

xmarter measurement

I-GRAPHX
INDUSTRIAL GRAPH XOLUTIONS

Xolutions for more efficiency

Innovative micro gas chromatography,
sensor and blending systems



i-graphx.com

Innovative Sensors and Analyser Systems for the Power to Gas Transformation

With the analyzer to the sample and not vice versa

Why lose valuable time? Why facing the risk of sample shift on the way to the lab? The times in which the sample carried manually to the analyzer – are over. The I-GRAPHX GmbH offers innovative micro process gas chromatography analyzer. Whether portable or stationary, I-GRAPHX devices are equipped with state-of-the-art micro technology and offer powerful laboratory-grade gas chromatography with low maintenance & costs, compact dimensions and extremely short analysis times.

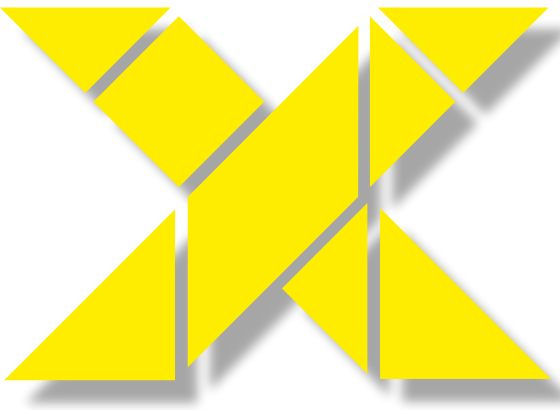
Individual tasks require individual solutions

Decades of expertise in a wide variety of application fields allows a growing number of applications which are covering about six main industries.

I-GRAPHX offers with Industrial Graph Xolutions a modular applicable solution concept. For each task, you will receive in excess of your standard solution a method which suits exactly your individual requirements at the highest possible measuring efficiency. Our X stands for a modular system with infinite possibilities of customized task solution. Efficiency is measurable and always pays off at the end.

- plenty of applications in several industry sections
- worldwide in use in more than 26 countries
- for over 20 years chromatography expertise

I-GRAPHX – smarter measurement



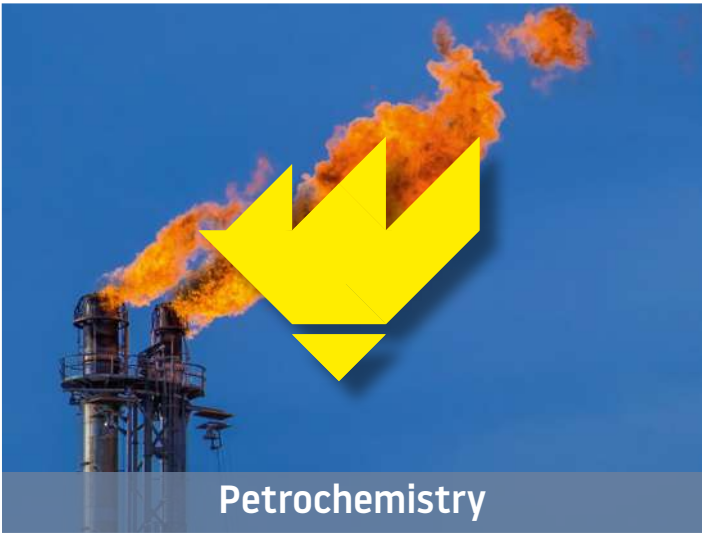
Chemistry



Energy



Laboratory



Petrochemistry

Modular use: always the right Xolution



Science



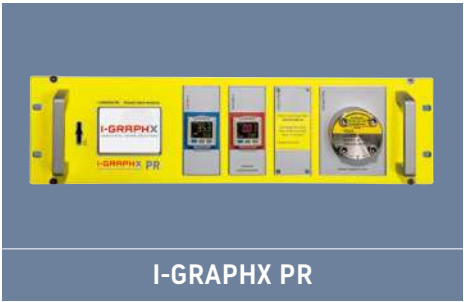
Environment

Products for transformation Ideas

I-GRAPHX Product Portfolio – with a solution-oriented approach for the greatest possible measuring



I-GRAPHX S



I-GRAPHX PR



I-GRAPHX PX



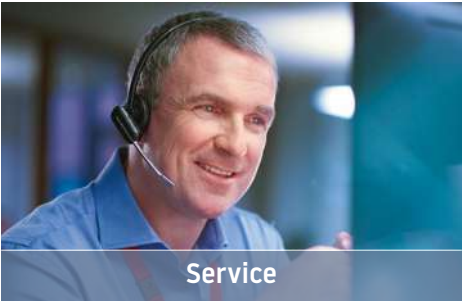
CA & BA



Accessoires & EPC Units



HMI communication Unit



Service



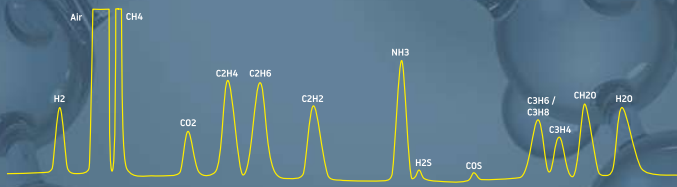
Micro Dosing Unit

Your advantages:

Our products are made according to your requirements, from a variety of established and tested technologies developed and built. I-GRAPHX allows an extremely fast acting, planning and implementation, even at special customer wishes – this also beside the Mainstream.

