

μ PGC-BioCH4

**Metrological analyzer
for continuous monitoring
of the quality of biomethane
and mixtures containing
up to 20% H₂**

**Quality analysis and
transactional measurement
of calorific value
(OIML R140, MID 2014/32/EU)**





CONTEXT, CHALLENGES, SOLUTION

The new benchmark
for monitoring
your biomethane plant

REGULATORY AND OPERATIONAL CONTEXT

The growing demand for sustainable energy has led to significant development in biomethane production. To be injected into the grid, it must meet rigorous quality and energy standards.

Traditional methods, based on periodic sampling, do not guarantee continuous monitoring of changes in gas composition.

Operators are often required to work in areas with a high risk of explosion, which considerably increases their exposure to danger.

μ PGC-BioCH₄: THE NEXT-GENERATION MICRO GAS CHROMATOGRAPH ANALYZER

An innovative solution that continuously monitors the composition of biogas, biomethane, and hydrogen-enriched biomethane. Thanks to the instant calculation of calorific value, the system allows for near real-time monitoring of the gas energy quality, thus ensuring full compliance with international regulations. Furthermore, an additional analysis option enables the monitoring of terpenes, which are problematic because they mask odor compounds (analysis performed in accordance with **EN ISO 2614:2023**). With its modular configuration, the μ PGC-BioCH₄ guarantees rapid maintenance interventions and reduced operating costs.

Data acquisition and processing are carried out via **PROstation** (from **Agilent Technologies**), a **web browser software**: no software installation is required on a PC; a tablet, smartphone, or any network-connected device is sufficient to access all functions. Results are continuously transmitted via Modbus, easily integrating with existing control systems.

All electronics and the processing unit are integrated into the motherboard inside the instrument housing, eliminating the need for an external unit or remote control unit.

The compact design simplifies installation, increases reliability, and makes the μ PGC-BioCH₄ the ideal choice for continuous, state-of-the-art biomethane quality monitoring.

THE μ PGC-BioCH₄ SOLUTION

■ Analysis of:

H₂, O₂, N₂, CH₄, CO₂, C₂H₆, C₃H₈, H₂S, COS
(optional: terpene analysis, compliant with **EN ISO 2614:2023**, and ammonia).

■ Speed:

< 180 sec. for calorific value calculation.

■ Reduced operating cost:

Minimal helium consumption.

■ ATEX certification:

II 2G Ex db IIB+H2 T5 Gb (zone 1).

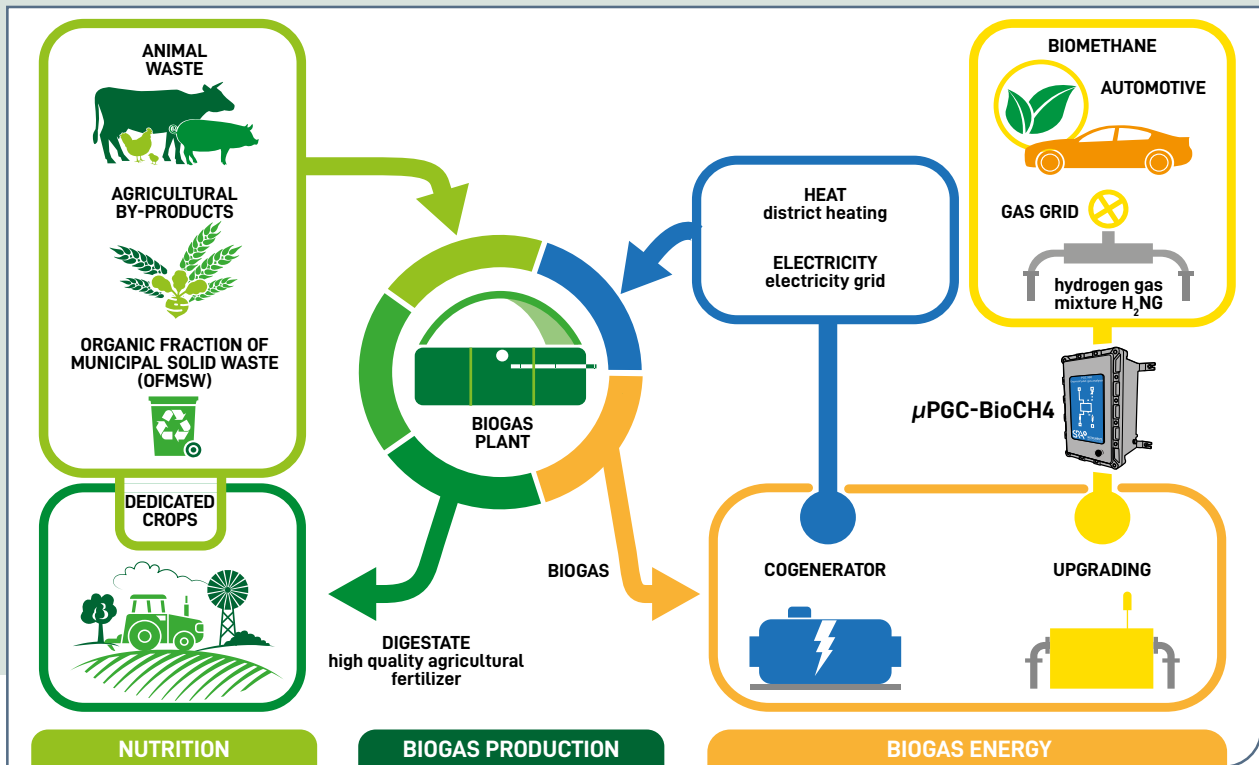
■ Simplified on-site maintenance:

Plug & Play modules.

TECHNICAL AND SOFTWARE DESCRIPTION

The heart of the system: PROstation

PROstation, developed and guaranteed by Agilent Technologies, is the software integrated directly onto the instrument's motherboard. It ensures continuous operation (24/7) by digitizing and automating all measurement and analysis operations.



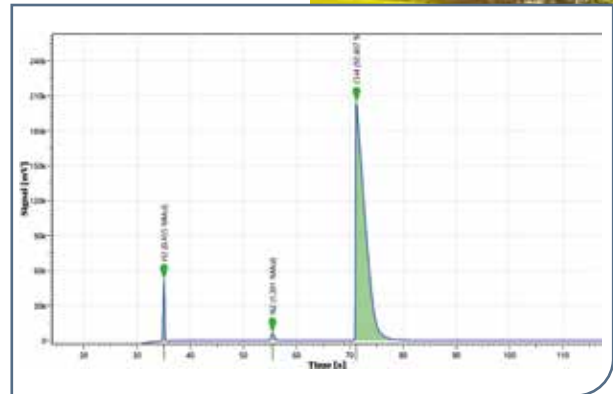
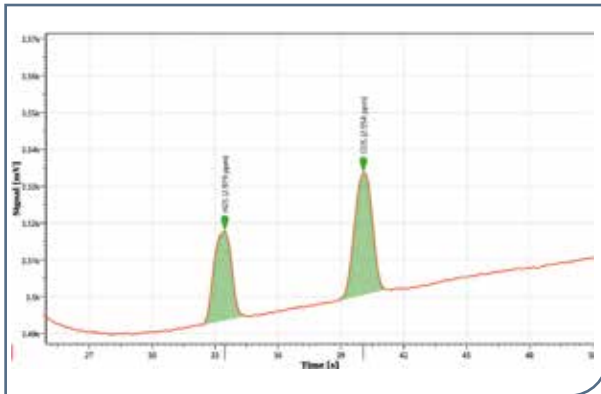
MAIN FEATURES

- **Remote Web Access**
View and control the system from any device (PC, tablet, smartphone) via a LAN connection.
- **Advanced Analysis Management**
Sequence programming, automatic calibration, alarm management, and immediate data transmission via industrial protocols (MODBUS RTU/TCP, RS485, 4-20 mA, FTP).
- **Continuous Calorific Value Calculation**
In less than 180 seconds, the system provides the energy value of biomethane, ensuring rapid operational decisions compliant with **ISO 6976:2016 / OIML R140** and **MID 2014/32/EU** standards.
- **Terpene Analysis Option**
Option to use a dedicated terpene monitoring module, compliant with **EN ISO 2614:2023**.

ADVANTAGES

- Online analysis without operator handling of the sample, thus reducing the risk of human error and analysis time.
- Fully autonomous analyzer, requiring no manual intervention during normal operation.
- Continuous monitoring, ensuring immediate detection of variations in gas composition and improved process control.
- Minimized downtime and product losses.
- Early detection of anomalies or non-conforming gases enables faster corrective action.

ANALYTICAL DETAILS AND CHROMATOGRAMS



Analytical Performance and Speed

■ Composition Analysis

Precise measurement of the main components: H_2 , O_2 , N_2 , CH_4 , CO , CO_2 , C_2H_6 , C_3H_8 , H_2S , COS (optional: terpene analysis, compliant with **EN ISO 2614:2023**, and ammonia) for a complete gas assessment.

