IN Cell Analyzer
Acquisition Software, Version 4.6
Release Notes

24 June 2014

Introduction

Version 4.6 of the IN Cell Analyzer software contains fixes and optimizations to improve instrument stability and usability. Many of the improvements involve remote control mode (for robotics) and the use of remote storage devices. Version 4.6 also includes new features that make the instrument easier to use.

Upgrading from version 4.5 to version 4.6 should not require training, because the look-and-feel of the user interface has not changed. Only a few of the differences are visible in the interface. The new features and interface changes should be intuitive.

User's Manuals and Service Manuals for version 4.5 are applicable to version 4.6.

The following release notes describe the primary changes and feature enhancements from release 4.5-11440 to release 4.6-12002 of the IN Cell Analyzer software. Also described are issues resolved from previous versions of the software and, if applicable, known issues with this version of the software.

As of June 2014, two patches have been created to fix issues identified with the original version (4.6-12002). See the "List of Changes" for information about patches 4.6-12159 and 4.6-12218.

New Features

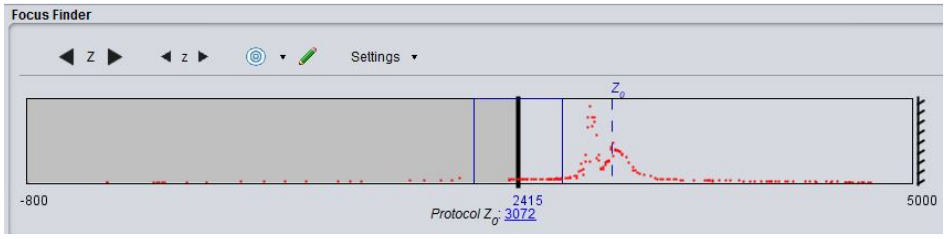
FocusFinder

FocusFinder is a semi-automated tool for interactively finding focus. Use *FocusFinder* when searching for focal planes and when creating new plate types. To enable and disable *FocusFinder*, select the **FF** button on the top, main toolbar.

A typical use case for *FocusFinder*:

- load a plate or slide
- select an appropriate imaging channel
- move to an area of interest using the Plate View in the lower left (for example, the center of well A01)
- enable *FocusFinder* by selecting the button labelled **FF** located in the main toolbar.

- change the focus by dragging the Z position indicated by the black bar, or by selecting the Z control arrows



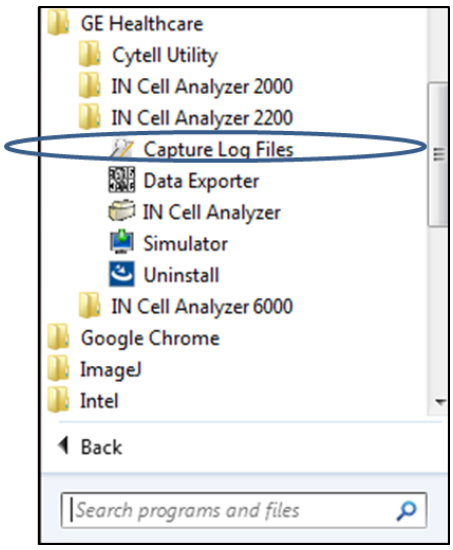
- watch the image display for out-of-focus objects – adjust the Z position to find the desired focal plane
- if necessary, adjust the FF binning and exposure time by selecting **Settings**
- optionally, use image autofocus to refine the focus
- record the Z position by selecting the green pencil.

Rapid acquisition using Z sectioning

Version 4.6 allows the Z step size to be set to "0" for rapid acquisition of a short time series. The maximum number of images is limited by computer memory.