- low maintenance costs
- fast commissioning
- extremely short analysis times
- very small, light and robust
- Gas or dissolved gases from liquids
- innovative micro-process gas chromatographs

I-GRAPHX PR PROCESS RACK ANALYZER



Highly sensitive and selective Gas analysis in your application.

The I-GRAPHX PR analyzer is our process analyzer for stationary applications in the standardized, compact 19" rack, 3U format.

The I-GRAPHX PR selectively analyzes gases and gases dissolved in liquids. The gas chromatography module can be entirely made of analyzes chips (MEMS made), resulting in very short analysis times. Optionally, the I-GRAPHX PR comes with a double analyzer, two analysis paths and up to four separation columns. These two analysis paths can be connected in parallel as well as in series.

On request, the I-GRAPHX PR can be equipped with a double carrier gas supply, to use two different carrier gases. Inline filters protect the analyzer from accidents in the process or the supply lines.

The sample gas is either pressurized or by using the built-in switchable suction pump supplied to the analyzer via a configurable bypass.

Typical applications:

- Chemical Synthesis processes
- Process monitoring
- Electrolysis, Catalysis processes
- Refinery gases
- Solvent
- Sulfur gases

Properties:

- Qualitative and quantitative high-precision gas analysis
- monitoring of continuous processes and measuring points
- Module for analysis of gases dissolved in liquid (optional)

Technical data:

- Electronic pressure regulation
- Inlet pressure monitoring with color change at over or falling below
- Measuring range 1 ppm - 100%*
- Accuracy: < 0.05% of meas.*
- Carrier gas consumption 1-5 ml/min*
- Power supply: 24 VDC, 6 A
- Ambient temperature range: -5°C to +50°C

Connections:

- Media: 1/16 Swagelok tube fitting (optional)
- 1/8", 1/4", 3mm, 6mm, VICI1/16" ZDV PEEK fittings
- USB (others on request)
- Control via GC Manager software
- Integrated status display
- DSub25 I/O connector

Unit size: *

- W x H x D: 19" x 3U x 370 mm
- Weight: approx. 6 kg*

Protection class:

- IP20

*depending on configuration
Changes of technical data, unit size, weights and other changes may occur.



I-GRAPHX S DESKTOP ANALYZER SMALL

Highly sensitive and selective Gas analysis in your application.

The **I-GRAPHX S** Analyzer is our desktop process analyzer for mobil and stationary applications.

The **I-GRAPHX S** selectively analyzes gases and gases dissolved in liquids. The gas chromatography module can be entirely made of analyzes chips (MEMS made), resulting in very short analysis times. Optionally, the **I-GRAPHX S** comes with a double analyzer, two analysis paths and up to four separation columns. These two analysis paths can be connected in parallel as well as in series.

On request, the **I-GRAPHX S** can be equipped with a mobile lightweight carrier gas supply. The sample gas is either pressurized or by using the built-in switchable suction pump supplied to the analyzer via a configurable bypass supply bottle. The sample gas will be feed to the unit by pressure or can be sucked with an integrated pump.

Typical applications:

- Electrolysis-, catalysis procedures
- Chemical synthesis processes
- Purity measurements
- Process monitoring
- Environmental management, landfill gases, bio gases
- Fast analyses of fuel in tank storage

Properties:

- Qualitative and quantitative high-precision gas analysis
- monitoring of continuous processes and measuring points
- Module for analysis of gases dissolved in liquid (optional)

Technical data:

- Electronic pressure regulation
- Inlet pressure monitoring with color change at over or falling below
- Measuring range 1 ppm - 100%*
- Accuracy: < 0.05% of meas.*
- Carrier gas consumption 1-5 ml/min*
- Power supply: 24 VDC, 6 A
- Ambient temperature range: -5°C to +50°C

Connections:

- Media: 1/16 Swagelok tube fitting (optional)
- 1/8", 1/4", 3mm, 6mm, VICI1/16" ZDV PEEK fittings
- USB (others on request)
- Control via GC Manager software
- Integrated status display
- DSub25 I/O connector

Unit size: *

- W x H x D: 310 x 120 x 290 mm
- Weight: approx. 4,7 kg*

Protection class:

