IN Cell Analyzer

Acquisition Software, Version 5.2

Release Notes - Patch 1

16 October 2015

Introduction

Version 5.2 of the IN Cell Analyzer software contains improvements, optimizations, and fixes over version 5.1.

Upgrading from previous versions (like 4.6, 5.0 or 5.1) should require only minimal training. The changes should be intuitive for most users.

The following release notes describe the primary changes between release 5.1-13722 and 5.2-14311 of the IN Cell Analyzer software. Additional information can be found in the release notes from previous versions of software, which are included within the 5.2 installers.

Autofocus Improvements

A number of changes have been made to the INCell's autofocus mechanism. A summary is provided below. Also see item 1464 in the section titled "Significant Fixes".

Autofocus Offset Measurement (1472)
The capabilities of the button used to generate autofocus offsets have been expanded to include software autofocus. Changing the AF method will now result in a prompt to re-measure the AF offsets. Software and hardware based AF methods generate different focus results, and will therefore require different offsets to achieve the desired focus. Refer to the tooltips for additional information.

Software Autofocus Accuracy (1486)
The Z accuracy of the software autofocus procedure has been improved by roughly one half the depth-of-field of the objective lens. The benefit of this improvement will be noticed in a number of areas including:
> - during scanning
> - when measuring AF offsets
> - during interactive sessions with the GUI
> - when using AF within the FocusFinder

Z Offset Handling (1477)
A variety of improvements were made to the internal mechanism that handles the Z focus offsets. V5.2 contains changes that might create a need to re-measure the autofocus offsets for acquisition protocols that use the 2X and 4X objective lenses. For best performance, GE recommends that users re-measure focus offsets when upgrading to V5.2.

Configuration tags "laf_offset_1_m" and "laf_offset_2_m" are now obsolete and have been removed from the factory defaults configuration files. The tags were rarely used, and they did not always have the desired effect.

Z Coordinates Displayed in GUI (1479)
Z coordinates are now consistently display in "User" coordinates. User coordinates are defined to be "Scanner" coordinates plus the objective Z shift. Previous versions of software displayed a mixture of Scanner coordinates and User coordinates, which created confusion.

General Improvements

XDCE Channel Ordering (1416)
Meta data for image channels will now be recorded in the order of acquisition. Sequential ordering is still not guaranteed, though, because it is not a requirement of the XML format used for the XDCE files. Nevertheless, working with ordered metadata is more convenient, especially for third party software. Previous versions of software did not always create XDCE files with sequentially ordered metadata.

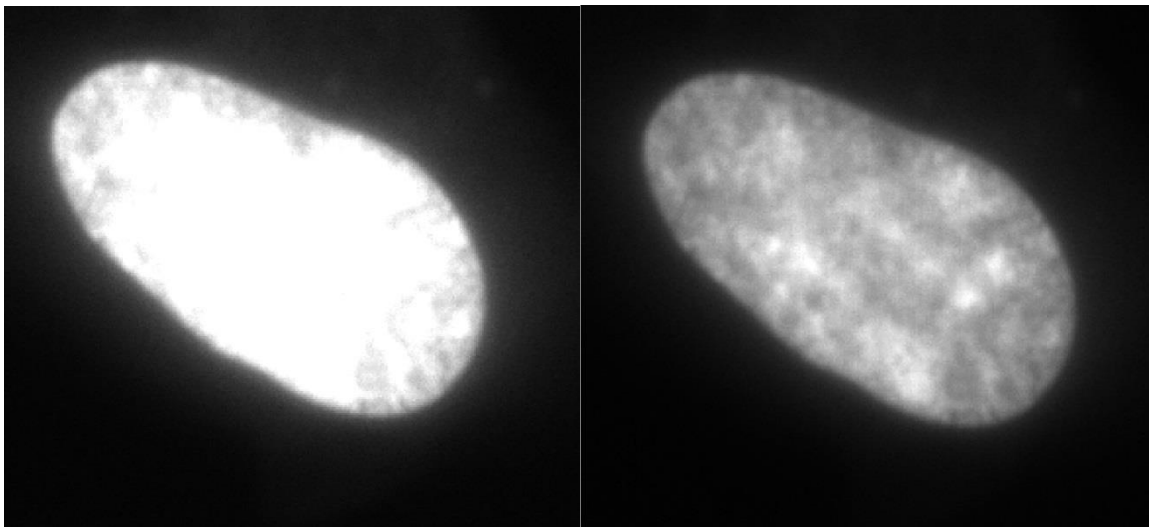### Cell Counting (1447, 1453, 1454)
The performance of the algorithm used to count cells has been improved by more than two-fold. There have been no changes to the detection algorithm, except that unnecessary processing has been removed. To make the cell counting more useful, a maximum size limit can now be set. Objects larger than the maximum size will not be counted. By default, the maximum is set to a very large area, which makes the default behavior of V5.2 the same as previous versions. Large objects will not be excluded from the cell count, unless the maximum size is reduced to a realistic size.