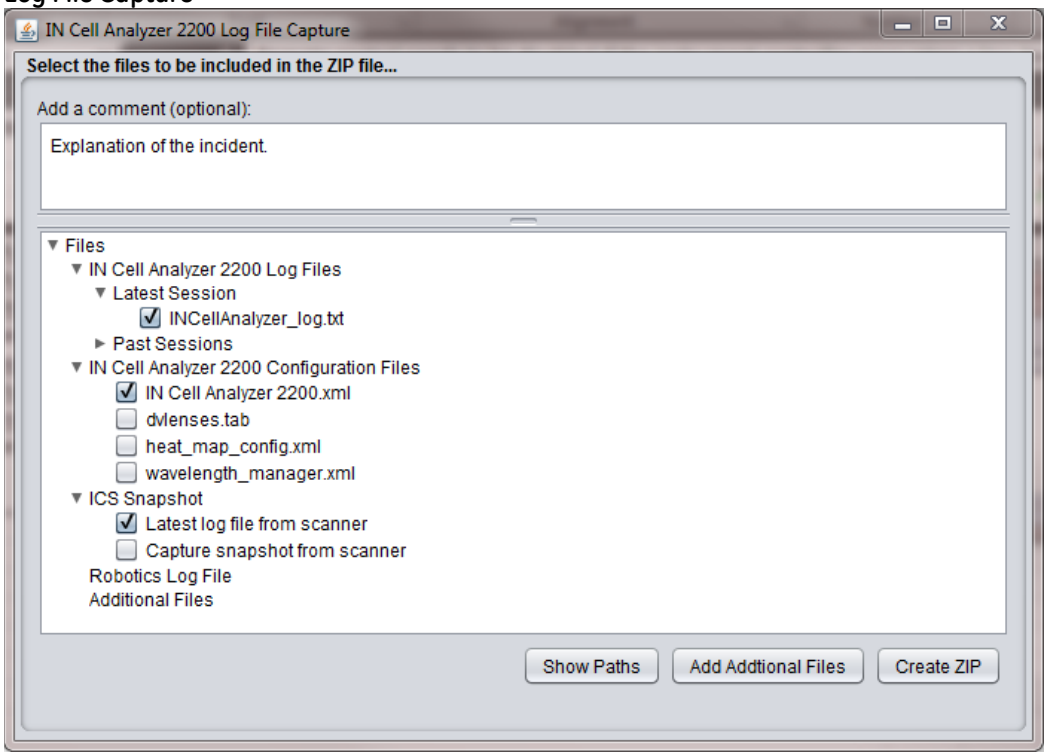
Log File Capture Tool

The Log File Capture tool provides a centralized method of gathering log files. The tool is available in the main program's **Help** menu and in the Windows **Start** menu.



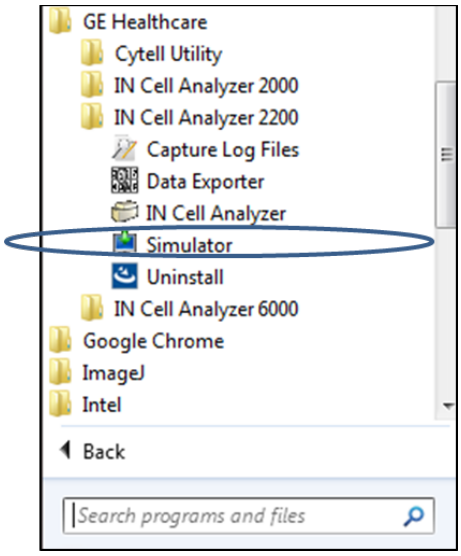
The Capture tool helps simplify the process of retrieving log files from remote sites. Reducing the number of steps involved with gathering log files streamlines the process of diagnosing and repairing acquisition-related issues. To use the Capture tool, add a brief comment about the situation, select the appropriate files, and then select **Create ZIP**. By default, log files are stored on the user's desktop.

