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AbioBundle Bioreactor

AbioBundle Series Glass Bioreactors

With nearly 20 years of experience in the biopharmaceutical industry and a dedication to craft high-end bioreactors, Applitech proudly presents the AbioBundle Series Glass Bioreactors. Backed by a highly skilled R&D team of over 150 professionals, the AbioBundle line represents years of refinement and expertise.

Designed with a deep understanding of user needs, AbioBundle M/E/P/D series bioreactors set new standards in process development. With AbioBundle, Applitech provides unparalleled support for your bioprocess development.

AppliSoftec Data Management Software

AppliSoftec, consisting of the AbioPIMS and AbioExpert series, is Applitech's proprietary bioprocess information management system.

AbioPIMS/AbioExpert complies with GAMP5, 21 CFR Part 11, and ANSI/ISA-88.01 Batch Control System Standards, offering robust audit trails. The software facilitates real-time data acquisition of bioprocess parameters, storing data in database for historical data analysis and traceability, and empowering enhanced production, quality, and equipment management.

AbioPIMS/AbioExpert is compatible with OPC UA protocol. AbioExpert can integrate with external devices (such as Nova Biochemical Analyzer, Kaiser Raman Analyzer, and cell counters) for advanced process strategies.

AbioPIMS/AbioExpert has a RECIPE design functionality with a graphical programming interface. Users can implement complex process strategies without any programming expertise.

AbioPIMS/AbioExpert is compatible with Applikon my-Control/ez-Control/ez2-Control series bioreactors



AbioBundle M-Series:

Utilizes the m-Control controller in a classic mini design, offering a compact footprint that saves space while enabling multi-unit parallel control. Supports 250mL/500mL/1L/2L/3L glass vessels, with optional configurations up to 15L.

AbioBundle E-Series:

Features ePlus-Control or eDual-Control controllers with a classic BenchTop design, intuitive touchscreen interface, and flexible configurations. Available in single-control, dual-control, or four-control modes. Supports 1L/2L/3L/5L/7L/15L/20L single-wall or jacketed glass vessels, tailored to user needs.

AbioBundle P-Series:

Features the PLC-based p-Control controller with robust expandability. Available in single-control, dual-control, or four-control modes. Supports 1L/2L/3L/5L/7L/15L/20L single-wall or jacketed glass vessels.

AbioBundle D-Series:

Features the DeltaV-based d-Control controller. Supports 250mL/500mL/1L/2L/3L/5L/7L/15L/20L single-wall or jacketed glass vessels. It can integrate with controllers supporting OPC, Modbus, or Profibus DP protocols for advanced monitoring and control

AbioBundle M-Series Bioreactors

The AbioBundle M Series Bioreactors feature a classic small-scale bioreactor design, enabling precise downscaling of laboratory-scale reactors while maintaining the same flexibility and adaptability. The system offers customizable configurations to meet diverse customer needs.

Features

- The working volume covers 50ml~2.4L.
- Embedded m-Control offers multi-functionality in a small footprint; customizable casing in multiple colors.
- Parallel cultivation with independent monitoring of each reactor.
- Up to 32 m-Control controllers form a network of parallel reactors.
- Control operations easily through web browsers or mobile devices (data can be stored and monitored without SCADA software).
- Data can be scaled up directly, minimizing media consumption and saving cost.
- 250mL/500mL small bioreactors use a Peltier-based temperature control system, eliminating the need for a chiller.
- Small footprint, less than 1m² for a 4-tank system.
- Online automatic detection of control parameters: pH, temperature, DO, agitation, level, foam, etc.
- Modular design allows easy adjustments to suit various applications and process control strategies.
- AiOpt algorithm for precise control of process parameters.
- Up to 4 variable-speed pumps, each with an independent Prime button.
- Up to 5 gas mass flow controllers (MFCs).
- Supports commonly used electrodes in the market and is compatible with smart electrodes.
- Total Gas Flow Control
- The aeration system includes 1 overlay and 2 sparger ports, with options for different sparger sizes and shapes.
- The agitation system features a servo motor and various impeller types, suitable for cell culture or microbial fermentation.
- Equipped with a unique breathing light to indicate system working status.
- Compatible with external devices such as cell density modules, fluorescent pH/DO electrodes, balances, etc.
- Comes standard with AbioPIMS Lite or AbioExpert Lite software.
- (Optional) Configurable to support vessel sizes up to 15L.
- (Optional) Enables remote monitoring capabilities.
- (Optional) Provides remote alarm notifications via SMS, phone calls, email or WeChat.
- (Optional) Advanced functionalities such as enhanced feeding strategies tailored to customer needs

m-Control Controller

- m-Control is an advanced control system for small-scale bioreactors, compact and ideal for setting up parallel cultivation systems of up to 32 units for rapid experimentation.
- m-Control can be used for both cell culture and microbial culture, with quick configuration switching.
- m-Control is accessible via web browsers or mobile devices, ensuring seamless operation and data monitoring.
- m-Control is available in multiple colors for a personalized touch to your lab.



