BioFlo® 120

Technical data and ordering information

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3. Unique Selling Points
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5. Additional Features

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BioFlo® 120

Bench-scale bioprocess control station

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- **Introduction**
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Performance Meets Value

The BioFlo 120 offers simplicity and ease of use without sacrificing capability:

- One controller capable of 250 mL – 40 L working volume on a wide variety of glass and BioBLU® Single-Use Vessels
- Universal control for microbial and cell culture processes
- Robust measurement and pre-run diagnostics with Mettler Toledo® ISM intelligent sensor connectivity
- Enhanced software package featuring simplified process control

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	BioFlo® 120	BioFlo®/CelliGen® 115
Price	5%+ price reduction vs 115!	High end of entry level market
Single-use	Expanded working range of 250 mL – 40 L (including the BioBLU 1c/f)	BioBLU 3c/f → BioBLU 50c
Sensors	pH, Redox, CO_2, DO, Optical DO: Analog and Digital Mettler Toledo ISM	pH and DO: Analog only
Software for applications	Universal control strategy for application Automated control modes (O_2/N_2, 3-gas, 4-gas)	Choose between fermentation and cell culture modes. No automated control modes
Auto Culture mode	NEW Feature!	Not available
Agitation	Bi-directional magnetic drive Expanded low end (5 rpm for mag drive) and high end (1500 rpm for 1 L direct drive)	Uni-directional Low end of 25 rpm and high end of 1200 rpm
Pumps	3x Watson Marlow easy load (pass-through) pumps	3x Watson Marlow (U-channel) pumps
Integrated Analog I/O	3 x included with Advanced models	Not available
Communication	Ethernet over Modbus IP network for SCADA and remote	Modbus
Footprint	Space saving compact design (9.5 in / 24 cm wide)	Medium to large (16 in / 40 cm wide)

	BioFlo® 120	BioFlo® 320
Single-use	Expanded working range of 250 mL – 40 L *Requires OP-76 for optical pH	Expanded working range of 250 mL – 40 L *Integrated optical pH
Sensors	2x Analog or Digital Mettler Toledo ISM	Up to 4x Analog or Digital Mettler Toledo ISM
Software for applications	Universal control strategy for application with automated gas mix + Auto Culture!	Universal control strategy for application with automated gas mix
Validation	No	Available for cGMP market
Gas Flow	1x rotameter or TMFC (high flow) with 4-gas mix valve bank, sparge only	1,3, or 4 TMFC (high or low flow) + 1 TMFC optional overlay for headspace gas
Pumps	3x Watson Marlow easy load (pass-through) pumps	Up to 4x Watson Marlow easy load (pass-through) pumps + 2x integrated connections for external variable speed pump (optional)
Agitation	Bi-directional magnetic drive Expanded low end (5 rpm for mag drive) and high end (1500 rpm for 1 L direct drive)	Bi-directional magnetic and direct drive
Integrated Analog I/O	3x included with Advanced models	3x included with all models
Communication	Ethernet over Modbus IP network for SCADA and remote	Ethernet over Modbus IP network for SCADA and remote
Footprint	Space saving compact design (9.5 in / 24 cm wide)	Vessel nest + left and right hand provides flexibility for install

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BioBLU® Single-Use Vessels

The BioFlo 120 is compatible with the entire BioBLU Single-Use Vessel portfolio (except BioBLU 0.3)

- **250 mL – 40 L** working volume range for cell culture applications
- BioBLU 1f and 3f for fermentation applications
- BioBLU 5p for continuous/perfusion processes

Autoclavable Vessels

Twenty-four vessel combinations

- 1, 2, 5, and 10 L vessel size
  - Fermentation:
    - Direct drive only
    - Heat-blanketed or water-jacketed (includes Rushton-type impellers and baffle cage assemblies)
  - Cell culture
    - Direct or magnetic drive
    - Heat-blanketed or water-jacketed (includes pitched-blade impeller)

Flexible Sensors

Integrated Mettler Toledo Intelligent Sensor Management (ISM) platform

- Sensor 1:
  - ISM pH/Redox, DO, CO_2
  - Analog electrochemical (EC) pH or redox sensor
- Sensor 2:
  - ISM pH/redox, DO, optical DO, CO_2
  - Analog polarographic DO

Pumps

- Three front-mounted fixed-speed pumps
  - Watson Marlow® easy load pump heads for convenience
  - Pumphead:114DV
  - Fixed-speed mode: % duty cycle (30 rpm)
- Connect up to three external variable speed pumps through analog I/O module

  (advanced model only)

New Motor Assemblies

- **Brushless** direct- and magnetic-drive motors
- **Clockwise** and **counter-clockwise** rotation for added in-process flexibility (magnetic drive only).