Log File Capture



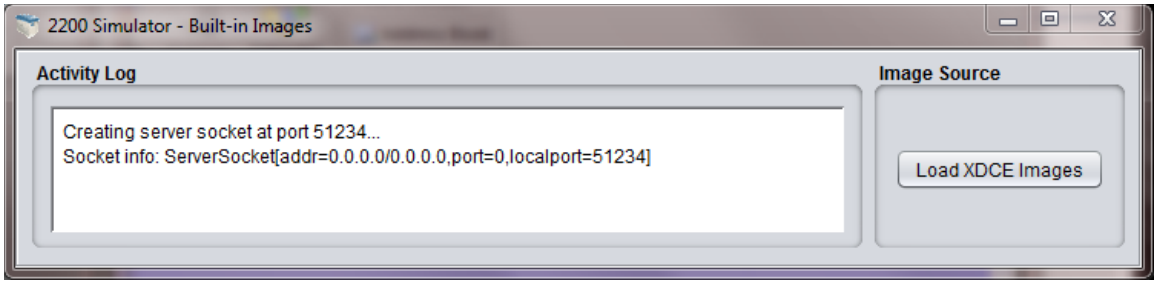
Instrument Simulator

An instrument simulator can now be used in situations where the instrument is unavailable. The simulator can be found in the IN Cell Analyzer's **Start** menu, located in the lower-left corner of the desktop. IN Cell will automatically attempt to connect with the simulator if the instrument cannot be found. Start the simulator before starting IN Cell.



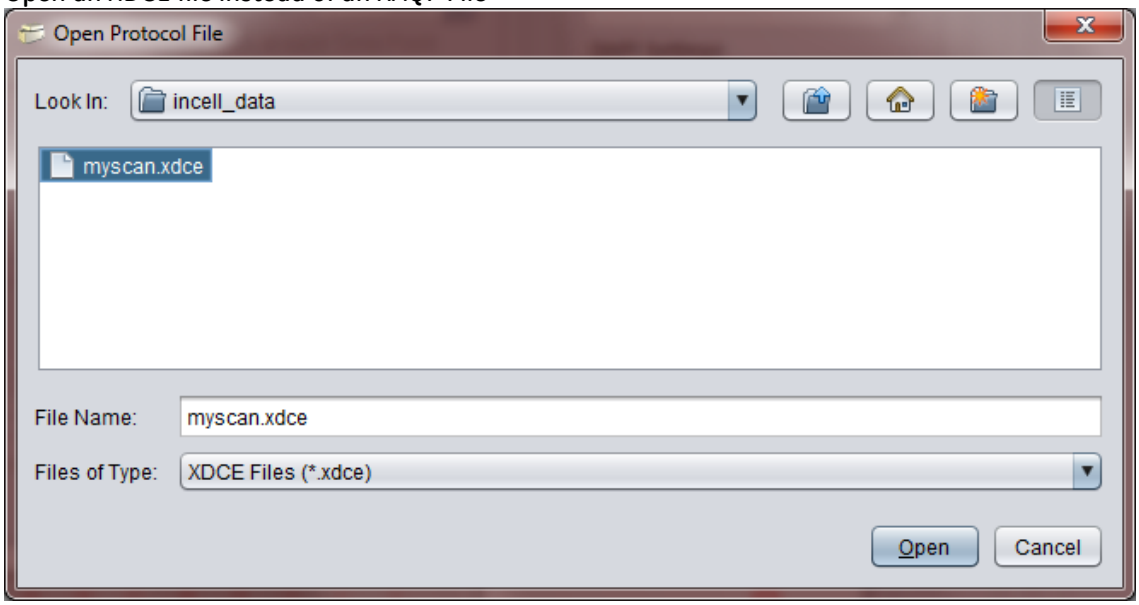
By default, the simulator will use built-in images. Select "Load XDCE Images" to simulate the acquisition of images from a pre-existing scan.

Simulator Interface



Another method of redirecting the simulator is to open an XDCE file (instead of an XAQP file) from the assay development mode of the main program. Choose "*.xdce" for the file type and then select an XDCE file. The simulator will automatically switch data sets. Also, the main program will load the original acquisition settings from the XDCE file. To restart at the beginning of the file list, select the **Eject** button and then reload the plate.

Open an XDCE file instead of an XAQP File



Software Configuration

Starting with Version 4.6, two configuration files will be used to control settings within the IN Cell Analyzer. One of the files contains the GE factory defaults, and the other file contains site-specific settings. The content, file names, and file locations are similar to those used with previous versions of software.

