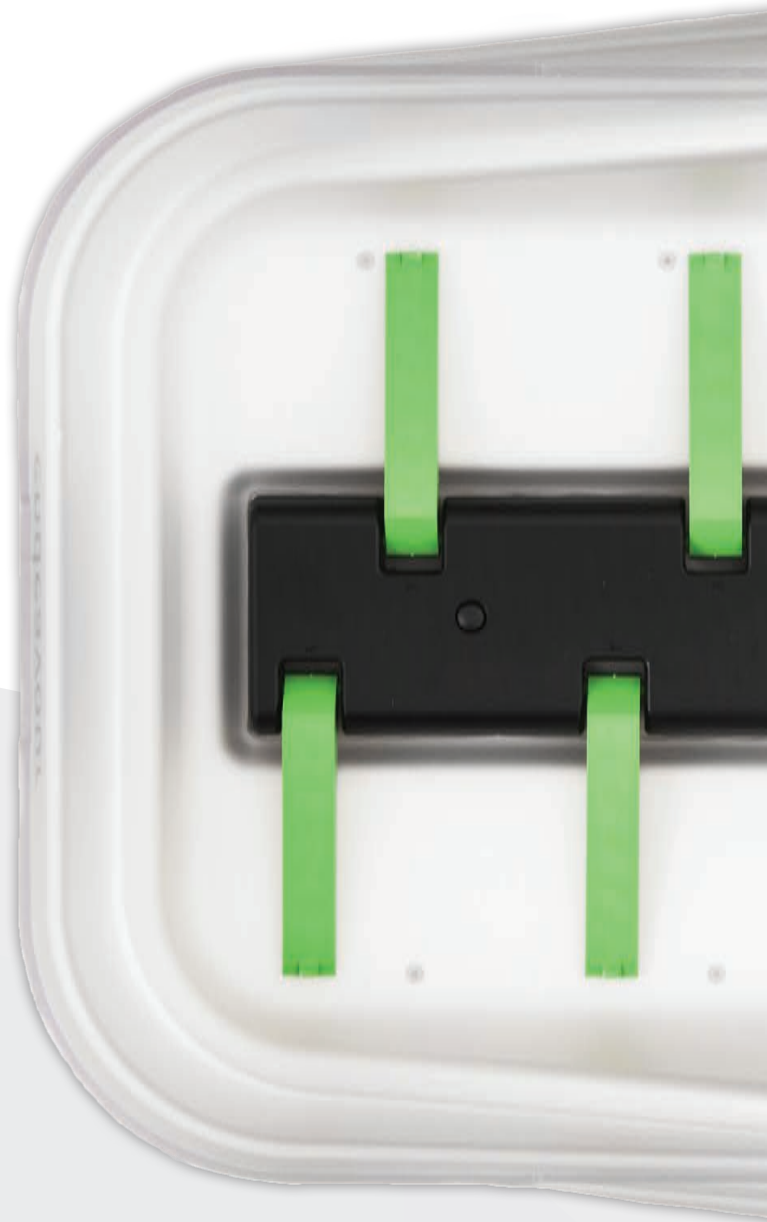


Select and price  
substrates with  
**Biogas Endeavour**



bioprocess  
CONTROL

[www.bioprocesscontrol.com](http://www.bioprocesscontrol.com)

# Simplify the selection and pricing of substrates

## Determine a substrate's true energy content

The Biogas Endeavour allows users to determine the biogas potential, anaerobic biodegradability and dynamic degradation profile of any biomass substrate. This in turn will allow users to select and price a substrate according to its true energy content of biomass, thus helping to ensure a good control of substrate economy for biogas plants.

## Compare your results and reports

The Biogas Endeavour supports all biogas potential test protocols, allowing for the standardisation of measurement procedures, data interpretation and reports.

In addition to providing automatic gas volume measurements and data logging, significantly reducing time, labour and knowledge demands, it also allows for data from different tests and operators to be easily compared. Thus, operators are able to compare all results and reports, and better monitor changes in substrate energy content over time and with each delivery.

