



## USE WHAT YOU HAVE

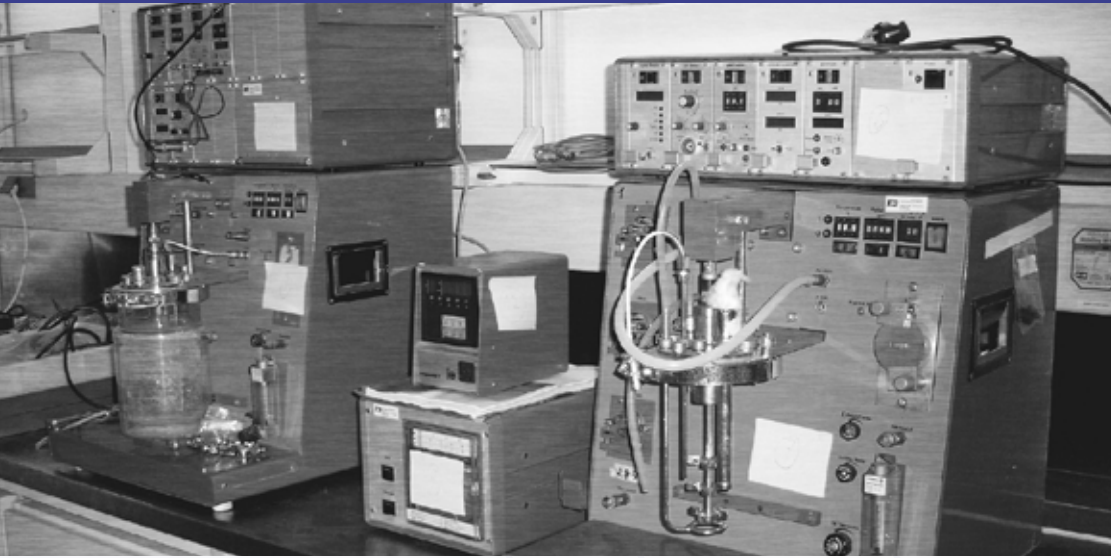
and connect it all with



**Revamp or  
retro-fit  
your bioreactor**



## You plan to revamp your old equipment?




## Do it with BlueSens!

### Learn more about the Use What You Have Spirit

Does this look familiar to you? Many laboratories have older bioreactors. These often gather dust in a corner, even though revamping you could breathe new life into them. The modular system Use What You Have is perfect for this. Use what you already have and add what you need. Our software bundles all data and enables modern automatic process control.

## Revamping or starting from scratch:

BOOK YOUR  
ONLINE CONSULTATION!