Magnetic Drive

Direct Drive

Direct-Drive Motor Assembly

High torque motor designed for the most viscous of cultures

- One motor assembly for all direct drive vessels
- Includes mechanical ‘toothed’ coupling for connection to direct drive bearing housing
- Autoclavable vessels
  - 25 – 1200 rpm (2,5, and 10 L)
  - 25 – 1500 rpm (1 L only) – for high OTR

Magnetic-Drive Motor Assemblies

Provides enhanced sterility for the most sensitive of cultures.

- Autoclavable Vessels
  - 5 – 500 rpm (1,2, and 5 L)
  - 5 – 150 rpm (10 L only)
- Single-use Vessels
  - 5 – 200 rpm (BioBLU 3c, 5c/p & 14c)
  - 5 – 150 rpm (BioBLU 50c)
  - 5 – 1200 rpm (BioBLU 1f/3f)
  - 5 – 500 rpm (BioBLU 1c)
- Same base motor (ESM 60) all vessels except BioBLU 3f (ESM 80)

Syringe Sampling

NEW! Syringe sampling equipment included standard with all BioFlo 120 Vessels

- Stainless-steel sampling tube
- Disposable Luer-lock syringes
- Swabable needle-free sampling valves

Accessories

Impellers:

- Rushton-type, pitched-blade, and marine impeller for both magnetic- and direct-drive assemblies
- Specialized spinfilter for use with microcarrier and suspension cultures

18-port Ethernet switch:

- Communication to SCADA software (BioCommand® or DASware®)
- Communication to local (router) or building network for IP addressing.

Scales:

- Up to 8 scales can be configured for use per control station.
  - 35 kg (+/- 0.002 kg resolution)
  - 15 kg (+/- 0.001 kg resolution)
  - 6 kg (+/- 0.0005 kg resolution)

Touchscreen

- 7” integrated touchscreen for local control
- High resolution with expanded field of vision
- Projected capacitive technology compatible with latex or Nitrile gloves

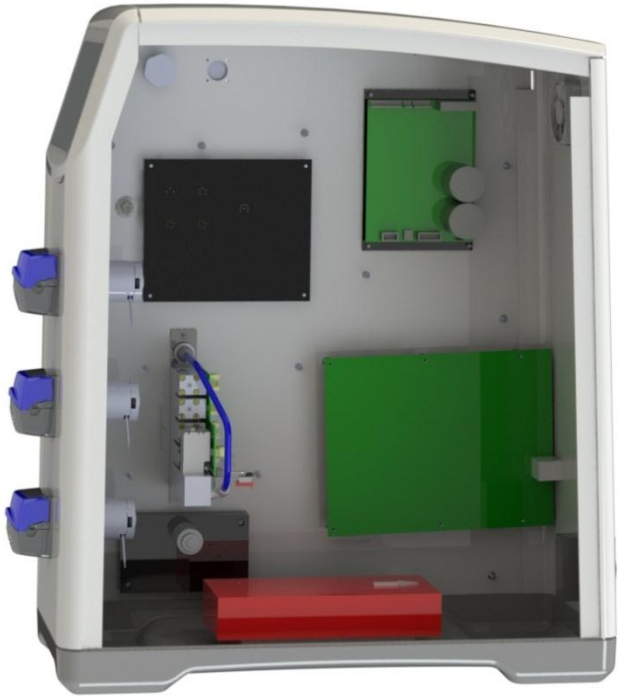
Easy Setup

Vessel connections laid out on a single utility panel for simple, fast setup

- Universal connection of interchangeable motors
- Sparge gas supply (air, O_2, N_2, CO_2)
- 2 x universal sensor connections (ISM/analog)
- Connections for heat blanket/jacket water heater, RTD, and level sensors
- 3x user-defined analog Input/Output connections (0 – 5 V, 0 – 10 V or 4 – 20 mA) – Advanced controllers only
- Water supply and return located on bottom for ease of use and protection for sensitive electronics

