iC FBRM™ 4.4

Release Notes

Dear Customer,

Thank you for purchasing iC FBRM 4.4, the simply powerful software package for ParticleTrack™ G400, G600/G600Ex, and E25 instruments. Everything you need to install and run iC FBRM 4.4 is stored on the installation media (CD-ROM or downloaded zip file).

Contents of the Installation Media

- – iC FBRM 4.4 Software (Autorun.exe)
- – iC FBRM 4.4 Release Notes (this file)
- – iC FBRM 4.4 Installation Guide
- – iC FBRM 4.4 Documentation Portfolio

For optimal viewing of the software documentation, use Adobe Acrobat Reader DC.

Installation Guide and System Requirements

Please install iC FBRM 4.4 according to the Installation Guide. This also describes the minimum PC requirements to run iC FBRM 4.4.

User Guide and Help File

The iC FBRM 4.4 Help file is available within the software. To access the context-sensitive Help from a specific place in the software, click in the software window and then hit F1 on your keyboard. The User Guide is located in the Documentation Portfolio.

Customer Support

If you encounter any issues with iC FBRM 4.4, please do not hesitate to contact your sales representative or service engineer, or contact us at:

support.msg@mt.com for General Support on your FBRM Instrument

iC@mt.com for Software Support

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Feature Comparison Table

Key features of iC FBRM 4.4 compared with earlier versions:

Feature	iC FBRM v4.0	iC FBRM v4.1	iC FBRM v4.2	iC FBRM v4.3	iC FBRM v4.4
Easy Data Collection and Instrument Control					
Wizard guided configuration & experiment setup	✓	✓+	✓+	✓+	✓+
Templates allow reuse of settings from previous similar experiments	✓	✓+	✓+	✓+	✓+
Live experiment toolbar consolidates key status and control functions	✓	✓	✓	✓	✓
Large value display for monitoring key parameters from across the room or under the fume hood	✓	✓	✓	✓	✓
Clean Window function for auto-removal of distributions collected while cleaning the probe	✓	✓	✓	✓	✓
Support for the Window Scraper	✓	✓	✓	✓	X
Support for existing FBRM G600 systems (without ACIO upgrade to ParticleTrack)	X	X	✓	X	X
Support for existing FBRM G400 systems (without ACIO upgrade to ParticleTrack)	X	X	✓	✓	X
Support for the ParticleTrack G400, G600, and E25 systems	X	X	X	✓	✓
Process task pane to monitor iC Process™ for FBRM runs	X	X	X	✓	✓
Intuitive Data Analysis and Visualization					
Import process data (temperature, RPM, IR, etc)	✓	✓	✓	✓	✓
Event linked annotations	✓+	✓+	✓+	✓+	✓+
Linked views simplify analysis and highlight data relationships	✓	✓	✓	✓	✓
Unweighted/weighted distributions together in one view	✓	✓	✓+	✓+	✓+
Integrated PVM image analysis features - zoom, measurements, adjustments	✓+	✓+	✓+	✓+	✓+
Live image import from iC PVM	X	X	X	X	✓
Drag & Drop Trends Between iC and iControl	✓	✓+	✓+	✓+	✓+
Import Trends from any iC/iControl Experiment File	✓	✓	✓+	✓+	✓+
User Defined Trends	✓	✓	✓+	✓+	✓+

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Feature	iC FBRM v4.0	iC FBRM v4.1	iC FBRM v4.2	iC FBRM v4.3	iC FBRM v4.4
Distribution Libraries	✓	✓	✓	✓	✓
3D Surface Viewer for Distributions	X	✓	✓+	✓+	✓+
Dual Chord Selection Models available for G400, G600	X	X	✓	✓	✓
Dual Chord Selection Models available for E25 probes	X	X	X	X	✓
Distributions from both Chord Selection Models displayed	X	X	X	✓	✓
D2i: AutoStats	X	X	X	✓	✓
Quick Reporting and Data Exchange					
Data export & import – fast and easy	✓	✓	✓	✓	✓
Integration with iControl™ for automated lab reactors	✓	✓+	✓+	✓+	✓+
Single click report generation	✓	✓	✓	✓	✓
Reporting to XPS read-only format with no need for MS Word to be installed	X	✓	✓	✓	✓
Support for iC Data Center to automatically capture, prepare and share experiments	X	X	X	✓	✓
Compatibility					
GAMP and 21 CFR Part 11 compliant	✓	✓	✓	✓	✓
Microsoft® Windows® 7 32-bit compatible	X	X	✓	✓	✓
Microsoft® Windows® 7 64-bit compatible (for new hardware)	X	X	X	✓	✓
iC FBRM Office compatible with 64-bit versions of Microsoft® Windows® 7	X	X	✓	✓	✓
Microsoft® Windows® XP	✓	✓	✓	✓	X
Microsoft® Windows® 8.1 Support	X	X	X	X	✓

