

Seamless

BioCommand® bioprocess control software for fermentation and cell culture

Added Convenience

BioCommand software packages are designed to enhance your ability to monitor and control your fermentation and cell culture processes through your personal computer.

BioCommand Track and Trend, Batch Control, and Batch Control Plus supervisory control and data acquisition (SCADA) software packages provide:

- > Automatic data logging
- > Remote monitoring and control capabilities
- > OPC-compatibility; data from other OPC-compatible devices in your lab or production facility can be integrated into your control strategies
- > Ability to monitor and supervise several fermentors and bioreactors from a single PC
- > Connectivity with our current and past PC-compatible fermentors and bioreactors, as well as with Windows® 10 operating systems
- > Batch Control and Batch Control Plus provide advanced programming capabilities with easy-to-use tools intuitive to most biological scientists and technicians

Which BioCommand is best for you?

Three distinct BioCommand packages are offered, providing the tools needed for research, optimization, and, if needed, security and audit trails to meet your regulatory requirements:

BioCommand Track and Trend

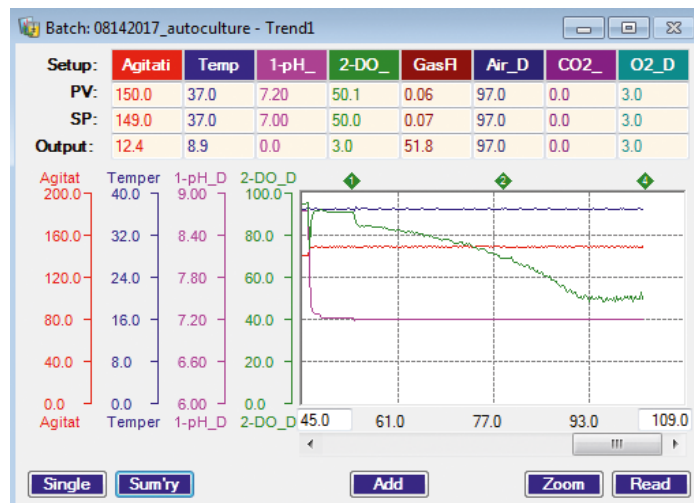
- > Ideal for basic lab management
- > This package provides full monitoring and historical record keeping capabilities; with control of setpoints, alarm settings and trend displays

BioCommand Batch Control

- > Includes all the features of Track and Trend, plus equipment lock-out and additional recipe features such as programming capability and a customizable synoptic display
- > The right choice to optimize and control your process

BioCommand Batch Control Plus

- > Adds three levels of security (operator, supervisor and administrator), event logs, audit trails and a database structure to help comply with 21 CFR Part 11 guidelines regarding electronic record keeping
- > Allows the powerful control capabilities of BioCommand to be utilized in FDA-validated processes

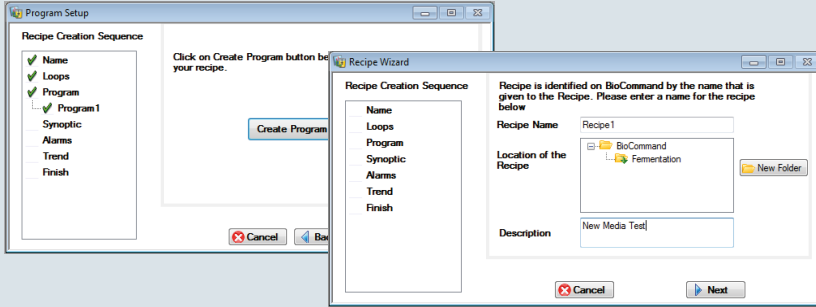


Up to eight parameters can be displayed per window; and multiple windows can be opened at a time. Track multiple parameters from one or more process runs; compare historical vs. current values; and export it all to a report if desired. Compress several day's data onto one screen for an overview of events, or "zoom in" to view the details. Our new customizable "add event" feature allows you to easily add notes or tags to your batch record to track events or conditions — such as inoculation or glucose addition — that may have transpired.

BioCommand Comparison

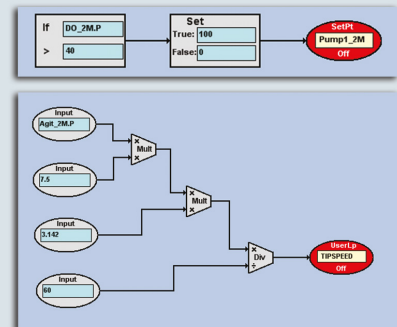
Recipe Features	Track & Trend	Batch Control	Batch Control Plus
Recipe Info	•	•	•
Loop Info	•	•	•
Alarms	•	•	•
Trend Graphs	•	•	•
Programming		•	•
Synoptic Display		•	•

Batch Features	Track & Trend	Batch Control	Batch Control Plus
Batch Info	•	•	•
User-Defined Event Log	•	•	•
Summary	•	•	•
Loop Info	•	•	•
Alarms	•	•	•
Trend Graphs	•	•	•
Data Log	•	•	•
Reports	•	•	•
Programming		•	•
Synoptic Display		•	•
Equipment Lock-Out		•	•
Audit Trail			•
Security			•



The improved recipe wizard, standard in all three packages, provides easy-to-follow onscreen instructions that walk you through the set-up of recipes, start to finish. Check marks indicate which parts of the recipe you have already created and saved, and which steps you still need to complete.

