BD FACSDiva™ software, one of the most widely used flow cytometry acquisition and analysis software applications, helps to expand flexibility and improve efficiency in today's integrated laboratory.

The software provides convenient and easy-to-use tools to simplify creation and management of samples and experiments. A wide array of analysis features provide laboratories that need a single software platform, efficient data management tools to simplify data storage and improve data organization. In addition, automated, flexible tools enable users to export data for downstream applications.

When used with BD FACSDiva™ CS&T research beads, the software provides a set of robust features that can be used to characterize, optimize, and set up BD Biosciences cell analyzers and sorters. System optimization can reduce QC time from an hour to minutes, and enable you to track instrument performance with Levey-Jennings plots. The software can also automatically adjust user-defined application settings to account for changes in the cytometer. Standardizing experiments by using application settings can ensure consistency of results over time and across multiple platforms.

Table 1. Specifications

<table>
<thead>
<tr>
<th>Cytometers supported</th>
<th>BD FACSCanto™ platform, BD FACS™ Aria™ platform, BD™ LSR II, BD LSRFortessa™, BD LSRFortessa™ X-20, and BD FACS™ Celesta™ flow cytometers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options supported</td>
<td>BD FACS™ Loader for the BD FACSCanto platform, BD™ High Throughput Sampler for the BD FACSCanto platform, BD FACS™ Celesta, and BD LSR platforms, and BD FACS™ Accudrop for the BD FACS™ Aria platform</td>
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<tr>
<td>Plates supported</td>
<td>U, V, and flat-bottom 96-well plates, flat-bottom 384-well plates, Terasaki plates (BD FACS™ Aria platform only)</td>
</tr>
<tr>
<td>Plot types</td>
<td>Histogram, 2D dot plot, 2D contour plot, 2D density plot</td>
</tr>
<tr>
<td>Scaling</td>
<td>Linear, log, biexponential</td>
</tr>
<tr>
<td>Auto gating</td>
<td>Autopolygon, autointerval, snap-to polygon, snap-to interval</td>
</tr>
<tr>
<td>Standard statistics</td>
<td>Minimum, maximum, geometric mean, mean, median, standard deviation, percent coefficient of variation, mode</td>
</tr>
<tr>
<td>Robust statistics</td>
<td>Robust standard deviation (rSD), robust percent coefficient of variation (rCV)</td>
</tr>
<tr>
<td>Export formats</td>
<td>JPG, TIFF, PNG, BMP, XML, CSV, PDF</td>
</tr>
<tr>
<td>Operating system</td>
<td>Microsoft® Windows® 7 Professional, Service Pack 1 (32-bit)</td>
</tr>
</tbody>
</table>
In a single application, BD FACSDiva software provides common and easy-to-use features that simplify instrument use, experiment and sample management, and ease transition across BD instrument platforms, from cell analysis to sorting.

**Graphical interface for changing cytometer configurations**
Create configurations for multiple filter, mirror, and fluorophore combinations used in the laboratory. Only users with administrative access can create, modify, or delete configurations.

**Hierarchical browser interface for creating and managing samples and experiments**
Create new experiments based on an existing template, add new specimens and tubes to an experiment, and select a plate type for the experiment (with loader option). Share experiments as needed to support efficient research collaboration and data sharing.

**Common workspace for plots and statistics**
Organize your workspace with use of global and normal worksheets. Use global worksheets when creating plots and statistics for acquiring and recording data from a set of tubes. Use normal worksheets when displaying plots and statistics for multiple tubes on a single worksheet.

**Standard experiment layout for single-point experiment design**
Use the Experiment Layout window to quickly add labels, keywords, and acquisition attributes to a single tube, multiple tubes, specimens, or the entire experiment.

**Object Inspector to quickly view and edit attributes**
For a single object or set of objects on the worksheet or Browser.
When used with BD FACSDiva CS&T research beads, the BD Cytometer Setup and Tracking (CS&T) feature provides baseline performance characterization of the cytometer, then adjusts and tracks daily cytometer performance to ensure consistent cytometer performance. This reduces QC time from an hour to minutes, and ensures reproducible and accurate acquisition data every day.

**Cytometer setup and performance tracking workflow**
Automates the characterization of fluorescence detectors and the entire optical configuration for each supported cytometer, as well as tracks day-to-day cytometer performance.

Create cytometer configuration

Defines the optical layout of the cytometer, which includes filters, mirrors, and parameter labels.

Define baseline

Determines the baseline performance of the cytometer and a target mean fluorescence intensity (MFI) and linear range for each parameter.

Check performance - Run daily

Measures the variation from the baseline and records data for tracking day-to-day cytometer performance, and adjusts the photomultiplier tube (PMT) voltages for each parameter to place the bright bead population at the target value.

For each parameter, CS&T determines a baseline PMT voltage that places the dim bead at an MFI equal to 10 x standard deviation (SD).

Correctly setting PMT voltage gain improves resolution, and reduces re-classification errors, yielding reliable results.
BD FACSDiva™ Flow Cytometry Software

Application settings

BD FACSDiva software enables users to create and re-use their own unique settings for any application. These settings, called application settings, ensure that the data and analysis results are as reproducible as possible. Standardizing experiments by using application settings can ensure consistency of results over time and across multiple platforms. This helps take the guess work out of setting up the cytometer for specific application types for a range of users and results in reproducible data from day to day.

CS&T workflow with application settings

1. Define a baseline and run performance checks
   - Perform during initial setup for each configuration
2. Create application settings
3. Check performance
   - Daily performance check before running experiments to track the day-to-day cytometer performance and variation from the baseline
4. Open an experiment and apply application settings
   - When application settings are applied, the day-to-day variability in instrument performance will change PMT settings accordingly to ensure reproducible data collection from day to day with minimal operator effort.

Analysis and Data Management

BD FACSDiva software provides an extensive list of easy-to-use analysis features for laboratories that want a single software platform for acquisition and analysis. This includes:
- One-click snap-to gating tools
- Hierarchical gating
- The ability to copy and paste gates
- Histogram overlay
- Bi-exponential display
- User selectable plot configurations
- Batch analysis

Additional features include automated compensation, user log for user tracking, data management tools to simplify data storage and improve organization of flow cytometer data. For laboratories that want to integrate BD FACSDiva software for use with other third-party analysis software, BD FACSDiva software provides automated, flexible tools to export FCS data (FCS 2.0, 3.0, 3.1), experiments (XML format), and results (CSV, PDF) for external use.

For more information, visit bdbiosciences.com/instruments/software/facsdiva.