FocusFinder - Fine Focus Control (1283)
The mouse wheel can now be used to adjust the Z position in fine increments. Fine focus is enabled when the cursor is located on top of the FocusFinder's Z control bar. The new control is especially helpful when working with high NA objective lenses.

Auto Display Contrast (1359)
The existing auto-contrast factor works well for most channels, although DAPI labelled nuclei are sometimes displayed with too much saturation. In the following figure, the original display setting (F=20) is shown on the left and the new display setting (F=35) is shown on the right. Only the display settings for DAPI have been changed in V5.2. All other channels will continue to use the previously defined setting of 20. To customize the settings for a specific channel, refer to ID 1359 in the summary table at the end of this document.

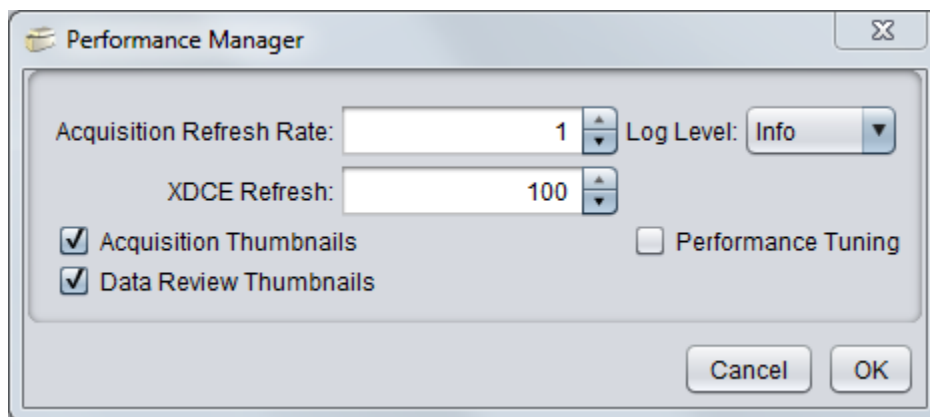**Pre V5.2 Contrast, F=20**   **V5.2 Contrast, F=35**
DAPI Labelled Nucleus

Acquisition Performance (1416)
The software that records XDCE files during acquisition has been optimized for use with large data sets. Long, fast time lapse scans will be able to run longer and more consistently than before.

Performance Manager (1416)
The Performance Manager provides access to settings that affect acquisition performance. The tool can be opened from the main program's "Application" menu. For information about the various settings, refer to the corresponding tooltips. The default settings provide a good balance between logging, screen refreshes, and performance.

Last Plate Type Remembered (1425)
When the software is stopped and then restarted, the last plate type is automatically selected in the *DashBoard*.