consulting.bluesens.com

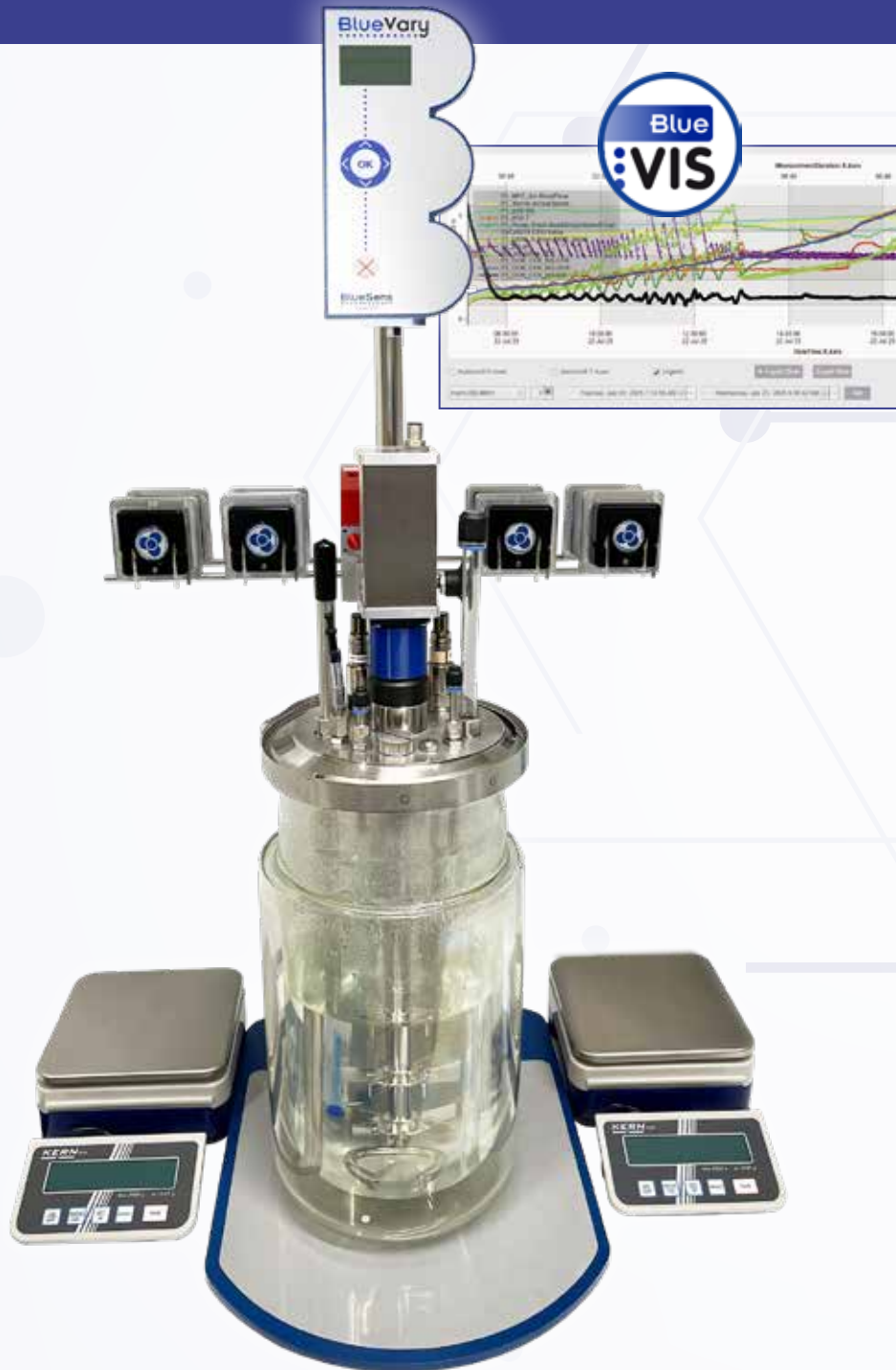


## BlueSens has modules for everything!

Revamping or just  
ONE NEW COMPONENT?  
We'll show you  
HOW TO GET IT UP  
AND RUNNING!



# Use What You Have – Perfectly coordinated



## The Use What You Have Concept

- Modular system – every module is stand alone
- Integration of existing bioreactors/ devices possible
- Affordable and flexibel
- Open to other programmes and reactor systems
- Start basic, expand when needed

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With **Use What You Have** from BlueSens, you can easily put together your ideal reactor setup. Use existing equipment and supplement it with new components.

- Cost-effective expansion possible
- Short delivery times
- Revamping also possible for pilot scale
- CER, OUR, RQ calculations, linear, exponential and RQ feeding strategies possible
- No annual costs
- No tower necessary, therefore completely freely modulable
- Programmable software through soft sensors, Matlab integration, OPC connection, Python integration, etc.
- Integration paths via RS 485, RS 232, 4-20mA, OPC DA/UA (ready)
- Free updates, remote control possible
- Data export from database to CSV file, graphical display of all parameters, automatic control of pH and DO as well as antifoam

# Module: off-gas analysis



## BlueVary – maintenance free gas analyzer

BlueVary consists of a basis station with three plug-in positions for gas sensor cartridges. Two different gases can be measured at once. The third plug-in position holds a pressure or pressure/humidity sensor cartridge. Gas sensor cartridges are selectable according to your application and can be changed easily as required.