When Version 4.6 of the IN Cell software starts, configuration settings are first loaded from the factory defaults. After that, site-specific settings are loaded. Site-specific settings take precedence because they are loaded after the factory defaults. Site-specific settings replace the factory defaults.

During installation, the file containing the factory defaults will always be overwritten. The file containing site-specific settings will not be overwritten. In the case of a new installation where site-specific settings do not already exist, the IN Cell installer will provide a template file containing commonly modified settings.

The configuration file names used by version 4.6 are essentially the same as those used by previous versions of software, except that the defaults file has "_default" appended at the end. In the case of the 2200, the file names are as follows:

Factory default:	C:\Program Files\GE Healthcare\IN Cell Analyzer 2200\config\IN Cell Analyzer 2200.xml_default
Site specific:	C:\Program Files\GE Healthcare\IN Cell Analyzer 2200\config\IN Cell Analyzer 2200.xml

The main benefit of the new approach is that GE can now deliver configuration updates to pre-existing installations. At the same time, sites that have customizations will not lose their modifications when upgrading. GE can add new settings without disrupting existing settings.

There are currently no provisions for automatically modifying the configuration settings within the site-specific configuration file. If you suspect that your system has a configuration-related problem, compare the site-specific settings with the factory defaults. If necessary, remove all site-specific settings and then restart the software. To recover the default configuration file, reinstall the software.

To allow images to be saved directly to a network drive (without first saving the images to the local drive), change the following setting to "false":

<save_to_network max_queue_size="0" display_behavior="default">**true**</save_to_network>

By default, the software will spool images to the local disk before copying files to a network drive. After making changes and saving the file, you must restart the program.

As of Version 4.6, the dialog box that provides support for exporting images to IN Cell Miner will be disabled. To re-enable this feature, use:

<!-- enable/disable support for INCell Miner --> <support_incell_miner>**true**</support_incell_miner>

As always, be careful when modifying IN Cell configuration files. Refer to the factory defaults if you encounter problems.

Improvements

- Review scan analysis jobs will now start after each well rather than at the end of the entire plate scan. Image processing will be overlapped with scanning.
- The numbers used within well names are now padded with "0" by default (for example, "A01" rather than "A1"). The old naming method can still be used. To control this setting, look in the "Preferences" dialog.
- Time points can now be specified in terms of hours, minutes, and seconds.

- More than one status message can be viewed by hovering over the status area in the lower left area of the main window.
- An Icon Tray has been added to the lower right corner of the main program.

The icons within the tray provide status information about licenses, the scanner door, the plate heater, and C02 control. For an explanation of each icon, hover over the icon with the mouse. The previous figure shows that valid licenses were found for 3D Deconvolution, Transmitted Light, and Plate Heating. Also, the scanner door is closed, the plate heater is off, and CO2 is turned off.

- LAF traces can be saved from the LAF tool. The file format is comma-separated values (CSV).
- A warning is presented if the compound plate and the protocol plate do not have the same number of wells.
- The software will present a warning if images are unsuccessfully copied from local to remote storage.
- The software will present a warning if remote storage is not keeping pace with the acquisition.
- The same button used to open the door can also be used to close the door. Depending on the state of the instrument, the button will be either green or dark red.

Button Color	**Button Action**
	Close the door, load the plate, and move to the center of well A01
	Eject the plate and open the door

- Aperture calibration for the IN Cell 6000 has more instrument controls, such as imaging channel and laser power.
- IN Cell Analyzer log files now have a size limit. The original log file will be retained in a time-stamped copy. The log file names include the time and date to help avoid confusion. For example:

  INCellAnalyzer_log20140307143126.txt

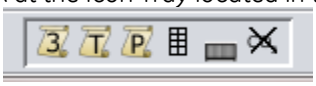
Software Licensing

Certain aspects of the software licensing mechanism have been changed in version 4.6. The new behavior should be an improvement, but it is important to be aware of the following changes:

- Old versions of the IN Cell software were able to find licenses in almost any location on the workstation's hard disk. Due to changes in the licensing software, this behavior has changed. IN Cell version 4.6 will only look for licenses in the program's main folder (e.g., C:\Program Files\GE Healthcare\IN Cell Analyzer 2200).
- IN Cell Analyzer will look for valid licenses in all files that end with ".lic". Specific file names are not required.
- It is no longer necessary to set true/false settings within the configuration file. IN Cell will not look in the configuration file to determine whether a feature should be licensed.