Desktop Installers (1299)

Unlike the standard installation packages, the Desktop installers will copy all INCell software files to a single folder on the user's desktop. In the case of the 2200, the path is "C:\Users\YOUR_USERNAME_HERE\Desktop\GE Healthcare\IN Cell Analyzer 2200".

The Desktop installers make no changes to the standard software or the Windows start menu. Previously installed software will still be accessible through the start menu.

To launch the Desktop version of the software, navigate to the appropriate .EXE file and then double-click. For example, double-click on: "C:\Users\YOUR_USERNAME_HERE\Desktop\GE Healthcare\IN Cell Analyzer 2200\IN Cell Analyzer 2200.exe". For additional convenience, create a link on your desktop by pressing the right mouse button on the .EXE file, selecting "Send To", and then selecting "Desktop (create shortcut)".

Desktop installation can provide benefits to sites that are currently running older versions of software. More than one version of software can be loaded on a single workstation. Sites can continue to use software that has been validated for experiments that are already in progress, while new software can be used for new experiments or whenever new features are required. Similarly, different users could have different versions and/or configurations installed on their respective desktops.

Desktop installations can be especially useful when upgrading sites that already have remote control software for automated scanning. GE suggests the use of a Desktop installation to smoothen the transition between the old and new versions of the acquisition software. In most cases, very little (if any) reconfiguration will be required. There are only two configuration settings (host name and the port number) that might need to be copied from the original configuration. The original settings can be found in the "automation_server_socket" section of the standard configuration file called
      "C:\Program Files\GE Healthcare\IN Cell Analyzer XX00\config\IN Cell Analyzer XX00.xml_default"
The equivalent desktop configuration file can be found at
      "C:\Users\YOUR_USERNAME\Desktop\GE Healthcare\IN Cell Analyzer XX00\config\IN Cell Analyzer XX00.xml_default"

The "host" name and/or "port" number of the following line may need to be modified.
      <automation_server_socket host="localhost" port="9999" />

The V5.2 installer has been tested with only V4.6, V5.0, and V5.1. Versions prior to V4.6 are untested. GE does not recommend using the V5.2 Desktop installers with standard installations prior to V4.6.

Note that Desktop installations must be manually setup with configuration files, plate types, and licenses. To transfer configuration settings, simply copy the appropriate files from pre-existing installations.

Distance Measurement - Finish Boundary (1356)

When measuring the distance around an object, press the "Enter" key to finish the boundary. The last point will be automatically connected to the first point, and the total boundary length will be calculated.

Remote Control / Robotics Mode Logging Efficiency (1488)

The remote control dialog box contains a log of the communication that occurs between the INCell acquisition program and the remote control client. Under most conditions (pre v5.2), the log fits without problem within the INCell's allocated memory. In the case where the remote client rapidly polls the instrument status, however, it was possible that the log could consume all of INCell's available memory. For details about when this issue might occur with prior versions of software, see 1488 in the list of changes.

Version 5.2 contains a more efficient logging mechanism that will not run out of memory.

Known Issues and Usage Notes

Information about previously reported topics can be found in previous versions of the release notes, which are located in "C:\Program Files\GE Healthcare\IN Cell Analyzer XX00\manual". Only new or updated items are described here.

Significant Fixes

Only the most significant items are described in this section. See the table in the next section for a full list of changes and fixes.

Adaptive Software Autofocus with Objectives that Use a Large Z Shift (1464)
The Z range used for the software autofocus procedure was incorrectly shifted by the objective Z shift. For example, if the objective Z shift was -100 um and the correct autofocus range was 1000 to 1200 um, then the software would use 900 to 1100um. In the case where the true focus was out of the scan range, then the software autofocus would fail to find focus. Since the Z shift was incorrectly applied before every field, the autofocus range had the potential to move progressively away from the desired focal plane.

