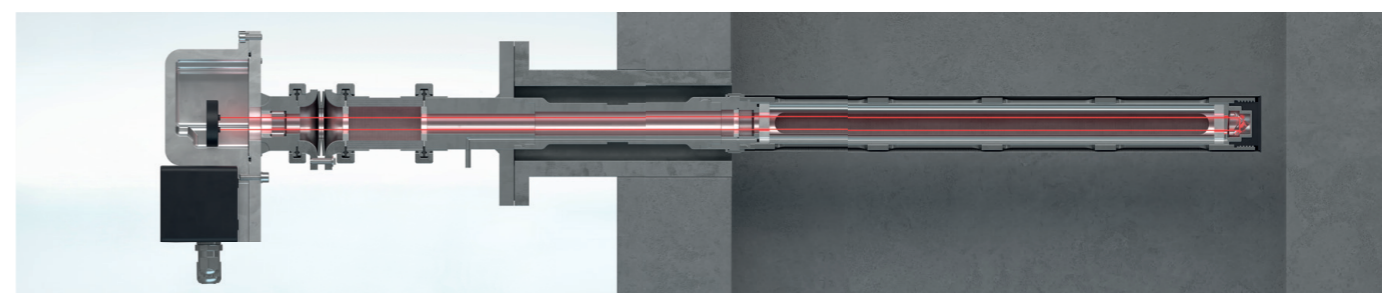


- SO₂**
- 20 cm optical path length: 0–2 vol%, LOD 100 ppm
 - 80 cm optical path length: 0–0.5 vol%, LOD 25 ppm

▼ Easy-to-Adjust Design with Just One Flange

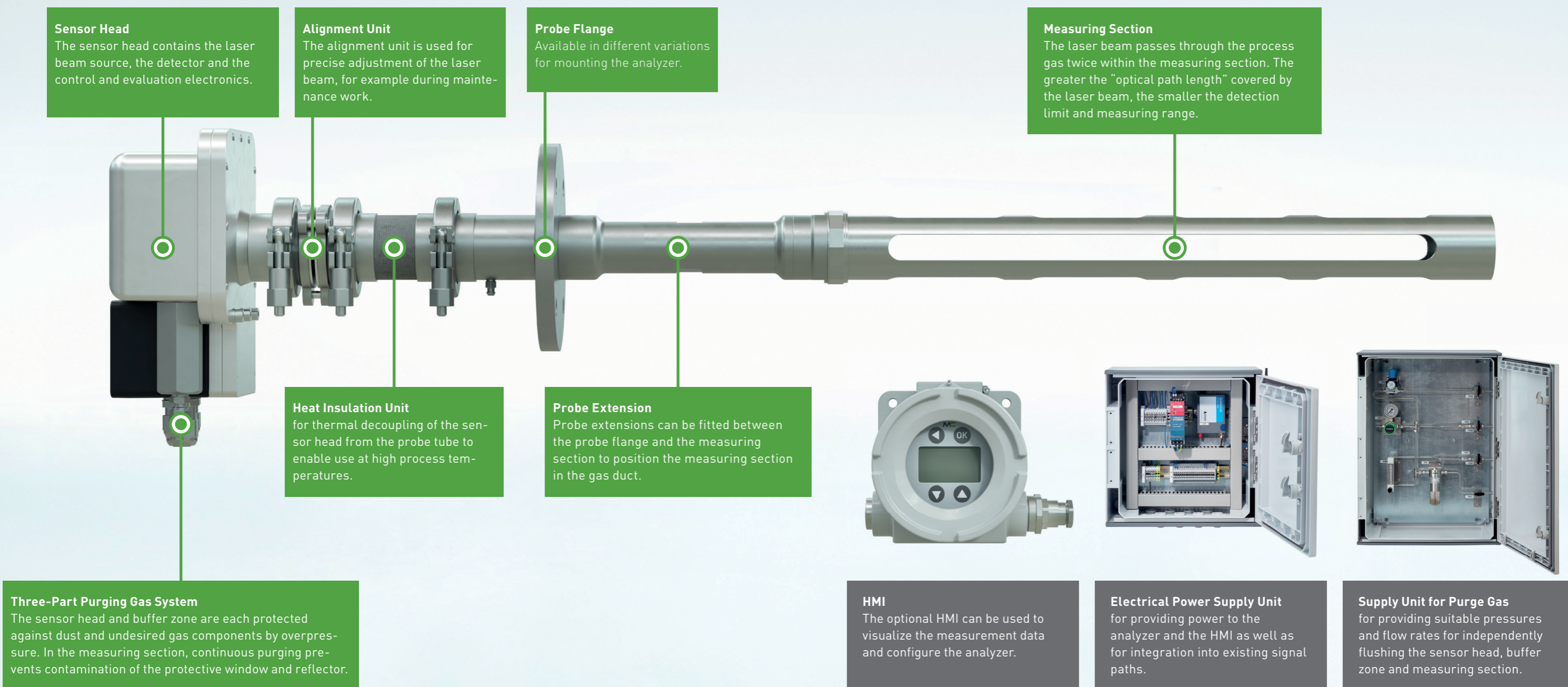
The transmitter and receiver are integrated into a compact sensor head, while a reflector is fitted at the tip of the probe. The laser beam passes through the gas to be analyzed in the measuring section and is then reflected back towards the sensor head by the reflector.