✓ = Supported feature   ✓+ = Supported feature with enhancements   X = Not supported

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Enhancements for Version 4.4

Full Support for Microsoft® Windows® 8/8.1

iC FBRM 4.4 Instrument and Office versions fully support the 32-bit and 64-bit versions of Microsoft® Windows® 8.1 as well as Microsoft® Windows® 7. Note that Microsoft® Windows® XP and Vista are no longer supported.

Live Image and Individual Import from iC PVM 7.0SP1

iC FBRM 4.4 can import individual image files that have been exported from iC PVM 7.0 SP1 (Service Pack 1). This can be done during a live experiment or after the experiment completes. To import images, use the PVM task pane in iC FBRM and select the folder where iC PVM is exporting the image files. For more information, see the tutorial video 'PVM images in iC FBRM' available from the Start Page.

Remote Control and Live Data Export Supported via OPC UA

Used in combination with the iC OPC UA Server, users can control the data acquisition (start, pause, stop, edit sample interval and duration, etc) and send both trend and distribution data to an OPC UA Client application, like a DCS. The iC OPC UA Server is available at no charge to iC users and can be found on your iC FBRM 4.4 installation CD or downloaded from the AutoChem Customer Community website (https://community.autochem.mt.com).

Note that use of the iC OPC UA Server is only recommended for users who are already familiar with the sophisticated OPC UA standard. For simpler real-time data sharing, the iC Data Share Excel Add-in can be used, also available on the iC FBRM 4.4 CD and the AutoChem Customer Community website.

4 m/s Scan Speed Supported for ParticleTrack G600/G600Ex instruments

Both 2 m/s and 4 m/s scan speed options are now available for the ParticleTrack G600/G600Ex instruments. Users may configure their instrument from the iC FBRM Start Page to scan at either 2m/s or 4m/s.

Dual CSM Supported for E25

iC FBRM 4.4 now allows users to select two Chord Selection Models (CSM) for ParticleTrack E25 instruments. Distributions from one or two CSMs can now be viewed simultaneously during the live experiment or during data analysis after the experiment is complete. Previously this was only supported for ParticleTrack G400 and G600/G600Ex systems.

Improved Handling of Stuck Particle Correction Settings via Experiment Templates

The stuck particle correction checkbox is a data treatment setting available during live experiments. Previously, if you ran an experiment with a template, the stuck particle correction setting was not imported. In iC FBRM 4.4, this setting is stored as part of the template. If a template is created from a 4.4 experiment then the template will match the setting at the end of experiment.

Note that if a template or experiment file created in 4.3 or before is used in iC FBRM 4.4, then stuck particle correction will be disabled by default so these templates should be recreated in 4.4 to ensure they work as desired.

Discontinued Features for Version 4.4

Discontinued Support for Legacy S400 A/C/Q and D600 Instruments

iC FBRM 4.4 does not support Legacy S400A, S400C, S400Q or any D600 series instruments. iC FBRM 4.3 is the final version to support these legacy systems. If you are interested in trading in a legacy FBRM system for credit towards a new ParticleTrack instrument, then please contact your local Mettler-Toledo Sales Representative.

Discontinued Support for Legacy C35 and ParticleTrack C35 Instruments

This version does not support any C35 series instruments so customers with C35 systems should not upgrade to iC FBRM 4.4.

