The Gas-Chromatograph
Since the 16th century people have sought ways in which to analyze gases for their compositions. Only in the last century the first operational gas-chromatograph has been developed.

Gaseous compounds are separated within the gas-chromatograph and the basic principles of chromatography have virtually remained the same to today. The gas-chromatography separation occurs in a separation column, which consists of a stationary phase and gets transported in the chromatograph by a mobile gaseous phase (carrier gas and sample gas).

The principle of the chromatography separation is based on ad- and desorption. The sample gas gets transported from the carrier gaseous phase through the separation column.

Appropriate to the substance the gaseous molecules in the sample gas temporarily get retained in the column and de-sorb as they flow through the column. As a result of this they pass the separation column slower than the molecules of the carrier gas.

This deceleration is measurable and gets described as chromatography retention. Each gas component in the sample gas mixture presents a certain and specific deceleration which gets recorded by a detector. The components can thus be prorated and defined qualitatively as well as quantitatively.
Why losing precious time? Why risk having the sample change on the way into the laboratory? The times are over when samples must be brought to the lab - now the chromatograph can be brought to the sample gas!

The I-GRAPH XC is portable and easy to use. It uses methods created in the laboratory. The results are displayed immediately after a short period of taking measurements. The analysis is done automatically, quickly and economically.

Advantages of the I-GRAPH XC
- Completely mobile, independent and automatic operation
- Immediately operable through start/stop key
- Very short, automatically time-controlled measuring cycles
- Simple user interface
- Comes with an on-board Windows operating system
- Operation is controlled through a 10,4" touch display
- Automatic data processing as well as data storage
- No external gas carrier supply required
- Qualitative and quantitative interpretation of analysis data
- Individual In-line calibration
- Runs on power supply and rechargeable batteries
- Lightweight
- Device is based on the patents of INRAG AG as well as SLS Micro Technology GmbH
- Can also operate with a solar panel

The I-GRAPH XC provides important data for process control:
- Analysis of gas flow
- Process control
- Quality analysis
- Environmental safety tests
- Emission control
**Emissions are discovered quickly to avoid airborne pollution!**

Emissions of gases into the environment can quickly cause grave effects in term of resultant airborne pollutions. These can also occur far away from the emission place at a later time and it is very important to localize the source and provide appropriate preventative measures.

The mobile I-GRAPH XC supports the work of specialists by providing results as soon as possible at the scene and can be applied in various situations.

**Technical Specifications:**

- **Mobile independent operation**
- **Dimensions:** length 350 x width 320 x depth 210 mm
- **Weight:** about 11,5 kg inclusive supplies and shelter cap
- **Detector:** WLD
- **Analysis time:** 30s to 180s
- **Operating temperature:** +2°C bis +55°C
- **Max. analysis temperature:** +300°C
- **Max. temperature ramp:** 10K/s
- **Power consumption averaged:** 15 W to max. 150 W
- **Operating voltage:** 12 to 24 V DC, 90 to 240 VAC with plug adapter
- **Sample gas volume:** 0,05 μl to 6 μl
- **Sample gas inlet:** statically inset from 50 kPa to 1000 kPa (0,5 to 10 bar)
- **Sample gas entrance:** over internal pump from -60 kPa to +60 kPa (-0,6 bar to +0,6 bar)
- **Carrier gas:** helium, argon (hydrogen)
- **Disposable cartridge of the carrier gas:** 100 ml/10 bar sufficient for 1 to 4 weeks permanent operation dependant to the column type
- **External pressure of the carrier gas:** 100 kPa to 1000 kPa (1 to 10 bar)
- **Consumption of the carrier gas:** 100 μl/min for the thin-film column, 500 μl/min for the packed column
- **Interfaces:** USB, ethernet 10/100 base, WLAN optional
- **Sensitivity:** 10 ppm for the thin-film column, 50 ppm for the packed column
- **Higher sensitivities are available optionally**
- **Flue gas connection by precision quick connect system:**
  - External carrier gas
  - Sample gas inlet 1
  - Sample gas inlet 2
  - Gas vent (sample and carrier gas)
- **Stores chromatograms**
- **Active column cooling, which allows a lower starting temperature than the ambient temperature**
- **Mechanical rating IP 44**
With the I-GRAPH XS you will have a cost-effective gas analysis device for laboratory operation. The compact I-GRAPH XS is a fully functional gas-chromatograph. You will receive a revolutionary analytical device which is suitable for various gas measurements.

The I-GRAPH XS is specifically designed for laboratory applications. With its integrated carrier gas supply it is not bound to a specific location but can be easily transported to various locations. The short measuring periods allow a quick analysis. Due to the electronic control the operator is always informed about the status of the functionality.

An integrated vacuum pump allows for the measurement of non-pressurized samples. The integrated touch-display allows more over for stand-alone operation without the use of a PC.

All relevant operating functions are easy to set-up or modify. Results are immediately available in easy to use format.