This doubles the active measuring path and therefore the sensitivity. Signal evaluation takes place in the sensor head and enables the provision of the measured data via various interfaces as well as visualization via the optional HMI or a web interface.



ILA1 Components & Accessories.

Flexible Configuration thanks to Modular Design.



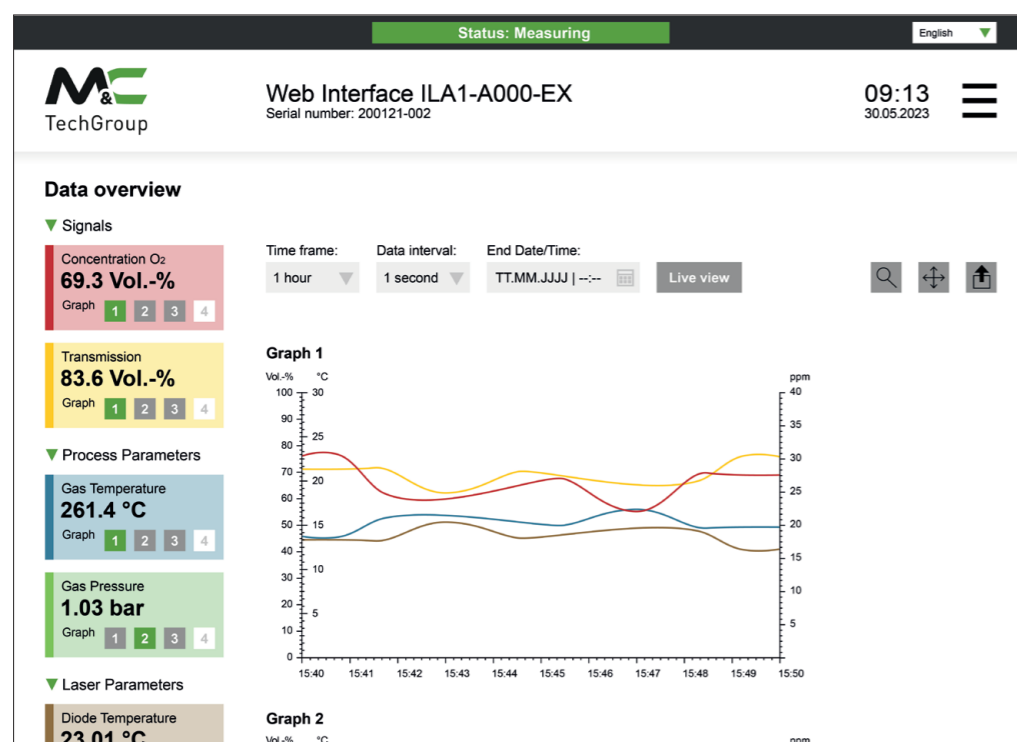
Gas Analysis in Real Time with ILA1 Laser Analyzer.

All Parameters Closely Monitored.

▼ Interfaces and Operation

For convenient operation of the Laser Analyzer, a web interface is available that can be accessed via a PC connected to the laser via Ethernet. Using this web interface, the analyzer's measuring data and additional key data can be tracked in real time and displayed flexibly in diagrams.

The analyzer as well as the analog outputs and any connected temperature and pressure sensors can be configured and calibrated via the user interface.



The following interfaces are used for integration into existing systems or for communication with the control center:

- ▶ Analog outputs (2 x 4–20 mA for concentration and transmission)
- ▶ Analog inputs (2 x 4–20 mA for pressure and temperature)
- ▶ Relay output (error status)
- ▶ Relay input (service status)
- ▶ Digital Interfaces
 - CAN (connection to HMI)
 - RS485
 - Modbus TCP/IP

▼ Display and Operating Unit DCU10 EX

Our optional HMI DCU10 EX that is approved for hazardous areas can be used to visualize the measuring data as well as to monitor and configure the analyzer. It enables access to all parameters of the analyzer and can be installed close to the measuring point, for example. The HMI can also be used as an auxiliary tool for adjustment.



▼ The Strengths of ILA1

The main advantages of the In-situ Analyzer compared to extractive measurement methods are, for example, the short response time and the avoidance of complex gas conditioning, which may affect the measurement due to washout effects. The special requirements for measuring directly in the process have been taken into account in the design of our analyzer. It is therefore particularly convincing in terms of the following criteria:

Use Under Demanding Process Conditions

In order to measure reliably at high process temperatures of up to 900 °C [1652 °F] and in highly corrosive gas mixtures, our analyzer is available in different material constellations. In addition to the alloys and sealing materials for the probe modules in the process, the optical elements and the insulating units for thermal decoupling of the sensor head have also been designed in such a way that they can be used under the most demanding process conditions.

Taking the Process Conditions into Account in the Signal Evaluation

To enable high measuring accuracy even under unsteady process conditions, compensation of the measuring signal with regard to process temperature and pressure is required. For this compensation, existing sensors can be integrated via an analog interface or via RS485, or sensors can be purchased as accessories from M&C.

Handling and Alignment

Compared to cross-stack analyzers, which have separate transmitter and receiver units that have to be mounted opposite each other on the gas duct, the installation, maintenance and adjustment of the M&C ILA1 Analyzer are considerably easier. For calibration, the probe is immersed in an optionally available calibration tube, which is pressurized with test gas. When the analyzer is subsequently reinstalled in the process, the adjustment is usually retained to a great extent.



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