Known Issues

No.	Issue	Description and Workaround
1. FB32927	**Installing with Instrument Connected** Installing iC FBRM 4.4 when a G400, G600, E25 is attached causes Picoscope device to be unrecognized.	Do not connect G400, G600 or E25 device to the PC during the iC FBRM 4.4 installation process.
2. FB40148	**Installation with iC Process** iC Process for FBRM service needs to be started manually after iC FBRM 4.4 installation.	If you install iC FBRM 4.4 after iC Process for FBRM 4.4 is already installed, and you upgraded the FBRMServer when prompted, you will need to manually start iC Process for FBRM 4.4 service or restart the computer.
3. FB38659	**Configuring 19mm - 75 Hz Probe for G400** The actual scan speed is 1.2 m/s, although the wizard only gives the option for 2 m/s	Although the wizard indicates 2 m/s on the Probe Speed page, the scan speed is actually 1.2 m/s so this discrepancy can be ignored.
4. FB40149	**Slow Display Update on Configure Instrument** The first page of the Configure Instrument Wizard may appear blank for up to 10 seconds under certain scenarios for ParticleTrack instruments.	For ParticleTrack instruments, all probe tips are already pre-configured in the factory. However, when you are configuring ParticleTrack instruments, especially two ParticleTrack G400 units, the system takes time to gather data from the probe(s) and hence the slow update in Configure Instrument Wizard.
5. FB39427	**ParticleTrack USB Interruption** Data collection recovery issue after a USB interruption for ParticleTrack instruments which are connected via the ThinkLogical USB fiber extender.	During an experiment, if the USB cable is disconnected then reconnected to the PC, data collection usually recovers within 2 minutes. On some occasions the recovery fails. If this happens, power cycling the field unit and leaving it off for about 15 seconds should enable the software to recover and resume data collection.
6. FB41605	**Dual G400 Restore After Power Loss** For dual G400 probe systems running simultaneous experiments, if both probes lose power, the system does not automatically reconnect once the power is restored.	Note that if only one of the probes loses power, then the other will not be affected and when the first probe's power is stored, then the experiment should recover. The issue only occurs if both probes are running and then they both lose power at the same time. **Workaround:** Reboot the computer to fix the issue once power is restored to both probes.

No.	Issue	Description and Workaround
7. FB43039	**Drag and Drop Trends** Drag and drop trends doesn't work between iC PVM and certain iC/iControl versions. iC FBRM 4.4. iC IR 4.3.35 SP1 and iControl 5.2.219 SP1, iC Raman 4.1.917.	An automatic Microsoft Windows update for DotNet can cause the drag and drop feature to not work between different iC applications on the same computer. If you see that dragging a trend, from one iC/iControl application to another does not work as it used to, then this update may be responsible. **Workaround:** Either use the 'Add Trends' button to import the data or use the copy/paste function.
8. FB40506	**Duplicate iC FBRM Trend Entries in iControl Trend Lists** Start iC FBRM experiment from iControl. Every time user uncheck and recheck 'dual CSM' option in iC FBRM data processing task pane, extra iC FBRM trends are added to the iControl trend list.	Avoid changing the CSM selection in the middle of the experiment when using iControl.
9. FB40323	**Sharing Data with iControl Warnings** Occasional data exchange warning in iControl when statistic trend names are changed in iC FBRM	When you run iC FBRM experiment with iControl, occasionally a 'data exchange warning' might be displayed in iControl. This indicates iC FBRM and iControl data exchange might be delayed. Please do a manual trend refresh in iControl to see the updated data.
10. FB40352	**Distribution Viewer Update** Unpinned distribution not removed from statistic viewer	Unpinned distribution is not removed from statistic viewer if the distribution is pinned in the tiled view.
11. FB26880	**Zooming in on Distribution Viewer** If the original channel grouping is log scale and the user zooms in on a region within the Distribution Viewer, the x-axis ranges and distribution displayed are in linear scale.	This only affects Distribution Viewer in zoomed-in mode. The distribution displayed in the Surface Viewer will remain in log-scale when zoomed in.

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These release notes summarize incremental changes in iC FBRM™.

Issues Addressed in Service Pack – Version 4.3 SP1

iC Data Center Support

iC Data Center is a key enabling technology that captures data from all connected instruments at the end of an experiment and stores it in a central location. If iC FBRM is configured to connect to an iC Data Center server, then upon experiment completion the experiment file is uploaded to the file share. An email is sent to the user who conducted the experiment with links to the shared file so that it can be easily accessed for further analysis or passed on to colleagues. The experiment file is also automatically re-opened on the iC FBRM instrument from the shared location so that any changes made will be on the master file. For more information on iC Data Center, please visit www.mt.com/icdatacenter.