Properties:

- Simple and process-suited measurement system
- High reproducibility of the results
- Various applications
- Mobile because of its low size and weight
- Quick measuring cycles
- Low gas consumption
Technical Specifications:

- Dimensions: width 305 x height 150 x depth 280mm
- Weight: ca. 3.5 kg
- Detector: WLD
- Analysis time: 30s to 180s
- Operating temperature: +2°C to +55°C
- Max. analysis temperature: +300°C
- Max. temperature ramp: 10K/s
- Power consumption: averaged 15 W
- Sample gas volume: 0.05 μl bis 6 μl
- Sample gas inlet: over internal pump from -60 kPa to +60 kPa (-0.6 bar to +0.6 bar)
- Carrier gas: helium, argon, (hydrogen)
- Disposable cartridge of the carrier gas: 100ml/10 bar sufficient for 1 bis 4 weeks permanent operation dependant to the column type
- External carrier gas pressure: 100 kPa to 1000 kPa (1 bar to 10 bar)
- Consumption of the carrier gas: 100 μl/min for the thin-film column, 500 μl/min for the packed column
- Interface: USB (2.0)
- Sensitivity: 10 ppm for the thin-film column, 50 ppm for the packed column
- Highersensitivity available optionally
- Gas connections: stainless steel, 1/16” AD, threads UNF 10/32
- Standard-ferrule 1/16”
- Supply: through the delivered plug adapter 90 to 240 VAC
- Setting temperatures whilst the operation: relative air humidity <60%
- Mechanical rating IP 44
Process safety above everything!

The I-GRAPH XP represents an integrated analysis device for your process application. The compact body consists of an injector, a separation column, a weighted Levenshtein distance (WLD) and an electric control.

Furthermore the complete gas analysis is integrated as one system through the pressure control, the bypass switching and the transfer pump. With this system gas mixtures can get analysed, identified and quantified.

The I-GRAPH XP is designed for the stationary operation. This permanent device provides data to an installed computer, which can transfer that data analogously or to a SPS control station. The downstream process can be controlled from the quick analyses.

With extremely short measure cycles the gas-chromatograph is the ideal solution for in-line gas analyses, which allow automatic control of the system. This automation of the analysis saves time and costs and is moreover precise and efficient.

In real-time the I-GRAPH XP continually analyzes the quality of the process gases, the product transportation, the exhaust gases as well as the product control in general. The compact XP-construction is especially suitable for applications in the Ex-zone.
**Technical Specifications:**

- **Process integrated operation**
- **Dimensions of the Ex-version:** length 210 x width 461 x height 187 mm
- **Dimensions of the standard version:** width 305 x height 150 x depth 280 mm
- **Weight of the Ex-version:** about 12 kg
- **Weight of the standard version:** 4 kg
- **Detector WLD**
- **Analysis time:** 30s to 180s
- **Operating temperature:** -20°C to +60°C
- **Max. analysis temperature:** + 300°C
- **Max. temperature ramp:** 10K/s
- **Power consumption:** averaged 12 W to max. 60 W
- **Sample gas volume:** 0.05 μl to 6 μl
- **Sample gas inlet:** over internal pump from -60 kPa to +60 kPa (-0.6 bar to +0.6 bar)
- **Carrier gas:** helium, argon, hydrogen
- **External pressure of the carrier gas:** 100 kPa to 1000 kPa (1 to 10 bar)
- **Consumption of the carrier gas:** 100 μl/min for the thin-film column, 500 μl/min for the packed column
- **Interface:** RS-232, optional LWL OZDV 2471G/P or others
- **Sensitivity:**
  - 10 ppm for the thin-film column,
  - 50 ppm for the packed column
- **Higher sensitivities available optionally**
- **Gas connections:** stainless steel, 1/16" AD, threads UNF10/32, standard-ferrule 1/16"
- **Supply:** +24 V DC, 8A
- **Setting temperature whilst the operation:** relative air humidity <60%
- **Internal bypass-switching for the quick supply of the sample gas**
- **Optional with 4x Analog output 4-20mA**
- **Ex-approval:** GOST/ATEX, II 2G Ex de IIC T5
- **Support for a two-channel operation (optional)**
- **Display LCD background illuminated (optional)**
- **Robust and process suitable measurement system**
- **Mechanical rating IP 65**
Professional software and support

The GC-manager for the online-analysis

The GC-manager allows for the operation and analysis of the computer based operating system. On the operating interface the measurements are represented graphically as well as in text file format. Through a zoom-function special measured peaks can get analyzed, compared and processed.

Methods can be stored for each application or project. Thus it is possible to create complete test series with different methods. Each measurement gets stored as one project including the relevant settings.

Programmable measuring cycles and temperature ramps

The appropriate measuring temperatures of the analysis can be saved individually in the methods as ramps or isothermal. The precision and the speed of the I-GRAPH X is thus increased.

Individual calibration

If recurrent unusual gas components get measured, which are not yet part of the calibration, you can still analyze these components with the I-GRAPH X. The relevant data can be saved as standard values in the project as well as in the method. The GC-software consequently fits to the requirements of the user!

Technical Support

The GC-software is constructed keeping the convenience of the operator in mind. If you furthermore require support you can simply transfer the measuring data per e-mail or call our hotline. Competent consultants will be pleased to help you.