Applications

- Mammalian and stem cell, microbial, fungal, plant cell, insect cell culture
- Cell line screening, process optimization, media optimization, and toxicity studies.
- High-density, aerobic, and anaerobic fermentation; protein expression research.
- Process development for vaccines, antibodies, and cell/gene therapies
- Batch, fed-batch, perfusion, and continuous culture.
- R&D, Pilot and small-scale production work

Configuration	Working volume	Vessel Type
AbioBundle M 250ml	50~200ml	Single-wall
AbioBundle M 500ml	100~400ml	Single-wall
AbioBundle M 1L	0.3~0.9L	Single-wall
AbioBundle M 2L	0.3~1.7L	Single-wall
AbioBundle M 3L	0.6~2.4L	Single-wall

AiOpt Algorithm	Independent Prime Button	Remote Monitoring	Remote Alarm	Advanced Feeding Strategies	Support for Larger Vessels
The optimized AiOpt algorithm ensures precise control of process parameters.	Each built-in pump is equipped with an independent Prime button, allowing users to easily fill or empty pipelines. To prevent misuse, this function requires operator-level login access to activate.	Remote access is enabled through permission management, allowing users to monitor systems remotely.	Alarm notifications can be sent via SMS, phone, Email or WeChat.	Through the AppliSoftec software, any type of feeding strategy can be implemented.	By configuring external modules, vessel sizes can be expanded to support up to 15L.

AbioBundle E-Series Bioreactors

The AbioBundle E Series Bioreactors are robust, flexible, and easy to operate, with options for upgrades and expansions. Ideal for mammalian cell culture and microbial fermentation R&D projects, they offer configurations for single, dual, or quad controls. Supporting both single-wall and jacketed vessels, the series meets the demands of complex processes and is suited for a wide range of applications. The dual/quad control modes allow for mixing and matching of vessels with different volumes and types, all operating independently.

Features

- The working volume covers 0.3~16L
- Modular Design: Add or remove functional modules based on application requirements.
- No welded components on the head plate; all metal parts are made from 316L stainless steel. Non-contact areas have a mirror-polished finish, and contact areas are electro-polished for easy cleaning.
- Borosilicate Glass Vessels offer excellent resistance to shock and corrosion with smooth surfaces for easy cleaning.
- Available with single-control (ePlus-Control), dual-control (eDual-Control), supports quad-control).
- 13.3" touchscreen and colorful interface for intuitive operation.
- Built-in storage to ensure no data loss.
- Supports up to 23 operator accounts simultaneously with three-level password protection.
- Features a web interface for easy bioreactor setup and control via a browser.
- (Optional) Biomass module enables real-time cell density measurement and feedback feeding operations.
- Agitation system: Equipped with a servo motor and mechanical seal stirrer; upgradeable to magnetic coupling.
- (Optional) Enhanced gas module allows switching between 1 overlay and 2 sparger pathways per gas.
- Each vessel supports up to 6 mass flow controllers (MFCs).
- Feeding control: Supports external balance integration for advanced feeding strategies via PID control.
- ePlus-Control supports up to 4 constant-speed pumps, with optional variable-speed pumps. eDual-Control supports up to 4 variable-speed pumps per vessel, each with an independent mechanical Prime button.
- Total Gas Flow Control: Maintains constant total gas flow during culture to prevent excessive shear forces on cells.
- Comes standard with AbioPIMS Lite or AbioExpert Lite software.
- (Optional) Enables remote monitoring capabilities.
- (Optional) Provides remote alarm notifications via SMS, phone calls, email or WeChat.
- (Optional) Advanced functionalities such as enhanced feeding strategies tailored to customer needs



Applications

- Mammalian and stem cell, microbial, fungal, plant cell, insect cell culture
- Cell line screening, process optimization, media optimization, and toxicity studies.
- High-density, aerobic, and anaerobic fermentation; protein expression research.
- Process development for vaccines, antibodies, and cell/gene therapies
- Batch, fed-batch, perfusion, and continuous culture.
- R&D, Pilot and small-scale production work

Model	Working Volume	Vessel Type
AbioBundle ePlus 1L	0.3~0.9L	Single-wall / Jacketed
AbioBundle ePlus 2L	0.3~1.7L	Single-wall / Jacketed
AbioBundle ePlus 3L	0.6~2.4L	Single-wall / Jacketed
AbioBundle ePlus 5L	0.9~3.4L	Single-wall / Jacketed
AbioBundle ePlus 7L	1.5~5.4L	Single-wall / Jacketed
AbioBundle ePlus 15L	3.0~12L	Single-wall / Jacketed
AbioBundle ePlus 20L	3.0~16L	Single-wall / Jacketed

ePlus-Control Controller

- Upgraded from the ePlus-Control.
- Features a 13.3" LCD high-resolution display for easy observation and operation.
- Enhanced data processing capability for faster response.
- Great flexibility and compatibility
- Integrated with more advanced functions to handle complex processes

eDual-Control Controller

- Upgraded from the ePlus-Control, the eDual-Control can connect to two glass vessels simultaneously.
- Features a 13.3" LCD high-resolution display for easy observation and operation.
- Supports two vessels per controller, saving space and equipment costs.
- Expandable to control up to four vessels simultaneously.
- Vessels can run independently or concurrently.
- Offers flexibility with different volumes and configurations for each vessel.

AiOpt Algorithm

The optimized AiOpt algorithm ensures precise control of process parameters.

Independent Prime Button

Each built-in pump is equipped with an independent Prime button, allowing users to easily fill or empty pipelines. To prevent misuse, this function requires operator-level login access to activate.

Remote Monitoring

Remote access is enabled through permission management, allowing users to monitor systems remotely.

Remote Alarm

Alarm notifications can be sent via SMS, phone, Email or WeChat.