Corrected Initialization Issues

Some users encountered errors when trying to start the first experiment after the system had been powered down overnight. There was an issue with the initialization sequence of the internal electronics that caused the errors. This has been resolved in the service pack.

Improved Recovery After Power Loss

Systems did not always recover from a loss of power. The logic for recovery has been improved to allow the system to recover faster and more reliably. Recovery performance is also known to be better on Windows 7 than Windows XP, and therefore upgrading to Windows 7 is recommended.

Enhancements for 4.3

Full Support for 64-bit Versions of Windows 7

iC FBRM 4.4 fully supports the 32-bit and 64-bit version of Windows 7 as well as Windows XP. Note that instrument control of FBRM D600 and S400 systems are only supported on Windows 7 and XP 32-bit operating systems due to driver limitations.

Support for New ParticleTrack Instruments with Onboard ACIO SmartChip Technology

iC FBRM 4.4 is the first software version to support the new ParticleTrack G400, G600, E25, and C35 instruments. All ParticleTrack and FBRM instruments utilize FBRM measurement technology to track the rate and degree of change of particles and droplets as they occur in their actual process environment. Inline measurements of particle dimension, count and shape are recorded in real time without the need for sample extraction or dilution.

ParticleTrack is the brand name for all current instruments featuring FBRM technology. ParticleTrack instruments include onboard ACIO SmartChip technology for storage of critical calibration and system configuration information – providing better security and traceability in experimental data. Earlier versions of G600 and C35 models (FBRM G600 and FBRM C35 systems) may be compatible with iC FBRM 4.4 with a ParticleTrack hardware upgrade. Please refer to the Installation guide for more details.

Support for Both FBRM G400 and ParticleTrack G400 Hardware

Users can operate up to two FBRM G400 units OR two ParticleTrack G400 probes on the same PC. The two units must be the same hardware type – you cannot combine FBRM G400 hardware with ParticleTrack G400.

Process Task Pane for Interaction with iC Process for FBRM

This task pane allows the user to interact with data from the iC Process for FBRM server by viewing live process data as a live iC FBRM experiment or by viewing historical data as an iC FBRM experiment by specifying a batch name or a range of dates and times.

Note: If iC FBRM is installed on the same computer as iC Process for FBRM server, then installing or starting the iC Process server service will interrupt any running iC FBRM experiments. When iC Process for FBRM and iC FBRM are installed on the same PC, do not run experiments using iC FBRM if the iC Process service is running. Users should use the Process task pane in iC FBRM to monitor the data collection instead.

AutoStats – New D2i Algorithm

A D2i (Data to information) algorithm called AutoStats is provided to help reduce your analysis time. The user runs AutoStats to obtain the most important information with the fewest number of statistics. Statistics which maximize sensitivity to change in the particle system under investigation are dynamically calculated based on the specific experiment data.

Trim and Merge Experiments

Samples can now be trimmed from a completed experiment. Two completed experiments can now be merged into a composite experiment file.

Distributions from up to Two Chord Selection Models Can Be Viewed Simultaneously

On G400, G600, and C35 systems, one or two Chord Selection Models (CSM) can be selected to measure and record simultaneously. The user can display the data from either one or two chord selection models at one time during the live experiment or during data analysis after the experiment is complete. CSM related diagnostics values are also available for both CSMs.

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Send Options for Trends and Distributions

Users can now send multiple trends from an experiment file to a Result Set. Similarly, users can select and send multiple distributions to a Distribution Library document.

Dual FBRM G400 Units Robustness

The system setup with dual FBRM G400 probes configured is more robust and works more reliably in iC FBRM 4.4. Previously, if one unit was running experiments and the other unit was connected but did not remain fully powered up, communication errors would sometimes occur in the live experiment. The interface has been improved to ensure smooth operation of each unit independent of any power changes on the other unit.

D600/S400 Electronic Settings Updated

Previously there were three options for the Electronic Settings for D600 and S400 instruments – Fine, Coarse, and Detection. The recommended options for this setting are 'Fine' or 'Coarse'. So to improve ease of use, the 'Detection' option was removed in iC FBRM 4.4.

G400 LED Status Lights

The rules for the LED lights on the G400 have been further defined to provide a more obvious indication of instrument status as shown in the below table.