- IP20

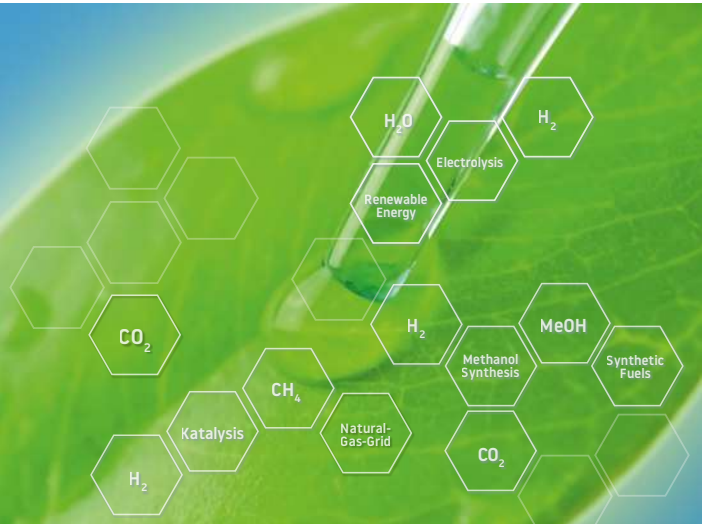
*depending on configuration

Changes of technical data, unit size, weights and other changes may occur.

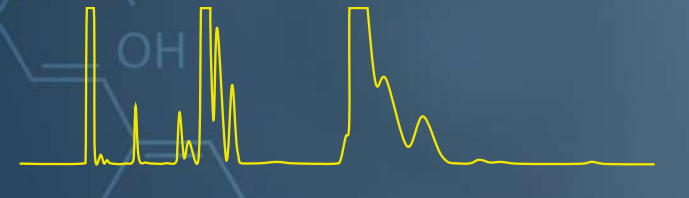


Mobile solution for the I-GRAPHX S

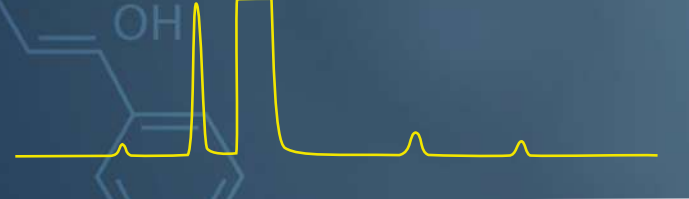
Applications



Gas in Liquid Analysis:



FuelCell:



P2X - Power to X is currently the global term for usability of renewable energies and to minimizing the greenhouse effect.

The **I-GRAPHX S** is used in various applications at **P2X** such as in the electrolysis of renewable energy to Hydrogen. Further in Catalytic Reaction of H₂ and CO₂ used to form methane.

For other chemical synthesis methods, the **I-GRAPHX S** monitors processes around i.e. synthetic fuels or raw materials for chemistry such as ammonia or methanol. Countless applications in sections of fuel cell Technology, purity measurement and quality control.

The **I-GRAPHX S** is also used in pyrolysis of waste and many other solid fuels or even biomass to monitor and analyze the exhaust streams.

In the field of analysis of dissolved gases in liquids the **I-GRAPHX S** comes with a specially developed separation module.

It is thus able to analyze gases dissolve in liquid. The **I-GRAPHX S** is often used in quick analysis of fuels in tank farms, as well as in quality control of new synthetic fuels (e-fuels) which mainly consist of lower alcohols.

A selection of further applications:

- Permanent gases, Noble gases
- Natural gases, LNG, Hythane
- Hydrocarbons
- Research
- Environmental management
- Landfill gas, Biogas
- Permanent gas analysis
- VOC's / BTEX



I-GRAPHX CGC COMPACT - GC

Fast chromatography – measures with high precision and selectively in a few seconds.

The **CGC Compact GC** measures in simple applications up to 10 gas components qualitatively and quantitatively quickly, safely and high precision.

Our smallest gas chromatograph is extremely compact and can be configured for a large number of applications. The **CGC** is universal for all applications in plant construction and self-sufficient systems where fast and precise gas analysis is required. Its chromatographic separation ensures that there is no irritation of the measurement signal by cross-sensitivity interference components.

The Micro Dual Channel Thermal Conductivity Detector used in the **CGC** is an in-house development of I-GRAPHX GmbH. Crafted in Microchip Technology (MEMS) it uses the unique specific physical heat conduction of each gas component.

A combination of MEMS Chip separation columns and/or classic capillary separation columns enable quick and efficient analysis on a Single-Channel separation column system with the smallest media consumption.