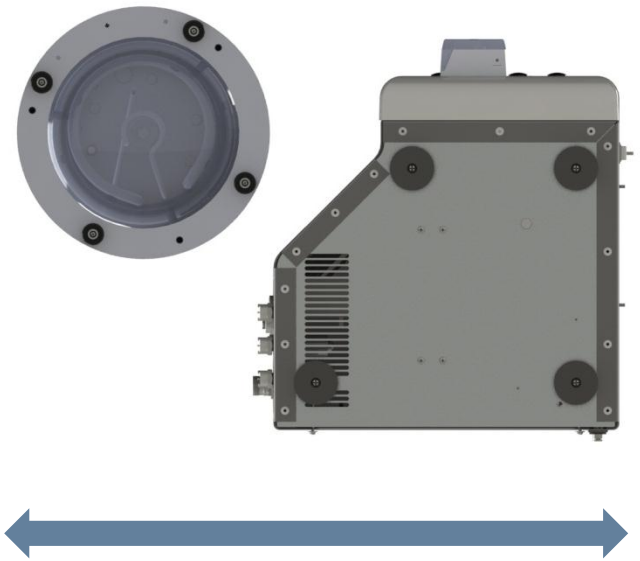
Improved Design

- IP21-rated ingress protection
- Internal components laid out on a single plane for improved access and more efficient service
- Space-saving compact footprint
- Wipe-down cleanability
- Weight reduced for lifting by a single person



Space Saver

BioFlo®/CelliGen® 115



BioFlo® 120

Total installed footprint reduced nearly 15%

Footprint

Vessel size	2 L		10 L	
Model	mm	in	mm	in
BioFlo 120*	525	20.7	615	24.2
Infors Minifors 2	455	17.9	--	--
Sartorius BIOSTAT A – Without Chiller*	525	20.7	--	--
Sartorius BIOSTAT A – With Chiller*	785	31	--	--
Applikon ez-Control*	780	31	920	36

**Assumes 3 in (75 mm) between control station and vessel*

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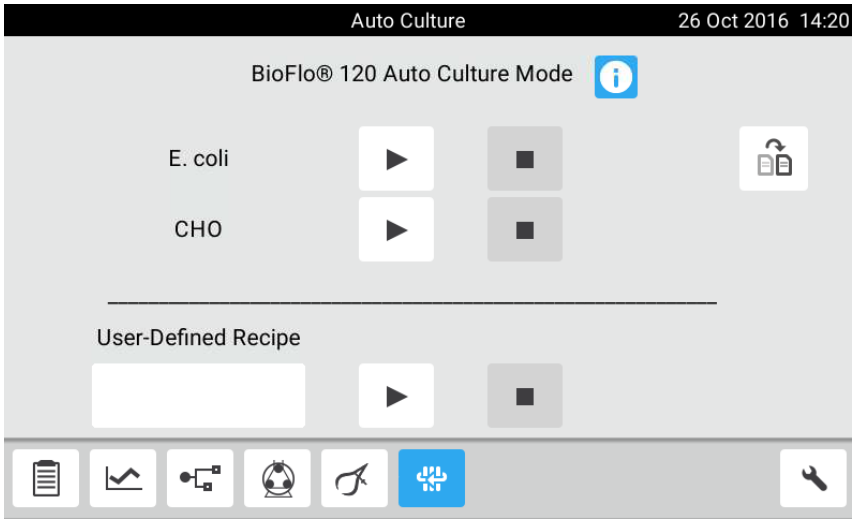
Overview

- **NEW!** Auto Culture modes provide 1-touch process control
- **Universal control** strategy for both microbial and cell culture application
- **Automated** gas mix algorithms for all processes
  - 4-Gas & 3-Gas for mammalian cell culture
  - O_2 Enrichment for aerobic microbial fermentation
  - N_2 Enrichment for anaerobic fermentation

Auto Culture!