	FBRM G400		ParticleTrack G400		
LED	**Text**	**Color**	**Text**	**Color**	**DESCRIPTION**
1	Power	Green	Power	Green	Lit when G400 unit powered on
2	Communication	Green	Communication	Green	Lit when G400 unit is communicating with the FBRM server
3	Check Status	Red	HW Status	Red	Lit when there is a hardware error which results in loss of measurement
4	Status 2	Green	SW Status	Red	Lit when there is a software issue or error for calculating Chord Length distribution which may cause loss of measurement

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Issues Addressed in Service Pack – Version 4.2 SP1

Support Two Different Hardware Configurations for C35

iC FBRM 4.2 SP1 supports the currently released C35 (Legacy) and the C35 (G Series) which will be released in 2012. C35 (Legacy) refers to C35 instruments that were manufactured prior to December 31, 2011. C35 (G Series) should be used for C35 instruments manufactured after January 1, 2012 that have C35 (G Series) marked on the system label. For C35 installations, please note that there are two different driver configurations and the correct drivers must be installed for the system to operate properly.

Important: iC FBRM 4.2 SP1 offers improved stuck particle detection and removal as part of improved Agglomerate Chord Selection Model. Minor differences in the Chord Length Distribution are to be expected after the software upgrade for current C35 (Legacy) users.

Communications to the D600 Field Unit Improved

Occasionally D600 systems reported "dropped communication to the field unit" error at the beginning of the experiment. Now the system waits for 20 sections to establish communication to the D600 field unit before declaring there was a communication issue. This was documented in the iC FBRM 4.2 Release Notes as Known issues (FB26989, FB33715).

G400 Check Status LED Light Correction

G400 'Check Status' LED will not be on when iC FBRM does not detect any errors from the hardware system. An obsolete hardware diagnostic was triggering the LED to light up and this has now been resolved.

C35 Scrape Button in the Start Experiment Wizard

For C35 systems, the Scrape Button in the Start Experiment Wizard did not wipe unless user already ran one experiment and pressurized the probe. This issue is now addressed and the Scrape button in the Start Experiment Wizard functions correctly.

Dependency on National Driver Installation for S400/D600 Field Units Removed

For PCs that do not have National Instrument drivers installed, the FBRM Server would fail to start for S400 and D600 field units. This issue is now addressed and the software no longer has dependency on the NI drivers for S400 and D600 field units.

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Hardware Initialization Errors Now Recognized

For G series and C35 systems, occasionally one or more hardware components had errors during initialization. The system did not warn the user of these errors or prevent user from proceeding with instrument configuration or running an experiment which subsequently could cause the iC FBRM software to crash. This issue is now resolved. Users are notified of hardware initialization errors. Users may need to power off the system, restart the FBRM service or reboot the PC if these errors are encountered.

Invalid Warnings at the Beginning of the Experiment Corrected

When the Chord Selection Model (CSM) failed to calculate certain diagnostics values, incorrect warnings such as "Maxima count low", "Average peak height low" and "Average signal intensity low" warnings were displayed at the beginning of the experiment. This issue is now resolved.

Clean Window Chord Selection Model

Now "Clean window" in the Start Experiment Wizard uses the Chord Selection Model (CSM) specified by the user as 'display default' in the instrument configuration. In the live experiment, clean window uses the default CSM specified in the Data Treatment Task Pane. The CSM used in the clean window is displayed on top of the chart as information.

Enhancements for Version 4.2

Full Support for 32-bit versions of Windows 7

iC FBRM 4.2 fully supports the 32-bit versions of Windows 7 and Vista as well as Windows XP.

iC FBRM Office Support for 64-bit Windows 7 and Vista Operating Systems

iC FBRM 4.2 supports the 64-bit versions of Windows Vista and Windows 7 for iC FBRM Office installations. Any computer that will be connected to an instrument must use a 32-bit operating system due to current constraints with the device drivers.

Supports the Next Generation FBRM systems – FBRM G400 and G600

iC FBRM 4.2 is the first software version to support the next-generation of FBRM systems, the FBRM G400 and G600. These advanced, compact systems provide:

- Interchangeable probe tips for G400 systems
- Redesigned optics for optimized precision and sensitivity to particle counts
- Improved electronics that enable more predictable measurements compared with in-line imaging

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- Stuck particle detection and stuck particle correction to ensure consistent measurements in challenging process environments
- Choice of Primary Chord Selection Model for sensitivity to primary particles or Macro Chord Selection Model for agglomerates and complex crystal

Two Distributions Can Be Saved Simultaneously

On G400, G600 and C35 systems, one or two Chord Selection Models can be selected to measure and record up to two distinct chord length distributions simultaneously. Only one chord length distribution can be displayed at one time. However, the user can easily toggle the display of either of the available chord length distribution measurements during the live experiment or during data analysis after the experiment is complete.