Advanced Feeding Strategies

Through the AppliSoftec software, any type of feeding strategy can be implemented.

AbioBundle P-Series Bioreactors

The P Series Bioreactors utilize a PLC-based control system designed for ease of use. Suitable for applications ranging from laboratory research to pilot-scale and production-scale operations, the system minimizes time and cost associated with scaling up. The p-Control controller can manage multiple vessels simultaneously, with options for tailored expansion.

Features

- The working volume covers 0.3~16L
- Touchscreen HMI, intuitive and user-friendly interface for simplified operation
- Siemens PLC platform
- Standard Fieldbus I/O Design to facilitate easy maintenance and functional expansion.
- Flexibility & Scalability, providing superior reliability and adaptability.
- Open platform that supports integration with systems like Pi data recording.
- Compliant with ISAS88, GAMP5, cGMP, etc.
- Measurement and Control Parameters:
 - pH, dissolved oxygen, temperature, foam, level, agitation.
 - Up to 6 gas channels per vessel.
 - Balance
 - Up to 4 built-in variable-speed pumps per vessel
- Enables simultaneous control of multiple bioreactors with different sizes, making scale-up more efficient.
- Comes standard with AbioPIMS Lite or AbioExpert Lite software.

Application

- GMP-compliant with audit trail for R&D or small-scale production
- Mammalian and stem cell, microbial, fungal, plant cell, insect cell culture
- Cell line screening, process optimization, media optimization, and toxicity studies.
- High-density, aerobic, and anaerobic fermentation; protein expression research.
- Process development for vaccines, antibodies, and cell/gene therapies
- Batch, fed-batch, perfusion, and continuous culture.
- R&D, Pilot and small-scale production work



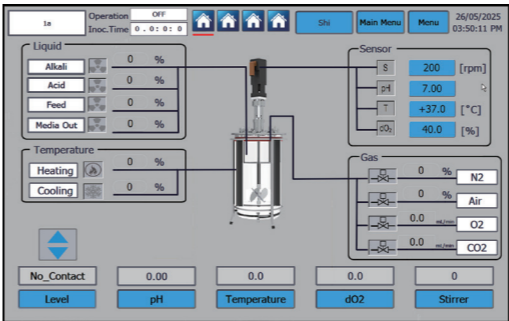
Siemens S7-1500



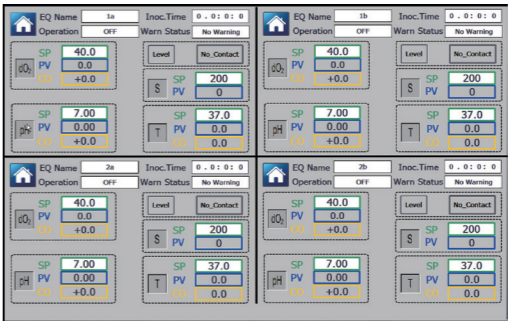
I/O module



Interface 1



Interface 2



AiOpt Algorithm

The optimized AiOpt algorithm ensures precise control of process parameters.

Independent Prime Button

Each built-in pump is equipped with an independent Prime button, allowing users to easily fill or empty pipelines. To prevent misuse, this function requires operator-level login access to activate.

Remote Monitoring

Remote access is enabled through permission management, allowing users to monitor systems remotely.

Remote Alarm

Alarm notifications can be sent via SMS, phone, Email or WeChat.

Advanced Feeding Strategies

Through the AppliSoftec software, any type of feeding strategy can be implemented.

AbioBundle D-Series Bioreactors

The AbioBundle D Series Bioreactors are based on the open-architecture DeltaV™ solution, utilizing Emerson DeltaV™ software and hardware. By integrating the automation advantages of DeltaV™ with Applitech's expertise in bioprocess technology, this platform provides a unified solution.

The DeltaV™-based AbioBundle D-Series facilitates seamless transfer of process control expertise and data management from laboratory settings to pilot and production scales, enabling efficient technology migration, scalable data transmission, shorter development cycles, and reduced costs.

Benefits

Modern Technology and Software Solutions

The d-Control control system provides you with a real-time database. You can view online real-time data displays, trends, alarms and event logging data, and even use this data for control strategies.

Enhanced Flexibility and Scalability

Up to 32 bioreactors can be connected to each system. It is possible to combine third-party data for advanced control strategies. Customized features are available to meet any complex control requirements. Data from the control system can also be transferred to higher level systems (MES,LIMS, ERP, etc.) as a basis for data analysis.

Improved User Experience via Advanced Automation Tools

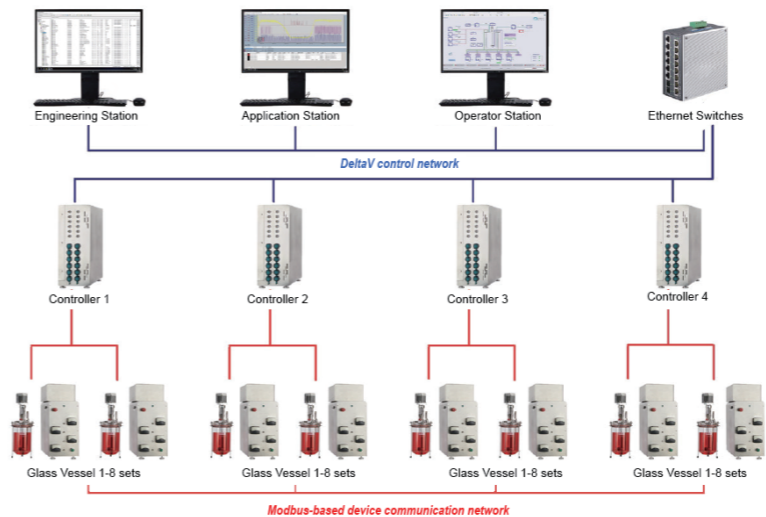
Users have direct access to a wide range of operational information, including current process values, status values, operational values, and alarms with appropriate alarm priorities and timestamps, for easy operation and clear information.