The bug has been present in all previous versions of software, but was not detected until recently. The problem mainly affects objective lenses with large Z shifts, which was not the case for the original Nikon lenses used during early development. The original lenses were parfocal within a small distance of about 10-20 um. The newer lenses, however, are much less parfocal. GE has measured Z shifts as large as 300-400um between the 10X/0.45 objective and high magnification, high NA objectives. The parfocality changes occurred when Nikon introduced the Lambda series objective lenses.

Only the adaptive range autofocus method was affected. The static range autofocus method worked as expected.

List of Changes Between 5.1-13722 and 5.2-14311

Items listed in this table have been fixed in version 5.2, unless otherwise discussed in the comments.

ID	Brief Description	Additional Comments
301	File names with double spaces are not supported by the 3D deconv. program.	The GUI software checks for double spaces. A warning is presented if the experiment involves 3D deconvolution.
1236	Objective lens shifts should be visible in the GUI	Objective lens shift values are now displayed in the objective lens page of the protocol designer. Also see #1479.
1255	Odd behavior when opening an XDCE in place of a XAQP file	The "Save" and "Save As" procedures should behave differently when working with an XDCE file.
1283	FocusFinder Z scrolling - add fine control	The mouse wheel can now be used to focus the instrument. Press the shift or control keys for finely spaced Z steps. For details, see the FocusFinder tooltips.
1299	Desktop installation packages that put all files into a folder on the desktop	Available from GE upon request. The Desktop installers provide a method of running more than one version of software on a workstation.
1346	Improve acquisition performance for "As Fast As Possible" mode	Mainly accomplished with XDCE file recording, as described in #1416.
1356	Add a "finish boundary" button for "multiple segment" distance measurement	Pressing the "Enter" key will connect the last point with the first point to create a complete boundary.
1359	Channel specific auto-contrast display settings (especially for the DAPI channel)	The GUI configuration file can now contain specific entries for every emission channel. The channel identifier is the emission filter name rather than the label. For example, "FITC2" will work, but "FITC_525" will not. If the auto scaling algorithm finds an auto scaling factor for the channel that's being displayed, it'll use that, otherwise the algorithm will fall back to the generic "auto_scaling_factor" (the setting without a channel attribute). Factory default configuration settings: <auto_scaling_factor>20</auto_scaling_factor> <auto_scaling_factor channel="DAPI">35</auto_scaling_factor>
1367	Add objective lenses to the Simulator to support more configurations.	The Simulator now supports most/all INCell objective lenses.
1394	Channel edit "*" symbol should not be used when only the exposure time has changed.	The "*" symbol indicates that the channel settings have been changed from the default. Changing the exposure time, however, should not register as a change.
1397	Link 3D parameters step size change doesn't work	The Z step sizes are now properly linked.
1398	Instrument shutdown procedure from main GUI triggers log file capture tool	The GUI software cannot run without the instrument (or Simulator). Selecting "Instrument shutdown" from the main GUI menu will now cause the GUI to shut-down. To resume work with the Simulator, restart the GUI.
1407	Pre-check Capture snapshot from Instrument in Log File Capture.	The toggle button to capture the instrument snapshot file will now be enabled by default.
1416	Optimize XDCE file recording during acquisition	Under certain conditions, XDCE file recording was responsible for slowing down acquisition. The IO procedures used to record the XDCE file have now been optimized, leaving more bandwidth for saving TIFF images.
1418	Pixel size problem in XDCE file - causes Investigator stitching to fail	The pixel size recorded in the XDCE file did not properly account for pixel binning.
1419	Cancel button should be disabled when appropriate (firmware & RPM installers)	The cancel button was sometimes enabled at times when it couldn't/wouldn't work.
1423	Select all FOVs per well and fix laser AF bug if first field of first well is excluded	Laser AF was inadvertently omitted if the first FOV was excluded from acquisition.
1424	Z-slice and Time-point sliders should update active images	The *DataReview* heatmap and the image display are now updated when the ZT image controls are changed.
1425	Remember last plate type used between sessions	When the GUI software reopened, the last used plate type will be automatically selected.