Distribution Viewer Highlights the Starting and End Range for Stats

The distribution viewer now highlights the start and end range for the statistics trend selected in the Trend viewer.

Ability to Link to PVM Software and Read the Distributions

iC FBRM 4.2 can now link to the PVM software and read the image analysis distributions it exports. The PVM interface is configured as a PVM probe in the iC FBRM configuration. The user must specify the desired image source and algorithm settings in the PVM software prior to starting an experiment in iC FBRM.

Settings for One-Click Experiment Stored Automatically

The system automatically saves the settings for one-click experiments. The settings include folder location, selected template, Phases (including the number of phases, experiment duration, and sample interval), Channel grouping and Averaging options, and selected statistics.

Template Files are Remembered Until Changed or Deleted

After a user selects a template file it will continue to be used for all experiments going forward until either a new template is selected or the user deletes the template file.

Analog Input Supports Multiple Probe Systems

iC FBRM 4.2 now supports external analog inputs configuration for multi-probe systems. Each probe can have up to 4 analog inputs.

Statistics Viewer displays User Defined Trends Values

Statistics Viewer now displays the values for User Defined Trends and reference trends.

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Additional Diagnostics Values for Troubleshooting

Additional diagnostic values are available for G400, G600, and C35 systems. New diagnostics included are Fouling Index, Stuck Particle %Corrected, and Detection Count.

Additional Ranges for Channel Grouping

Additional upper limits of 30, 300, 500, and 3000 microns are now available for both linear and log scale, as well as Standard and High grouping resolution.

Redundant Statistics Removed

iC FBRM 4.2 no longer provides Number/Length/Area/Volume based Mean particle dimension statistics. These statistics are already available as the Mean (no weight, length weighted, squared weighted and cube weighted).

Improved Sub-sampling in Trend Viewer

iC FBRM 4.2 provides improved sub-sampling for trends when the number of points displayed goes beyond 20,000 data points. The improved algorithm ensures that important transient information will not be missed. A message is displayed at the bottom of the trend chart to inform the user the ratio of the sub-sampling.

Improved Default Y Axis Captions for Trends

iC FBRM 4.2 does smarter grouping of trends for the Y-axis. This means that trends having similar units will, by default, be grouped on a single Y axis and that trends that have different units or are otherwise fundamentally different, such as Total Counts and diagnostic trends, will be on different Y axes.

Improved AutoScale Behavior in Trend Viewer

When AutoScale is turned on in the Trend Viewer, the Y axis shows the actual values for the selected trend. If no trend is selected, the Y axis will be shown as 0% to 100%.

New Rainbow Color Scheme for Surface Viewer

The new 'Rainbow' color scheme option for the Surface Viewer assigns colors based on Y value, from low (blue) to high (red). This is now the default selection and it makes visualizing peak intensities and changes over time much easier.

Length Normalized Counts Remove Scan Speed Count Dependency

C35, G400 and G600 Instruments have had counts/s replaced with a length normalized "counts" which provides a particle count independent of scan speed. Count behavior of S400 and D600 instruments remains the same as in previous iC FBRM versions.

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Additional Weighting Option Available

The viewing options on the Distribution Viewer have been updated in iC FBRM 4.2 to allow for more advanced analysis with weighing options. In previous versions, users could view distributions as either 'Unweighted', 'Weighted' or 'Both'. For version 4.2, the user can view distributions as either 'default weighted', 'Weighted' or 'Both' and they can specify if the default weighting type should be either 'No weight' or 'Inverse length weight'. The 'No weight' option, which is selected by default, provides the same results as the original 'Unweighted' view. The weighting options are saved as part of the documents and get copied from the templates used.

Enhancements for Version 4.1

Multi-Probe Support

The latest iC FBRM software is now the default control software for all lab-based C35, D600, and S400 instrument models, including multi-probe S400Q and S400C products. Certain S400Q systems may require hardware upgrades.