Faster Time-to-Market and Cost Reduction

Easily and seamlessly migrate research data and control strategies from the laboratory to pilot and production plants.

Applications
Microbial and Cell Culture
Fed-Batch, Perfusion, and Continuous Cell Culture
Single-Use Bioreactor Processes
Stainless Steel Bioreactor Processes for Pilot and GMP Commercial Manufacturing
General Bioreactor Applications

System Architecture Diagram



The system architecture integrates hardware, software, and interfaces, creating a software solution specifically tailored for bioreactors. Engineers and operators can efficiently monitor reactor operations and utilize tools to design and implement solutions. Connectivity with other systems is achieved through industry-standard OPC protocols, enabling system enhancement and optimization.

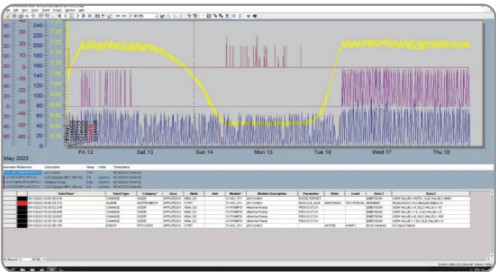
Features

- Open Architecture**
Uses open communication protocols with a scalable system architecture.
- Customizable DeltaV™ Software**
Provides tailored control strategies based on specific client requirements.
- Alarm**
Prioritizes alarms by importance, including factors such as operator relevance, acknowledgement status, activation state and designated responsibility area.
- SMS Alarm**
Sends real-time alarm notifications via SMS to designated personnel, ensuring timely resolution.

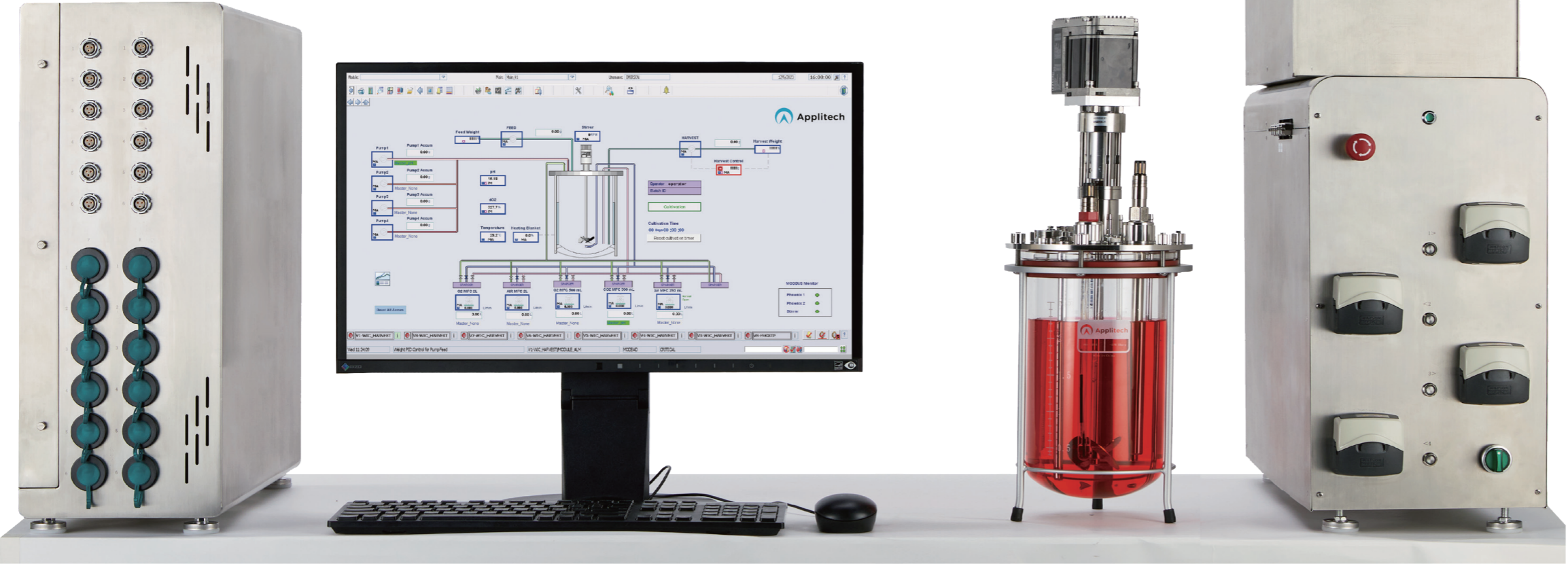
01/01/2413:58:20 M245 PH
Alarm started 11.12541

01/01/2413:58:49 M245 PH
Alarm ended 7.003653

- Process Historical Data View**
Embeds status information, alarms, and event logs collected by the DeltaV system into trend charts, providing a more accurate and comprehensive historical data view.