1427	Change request for default focusing options used with "As Fast As Possible".	The default state of the feature called "Refocus at each Time Point" will now be matched to the type of time lapse imaging. For example, the default condition for "As Fast As Possible" acquisition will be off, because it doesn't make sense to refocus between closely spaced time points. In the case where the feature is in an inappropriate state, the GUI will present a warning to the user.
1428	Relative timestamp problems in the CSV file	The T0 value used for determining relative time-stamps was not always defined correctly. Certain scan types used a T0 value that didn't match the scan type. The absolute timestamps are OK. To work around the problem, use a spreadsheet program to subtract the desired T0 value from the absolute time-stamps.
1430	3DD imaging mode not retrieved from XDCE file when opened as an acquisition protocol	Only happens if the workstation is not licensed for 3DD. A warning is now presented.
1432	Add information to error message that occurs if unable to save an acquisition protocol	Additional diagnostic information is now provided if the acquisition protocol is moved or deleted by an outside program during operation.
1436	Tiff file naming bug when using deconvolution and lots of channels	The bug occurred when defining multiple channels for deconvolution using the "Channel Settings" page of the protocol designer. Protocols created with the *Dashboard* were not affected.
1437	Add tooltips for LH related GUI items	The LH tooltips have been updated.
1441	Arrange the list of plate/slide parameters according to priority/usefulness.	The plate/slide parameters have been arranged according to their utility.
1442	"Average acquisition rate" calculation needs to be changed.	The calculations used to generate the "average acquisition rate" within the XDCE summary report have been corrected. The time-stamps were/are correct. Only the rate calculation was incorrect.
1443	Field overlap problem when the image size is changed.	The field locations will now be updated whenever the image size is changed.
1444	Strange behavior when centering objects after shifting image.	The GUI controls for centering objects in the field-of-view did not work properly if the image was manually shifted (left/right, up/down) in the *DashBoard*.
1445	Cell counting errors when using "Sample Now..." do not reset number of cells	The number of cells reported by the "Sample Now" button was not updated in cases where a cell counting error (of any kind) was encountered. The value will now be reset to zero, indicating that no cells were found.
1447	Optimize cell counting performance.	The cell counting algorithm now runs about 2X faster than in previous versions. No significant changes have been made to the cell counting algorithm, except that redundant calculations have been removed.
1453	Cell counts recorded in XDCE file are out of sync with acquisition	The recorded number of cells for a given image was actually the count for the previous image. See #1242.
1454	Add a maximum size limit to the cell counting procedure.	Previous versions only provided a minimum size limit, but not a maximum size limit. The maximum size helps avoid counting invalid objects.
1456	Imaging mode "Phase Constrast" is misspelled.	The misspelling has been fixed, although existing XDCE files will still contain the spelling error. The SW will support both spellings within the XDCE files.
1458	DIC calculation uses an image buffer that is 4X larger than necessary.	Fixing this item does not necessarily fix any bugs, but it does help reduce memory consumption.
1461	Log file capture tool should also get the factory defaults configuration file.	The log file capture tool will now include the factory defaults configuration file, even though the file should not be modified post installation.
1462	Correction collar setup will skip lenses if there are empty turret positions	The problem was created in V5.0. It is now possible to have a blank turret position before having a position with an ASAC objective lens.
1463	Field graphics refresh problems while updating selected wells in Plate View graphics	The field-of-view graphics within the plate view will now update properly when updating the selected wells.
1464	Adaptive software AF Z range walks by objective Z offset	An old problem made worse by large objective Z shifts. By convention, Z shifts are determined relative to the 10X/0.45. Instruments that have objective lenses with large Z shifts will be most susceptible to this bug.