Old license files are still valid, but they must be located in the proper folder. On older workstations, licenses were often stored in "C:\Program Files\GE Healthcare\licences" [sic]. To activate the licenses for use with version 4.6, copy the ".lic" files to the appropriate program folder.

To determine which features are licensed, look at the Icon Tray located in the lower right corner of the main program.

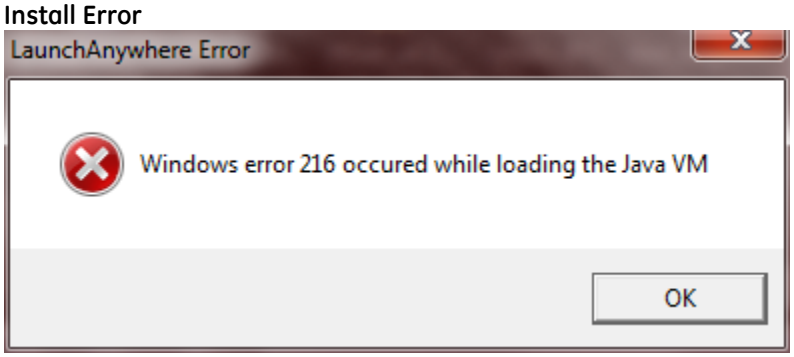


In summary, license files should be located in the program's main folder and should end with ".lic".

Installation Notes

Installation packages are named according to the instrument model. Be sure to choose the installation package that matches the instrument. Look for "2000", "2200", or "6000". For workstations running 64-bit Windows 7, use installation packages that contain "x64" in the file name. Packages that do not contain "x64" in the file name are intended for computers running 32-bit Windows (XP or Windows7). Attempting to install a 64-bit package on a workstation running a 32-bit operating system will result in the error message shown in the following figure.

Install Error



Note that the Java VM is bundled within the IN Cell installation package. It is not possible to switch to an alternative Java VM after installation.

Bug Fixes (relative to v4.5 and earlier)

Over 80 bugs were fixed between version 4.5 and 4.6. For a full list of fixes and changes, refer to the section at the end of this document. Some of the significant fixes are listed here.

Java memory allocation during startup now more intelligent
The IN Cell software will now allocate memory according to what is available on the computer, rather than simply requesting a large, fixed-size block. Modification of the JVM heap size should not be needed to start version 4.6. The exact amount of memory obtained by the IN Cell software will depend on the resources of the computer. As a consequence, sites may need to look at the memory requirements of other software running on the workstation. To obtain the memory needed for acquisition protocols involving lots of images, it may be necessary to stop other programs before starting IN Cell.

Acquisition protocol and image file names may not contain special characters (like "#")
IN Cell will now prevent the use of special characters in new acquisition protocols and image file names. Pre-existing file names will not be changed, but warning messages will be displayed. Many bugs can be traced to file names with special characters. Even if IN Cell were able to handle special characters without fail, there are many external issues that arise from the use of special characters. For example, special characters can break the remote control communication protocol used by robotic control programs (e.g., Overlord and Cellario). There is simply no way to be certain that special characters will not cause problems. Avoiding their use is the practical solution.

Failure to Start a Scan
On rare occasions, Version 4.5 of software would stall at the very start of a scan. The frequency of this failure was calculated to be only 1 in 10000, so this issue should not be confused with more common failures.

IN Cell 2000 Lamp Timer Extended Count-Down
Modified the count-down method used for the 2000's lamp timer thereby resolving the issue causing the extended count-down in Version 4.5.

Missing Objective Lens Configuration
Certain problems within the IN Cell Analyzer were traced to missing objective lens configuration information. Install the factory defaults configuration file (see **Software Configuration**) to address these problems.