- Reports**
Offers MS-Excel-based reporting and analysis tools for easy integration of historical data into Excel spreadsheets.
- Advanced Automation Tools for Optimal User Experience**
 - Bioreactor Overview
 - Sensor/Actuator Calibration Overview
 - Feed Monitoring
 - Total Gas Flow
 - Weight Control
 - Multi-point Cascade
 - Perfusion
 - Cell Culture Mode



AppliSoftec Bioprocess Information Management System

AppliSoftec is available in two series: AbioPIMS and AbioExpert, with each series divided into four versions based on functionality: Lite, Standard, Advanced, and GMP.

AbioPIMS series supports AbioSUS Single-Use Bioreactors, AbioWave Single-Use Rocking Bioreactors, and AbioBundle M/E/P Series Glass Bioreactors.

AbioExpert Series supports AbioBundle M/E/P Series Bioreactors, AbioPilot Stainless Steel Bioreactors, and can also collect data from analytical devices such as Nova and Kaiser.

The AppliSoftec Series Software is also compatible with the Applikon my-Control, ez-Control, and ez2-Control series bioreactors.

The AbioBundle M/E/P Series Bioreactors come with AbioPIMS Lite or AbioExpert Lite Software by default, with optional upgrades to higher-level versions within the same series.

AbioPIMS Bioprocess Information Management System

AbioPIMS (Process Information Management System) is a process information system developed by Applitech for the industrial biotechnology and biopharmaceutical industries.

- Features:**
 - Enables enterprise-wide data management and information sharing across all divisions and subsidiaries.
 - Rapidly addresses the needs of bioprocess development and production.
 - Enhances efficiency, cost-effectiveness, and reduces engineering expenses.
 - Compatible with major bioreactor platforms, integrating seamlessly with analytical and operational instruments for comprehensive data acquisition.

- Access Management:**
 - Password protection; customizable access/operation permissions; user group configuration.

- 21 CFR Part 11:**
 - Adheres to 21 CFR Part 11 standards, offering three security levels: Operator, Supervisor, and Administrator.
 - Provides event logging, audit trails, and electronic signature capabilities.

Batch	Time	Location	Operator	Device	Parameter	Value	Unit	Comment
2024-05-10-001	2024-05-10 00:00:00	101-101-001	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-002	2024-05-10 00:00:00	101-101-002	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-003	2024-05-10 00:00:00	101-101-003	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-004	2024-05-10 00:00:00	101-101-004	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-005	2024-05-10 00:00:00	101-101-005	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-006	2024-05-10 00:00:00	101-101-006	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-007	2024-05-10 00:00:00	101-101-007	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-008	2024-05-10 00:00:00	101-101-008	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-009	2024-05-10 00:00:00	101-101-009	Operator	AbioPilot	pH	7.0	pH	
2024-05-10-010	2024-05-10 00:00:00	101-101-010	Operator	AbioPilot	pH	7.0	pH	

- Configuration:**
 - With a variety of data acquisition port configuration, the system specifies the data acquisition channel and data import template file.
 - ① Supports multi-device integration with connection to parameter configurations and control strategies.

GENERAL SETTING

CONNECTION SETTING

STORAGE SETTING

Polling Rate (ms) 1000

Maximum Retry Times 1

Reconnection Speed (s) 10

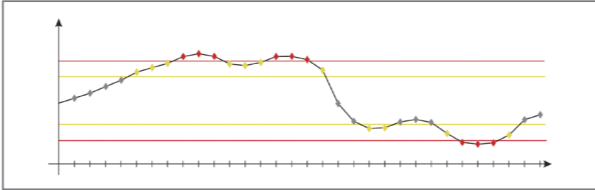
IP 192.168.1.160

Port 1883

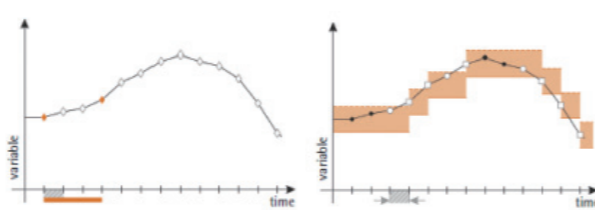
Device Ident. 1-31.2-32

Connection Detection

- ② Advanced alarm settings: high-high, high, low, low-low thresholds with customizable alarm and response strategies.



- ③ Flexible storage modes: periodic or event-based, with value transformations and display configurations.



- OPC:**
 - Built on an OPC platform, the OPC Client ensures flexible device connectivity, enhancing control over critical process parameters.
- UI:**
 - Intuitive configuration processes streamline usability and accelerate task execution. Navigation tools allow quick access to configuration, monitoring, trending, alarms, and sampling modules.



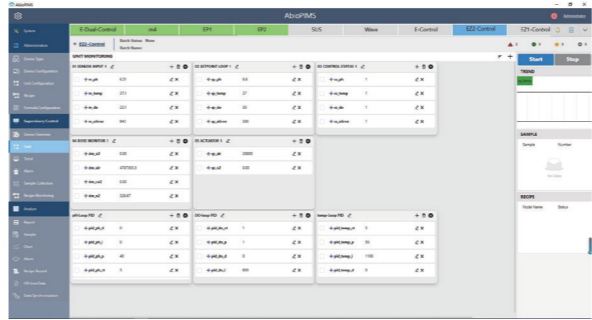
- Data Monitoring & Management:**
 - Comprehensive monitoring and historical data recording with periodic and event-driven save modes; ensures data integrity and security, enabling fast, robust, and searchable data management; supports exporting data and configuration information into customizable reports; includes extensive system logs, alarm histories, and traceable operational records.