3-D Surface Viewer

The Surface Viewer shows a three dimensional view of the entire experiment with a time line and two planes, one in the x axis and one in the z axis for an in-depth analysis. The display can be enlarged or reduced in size, completely rotated about all three axes, and moved within the Surface Viewer. The data displayed in the 3D Surface Viewer matches the data treatment settings including averaging settings, channel groupings settings, and selected algorithm.

Experiment Files

Experiments in prior versions of iC FBRM software were saved in two files—one for the experiment (*.icFbrm) and one for the raw distribution data (*.icFbrmRaw). Starting with iC FBRM 4.1, experiments are stored in one file. When the user opens an experiment from an earlier software version, it will be saved as a single file. The old *.icFbrmRaw file is not erased so if retaining the older experiment file (*.icFbrm) is desired, the user should choose the "Save as" method to create a copy in the new format.

Template

The user can save an existing FBRM Experiment file as a template for future use.

Serial I/O Configurations

Serial I/O Configurations are now persisted in the experiment template. Additionally, the serial I/O configurations are supported with S400C and S400Q multi-probe systems.

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One-click Experiment

The user now has the option to skip the New Experiment wizard. Selecting one-click experiment will immediately start an FBRM experiment in pause mode.

Moment Statistics

Users can now calculate moments (0th – 4th order) of the chord length distribution, in addition to moments ratios.

Statistics Viewer

The user now has the ability to directly copy the statistics table to the clipboard as an image.

Reporting to XPS

In addition to sending reports to Microsoft Word, version 4.1 also allows reports to be directed to an XPS document. XPS (XML Paper Specification) was developed by Microsoft to provide a read-only definition for document layout and formatting (similar to what an Adobe PDF provides). Users can now generate non-editable reports using XPS, allowing them to create and view reports even if they do not have Microsoft Word installed on the PC.

The XPS reader software is included with Microsoft DotNet 3.0 (this is a free add-on that is installed with many software packages, such as iC FBRM, and is part of the standard Vista operating system).

Diagnostics Values for Troubleshooting

Additional diagnostic values are available in C35 systems.   When system alarms occur, diagnostic values continue to be collected to provide additional information. Additional diagnostics have been added to help troubleshoot hardware problems for C35 systems. The diagnostic statistics remain available when the distribution is made into a reference distribution.

PVM Viewer

When copying PVM images and pasting into other documents (such as Microsoft PowerPoint or Excel), the PVM images will include the time stamp.

Auto-focus

The auto-focus and software controlled motorized manual focus is no longer supported with C35 systems.

Distribution Viewer

Upon saving a data analysis session with iC FBRM, the weighting, normalization, and cumulative display options for a distribution are now saved.

Enhancements for Version 4.0

One-Click Reporting

One-click reporting is available now for all iC FBRM document types—Experiments, Result Sets, and Distribution Libraries. The report is a Microsoft Word document that can be edited, saved, and printed by the user.

Distribution Libraries

Distribution libraries are now supported in iC FBRM. These libraries can be used to store reference distributions for easy future access and comparison.

User Defined Trends

The User Defined Trends Task Pane gives the user the ability to perform certain math operations on existing trends in their Experiments and in Result Sets. In addition to the basic math operations, the User Defined Trends Task Pane has functions to calculate % Yield and % Conversion.

View PVM Images Enhancements

The PVM viewer has new features for zoom and pan controls, tape measure, and image enhancements such as sharpen and optimize image histogram (brightness and contrast). All image controls have also been consolidated into a task pane for ease of use.

Support for the Window Scraper

The Window Scraper on a C35 probe can be configured from the iC FBRM software. Options include scraping at user defined time intervals or detecting stuck particles and scraping when these particles cover a significant portion of the window. There is also an option available to mathematically remove stuck particles from the distribution.

Clean Window Dialog Box

A new option has been added to facilitate manually cleaning the probe during an experiment. When the Clean Window dialog box is open, iC FBRM increases the sample acquisition rate and disables the mathematical removal of stuck particles. You can monitor trends and distributions as you clean the window. When the dialog box is closed, the data collected while the dialog was open is removed from the experiment.

Multiple Instrument Connection

If you have multiple instruments available via the network, you can connect the iC FBRM client to any of the instruments. Note that you can only connect iC FBRM to one instrument at a time, and the instrument only allows one client to connect at a time.

Additional Control of Hardware from iC FBRM Interface

Adjust the focus and control the scan speed of the instrument right from the iC FBRM screen.

