

Data Review and Analysis with iC FBRM™

Use this quick reference after all hardware/software connections have been established, the instrument configured, and an experiment run. For additional information, review the **FBRM Data Analysis Webinars** and video tutorial links on the iC FBRM Start Page under More Information.

I. Initial Steps

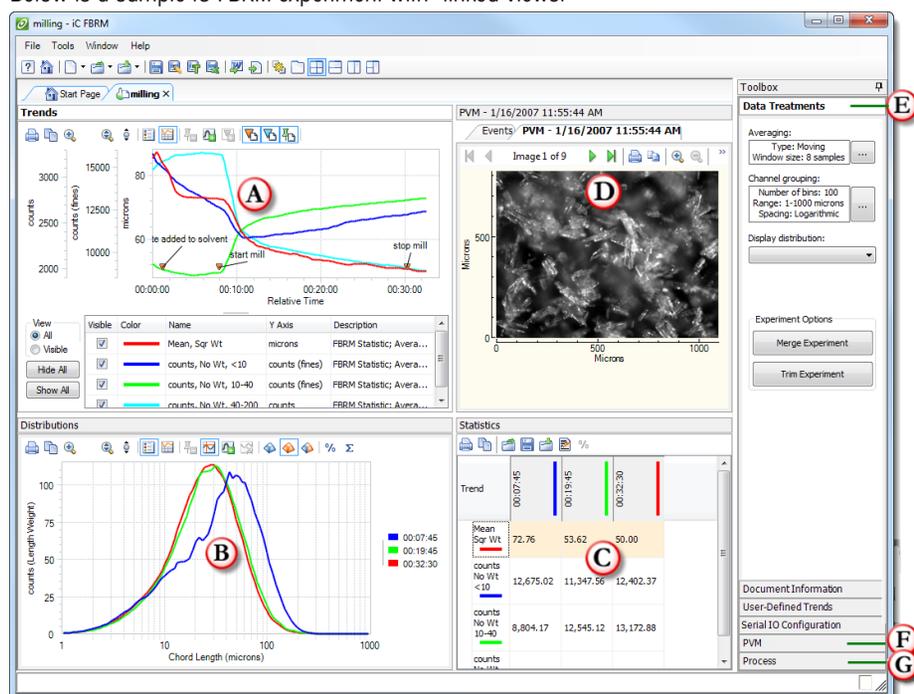
1. Open the iC FBRM™ software application.
2. Review and analyze data acquired with iC FBRM software or data acquired with iC Process™ for FBRM®.

To review and analyze data from iC FBRM—Click **Open Experiment** from the Start Page, select the file to analyze, and click **Open**.

To review and analyze data from iC Process for FBRM—Access the file through the Process task pane **G** in the iC FBRM Toolbox.

II. Reviewing Experiment “Linked Views”

Experiment data displays in linked views. Linked views are time-synchronized, meaning when you make a selection in one viewer, the other viewers display corresponding data. Below is a sample iC FBRM experiment with “linked views.”



- A Trends Viewer**—Displays trends of user-configurable statistics throughout the experiment.
- B Distributions Viewer**—Displays chord length distribution.
- C Statistics Viewer**—Statistical data in table form for the pinned distributions.

- D Particle Vision and Measurement (PVM)** (if applicable)—PVM images enhance FBRM data acquisition by displaying high-resolution images of particles and particle mechanisms. Link to the exported iC PVM images or open the PVM image sequences file (.seq) through the PVM task pane **F** in the iC FBRM Toolbox.

Working with Linked Views

Below are some options for controlling the view.

- Click a selected point in the Trends Viewer chart to display the corresponding distribution, statistics, and PVM image.
- Right-click in the Trends Viewer chart to enable Show Toolbar, Show Legend, Show Details, and Show Tooltips, if not already enabled.
- Right-click in the Trend Viewer and select X Axis Format to set the x-axis to Relative time, Absolute Time, or Sample Number.