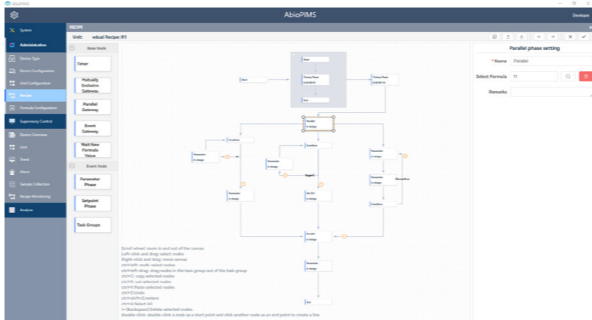
- CHART:**
 - The chart window provides robust visualization capabilities, allowing users to view all relevant process parameters and configure online trends as needed:
 - ① Options for zooming, panning, stretching, clipping, and selecting time ranges. Users are also able to modify curve styles, choose to hide or display parameters, and add, edit, or delete individual charts.
 - ② Compares and track process data across up to 8 historical batches simultaneously, aligned on a process timeline; synchronizes comparisons between current running data and historical data on the same timeline for comprehensive analysis.



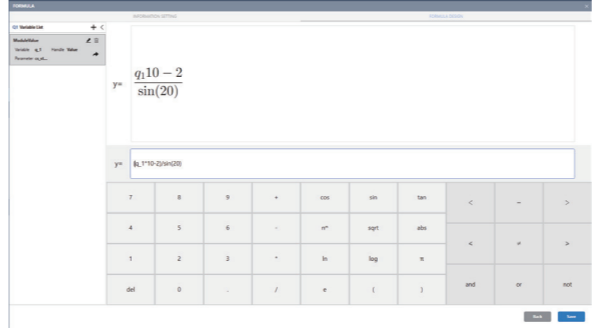
- MONITOR:**
 - Quick switching to 24 monitoring units, allowing detailed visualization of all relevant information.
 - Customizable monitoring module displays and navigation to menus like batch operations, alarms, recipes, real-time trends, and sampling.



- CONTROL:** Capability for individual or batch parameter control.
- Recipe Design:**
 - Simple and intuitive recipe design guided by on-screen instructions.
 - Allows advanced control strategy development, automatically adjusting setpoints based on time and cultivation conditions.
 - Requires no programming skills; users can drag and drop logic blocks to create branches, loops, waits, jumps, or parallel executions.



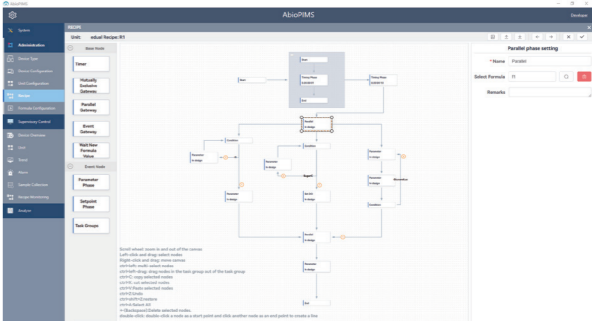
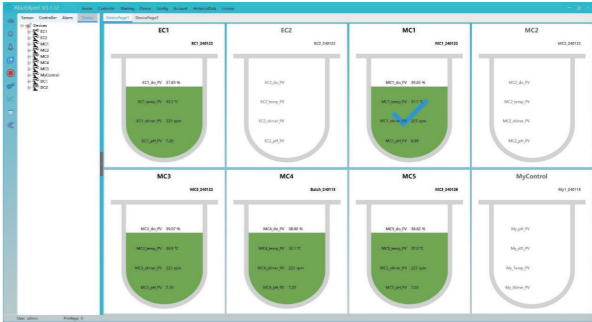
- Calculator Module:**
 - Efficiently transforms data with calculation tools for key bioprocess parameters and indirect variables.
 - Integrates seamlessly into recipe modules to enable logical connections and process automation.



AbioExpert Bioprocess Information Management System

AbioExpert is a professional software solution independently developed by Applitech, specifically designed for stainless steel bioreactor applications and built in parallel with AbioPIMS. It is widely applicable in industrial biotechnology and biopharmaceutical industries.

While AbioExpert shares core functionalities with AbioPIMS, its application range differs. The AbioExpert series is primarily intended for AbioPilot Stainless Steel Bioreactors and does not support AbioSUS Single-Use bioreactors or AbioWave Rocking Bioreactors.



