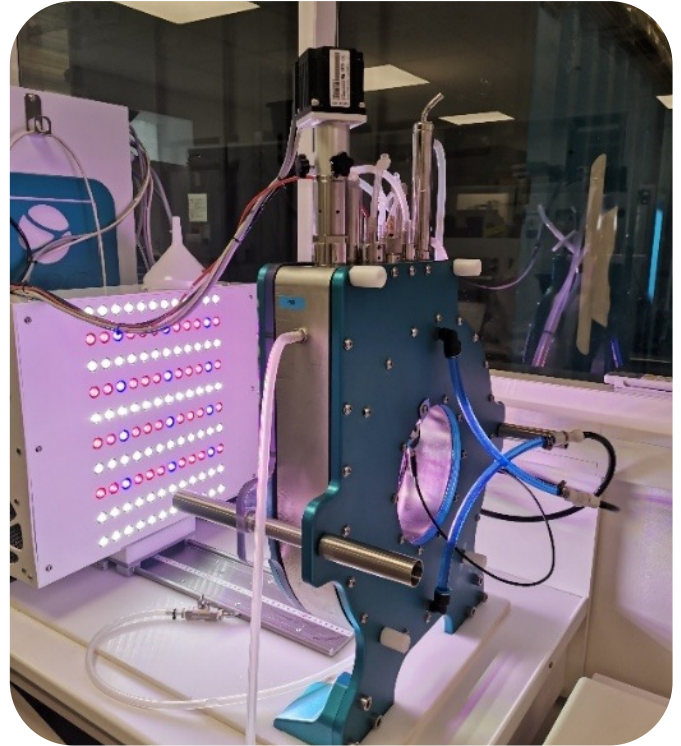
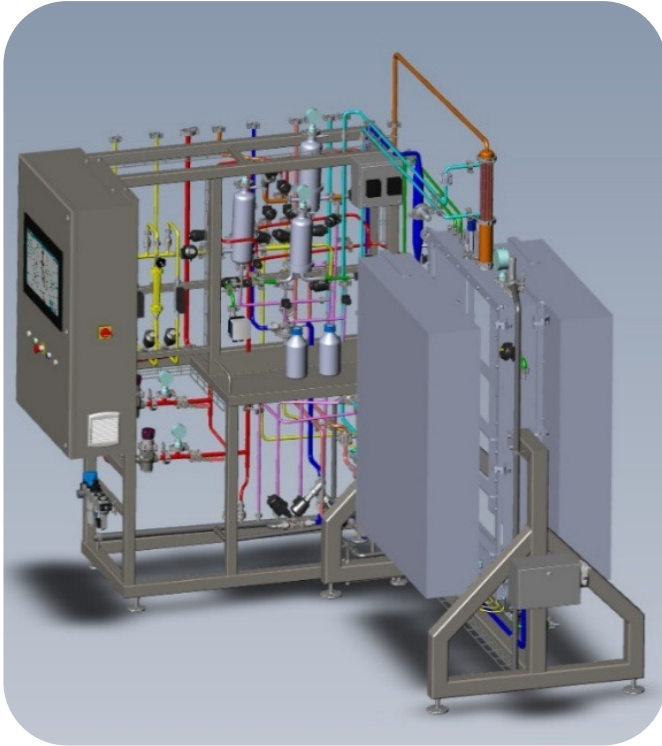




The Photobioreactors were developed with particular focus on the quality and multifunctionality. All of them have a flat-vessel design that enables bringing uniform illumination over the whole volume of cultivated culture. They are made in polycarbonate with some parts in stainless steel 316L.

Photobioreactors feature a unique combination of the cultivator and monitoring device with user-friendly software control which offers remote control via internet. The core of the Photobioreactor system is a flat cultivation tank with integrated temperature regulation in the range of 15 - 60 °C and bubble stirring (aeration) of the culture.

The modular Photobioreactors are designed to allow for precise control and optimization of the cultivation conditions by continuous monitoring of fluorescence parameters, photosynthetic efficiency, optical density of the culture and pH of the suspension to determine the need for CO₂ injection. The Photobioreactors provide or ensure control and monitoring of numerous parameters essential for successful culture cultivation and maximum production of biomass such as stable suspension temperature, homogeneous light illumination and light spectral distribution.

LAB-SCALE & PILOT-SCALE PHOTOBIOREACTOR

The photobioreactors are currently manufactured in two standard versions differing in the volume of their cultivation vessels: 2L and 130L

VESSEL		
Total volume	2L	130L
Width	350mm	1000mm
Height	370mm	1350mm
Depth	150mm	
Materials	Polycarbonate (vessel) AISI 316L (head plate)	AISI 316L for wetted parts AISI 340L for non-wetted parts
LED lights		800x1000mm panel with 80 white LED and 5W power

PIPING (FOR PILOT)	
Material	Sanitary grade steel
Piping construction	Air supply Plant steam supply Clean steam supply Cooling water supply Cooling water return Waste water drain Waste liquid drain Waste gas out
Fittings	Diaphragm valve Angle seat valve Steam trap Diaphragm pressure gauge Ball valve and Pneumatic angle valve Check valve Safety valve
Pipes welding	Orbital welding (product line) Manual welding (general line)