NEW! 1-touch processing for microbial and cell culture processes

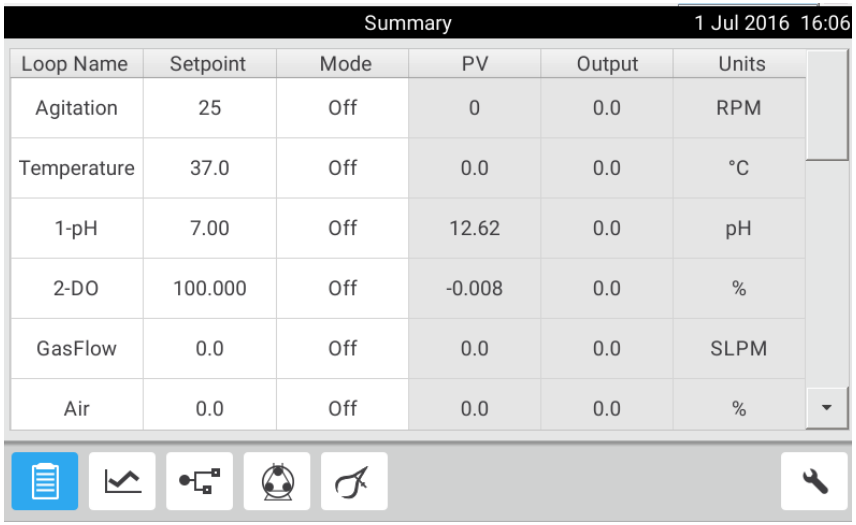
- No learning curve
- **Automated** control of critical process parameters
- **Evolves** with the process. Adjust values and save to user-defined recipe library for future 1-touch process control



Summary

Overview of individual parameters and current state.

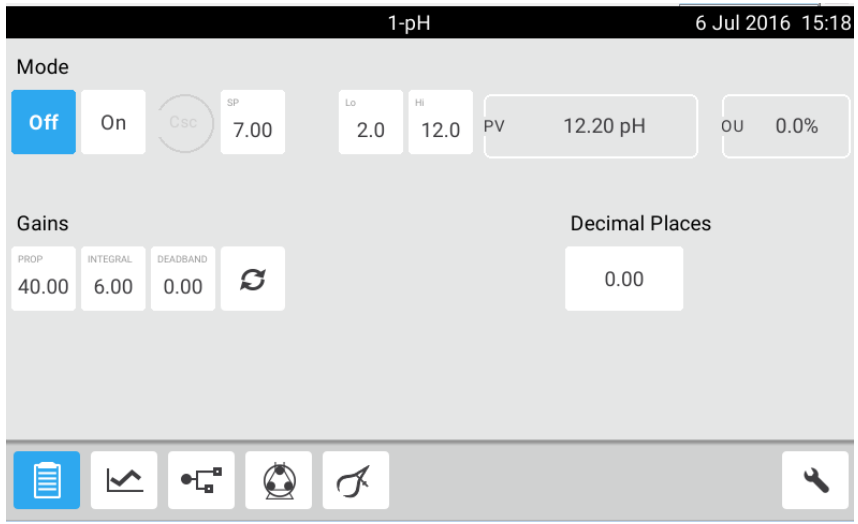
- Navigate to loop gauge screens
- Define loop mode, and SP **(NEW!)**
- Loop status
  - Off = white
  - On = blue
  - Alarm = red



Loop Gauge

The main interface for the user to define the loop parameters

- Define loop mode, SP, and SP limits
- View cascade indicator **(NEW!)**
- View loop process value and output
- Define rotation (**NEW!** – agitation only)
- Edit deadband values (pH only)
- View and edit P&I values (pH and DO sensors only)

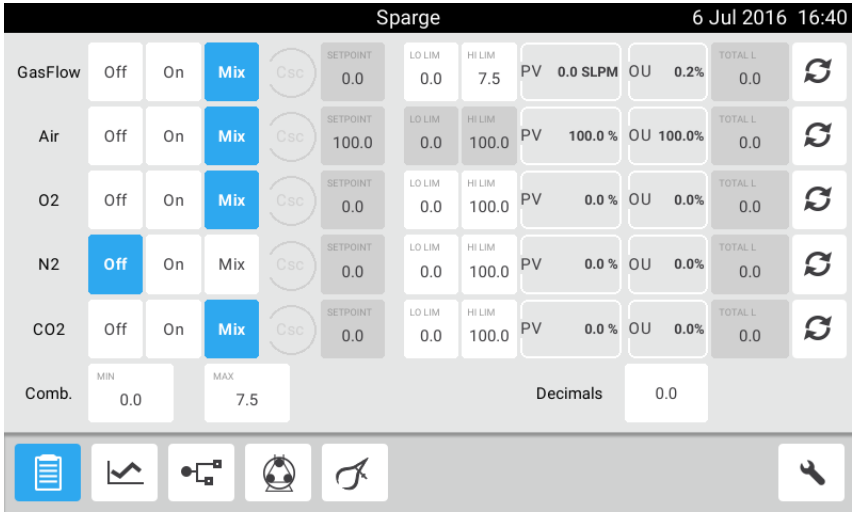


Sparge

NEW! A consolidated view of all gasses being introduced into the culture

From this screen the user can:

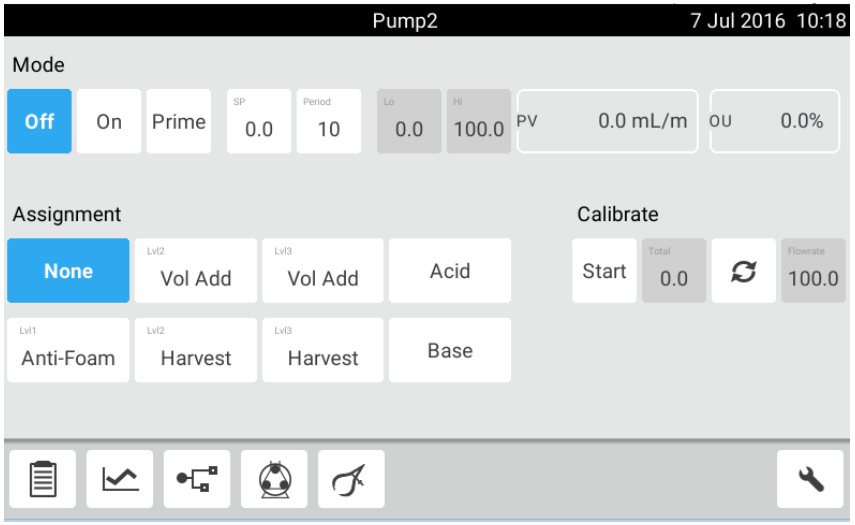
- Define loop mode, SP, and SP limits
- View cascade indicator **(NEW!)**
- View loop process value and output
- View and edit gas mix algorithms
- View totalizer



Pumps

Interface for the user to define specific parameters all available pumps (front mounted and external)

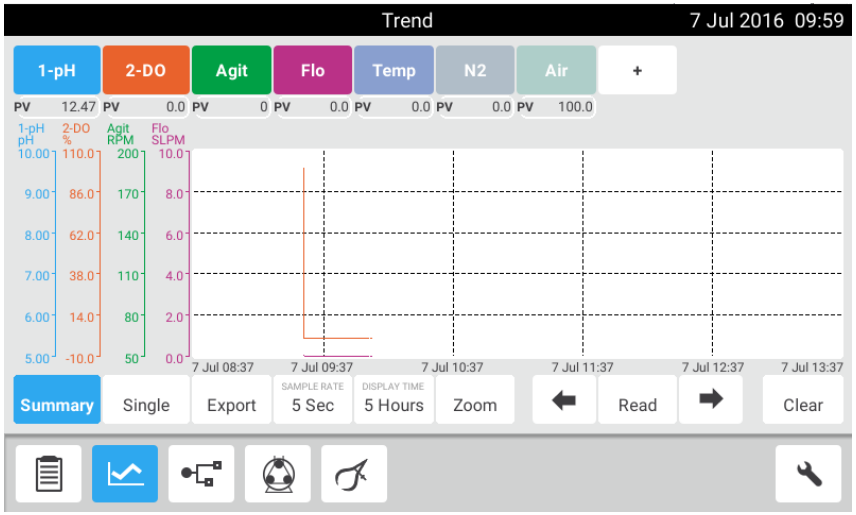
- Define loop mode, SP, and SP limits
- View loop process value and output
- Define loop assignment
- Calibrate pump