1465	Add plate type files for Arrayit M96 and M384 well plates	Added.
1471	LH dispensing Y offset uses the well width rather than the well height	Usually benign. Only affects plates that have wells with a large width/height aspect ratio.
1472	AF offsets should be intelligently handled when the AF method changes.	AF offsets are unique to each AF method. The offsets need to be changed or re-measured if the AF method (laser AF, software AF, or laser+software AF) changes.
1473	Adding or removing columns in the *ReportGenerator* resorts the table	The sort order was being reset whenever a new column was added or removed from the table.
1474	Problem imaging thick bottom plates with the 20X/0.75 (id 12207)	There were two problems: 1. the safety check was too conservative. 2. when the safety check failed, the software overreacted to the issue and shutdown. Both problems have been fixed.
1477	LAF Z offset calculation model is unnecessarily complicated.	The new model uses the plate bottom's index of refraction.
1478	Default laser AF power in configuration file for 2X and 4X is only 1%	The default laser power has been increased to 2%, because the LAF is not necessarily reliable at 1%. The change only affects the default laser power. The actual power that gets used during a scan is determined from the current acquisition protocol.
1479	Z coordinates used by client/GUI are inconsistent	Most of the GUI used User Coordinates, but there were some exceptions. The GUI now uses User Coordinates everywhere. To further reduce confusion, the objective lens page within the protocol designer also reports the objective lens XYZ shifts.
1481	Software autofocus button(s) within the GUI should be disabled unless the current Z position is reasonable.	Software autofocus will not be allowed if the Z position is less than 500 um above the minimum Z position (Zmin is typically -1500um).
1482	Instrument control software installers have been resized to save screen space.	Only the appearance has changed.
1483	Distance measurement tool uses more precision than necessary.	The precision is now set to 0.1 um, which is appropriate for the resolution of the instrument.
1484	Add the workstation's MAC address to the "About" dialog	The MAC address is useful for software licensing.
1485	Obsolete LH warning messages in the IC log file.	The warning messages were obsolete and benign.
1486	Problem with Z movement during image/software AF	The Z position used during image AF was imprecise, leading to slight focus problems during image AF. The problem existed in all previous versions of software that used the sCMOS camera (2200 and 6000). Affects all methods that use image based AF.
1488	Remote Control/Robotics dialog uses lots of memory	Much of the communication with the remote client was being logged in memory. This logging method existed in all previous versions of software. Version 5.2 uses an efficient method of logging communication with the remote client. Factors that contributed to memory consumption during remote control operation (prior to V5.2): - overly rapid status checking ("polling") by the client - long list of XAQP files in the AQP folder - low workstation memory for the INCell GUI (especially when using WinXP workstations with 4Gb of RAM)
1491	FocusFinder Z control buttons (coarse & fine) don't stop immediately when released	The Z position now stops shortly after releasing the control buttons.
1492	New acquisition protocols are marked "changed" even when new.	The GUI software will be less likely to prompt the user to save new, unchanged acquisition protocols. In this case, changing the objective lens caused new, future protocols to be marked as "changed".
1493	*DataReview* image display flashes when changing ZT position.	Images will now be updated more smoothly.

1495	LH needle should always be retracted from the well if an error is encountered during a dispense operation.	If a low-level HW error is encountered during a LH dispense operation, the needle should always be retracted from the well. For example, if the software detects that the LH pump has failed, then the LH needle should be removed from the well at the same time that the error is reported to the GUI. Previous versions of software reported errors (to the GUI and to the ICS log file), but did not retract the needle. Retracting the needle immediately will help prevent damage caused by subsequent XY stage motion.
1499	Add tooltips to the plate heater controls	Useful information about the plate heater controls can now be found in the relevant tooltips.
1500	Rename the plate heater "Current Temperature" field to "Current Status"	Changing the name is appropriate, because the field actually contains the current status of the plate heater (rather than the temperature).
1507	Burst mode memory check should not include the number of wells	There were two problems with the calculation: 1. all fields in the scan were used, rather than just a single field 2. camera binning was not taken into account
1510	WFTZ well list in the *DataReview* is not updated during acquisition.	The WFTZ combo box is now updated to match the current scan location.
1511	The GUI's maximum allowed bottom thickness is not large enough for all plate types.	The current, maximum allowed value (1500 um) is insufficient for certain tissue culture plates. The new maximum is set to 2500 um.