AERATION UNIT

Surface aeration or deep aeration via sparger

Absolute filter 0,2 µm

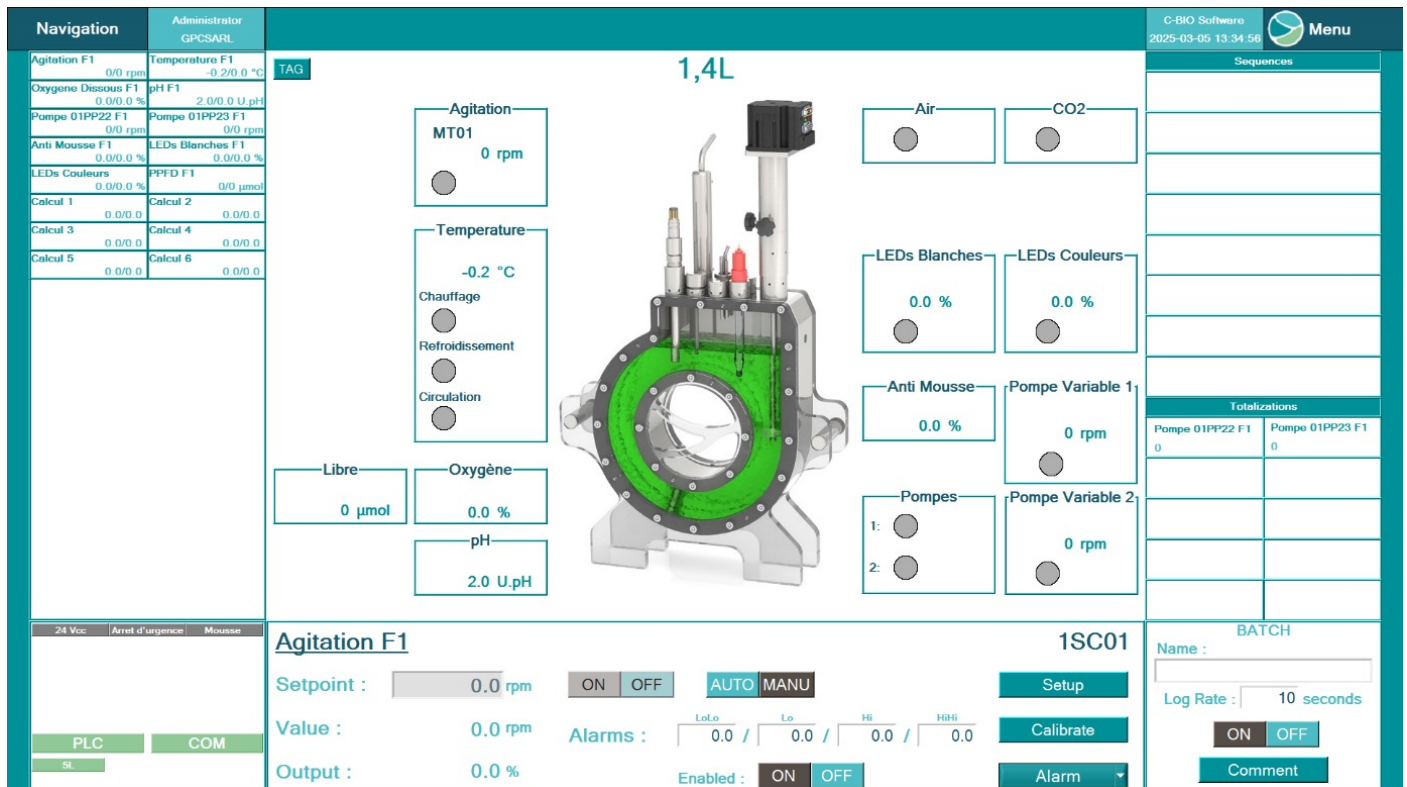
Manual flow meter or automatic MFC (mass flow controller)

Automatic Air supply

COMPONENTS	LAB-SCALE PHOTOBIOREACTOR	PILOT-SCALE PHOTOBIOREACTOR
Head plate	Condensor Port (M20) Septum port or pO ₂ sensor port (M20) pH sensor port 3 injection ports (M10) Agitation port (M26) Thermowell for temperature sensor	Diaphragm Pressure Gauge Gases exhaust with condensor Inoculation Ph sensor pO ₂ sensor Foam sensor port Port for addition of acid, base, anti-foam and substrat Port for addition of media Exchanger outlet
Upper sidewall	Surface aeration or sampling port	Harvest port
Middle side wall		Temperature probe Sterile Sampling system
Bottom	Sparger port Drain system	Sterilizable bottom valve Air line Exchanger

C-BIO 2™ SOFTWARE

The C-BIO 2™ software has an intuitive interface that provides quick access to all your controllers' parameters, to facilitate the management of your fermentation or cell culture process.



TECHNICAL INFORMATION

Operating system	Windows 11
Access Security	3 levels access with passwords
Operator	➤ Start or stop a controller ➤ Send a set-point to a controller ➤ Calibrate the pH and pO2 probes ➤ Start or stop a sequence ➤ Change the description of a sequence ➤ Visualize the progress of a sequence ➤ Visualize the alarms ➤ Visualize the Audit Trail ➤ Start or stop a batch ➤ Start or stop a profile ➤ Visualize the list of digital inputs/outputs ➤ Use the trends module ➤ Perform an emergency stop
Engineer (in addition to the operator)	➤ Change the controllers' configuration ➤ Calibrate all the controllers ➤ Create and change alarms ➤ Create and change a sequence ➤ Create and change a profile ➤ Create and change new controllers from the calculation module
Administrator (in addition to the operator and engineer)	➤ Create, modify or delete users