Trend

Graphical view of process data for the user

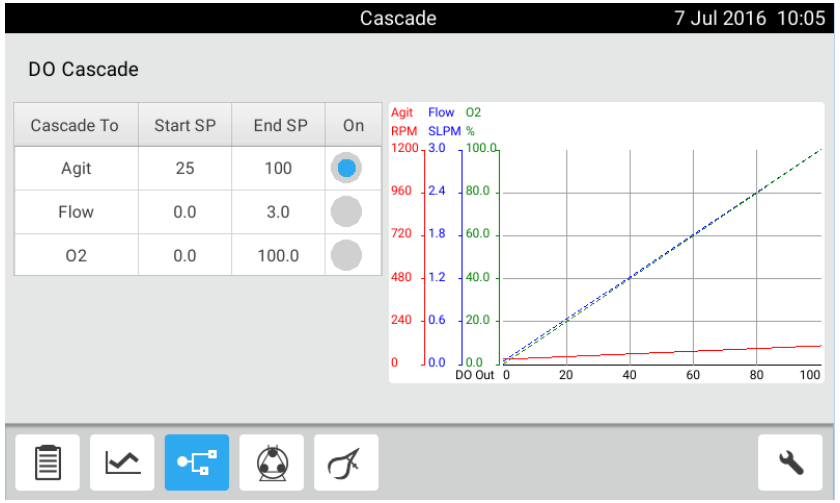
- Trend up to 8 loops **(NEW!)**
- Choose which loops to trend (**NEW!** – trend SP, PV, or both)
- Export data to USB memory key
- Define viewing window time range
- Utilize Zoom and Read line functions



DO Cascade

NEW! Easy to use DO Cascade

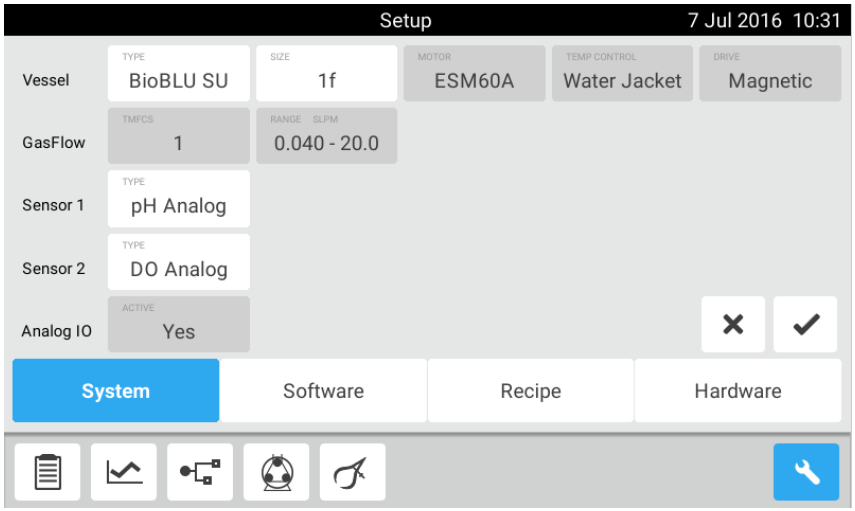
- Enable any combination of Agitation, GasFlow, and oxygen
- Simply define min and max cascaded values
- Observe graphical representation prior to enabling **(NEW!)**



Setup

Configure settings for individual unit configuration

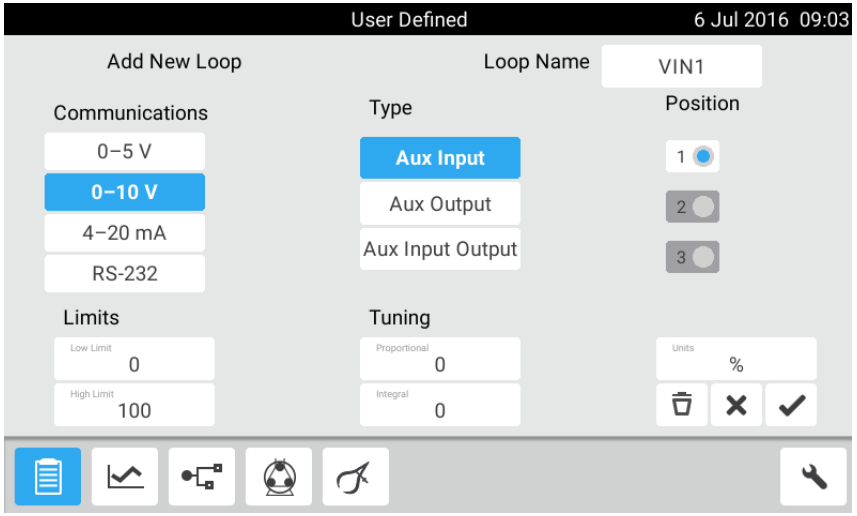
- **System**: Setup and view current system configuration
- **Software**:
  - Update and view current software
  - Export Log for service data export
- **Recipe**: Save/copy recipes to local machine and USB **(NEW!)**
- **Hardware**:
  - View IP address (for SCADA)
  - View current hardware setup