## Take control of selecting and pricing substrates

The high quality of the data obtained from the Biogas Endeavour can be used to extract important kinetic information of the degradation process, which in turn can be used for selecting and pricing substrates according to their true energy content of biomass. This in turn will help biogas operators and substrate suppliers to better control their substrate economy, having a positive impact to overall profitability.

## Explore the potential of available substrates

The Biogas Endeavour is a well-engineered instrument developed for biogas plant operators for the rapid evaluation of biogas production potential from various biomass substrates.

The Biogas Endeavour will allow operators to fully explore the biogas potential of all available substrates and make better business decisions based upon the true value of a substrate.

up to

6

cells

10<sub>ml</sub>  
measuring  
resolution





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The Biogas Endeavour allows users to determine the biogas potential and dynamic degradation profile of any biomass substrate

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Up to 13 litres cumulative gas per channel for each batch test

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### Outstanding real-time performance

The Biogas Endeavour is an efficient analytical instrument for conducting real-time biogas production assays, having sampling, analysis, recording and report generation fully integrated and automated. A multi-channel analyser consisting of six parallel reactors and the same number of measurement channels (flow cells) attached to a data acquisition system, allows for the real-time investigation of different samples.

### Temperature and pressure compensation

The real-time temperature and pressure compensation feature of the Biogas Endeavour ensures that the impact of measurement conditions can be minimised and data presentation standardised. The temperature and pressure of gas are measured every time a flow cell opens, allowing the user to derive exact kinetic information compensated for any variation over time, while considering the vapour content of the gas. The normalised volumes are presented under dry conditions at 0 °C and 1 atm.

### Stable and reliable operation

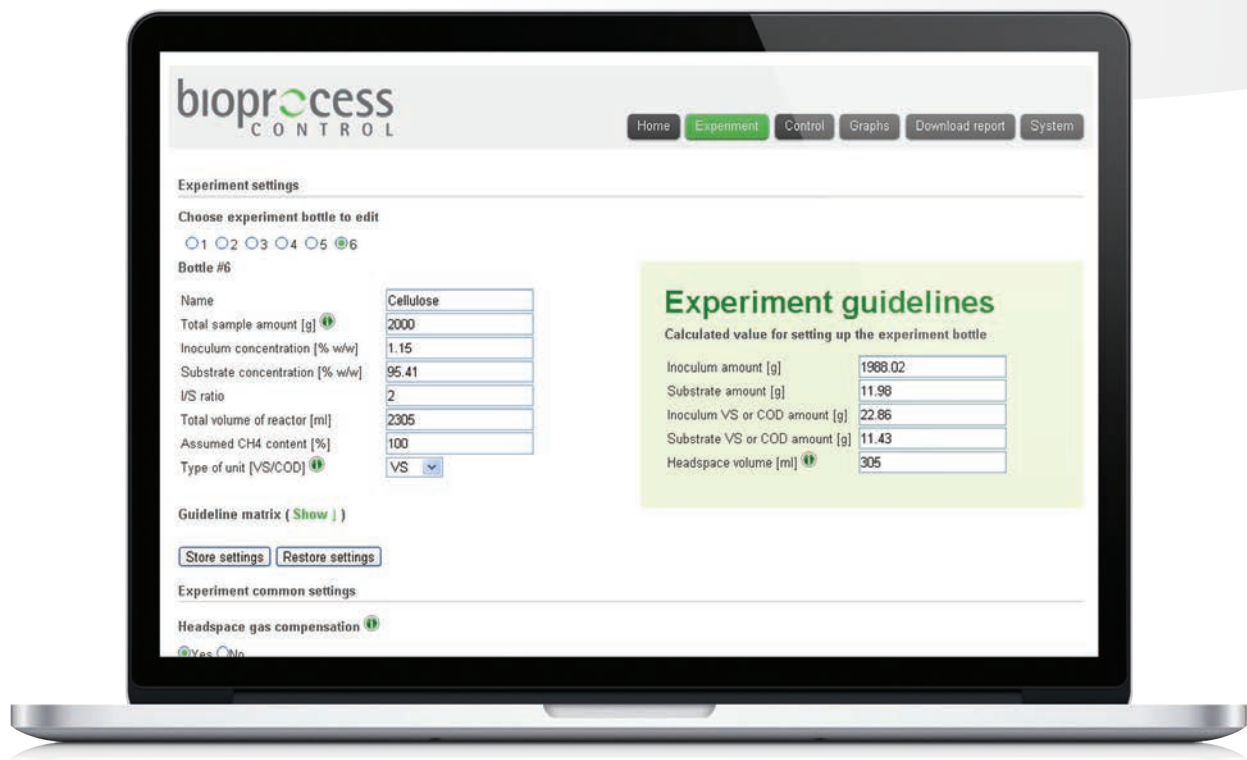
The internal software of the Biogas Endeavour runs on an embedded ARM CPU utilising the Linux operating system. This provides for an unmatched stability, data protection and minimum downtime. Thus, users will never experience data loss under normal operating conditions, which is always a risk with PC based solutions. Software updates issued by Bioprocess Control can be installed by the user in a controlled and easy manner.