■ Energy Meter

The calorific value is determined in less than 180 seconds, enabling rapid intervention in case of gas quality variations.

■ Data Visualization

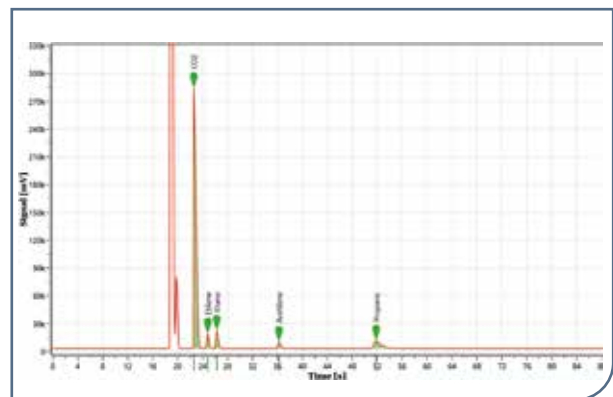
Detailed chromatograms clearly highlight the peaks of the different components, facilitating diagnosis and compliance monitoring.

■ Reliability and Continuity

Designed to operate in extreme conditions (from $-25\text{ }^\circ\text{C}$ to $+40\text{ }^\circ\text{C}$) and ensure constant monitoring, the analyzer contributes to process optimization and plant safety.

■ On-Site Maintenance

Its plug-and-play modularity minimizes instrument downtime.



APPLICATIONS

- Quality control of biomethane or hydrogen-containing mixtures injected into the gas network.
- Monitoring of the energy recovery process (analysis of terpenes, mercaptans, and H_2S in biogas).
- Transactional measurement of calorific value.



TECHNICAL SPECIFICATIONS

Parameters	Value / Description
Application	Online analysis of biomethane composition and calculation of calorific value; terpene analysis option
Inputs/Outputs	2 × RS485, 1 × RS232, 1 × LAN (MODBUS TCP/IP), Wi-Fi
Supported Protocols	MODBUS RTU, TCP/IP, RS485
ATEX Certification	ATEX Zone 1 (II 2G Ex db IIB+H2 T5 Gb); CE and EU compliant; EMC 2014/30/EU
Transactional Measurements	ISO 6976:2016 / OIML R140 / MID 2014/32/EU issued by NMI Certin V.B. (TC1288 certificate dated October 23, 2025)
Carrier gas	Helium (He)
Carrier gas pressure	5,5 ± 0,2 bar rel.
Carrier gas purity	Class 5,5 minimum (≥ 99,9995% purity)
Carrier gas connections	1/8" Swagelok
Sample connections	1/8" Swagelok
Sample gas conditions	P _{min} : 0,2 bar rel.; P _{max} : 1 bar rel.
Compounds analyzed	H ₂ , O ₂ , N ₂ , CH ₄ , CO ₂ , C ₂ H ₆ , C ₃ H ₈ , H ₂ S, COS (optional: terpene analysis according to EN ISO 2614:2023, and ammonia)
Sample inputs	1 to 2 sample inputs + 1 standard (automatic calibration possible)
Repeatability	< 1% RSD for CH ₄ ; < 2% RSD for CO ₂ ; < 1,5% RSD for H ₂ S
Accuracy	Class A (±0,5%)
Operating temperature	-40 °C / +60 °C
Temperature range for Class A accuracy (± 0,5% accuracy)	-25 °C / +40 °C
Dimensions / Weight	48,5 × 30,5 × 24,9 cm / ~27 Kg
Software	PROstation; web browser compatible with WELMEC 7.2 (no dedicated PC required)
Power supply	100-240 VAC 50-60 Hz 150 W max
Power consumption during operation	36 to 46 W
Analysis time	< 180 sec. for calculating calorific value
Terpene analysis (optional)	Compliant with EN ISO 2614:2023 - Additional analysis for complete gas characterization



CONCLUSIONS

- The μ PGC-BioCH₄ is the ideal solution for those who demand uncompromising precision, safety, and compliance in biomethane monitoring.
- Near real-time data: instant calculation of calorific value (ISO 6976:2016 / OIML R140).
- Analytical flexibility: optional terpene monitoring (EN ISO 2614:2023).
- Maximum efficiency: intuitive interface and fully automated management, without dedicated software or PC.
- Guaranteed compliance: fully aligned with european standards, for total operational peace of mind.

Improve the quality of your biomethane, reduce risks, and optimize your processes with μ PGC-BioCH₄ technology.

Contact us for a demonstration or a personalized quote!