User-Defined Loops

Configure settings for individual unit configuration

- Select **Communication**:
  - Analog: Voltage or mA
  - Digital: RS232
- Select from **Type** (Input/Output)
- Select available **position**
- Set **Limits/Tuning**
- Define desired units of measure (**UoM**)



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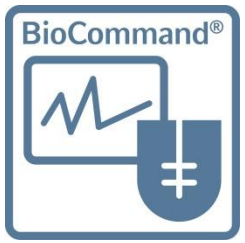
BioCommand®



Eppendorf offers three next-generation New Brunswick™ BioCommand® software packages to enhance your ability to monitor, control and log data from your fermentation and cell culture processes through your personal computer (PC).

- **Track & Trend**: Entry-level package designed specifically for researchers and scientists requiring basic data management and monitoring capabilities. Trend and control parameter setpoints, establish alarm settings, and produce batch records.
- **Batch Control**: Intermediate package includes all the capabilities of Track and Trend, plus additional features including a sophisticated programming module, custom synoptic display window, and equipment lock-out feature. Ideal for process optimization
- **Batch Control Plus**: Premium package includes all of the features of the previous two packages, adding three levels of security, event logs, and audit-trail capabilities to be compatible with the FDA 21 CFR Part 11 requirements, allowing the software to be utilized in FDA validated processes.
- **OPC Server**: Included with all BioCommand software packages listed above. Additionally, can be used without BioCommand packages to provide connectivity to third-party SCADA such as MATLAB®, LabVIEW® and other OPC-compatible packages.

Unlimited Applications

Grow any cell type you can think of: Mammalian, stem, microbial, insect, plant cells, fungi, and more…

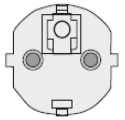
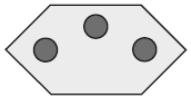
Unlimited process flexibility:

- Batch, fed-batch, continuous, or perfusion
- Supports high-density, micro-aerobic, and anaerobic fermentation
- Secreted products production
- Process development for cell and gene therapies

Required Utility Specifications

Dimensions	Width	Depth	Height
	24.7 cm (9.7 in)	55.9 cm (22.0 in)	62.9 cm (24.8 in)
Weight	14.8 kg (32.7 lb)		
Gas requirements > Process air > Oxygen > Nitrogen > Carbon dioxide	> Autoclavable vessels: 10 psig (0.69 barg) max > Single-use vessels: 6 psig (0.44 barg) max > Push connect fittings accept 1/4 inch tubing or hose barb fitting		
Water requirements	> Stainless steel quick connect fittings to 3/8 inch ID silicone tubing > Must be regulated to 10 PSIG (0.69 barg) > 50 µm filtration > Temperature: 5 °C minimum > Flow rate: 1.9 lpm (0.5 gpm) minimum		
Exhaust requirements	> 0.5 psig (0.035 barg) maximum		
Electrical requirements	> IEC-C14 connection > 100 – 120 (±10%), 208 – 240 (±10%) VAC, 50/60 Hz, 10 A , single-phase		
Ambient conditions	> 10 °C – 30 °C > Relative humidity up to 80 % non-condensing > Altitude up to 2000 m		

Plug Type/Recepticle

Plug and cable type	Electrical supply	Plug
North America, Japan (Plug Type B) Cable: SJT 14/3 75C	125 V/60 Hz 15 A	
EU and Korea (Type CEE 7/7) Cable: H05VV-F 3*1.0mm^2	250 V/50 Hz 10 A	
Australia, China, Argentina (Plug Type I) Cable: H05VV-F 3*1.0mm^2	250 V/50 Hz 10 A	
Switzerland (Plug Type J) Cable: H05VV-F 3*1.0mm^2	250 V/50 Hz 10 A	
United Kingdom (Plug Type G) Cable: H05VV-F 3*1.0mm^2	250 V/50 Hz 10 A	
Brazil (Plug Type N) Cable: H05VV-F 3*1.0mm^2	250 V/60 Hz 10 A	
India (Plug Type D) Cable: H05VV-F 3*1.0mm^2	250 V/50 Hz 10 A	

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We Know Bioprocessing