Typical applications:

CGC401 – Hythan	CGC404 – Syngas
CGC402 – LNG	CGC405 – Landfill
CGC403 – Biogas	CGC406 – Fuelgas

Properties:

- Fast Selective Chromatography
- Qualitative and quantitative high-precision gas analysis
- Monitoring of continuous processes
- Low operating costs due to minimal maintenance effort

Technical data:

- 2 point or multi-point calibration
- Electronic pressure regulation
- Measuring range 10ppm - 100%
- Display Vol. %, resolution up to 1 ppm (web server application)
- Accuracy: < 0.1% of meas.
- Power supply: 24 VDC, 3 A
- Ambient temperature range: -5° C to + 50° C

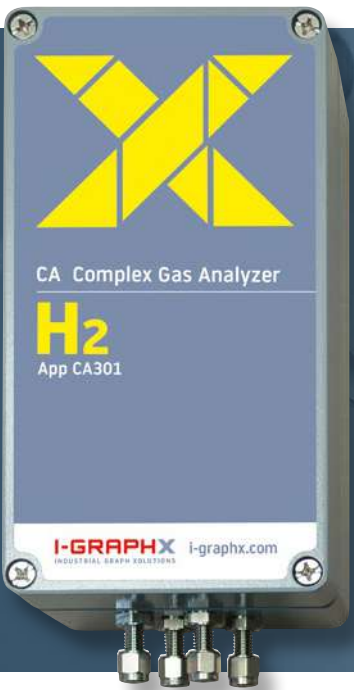
Connections:

- Media: 1/16" or 1/8" Swagelok tube fitting (others on request)
- RS232 (others on request)
- Monitoring: via web server, optional display
- Analog OUT: 4-20mA (optional)

Unit size:

- W x H x D: 220 x 120 x 80 mm
- Weight: about 2.2kg

Changes of technical data, unit size, weights and other changes may occur.



I-GRAPHX CA COMPLEX GAS ANALYZER

Hydrogen measurement very precise and selective.

The **CA Complex Analyzer** will measure Hydrogen (H₂) qualitative and quantitative in all possible gas mixtures in a very fast and very precise way.

On the way to no longer used gases that are harmful to the climate, Hydrogen (H₂) will by the most important energy provider. The correct amount of hydrogen (H₂) will be very important to the using industry and will also be necessary to ensure the transport of the gas in new gas distributor networks.

The **I-GRAPHX CA** can be used for all tasks to detect and measure Hydrogen (H₂) in any possible gas mixture. The gas separation technic (chromatography) will ensure that there will be no irritations by other components.

The dual channel thermal conductive detector is an in-house development of I-GRAPHX GmbH. The detector is built in microchip technology (MEMS) and used the specific heat conduction of the different gases. This construction enables a fast and continuous measurement of Hydrogen (H₂).

This special design enables the unit to react very fast. While the sensor is glass passivated, it is protected against aggressive gases and can be used in harsh environment during long time. The thermal conductivity detector is very reliable, with no movable parts and will withstand vibration.

Properties:

- Accurate and long-term stable analysis
- Monitoring of continuous processes
- Very fast H₂ detection
- low operating costs, minimal maintenance

Technical data:

- 2 point or multipoint calibration
- Integrated temperature compensation
- Electronic pressure regulation
- Measurement range: 10 ppm to 100%
- Measurement results: Vol % resolution 1 ppm
- Power supply: 24 VDC, 0.5 A
- Ambient temperature: -5 °C to +50°C
- Accuracy: < 0.1% v.M

Connections:

- Media: 1/16" or 1/8" Swagelok tube fitting (others on request)
- RS232 (others on request)
- Monitoring: via web server, optional display
- Analog OUT: 4-20mA (optional)

Unit size:

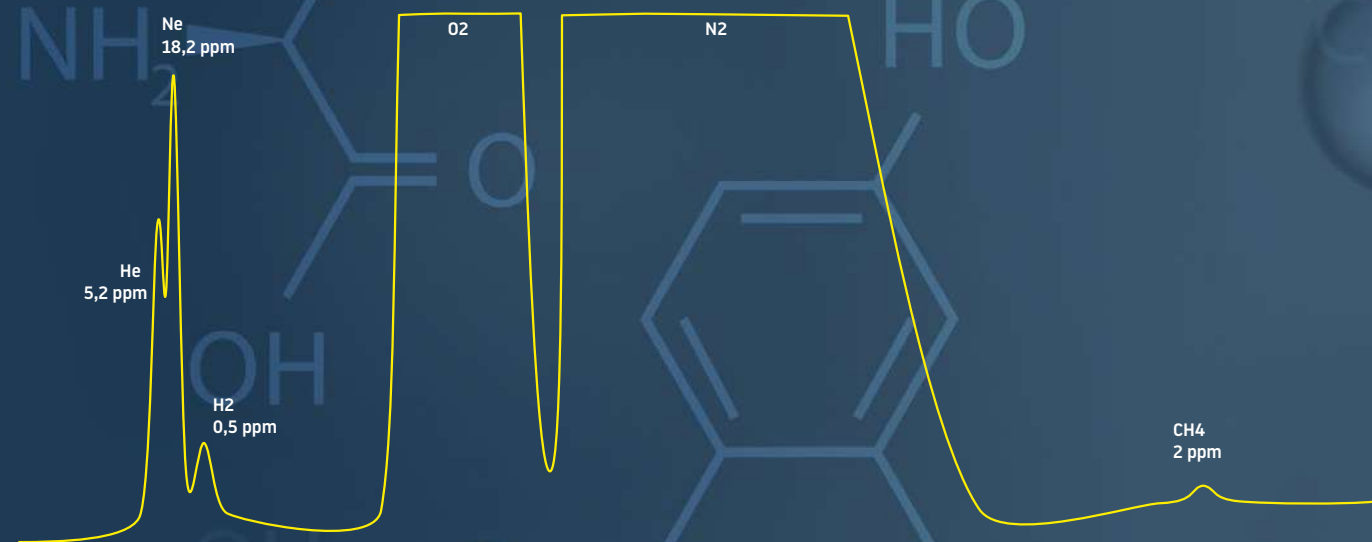
- W x H x D: 220 x 120 x 80 mm
- Weight: ca. 2.2 kg

Changes of technical data, unit size, weights and other changes may occur.

Gas analysis with innovative micro gas chromatography ...