The BioCommand powerful programming feature has been designed to help scientists and process technicians write sophisticated control strategies to automate setpoint changes based on culture conditions and time. No programming skills needed. Simply drag and drop the logic blocks into place to create “If-Then” statements. In the example (right, top), if the DO is greater than 40, the software automatically adjusts the setpoint of Pump 1 to 100. If the statement is false, the setpoint is set to 0. Programs can also be used to calculate values which are not already present as loops based on already-available information (right, bottom). Here, tip speed is calculated from a mathematical formula and agitator speed. This value becomes a new loop and can be recorded as part of the batch information. For advanced programmers, Visual Basic script can also be used.



For infinite convenience you can open and view multiple screens at a time; simply click on the blue header to collapse individual screen views:

- 1. Batch and recipe explorer screens,** included in all three BioCommand packages, provide at-a-glance viewing and easy navigation to all your recipe information, batch runs, alarm settings, control loops and more. They eliminate the need to close your process window to hunt for a stored recipe or file. Scan the list, locate the batch, double-click to open.
- 2. Trend graph windows:** Custom trend screens allow you to compare and track all of your process data. Multiply trend graph windows can be simultaneously opened.



- 3. Batch summary screen** displays setpoints, current values, and more. Provided in all three BioCommand packages.

- 4. Program screen** displays user-defined programs as described above.

BioCommand Specifications*

System Requirements	Supported OS	Windows 10 (Professional, Enterprise) – English OS Only
	Required Hardware	CD-ROM and Unshared Serial Port (RS-232)
	32-Bit Systems	Computer with Intel or compatible 1GHz or faster processor (2 GHz or faster is recommended. Only a single processor is supported.) Minimum of 512 MB of RAM (1 GB or more is recommended) 4 GB of free hard disk space
	64-Bit Systems	1.4 GHz or higher processor (2 GHz or faster is recommended. Only a single processor is supported.) Minimum of 512MB of RAM (1 GB or more is recommended) 4 GB of free hard disk space
Supported Equipment	All instruments using the NBS AFS, NBS MODBUS, TCP MODBUS and Allen Bradley MODBUS communication protocols. These include: BioFlo/CelliGen 120, 320, 415, 510, 610, 720 and Pro; Allen Bradley Controller and NBS Process Controllers: USB to Serial Converter; Analog I/O Module. Selected legacy controllers are also supported.	
Communications	Protocol: NBS AFS / NBS MODBUS / AB MODBUS / TCP MODBUS Fermentor to MCA: RS-422 Multidrop MCA to Fermentor: RS-232 Maximum of four systems per com port recommended	
Data Logging	Automatically initiated; User-selected interval; Independent data logs for each process; Secure database	
Displays	Trend Graphs: Up to 8 x-y plots on one window Batch Summary: Alphanumeric table of loop values Synoptic: Graphical representation of process information Programs: Displays current control diagrams Alarms: Current alarms, alarm log, alarm setup Reports: Can be run any time for current or historical batches Event Log: Displays all batch events which have occurred (Batch Control Plus only) User-Defined Event Log: Displays all "Add-Events" marked on trend screens Data Log: Includes all loop data for the batch	
User Authorization Levels	Administrator, Supervisor and Operator (Batch Control Plus package only)	

Ordering Information

Item	Part No.	Description
BioCommand® Track and Trend	M1326-0000	Includes Program on CD-ROM, one Multi-Controller Connection Kit and BioCommand® User Guide. Additional kits and/or cables may be purchased separately, as listed below.
BioCommand® Batch Control	M1326-0010	
BioCommand® Batch Control Plus	M1326-0020	Contains one 50' / 16 meter RS-422 Serial Cable, one RS-232/RS-422 Converter and one BioCommand® Cable. Kit contents may also be ordered individually, as listed below.
Multi-Controller Connection Kit	M1286-0100	
50 foot / 16 meter RS-422 Serial Cable	M1171-8010	One cable is included with each BioCommand® package. Purchase one additional cable for each additional process controller. Multiple cables may be connected for longer lengths. Length each: 50 feet /16 meters
RS-232/RS-422 Converter	P0460-7550	Used to convert RS-232 serial pin-out to RS-422 cable connection
BioCommand® Cable	M1286-8010	Converts RS-232 signal to RS-422 to facilitate BioCommand® communication with controller
RS-232/USB Interface Box	M1287-0020	Converts up to eight RS-232 COM ports into USB for customers whose computers lack an RS-232 connection

* Specifications and catalog numbers subject to change without notice.

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