### Network ready and easy access

The Biogas Endeavour is designed to allow easy access from a remote location. Through the use of standard protocols and connections, the Biogas Endeavour behaves like any other unit on an internal network, secured by a user definable password.

All interactions with the software are conducted through a web browser using any computer. Thus, experiment monitoring can be carried out with any kind of smart phone or tablet device.

# Software for Biogas Endeavour



## A software application designed for biogas potential tests

The Biogas Endeavour web-based software application has been specially designed for carrying out biogas potential and anaerobic biodegradability tests. This application, which is easy to understand and navigate, allows users to set-up an experiment, monitor its progress and download results with little effort. Moreover, all data is in a format that allows for easy analysis.

The Biogas Endeavour software application is simply a natural extension of an already universal hardware platform that has been designed for carrying out biogas potential and anaerobic biodegradability tests.

## A simple and intuitive experiment setup

The Experiment Settings feature of the software application allows users to prepare an experiment by calculating and setting up individual data for each batch test. The user enters values for the total amount of sample, volatile solids (VS) or COD content of inoculum and substrate, inoculum to substrate ratio, total reactor volume, and expected CH<sub>4</sub> content of the produced gas. The software then automatically calculates and generates experiment guidelines for the amount of substrate and inoculum needed in each batch test.

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A software application specially designed for biogas potential tests

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### Total control throughout an experiment

The Control feature of the Biogas Endeavour software application allows users to control both the mixing of reactors and status of each batch test in real-time during an ongoing experiment.

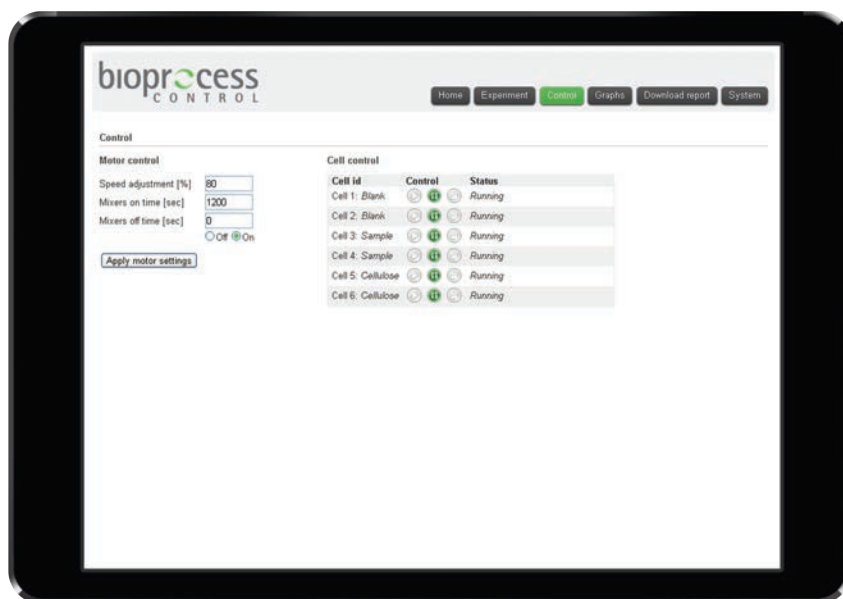
Users can control the speed and on/off time of mechanical agitation to ensure each reactor is operated under optimum mass transfer conditions.