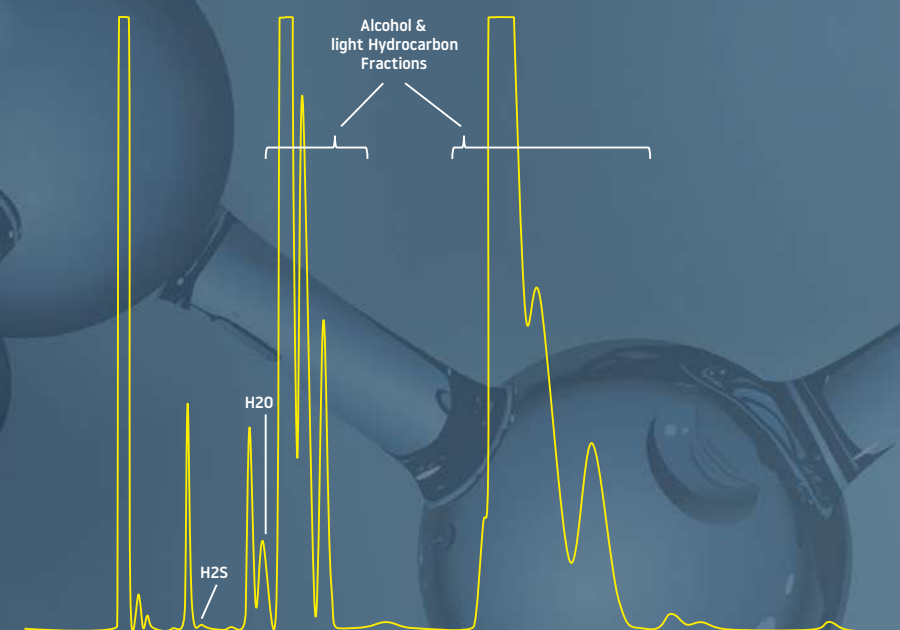
Media: Gas

Ambient Air

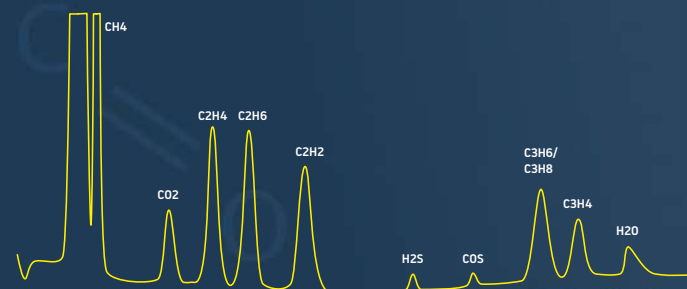


Media: Liquid

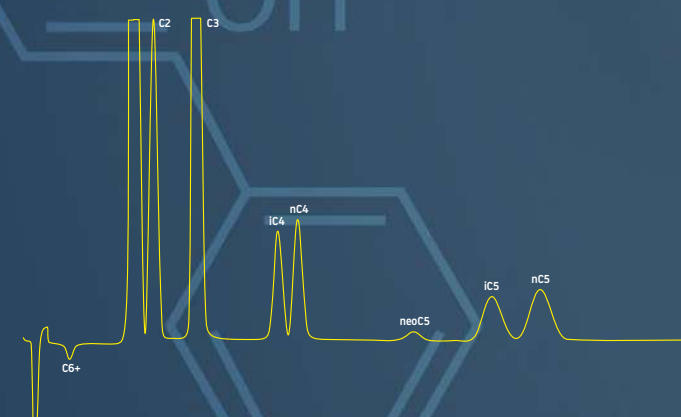
Gasoline E5



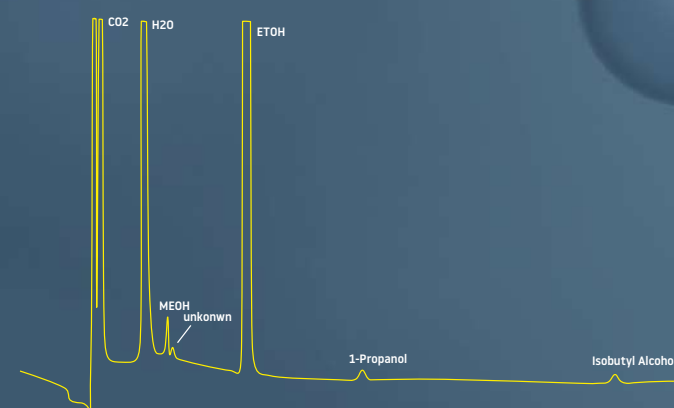
Light Hydrocarbons



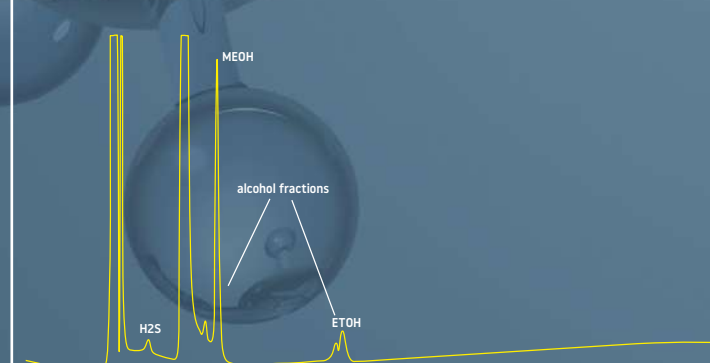
Natural Gas C6+



Beverage (Beer)



BIODIESEL



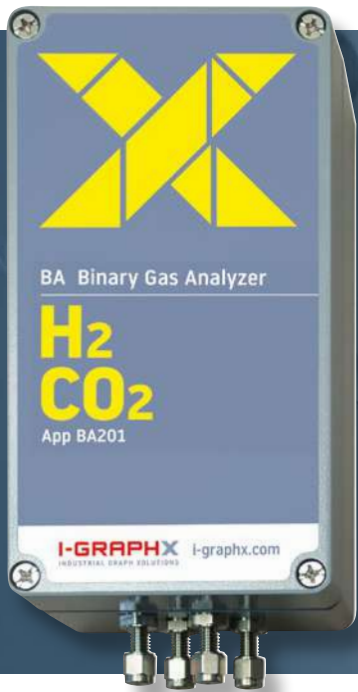
... combined with a unique separation module, allows this the analysis of dissolved gases out of liquids with one and the same analyzer.

I-GRAPHX ANALYSIS OPTIONS

- Single stream
- Parallel stream
- Column switch
- Pre column backflush to vent
- Pre column backflush to detector
- Pre concentrator (TRAP)
- Dissolved gas out of liquides

I-GRAPHX Applications from A-Z

- | | | |
|-----------------------|-------------------------|-------------------|
| ■ Aromatics | ■ Landfill gas | ■ Refinery |
| ■ Amine derivative | ■ Mud logging | ■ Solvents |
| ■ Synthese gases | ■ Natural gas | ■ Sulphur |
| ■ Biogas / Biomethane | ■ Nobel gases | ■ Synthesis |
| ■ Flare gas | ■ Oil & Gas exploration | ■ Transformer gas |
| ■ Gasoline | ■ Permanent gases | ■ VOC's / BTEX |
| ■ Greenhouse gases | ■ Power to gas | ■ Waste gas |
| ■ Hydrogen production | ■ Pyrolysis gases | ■ FuelCell |
| ■ Hydrocarbons | ■ Reaction gases | ■ Hythan |



I-GRAPHX BA
BINARY GAS ANALYSER



X-VIEW
The SMART VISUALIZER

Measurement of hydrogen and binary gas mixtures

This device is built to detect band measure Hydrogen (H₂) in binary gas mixtures like H₂ with N₂ or CO within CH₄. The device will be used during the generation of H₂ using electrolysis, inside air separation units, during the syngas production and during the development of fuel cells. Many more applications are possible.