- Online off-gas measurement (Cartridges for O<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>)
- Humidity and pressure compensated
- Online CER/OUR/RQ calculations
- Calculation of evaporation
- cCER (cumulative CER) for biomass determination
- Available for various gas types and concentration ranges



### Maintenance free

No need for annual maintenance. Performing our established one-point calibration regularly is all you have to do.



### Maximum flexibility

Combine two gases for parallel measuring.



### No specific training – easy to install and handle

Install and calibrate it yourself. PC housing and various connections guarantee easy handling.



### Fits on every scale

Applicable from lab to industrial scale.

Use scale-independent exhaust gas data for process optimization.



Learn more about BlueVary

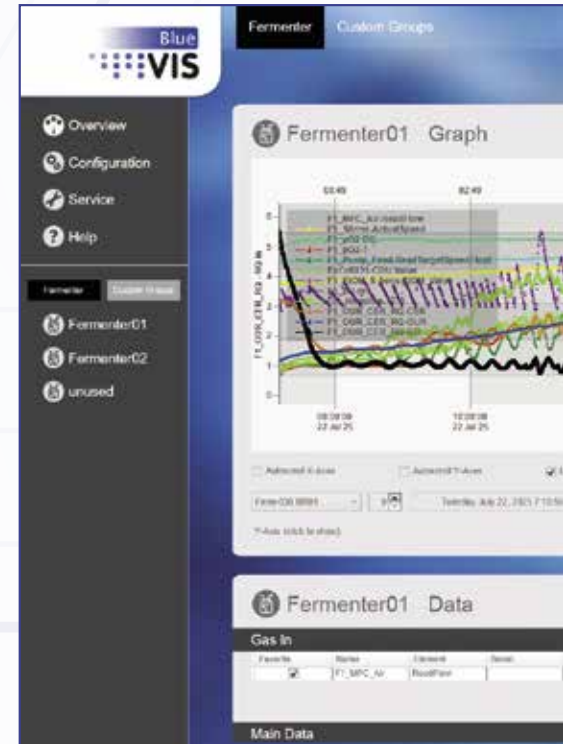
[bluevary.bluesens.com](http://bluevary.bluesens.com)

# Module: Bioprocess Software BlueVIS

## BlueVIS – bioprocess software

BlueVIS software allows to mix and match equipment to create a working setup.

- Process software for automatic regulation
  - DO cascades freely adjustable
  - Automatic pH regulation
  - Batch end detection
- PID control of all parameters possible
  - Linear, exponential, or RQ feeding possible
- Integration of existing sensors, scales and other equipment
- Creation of custom soft sensors
- No annual fees and free updates
- Recording in database, export via CSV file or online connection via **OPC DA/UA**
- Custom Python and Matlab scripts can be imported



### Parallel tracking of important process parameters

Monitoring, acquisition and integration of data from all components and for process control in real-time.



### Open to other systems and brands

Integrated **OPC server/client** for data exchange to other systems and programs. Connection to other bioprocess software possible



### BlueVIS

Calculates OUR, CER, RQ, growth rate and biomass, offers math sensors and connects to MATLAB.



Learn more about BlueVIS

[bluevis.bluesens.com](http://bluevis.bluesens.com)



## Module: Bioreactors

### Bioreactors

Use your own (old or new) bioreactor (up to pilot scale) or purchase one from BlueSens.

- 2, 4, 10L (working volume) double-walled glass reactors
- Stainless steel headplate with 14 connections
- Rushton impeller (height-adjustable)
- Sampling system (height-adjustable)
- Large exhaust air cooler
- Unlimited number of addition ports
- Automatic anti-foam sensor
- Various spargers
- Interchangeable vessels (e.g., 1x setup with 2L, 4L, and 10L reactors)
- Various adapters (PEEK and stainless steel), also customized on request

### Temperature control

- Process temperature 15-60 degrees Celsius (other ranges available on request)
- Temperature measurement in the medium
- Various units for temperature control
- Existing units can be connected

## Module: Probes

### pH, DO/pO<sub>2</sub>, Biomass, Redox ...

Use your own probes or purchase them from BlueSens.