Additional Information

- Free Trial**
 - All AppliSoftec software series come with a free trial for the first 60 days post-installation.
- Software Updates**
 - AppliSoftec software is continuously updated, and customers can freely upgrade to the corresponding versions.
- Minimum System Requirements**
 - Processor/Clock Rate: Multi-core processor, 2.5 GHz
 - RAM: 8 GB (16 GB recommended)
 - Hard Disk Space: 256 GB
 - Optical Drive: DVD-ROM drive
 - Network Adapter: 1+ LAN adapter, RJ-45, 100 Mbit
 - Graphics Card: DirectX 10, 1 GB RAM (recommended)
 - Screen Resolution: 1920 x 1080, 100% scaling
 - Display Monitor: 23.8-inch monitor
 - Operating System: Microsoft Windows 10 (64-bit)
 - Runtime Components: .NET Framework 4.0 / .NET Framework 5.0 / .NET Core 3.1
 - Other Software: Microsoft Excel (2013 or newer recommended) / SQL Server 2014 / MongoDB

AppliSoftec Series Software Feature List

AppliSoftec Specifications	AbioPIMS Lite AbioExpert Lite	AbioPIMS Standard AbioExpert Standard	AbioPIMS Advanced AbioExpert Advanced	AbioPIMS GMP AbioExpert GMP
GENERAL				
User interface languages	AbioPIMS: Chinese, English; AbioExpert: English			
Operating system	AbioPIMS: Windows 10 64-bit; AbioExpert: Windows 7 or later, 64-bit			
Communication drivers included	m-Control, ePlus-Control, eDual-Contorl, p-Control; my-Control, ez-Control, ez2-Control			
Optional drivers for analytical Instruments	No	No	AbioExpert: Nova Flex2, Kaiser and more	
Number of supported process units	AbioPIMS: up to 24 units; AbioExpert: up to 16 units			
Measurement of process values from controllers	Yes	Yes	Yes	Yes
Control of process setpoints in process controllers	No	Yes	Yes	Yes
Starting and stopping of control loops	No	Yes	Yes	Yes
Programming of local process controllers	No	No	Yes	Yes
Reading of calibration data	No	No	Yes	Yes
Automatic report generation	No	Yes	Yes	Yes
21 CFR part 11 compliant	No	optional	optional	Yes
GAMP5 compliant	Yes	Yes	Yes	Yes
ISA S88 standard	Yes	Yes	Yes	Yes
Password protection	No	Yes	Yes	Yes
User definable access rights	No	Yes	Yes	Yes
Remote Access	No	optional	Yes	Yes
Process value alarms	Yes	Yes	Yes	Yes
Process value simulation	Yes	Yes	Yes	Yes
OPC UA/DA client	AbioPIMS: UA/DA; AbioExpert: UA			
Auto start after power failure	Yes	Yes	Yes	Yes
DATA MANAGEMENT				
Database management	AbioPIMS: Microsoft SQL/MongoDB; AbioExpert: MySQL			
Minimum sampling frequency	1 s	1 s	1 s	1 s
Sample frequency selectable per parameter	Yes	Yes	Yes	Yes
On line data collection	Yes	Yes	Yes	Yes
Off line data collection	Yes	Yes	Yes	Yes
Data export to Excel	Yes	Yes	Yes	Yes
Data export in ASCII format	Yes	Yes	Yes	Yes
Graph export in graphics format	Yes	Yes	Yes	Yes
On-line calculations using on-line and off-line data	No	Yes	Yes	Yes
Configuration management	No	Yes	Yes	Yes
Sample data management	No	Yes	Yes	Yes
DATA DISPLAY				
Line graphs	Yes	Yes	Yes	Yes
Maximum Number of y-axes per Graph	AbioPIMS: 6 y-axes; AbioExpert: 8 y-axes			
Procedure flow chart	No	Yes	Yes	Yes
Combination of current and historic data in graphs	Yes	Yes	Yes	Yes
Combination of different active batches in graphs	Yes	Yes	Yes	Yes
Measured data table display	Yes	Yes	Yes	Yes
Scatter plots	Yes	Yes	Yes	Yes
Storage of predefined graph settings	Yes	Yes	Yes	Yes
SUPERVISORY CONTROL				
Programming of time based actions	No	No	Yes	Yes
Programming of event based actions	No	No	Yes	Yes
Manual setting of local control setpoints	No	Yes	Yes	Yes
Recipe definition	No	No	Yes	Yes
OTHER				
Event viewer for system comments	Yes	Yes	Yes	Yes
Audit trail	No	optional	optional	Yes
Validation support	No	optional	optional	Yes
Service & support package	1 st year			