Initial Zoom Level of DataReview No Longer Causes Tiny Image
The initial zoom level of the DataReview display area is now properly set.

Enabling/Disabling On-line Cell Counting and Protocol Loading
Resolved issue where enabling and then disabling on-line cell counting led to a condition where the software would fail while loading the next acquisition protocol. As a result, certain protocol settings were uninitialized. This issue predates version 4.5.

Color Acquisition on Dashboard No Longer Fails if Base Folder Set to Network Drive
The base folder can now be set to a network drive when using color acquisition.

Blank Thumbnails in the Plate View
Resolved an internal problem with the preview channel setting that was causing blank thumbnails.

IN Cell Remote Control mode Now Compatible with the Hudson Robotics Software
Resolved a threading problem within the IN Cell software that led to a condition where messages from the Hudson robot control software caused an internal dead-lock.

Improved Handling of Instrument Failures in Remote Control Mode
In the event of a low-level failure (e.g., encoder error) during a robotics run, the IN Cell remote control mode now disables remote control, preventing further activity. Previous versions of IN Cell did not properly change state when serious errors were encountered.

Known Issues and Usage Notes

In ReviewScan, Object Thresholding analysis requires Windows .NET Framework 4.0.
On older IN Cell Analyzer systems running .NET Framework prior to v4.0, an upgrade to v4.0 is necessary.

Solution: Download and install Windows .NET 4.0 from either:

http://www.microsoft.com/en-us/download/details.aspx?id=17851 (web-based)

or

http://www.microsoft.com/en-us/download/details.aspx?id=17718 (stand-alone)

3D Deconvolution fails if the corresponding OTF file is missing
Contact GE Technical Support for help locating and installing the appropriate OTF file.

IN Cell 2200 Quad Selection for Brightfield Imaging
When using brightfield imaging on an IN Cell 2200, the following Emission filter/Quad combinations are recommended:

Quad 1 / Cy3
Quad 2 / Texas Red
Quad 3 / Texas Red

In the case of the Quad 2/Texas Red emission, the intensity will be substantially lower than when using Quad 1/Cy3. Adjust the exposure time accordingly.

Network Attached Storage (NAS) Performance
Data storage on Network Attached Storage (NAS) can be very slow in certain situations. The configurations listed below have been associated with slow performance. There may be other configurations as well.

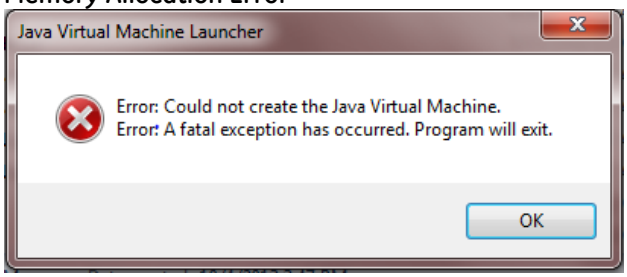
- Java (IN Cell), Windows 7 (workstation), Windows Storage Server 2003 (NAS)
  http://www.sysprobs.com/windows-7-network-slow

- Java (IN Cell), Windows 7 (workstation), Samba (NAS)
  http://stackoverflow.com/questions/14963927/extremely-slow-file-listing-using-java-samba-win-7

IN Cell Analyzer Startup Problems
In cases where the IN Cell Analyzer software fails to start, select and hold the CTRL key while launching the program. A console window will appear. The last part of the output will often contain useful information about the failure. For memory allocation failures, follow the instructions in the next item.

Java Virtual Machine (JVM) Memory Allocation During Startup
If the IN Cell software fails to start due to a memory allocation problem, an error message like the following may appear:

Memory Allocation Error



Use the following steps to reduce the amount of memory requested during initialization:

1. Open the program configuration file in a text editor:

   "C:\Program Files\GE Healthcare\IN Cell Analyzer 2200\IN Cell Analyzer 2200.lax"

   If necessary, substitute the appropriate scanner model number (e.g. "2000" or "6000").