The bottom thickness is only checked in one place against the maximum. The XPLT files can contain any value. Editing the XPLT file is a workaround with previous versions of software. |
1512	Display the 6000 confocal aperture size in rows on the sensor.	The aperture size tooltip will now report the aperture size in units of rows and Airy Disk Units (AU).
1514	Remove "Liquid Handling" column from the TimeSeries table if the instrument does not have LH hardware.	The "Liquid Handling" column will only be present with systems that have liquid handling hardware.
1516	Fix installation problems caused by corrupted Java files.	Removing potentially corrupted files during the pre-installation procedure will help avoid this failure.
1517	Add a plate definition file for "Single Slide Holder 29017934 default.xplt"	The plate type "Single Slide Holder 29017934.xplt" is installed with the "Never Overwrite" option, because this plate type is intended to be modified by users. To ensure that all sites have an up-to-date, default slide holder plate type, the new plate type will be installed using "Always Overwrite".
1518	Add the depth-of-field and minimum Z step size to the list of lens parameters.	The depth-of-field and Z step size are useful for setting up 3D imaging and for software autofocus.
1520	Add "Optical Resolution" to the list of objective lens properties	The Rayleigh optical resolution at 500nm is now presented in the list of objective lens properties within the acquisition protocol designer.
1522	Add a command line option to the Simulator for loading XDCE files	The Simulator can now be launched with a specific XDCE file using the command line option called "-xdce". Provide the XDCE file name (with full path) after "-xdce".
1528	*DataReview* graphics can stop updating during a scan.	The *DataReview* graphics can stop updating, even though the scan continues. The problem only happens under special circumstances. A series of acquisition protocols with different numbers of channels must be loaded from disk and then run with the scan button. The issue is limited to the graphics update and does not affect the scan results. Symptoms of the problem include log messages containing "ConcurrentModification" and "IndexOutOfBounds" exceptions.
1530	Change the incubation position to a better location.	Temperature uniformity of the plate is essential for certain types of experiments. Recent measurements have shown that centering the plate over the objective lens during incubation works better than moving to the original location (which was near the corner of the plate). The temperature uniformity improves from roughly +/- 2C to about +/- 0.5C.

The changes apply only to time-lapse experiments that use the feature called "Incubate between time points". |