- Automatic pH measurement and regulation
- Automatic DO measurement and regulation (stirring speed and gas supply)
- Integration of all Hamilton probes possible (redox, biomass, dCO<sub>2</sub>)
- Probes from other manufacturers can also be integrated, including existing probes



## Module: Peristaltic Pumps

### Pumps

Use your own pumps or purchase them from [BlueSens](#).

**FPP1 pump** has an integrated stepper motor and can be operated in both directions.

- Our digitally controlled peristaltic pump can be **operated continuously or in pulses**
- Min. 0.1 rpm, max. 300 rpm, resolution 0.01 rpm
- Min. 1.75 ml/h, max. 85 ml/min, step size 1.75 ml/h
- Can be used for all solutions (base, acid, feed, antifoam, etc.)
- Flexible conversion of pumps (acid → feed)
- Calibration in ml/min possible, as well as gravimetric feeding in conjunction with a balance



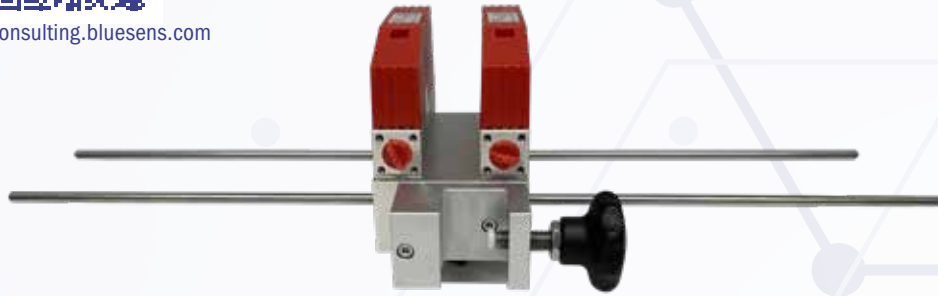
## Module: Stirrer Motor FSM-2

### Stirrer

Use your own stirrer or purchase one from [BlueSens](#).

The driving force - FSM-2 stirrer motor

- Adapters for reactors of other brands on request
- Automatic and manual DO control
- For bioreactors up to 10L TV
- Up to 1500-2000 rpm max. (depending on viscosity)
- Digital interface: RS485 (ModBus RTU)
- Safety button
- Integration in automatic DO control
- Slight warming



## Module: Mass flow controller

### MFCs

Use your own MFC or purchase one from [BlueSens](#).

Mass flow controller: control the flow or regulate your automatic DO cascade ([BlueVIS](#)).

- Mass flow controller for air, N<sub>2</sub>, O<sub>2</sub>- Automatic control via [BlueVIS](#) software
- Integration into automatic DO control
- Multiple MFCs per reactor possible
- Can be integrated into automatic OUR/CER/RQ calculation
- Currently MFCs from manufacturers Vögtlin and Bronkhorst, other manufacturers possible



## Module: Balances

### Balances

Use your own balances or purchase them from [BlueSens](#).

For tracking the weight of feed and other solutions

- Gravimetric feeding possible
- Different precision balances
- Measuring ranges between 0.01 g to 30.000 g available
- We currently offer various balances from Kern but existing balances (from other manufacturers) can be integrated on request

## Different accessories

Use your own accessories or purchase them from [BlueSens](#).

The right accessories round off your modules to create the perfect system

- Headplate with flange D=150 mm, 7x PG13.5, 7x11 mm ports
- Spargers
- Sample tubes (height-adjustable)
- Baffles
- Various Rushton impellers (height-adjustable, up flow and down flow possible)
- Chillers



## Talk to our experts



**Book our expert online! It's free!**

If you have any questions, please feel free to contact our experts. We are happy to arrange a personalized online consultation to support your needs.

[consulting.bluesens.com](https://consulting.bluesens.com)



## Do you have questions?

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Do you need help choosing which device is right for you?

Would you like to know how much a particular product costs?

Would you like to know what exactly the benefit for your work is and what your price would be?

Our sales team will be happy to advise you free of charge by phone or online.



[BlueSens.com](https://www.bleusens.com)

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