III. Treating Data for Better and Faster Analysis

- Select the **Data Treatments** task pane **E** from the iC FBRM Toolbox.
- Click **Averaging** and select the “Enable averaging” check box. Choose **Moving** (adjust the number of successive measurements in a moving average) or **Exponential** (adjust the Alpha factor).
- Click **Channel Grouping...** and use drop-down menus to modify **Resolution, Spacing, and Range**, as needed. This updates the Distributions Viewer.
- Click **Display distribution** and choose between Chord Selection Models (CSMs) to improve the accuracy of the chord length distribution for a given particle system.
Primary CSM is best suited for tracking opaque particles, highly concentrated suspensions, small needle-shaped particles, and bimodal distributions.
Macro CSM is best suited for tracking droplets, faceted crystals, low concentration suspensions, agglomerates, and transparent crystals.

IV. Comparing Trends (Trends Viewer) **A**

Trends can be shared among experiments. You can manually shift an imported or “reference” trend in time to align a common event from two experiments. For example, you could compare the growth of particles following the start of solvent addition.

1. Open the Result Set or Experiment you want to reference.
2. Add Trends () to the current experiment.
3. Drop the graph into the Trend Viewer and right-click the Reference Trend to rename it.

V. Analyzing Distributions (Distributions Viewer)

Use the Distributions Viewer toolbar to manipulate the display. For example, to change the Y axis to display percent normalized rather than counts, click the % toolbar icon .

Adding or Pinning a Distribution for Analysis

1. In the Trend Viewer, click in the graph at the time of interest.
2. In the Distribution or Trend Viewer, click the green pin. The new pinned distribution is automatically generated in the Distribution Viewer and the Statistics Viewer will update to incorporate the new data.

Selecting the Mathematical Treatment for the Distributions

In Distributions Viewer toolbar, click one of the following three distribution buttons:

-  **Weighting Type 1** (blue)—Enhances resolution to fine chords (Unweighted).
-  **Weighting Type 2** (orange)—Enhances resolution to coarse chords (Sq. Weighted).
-  **Both** (blue and orange)—Simultaneous view.

NOTE: Other weighting types can be defined in place of Sq. Weighted including Inverse Length, Length Weight, and Cube Weight.

VI. Analyzing Statistics or PVM Images

To modify, add, or delete statistics: Click **Edit**  from the Statistics tab toolbar:

- Select a statistic to modify its type, rate of change, range, or weight.
- To add a statistic, select the type of statistic from the drop-down list and click **New**. After defining a statistic, click **Save**.

Viewing and Measuring Particles (PVM Viewer)

The PVM viewer enables you to analyze individual particles such as crystals or droplets from a corresponding PVM experiment.

VII. Annotating an Experiment

Annotations on conditions that affect the particle distribution can be added during a live experiment to provide useful details during results analysis. You can also add annotations as you review an experiment. To add an annotation, select a place in the trend chart and click the Add Annotation icon. 

VIII. Saving an Experiment as a Template

You can save an experiment as a template for future experiments (File > Save As Template). The template retains all sampling intervals, phases, averaging settings, statistics definitions, scan speed, Chord Selection Model.

Templates do not include any data or messages.

Templates are also used for method development in iC Process for FBRM.

IX. Generating Reports

To save your analysis, click Save  in the main toolbar. You can retrieve the analysis at any time by opening the experiment file. Analysis and data manipulation will not affect the original FBRM data.

Use the Create Report features—You can generate a formatted report of the experiment in Microsoft® Word® or XPS (read-only) format. To generate a report, click the toolbar buttons:

 (Create Read-Only Report) or

 (Create Microsoft Word Report).

Reports appear when generated, but they need to be saved.

Use the copy-and-paste feature—You can copy a chart and paste it in any software that supports bitmap (.bmp), metafile (.wmf), or text (data only). Right-click in the chart area, select Copy Chart to Clipboard, and choose the format. Open the reporting software and paste the chart. You can also copy-and-paste a trend or distribution to or from Microsoft® Excel®.

Export Data from the Entire Experiment—Select File > Export from the main toolbar. A CSV Export message identifies all the current display settings that will be exported with the comma-separated values.

Print a Linked View—Right-click in any iC FBRM linked view and select a printer.

NOTES:

- Refer to the [iC FBRM video tutorials](#), [online Help](#), or [software user guide](#) for more about iC FBRM.
- Review the [Quick Reference sheet on “Experiment Setup in iC FBRM”](#) for an introduction to starting an experiment.

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Subject to technical changes
MK-PB-0029-AC Rev D DCN 2750
P/N: 14696414 © 12/2015

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