Users can also easily start, pause and stop data acquisition of an ongoing experiment at anytime by means of a simple to use cell control feature, which also indicates the status of a cell at all times. Overall, this allows users to have optimal control of all reactors and batch experiments at all times with the simple click of a virtual button from the software user interface.

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Effectively  
select and price  
substrates

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### See your experiment in real-time and anywhere

The Graph feature of the Biogas Endeavour software application and embedded web server allows users to see their experiment in real-time and from anywhere. Users can easily monitor the accumulated gas volume and flow rate of each reactor by selecting and viewing only the one they wish to see.

Moreover, all values displayed are, if selected, adjusted for gas solubility and/or initial headspace composition and all gas volumes normalized to 1 atmospheric pressure, 0 °C and zero moisture content. This flexibility and precision allows users to always know the status of an experiment, as well as the data being produced.

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Always have total  
control over your  
experiment at any  
time and any place

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# Wide user base and application areas

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## User base

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The Biogas Endeavour is currently used by energy producers, organic waste handlers, wastewater treatment plants, food producers, bio-ethanol producers and bio-hydrogen producers.

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## Application areas

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The Biogas Endeavour can be used to conduct anaerobic respiration studies, biodegradability tests, anaerobic toxicity assays and determining the true biogas potential and dynamic degradation profile of any biomass substrate.





## Technical specifications

### Sample incubation unit

Maximum number of reactors per system: 6

Reactor material: glass

Standard reactor volume: 2000 ml

Dimension: 53 x 33 x 24 cm

Temperature control: up to 95°C (203°F)  
(precision of 0.2°C)

Mixing in the reactor: mechanical (adjustable interval and speed), maximum speed 140 rpm



### Flow cell array and DAQ unit

Working principle: liquid displacement and buoyancy

Up to 6 cells running in parallel

Built-in pressure and temperature sensor

Measurement resolution: 10 ml

Detection capacity: up to 33 l cumulative gas per channel for each batch test

Measuring range for instant gas flow rate: 10 to 120 ml/min

Embedded data acquisition (maximum capacity  $2 \times 10^4$  flow cell openings)

Dimension: 51 x 44 x 18 cm

Housing: plastic

High precision measuring instrument ( $CV \leq 1\%$ )



### Software features

- A software application specially designed for biogas potential and anaerobic biodegradability tests
- Web-based software running on an embedded server
- On-line real-time gas flow and volume display
- Automatic real-time pressure and temperature compensation
- Real-time gas flow and volume normalisation
- User-friendly guidelines for experiment setup
- Possibility of multiplexing, allowing for simultaneous batch analysis at different startup times
- On-line system logger for operational diagnosis
- Power supply: 12 V DC / 5 A
- Usage: indoor

# Bioprocess Control – optimising the production of **biogas**

Bioprocess Control is a technology and market leader in the area of advanced instrumentation and control technologies for research and commercial applications in the biogas industry.

The company was founded in 2006, and brings to market more than 15 years of industry leading research in the area of instrumentation, control and automation of anaerobic digestion processes. Today Bioprocess Control has product exports to more than 35 countries.

Bioprocess Control has a broad product portfolio covering biochemical methane potential (BMP) tests, substrate analysis, process simulation, gas flow measurements as well as a series of bioreactors. AMPTS – the Automatic Methane Potential Test System has quickly become the preferred analytical instrument around the world. It is used by both academic and industrial actors in the biogas industry.

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SCAN THE QR:  
Learn more about the  
Biogas Endeavour online