1532	Failure to load XDCE files from a mapped drive when selected manually from *DataReview*.	By design, images saved to a "mapped drive" are not loaded at the end of a scan. The logic that was skipping the load also prevented the images from being manually loaded.
1536	Camera sensor dimensions are not correct in the XDCE file.	The problem only occurs when using image ROIs that are smaller than full size. The issue appears to be benign, but is still worth fixing. The INCell log file reports an error regarding "ArrayIndexOutOfBounds" while loading XDCE files that have an incorrect size. The condition is handled without failure.
1537	Format improvements for the time series list.	The time values are sometimes displayed with unnecessary precision due to small round-off errors.
1541	Update the contents of the built-in help system (.chm file) for the 6000.	The section that describes the aperture calibration needed updating.
1543	Make "Link 3D" true by default.	Prior to this version, the default was true for the 6000, but not for the 2000 or 2200.
1544	*FocusFinder* doesn't always use the active channel.	In certain situations, the *FocusFinder* used the previously active imaging channel rather than the current channel.
1546	*DataReview* heatmap font is too small when working with 1536 well plates.	The font used for the heatmap color bar was unnecessarily scaled to match the well size.
1547	*DataReview* autocontrast button changes state when opening images from new wells.	The state of the autocontrast button will no longer change when loading images from new wells. The button will remain in its previous state.
1548	*DataReview* RGB toggle behavior is confusing.	The display toggles used to control RGB selections will now work more predictably.
1555	Time-point field is too narrow in the DataReview WFTZ selector.	Time-points with 3+ digits will now be visible in the WFTZ selector.
1556	Color acquisition on the *DashBoard* should not warn the user about the plate temperature.	The quick method used to acquire single color images does not need to warn the operator about the plate temperature.
1563	Underscore character not visible in the annotation field in the "Run Scan" windows.	The field height was slightly too short.
1566	*ReviewScan* analysis not compatible with user defined channel names	Fixed.
1567	*ReviewScan* reports a plate type mismatch.	The plate type was being refreshed from the first scan in the list but not the subsequent scans.
1574	*ReviewScan* analysis for 48-bit Tiff export is broken.	Fixed.
1580	*DataReview* image display out of sync with channel display toggles.	The on/off state of the image display was sometimes out of sync with the channel display toggles across the top of the image panel.
1583	Flat-field calibration does not work with odd binning values (e.g. 3x3)	Fixed.
1584	Add warning(s) if the acquisition protocol is incompatible with Investigator.	Certain acquisition protocols will generate XDCE files that are incompatible with Investigator. For examples, refer to the V5.0 release notes. The *RunScan* dialog will now present a warning.
1586	Investigator does not work with plate names that contain "/"	The following plate types will cause problems for Investigator because they all contain the "**/**" character in the tag called "name=". Corning 3615 3631 96-well plate.xplt Corning 3712 3985 384-well plate.xplt Costar 350616 6-well plate.xplt Costar 3512 13 12-well plate.xplt Costar 3524 26 24-well plate.xplt The problem is not new. Four of the files have been in existence since 2008. V5.2 contains workarounds to help reduce the effects of this problem within Investigator. Workaround for analyzing existing XDCE files with Investigator: manually edit the XDCE file. Find the plate name tag "name=" (for example name= Costar 3524**/**26 24-well plate "). Replace "**/**" with a space or other character.

1606	3D deconvolution file naming issues when using channels with the same name.	Conditions that lead to the naming issue: - create an acquisition protocol with more than one 3DD channels with the same name (e.g. "FITC"). - remove a different channel (e.g. "DAPI") - run the scan and observe that only one set of 3DD images has been generated. Also observe that the "wix" tag is absent from the file names. The bug has existed since V4.6. Restarting the INCell GUI is a possible workaround if working with V4.6, V5.0, or V5.1.
1620	Laser Autofocus Z Range for Time Series Scans involving Multiple Field Scans	The calculations used to determine the LAF Z range have been improved for scans that involve time series with more than one field. The improved Z range applies to fields following the first one. The changes do not affect the LAF used for the first field.
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1644	File comparison tool doesn't work on the 6000.	The WinMergeU.exe program was not properly installed in the bin directory. Affects service mode on the 6000 only (both the std and desktop installers).
1646	Add a Russian translation of the Operator's Manual.	Required on systems installed in Russia. The document is located at "...\GE Healthcare\IN Cell Analyzer XX00\manual\Manual 2200\Machine Directive Operating Instructions".
1647	Fix Z warning messages that occur when attempting to move to Z=-1500 um.	The error message "Unable to move outside of Z stage boundaries." was caused by a numerical precision problem in the software. The issue is not related to the hardware.
1648	System report type templates are not installed by the 6000 desktop installer.	The templates were not properly installed, limiting the capabilities of the ReportGenerator. Only affects the 6000 desktop installation.
1649	Invalid hardware compatibility check during 2000 initialization.	The GUI software was only checking for 2000 serial numbers that start with "BX", even though many system serial numbers do not contain "X". (The workaround when using the original release of V5.2 was to add an "X" after the "B".)
1650	Service mode controller file comparison doesn't work on the 2200.	Fixed.

Notice to purchaser
IN Cell instruments are for research use only -- not for use in diagnostic procedures.

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