AbioBundle M/E/P/D Series Bioreactors Technical Specification

Vessel Parameters	Total Volume(L)	Working Volume(L)	Minimum Working Volume(L)	Total Volume H/D Ratio	Working Volume H/D Ratio
250ml Single-Wall Vessel	0.29	0.2	0.05	2.3	1.6
500mL Single-Wall Vessel	0.55	0.4	0.1	2.1	1.5
1L Single-Wall Vessel	1.25	0.9	0.3	2.1	1.5
1L Jacketed Vessel	1.25	0.9	0.3	2.1	1.5
2LSingle-Wall Vessel	2.2	1.7	0.3	2.3	1.9
2L Jacketed Vessel	2.2	1.7	0.3	2.3	1.9
3LSingle-Wall Vessel	3.1	2.4	0.6	1.9	1.5
3L Jacketed Vessel	3.1	2.4	0.6	1.9	1.5
5LSingle-Wall Vessel	4.8	3.4	0.9	1.6	1.1
5L Jacketed Vessel	4.8	3.4	0.9	1.6	1.1
7LSingle-Wall Vessel	6.8	5.4	1.5	2.2	1.8
7L Jacketed Vessel	6.8	5.4	1.5	2.2	1.8
15LSingle-Wall Vessel	16.5	12	3	1.7	1.45
15L Jacketed Vessel	16.5	12	3	1.7	1.4
20LSingle-Wall Vessel	23	16	3	2.4	2
20L Jacketed Vessel	23	16	3	2.4	2
Vessel Parameters	Internal Diameter (mm)	Internal Height (mm)	Autoclave Dimensions (DxH mm)	Headplate Ports	
250ml Single-Wall Vessel	55	125	ø180 x 240	16: Stirrer*1, PG13.5*2, M12*1, M8*5, Fixed ports*7	
500ml Single-Wall Vessel	71	145	ø210 x 280	17: Stirrer*1, PG13.5*2, M12*2, M8*5, Fixed ports*7	
1L Single-Wall Vessel	95	200	ø180 x 380	13: M30*1, G3/4**1, M18*4, Fixed ports*7	
1L Jacketed Vessel	95	200	ø220 x 420	13: M30*1, G3/4**1, M18*4, Fixed ports*7	
2LSingle-Wall Vessel	105	240	ø200 x 460	16: M30*1, G3/4**1, M18*5, 10mm*6, 6mm*3	
2L Jacketed Vessel	105	240	ø240 x 500	16: M30*1, G3/4**1, M18*5, 10mm*6, 6mm*3	
3LSingle-Wall Vessel	130	240	ø200 x 460	18: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*6, 6mm*3	
3L Jacketed Vessel	130	240	ø240 x 460	18: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*6, 6mm*3	
5LSingle-Wall Vessel	160	250	ø200 x 520	19: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*10	
5L Jacketed Vessel	160	250	ø260 x 570	19: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*10	
7LSingle-Wall Vessel	160	350	ø260 x 630	19: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*10	
7L Jacketed Vessel	160	350	ø360 x 670	19: M30*1, G3/4**1, M18*5, 12mm*2, 10mm*10	
15LSingle-Wall Vessel	222	440	ø400 x 730	19: M30*1, 27mm*6, 12mm*2, 10mm*10	
15L Jacketed Vessel	222	440	ø480 x 760	19: M30*1, 27mm*6, 12mm*2, 10mm*10	
20LSingle-Wall Vessel	222	620	ø400 x 920	19: M30*1, 27mm*6, 12mm*2, 10mm*10	
20L Jacketed Vessel	222	620	ø500 x 1000	19: M30*1, 27mm*6, 12mm*2, 10mm*10	
Controller Performance Parameters	m-Control	ePlus-Control	eDual-Control	p-Control	d-Control
Dimensions (W x D x H, mm)	195x370x340	428x485x800	516x584x800	main380×620×790 vice380×620×780	Main200×550×520 vice227×620×585
Weight (kg)	14	40	58	main75,vice65	main17,vice45
Screen Availability	No	Yes	Yes	Yes	No
Platform Type	Embedded+IPC	Embedded	Embedded+IPC	PLC	Delta V
Recommended Application Stage	Research and Development (R&D)	Research and Development (R&D)	Research and Development (R&D)	R&D / Production	R&D/Production
Control Mode	Single control	Single control	Single/dual/quad control	Single/dual/quad control	Multi-unit control
Supported Glass Vessels	250ml-3L(Single-welled)	1L-20L	1L-20L	1L-20L	250ml-20L
Temperature Control	Peltier or electric heating blanket				
Power Supply	Single-wall vessels use electric heating blanket/heat exchanger for temperature control; Jacketed vessels use water circulation in the jacket for temperature control.				
Agitation System	220 V (± 10%) , 50/60 Hz , 5/10 A				
Impellers and Baffles	Direct-drive servo motor with mechanical seal stirring assembly; stirring speed range: 0–2000 rpm				
Feeding System	Offers various sizes of three-blade Marine impellers and six-blade Rushton impellers, with options for custom-designed impellers for specific requirements. Fermenters come standard with three detachable baffles.				
Supported Built-in Peristaltic Pumps	Standard configuration includes three-channel feeding ports, with optional single-channel feeding port available; supports external peristaltic pumps, balances, and sensors. Combined with AppliSoftec software, various advanced feeding strategies can be implemented.				
Sampling System	4 variable-speed pumps	4 variable-speed or constant-speed pumps	8 variable-speed pumps	8 variable-speed pumps	Multiple variable-speed pumps
Aeration System	Fixed-height sampling tubes are standard, and multiple tube sizes are available; optional manual aseptic sampling systems or disposable sampling solutions are available.				
Supported Built-in MFCs	Overlay/Deep Large Bubble/Micro Bubble Ventilation alone or in combination; optional gas selection kit; total gas volume control				
Exhaust System	5	6	12	12	As required
Standard Electrodes	The fermenter comes with a standard exhaust condenser tube, while the cell culture vessel offers flexible configuration options.				
Optional Sensors	A Pt-100 temperature electrode; 12mm standard pH/DO electrodes, with default configurations for Mettler or Hamilton electrodes. Other brands are available upon request.				
User Password Permissions	Single-point level/foam electrodes; external balance; biomass probes; Raman spectroscopy probes, etc.				
Functional Expansion	Three-level password protection (operator, system engineer, service engineer); supports creating individual user accounts, allowing assignment to specific operators for exclusive use.				
Audit Trail	8DO and 4AI/AO	8DI、4AOand8AI/DO(external USB serial port box)	Multiple		Multiple
Other Features	Not compliant	Not compliant	Not compliant	Compliant	Compliant
	Built-in peristaltic pumps with independent Prime buttons; key process parameter algorithm control functionality; dynamic indicator light to display system working status.				