The dual channel thermal conductive detector is an in-house development of I-GRAPHX GmbH. The detector is built in microchip technology (MEMS) and used the specific heat conduction of the different gases.

This special design enables the unit to react very fast. While the sensor is glass passivated, it is protected against aggressive gases and can be used in harsh environment during long time.

Temperature and pressure will be compensated inside the unit and therefore calibration effort can be reduced to a minimum. The sensor is very durable has no moving parts and resist vibration and other environmental influences.

Visualization and controlling of analyzing-processes

The brand-new X-View is setting a new benchmark in visualization of process data. It not only shows the data in a precise manner but also translate the data to your need. Therefore the many integrated interfaces will support the following protocols: CAN-Bus, MODBUS, TCP and other proprietary protocols. In addition analog and digital inputs will be visualized and analyzed by the X-VIEW. Additional the unit is able to control processes.

The example above shows the data from a connected quantity counter that are shown and evaluated.

The data from an additional connected H₂ analyzers are shown as quality value in the display. All data can be displayed and limits will be monitored.



Data transfer via integrated web server to any device with browser connectivity (i.e. tablet)

Properties:

- Accurate and long-term stable analysis
- Monitoring of continuous processes
- Very fast H₂ detection
- low operating costs, minimal maintenance

Technical data:

- 2 point or multipoint calibration
- Integrated temperature compensation
- Electronic pressure regulation
- Measurement results: Vol % resolution 1 ppm
- Power supply: 24 VDC, 0.5 A
- Ambient temperature: -5 °C to +50°C
- Accuracy: < 0.2% v.M and <0.5% v.E

Connections:

- 1/16" or 1/8" Swagelog connections
- RS232, RS485, USB and WLAN
- Monitoring via webserver, and optional display
- analog output: 4 – 20 mA

Unit size:

- W x H x D: 220 x 120 x 80 mm
- Weight: ca. 2.2 kg

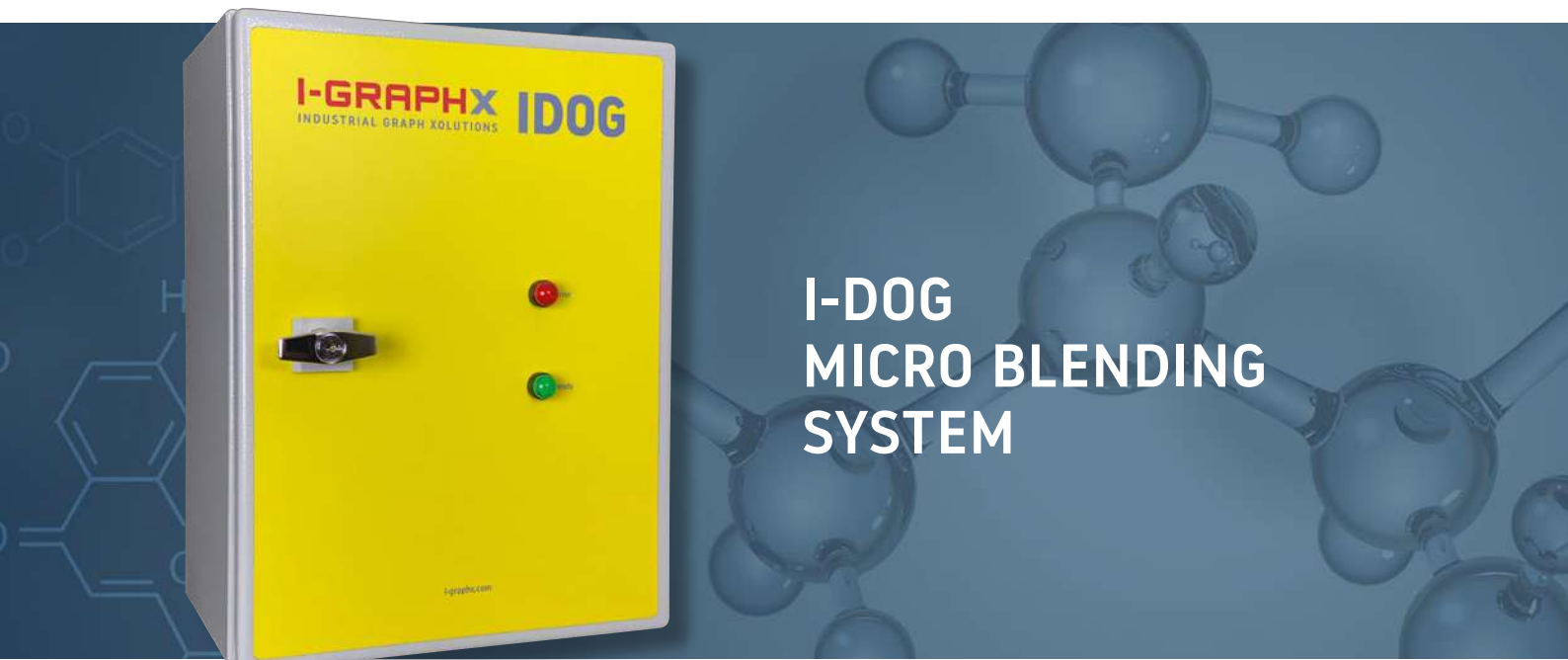
Changes of technical data, unit size, weights and other changes may occur.