Integration with New iControl Products

iC FBRM experiments can now be coordinated with experiments in iControl LabMax™ and iControl EasyMax™ as well as with iControl RC1e™. iControl can choose templates, start experiments, change and copy trend data from iC FBRM™.

Import Trends from any iC/iControl 4.0 Experiment File

All iC and iControl 4.0 applications now use a common data file format to allow for even better data exchange. All iC and iControl applications now have the ability to import trends from any iC/iControl data file. In addition, iC FBRM also has the ability to import trends from legacy WinRC™ files which is particularly useful for including temperatures and other process variables while analyzing old MultiMax™, RC1e™ or LabMax® experiments.

Drag & Drop Trends Between iC and iControl 4.0

For users working with multiple iC and/or iControl 4.0 applications, it is now possible to drag-and-drop trends between any such applications running on the same computer. In the case of trends from a live experiment, the trend will continue to update in the application it is dropped into.

Simplified Logging System

Easily collect all log files into a single zip file for mailing to METTLER TOLEDO.

Support for Windows Vista Operating System

iC FBRM 4.0 is compatible with the Windows Vista Operating System as well as Windows XP.

Initial Release Version 1.0

Instrument and Office Support

iC FBRM supports online acquisition using the iC FBRM instrument software. One iC FBRM instrument software license supports acquisition from one FBRM instrument hardware. iC FBRM

office software licenses can be used by multiple users to analyze data from multiple instruments running iC FBRM or FBRM Version 6 software. To learn more about multiple instrument or office licenses, please contact icfbrm@mt.com or call +1.410.910.8500.

Hardware Support

iC FBRM Instrument software supports the online acquisition from D600, S400A, and S400E hardware. iC FBRM Office software supports analysis of data from all S series and D series FBRM products.

Wizard Guided Experiment and Instrument Setup

iC FBRM simplifies the workflow for creating a new experiment by providing intelligent default values for all the "set and forget" configuration parameters in the Configure Instrument wizard. This wizard is always available, but can be skipped by most users once the instrument has been initially configured. The Start Experiment wizard includes verification that the probe is properly cleaned with intuitive status visualization. The end result is that iC FBRM makes it easy for non-experts to collect high-quality particle characterization data.

Experiment Phases

iC FBRM supports varying sample times throughout the course of the experiment. With this feature, samples can be collected more frequently during the "fast" parts of the reactions, and more slowly during the "slow" parts of the reaction. The Start Experiment wizard includes a new "Experiment Duration" page to create the phases.

Experiment Templates

The user can apply experiment templates when creating a new experiment. An experiment template is any previously created experiment file. When applying an experiment template to a new experiment, the template's Peak Definitions, Data Treatments, Reference Distributions, and Phase definitions are copied to the new experiment before it starts.

Live Experiment Tool Bar

iC FBRM includes a Live Experiment Toolbar when running experiments. This toolbar includes Pause/Resume and Quick annotation features and has timers to track the experiment Elapsed Time, time until the Next Measurement, as well as the Time Remaining in the experiment. Also, the sample interval and phases can be edited from the Toolbar without pausing the experiment.

21CFR11 Compliance Ready

The iC FBRM has passed the factory acceptance testing (FAT) per the METTLER TOLEDO FBRM Products software development lifecycle and GAMP guidelines. iC FBRM only provides the core technical requirements of a compliant system. Specifically, this includes support for tamper-

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detection of electronic records and the logging of audit trail messages in experiment documents. Compliance also requires both procedural controls and administrative controls to be put in place by the user. Please contact METTLER TOLEDO to receive information on our software audit or validation package.

Integration with iControl

iC FBRM experiments can be coordinated with experiments in iControl RC1e™ 3.3. iControl can choose templates, start experiments, change and copy trend data from iC FBRM™.

Online Communication

iC FBRM has bidirectional communication between iC IR™ and iC Raman™. This includes live data transfer and reviewing data with drag-and-drop technology. iC FBRM communicates with PVM sequence files while reviewing data. iC FBRM can communicate to iControl by sending trends in real time. iC FBRM supports up to four analog inputs per instrument. iC FBRM supports bidirectional communication with the FBRM Serial protocol (eg. METTLER TOLEDO Labmax®, RC1™, MultiMax™, and HEL, Argonaut, Systag). Contact iCFBRM@mt.com for more information.