Properties:

- Visualization of analyzed data
- Control of processes
- Distribution of measurement data
- Data changer:
 - digital to analog
 - analog to digital
- 7" graphic display
- Lighted keyboard with optical feedback
- WEB Server
- embedded Linux OS

- analog inputs
- analog outputs
- digital inputs (optocouplers)
- digital outputs (optocouplers)
- digital outputs (power outputs)
- Ethernet
- WLAN
- MODBUS
- CAN-Bus
- IP 65 protection

Changes of technical data, unit size, weights and other changes may occur.



I-DOG MICRO BLENDING SYSTEM

I-DOG – fully automated blending system

The **I-DOG** is a fully automated blending for liquids. It was developed to dose smallest quantities and therefor it will be used to inject additional substances. The unit is able to suck the liquid by itself and will get the amount value from a flow meter or a controlling unit. Therefore, it is specialized to add additives to fuel.

At the end of a additive injection all the injection data will be monitored and saved. The internal Flash-memory will save the data even at loss of power. With a service application all data can be read out and new values can be stored in the **I-DOG**. All password protected values can be deleted.



Control cabinet with storage bottle and I-DOG

Technical data:

- Injection values: 1 ppm to 50 ppm (max 300 l/minute)
- Self-sucking
- High quality internal fluid pass also for sensitive material
- Power supply: 24 V DC /230 V AC
- Additive supply control 2 calculated values or sensor signal
- Status display with LED
- Two switches for service

Connections:

- Micro USB
- RJ45 network connector
- liquid connection 3 mm tube
- power connector
- input for external release (electrically separated)
- error output (electrically separated)

Unit size:

- W x H x D: 300 x 400 x 210 mm
- Weight: 8,8 kg

Changes of technical data, unit size, weights and other changes may occur.

I-GRAPHX technology – allows quickest possible measuring of smallest substances

Through the consistent use of microsystems technology, the essential components of this micro gas chromatograph, such as injector, separation column and detector are made of silicon Pyrex chips. Only the use of these MEMS components (Micro-Electro-Mechanical Systems), allows very fast analysis of very small amounts of substance.

I-GRAPHX Customizing & Accessories – individual solutions according to your needs



CUSTOMIZING & ACCESSOIRES

I-GRAPHX Accessories

I-GRAPHX offer besides the already known main products, a wide range of other useful equipment which complement I-GRAPHX existing analyzer or that can be purchased separately for other uses.

Your Advantages:

- direct from the manufacturer
- matched accessories
- fits perfectly
- available at short-notice
- Receiving value and guarantee

I-GRAPHX Customizing – special solutions for special requirements, developed to your wishes

A unique module to your advantage

The heart of the device is the world's only fully functional gas chromatography module, which can be constructed from MEMS-made analysis chips. The resulting analytical setup can represent nearly any imaginable gas chromatographic configuration. It can configure up to four separation columns. Depending on the application, the I-GRAPH® gas chromatographs can deliver results within seconds depending on the application. This is the prerequisite for process monitoring (inline analysis) and process controlling. The very low energy and media consumptions enable the mobile use of our Micro-GC.

I-GRAPHX Rent – Measuring Efficiency for cost effective customer solutions



RENT

Do you have a project that requires highly complex and expensive measurement technology and this only for a limited period of time? Just rent the analyzer technique. You will not suffer any loss in value of the equipment. You avoid complicated write-offs and you always receive a tested, reliable measuring device.

Efficiency for rent:

- financial scope
- no long-term depreciation
- more economical
- budget friendly
- no loss of value
- tax benefits
- up to date

More Information at:
info@i-graphx.com / +49 40 333 860 55

INDUSTRIAL GRAPH XOLUTIONS



Chemistry



Energy



Laboratory



Petrochemistry



Science



Environment

I-GRAPHX – Your Benefits:

- You as a customer are in the foreground!
- high flexibility and fast response due to small company size
- A solution-oriented approach to your needs and requirements
- maximum measurement efficiency thanks to the modular system – Industrial Graph Xolution.
- For each of your tasks the individually correct solution.
- maximum flexibility with less costs

I-GRAPHX – xmarter measurement



I-GRAPHX GmbH
Gutenbergstraße 31
21465 Reinbek
Germany

+49 40 333 860 55
info@i-graphx.com

i-graphx.com