2. Modify the maximum RAM fraction from "1" to a larger value like "2".

```
#   LAX.NL.JAVA.OPTION.ADDITIONAL
#   -----------------------------
#   Maximum allowed fraction of the available memory allocated during JVM
startup. Use values like 1,2,3, where 2 corresponds to 1/2 of the
available memory.
lax.nl.java.option.additional= -XX:MaxRAMFraction=2
```

3. Alternative to solution 2, add a setting to control the maximum heap size. A value like "800M" should work for computers with limited memory. Use an even smaller number if necessary.

```
#   LAX.NL.JAVA.OPTION.JAVA.HEAP.SIZE.MAX
#   -------------------------------------
#   -Xmx max heap memory setting
lax.nl.java.option.java.heap.size.max=800M
```

The software is designed to operate on standard IN Cell workstations. Computers with less memory (like laptops) will often require modification.

Installation problem with ReviewScan Analysis Files
On certain workstations, installation of the ReviewScan analysis software may fail. The explanation for this failure is currently unknown, but it appears that local security procedures may be preventing DLLs, EXEs, and ZIP files from being installed to the "ANP" folder. There are three symptoms of this condition:

1. There are no analyses available in the ReviewScan setup page within the GUI.
2. The installation procedure slows down when copying the ReviewScan files.
3. The ANP folder (e.g., "C:\ProgramData\GE Healthcare\IN Cell Analyzer 2200\ANP") is empty.

Contact GE support for help fixing this installation problem.

Plate Lid Heater Toggle Button "Turns Off Automatically"
When using the plate heater button on the toolbar, the lid heater toggle button will turn off automatically if the "Turn On" button is not pressed. To work-around this problem, select the lid heater toggle button and then press the "Turn On" button.

Plate Lid Heater has Two Sets of Temperature Controls
The primary control value is located within the protocol designer. This is the value used when an acquisition protocol is run. The secondary value is located within the main program's toolbar. Use the secondary value for temporary control of the plate heater.

Dark Imaging Problems
The original release (12002) of version of 4.6 had a bug that sometimes caused errors during dark image acquisition. Measurement of flat-field calibrations (FFC) was effectively disabled by this bug. Release 12159 contains a fix for this bug.

PAA Overlord2/3 - Issues and Workarounds

There are a number of issues that can affect the reliability of automated plate scans using Overlord and IN Cell. Certain conditions can be recovered by selecting the **Retry** button on the Overlord main screen. Many of the problems can be traced to the "Network Attached Storage" performance issues described above.

Overlord and Driver versions
Testing at GE and PAA has confirmed that the following versions of the PAA software work well with the IN Cell Analyzer version 4.6:

Overlord Main Program: 3.0.23.18
Overlord INCell Driver: 1.0.3.18

For best compatibility between the PAA and IN Cell software, use a driver version greater than 1.0.3.10. Version 1.0.3.18 is included within the IN Cell software package:

"C:\Program Files\GE Healthcare\IN Cell Analyzer 2200\thirdparty\Overlord.Commands.GEIncell2000.1.0.3.18.zip"

Overlord IN Cell Driver Update Procedure (Typical)

1. Shutdown Overlord.
2. Copy the new driver (a DLL file) to C:\program files (x86)\paa\overlord3\commands.
3. From the Overlord commands directory, run the following command:

   C:\> "..\setup\register dlls.exe" Overlord.Commands.GEINcell2000.dll"
4. Restart Overlord.
5. On the ***Setup:Command Setup*** page:
   a. Remove the old version of the command driver (e.g., 1.0.3.3).
   b. Add the new version (e.g., 1.0.3.18). Answer "yes" if asked to restore.
6. Open GEIncell 2000 device. Select Type=2000;, reset the host and timeout parameters if needed.
7. Open affected .ovp files. Overlord will remove the old INCell device, because the version has changed. Re-add the new version of the device and then reset the Run.

Overlord Error Message: "A script engine for the specified language cannot be created."
This error message has been traced to corrupted registry setting that can be fixed by following the instructions located at this web address:

http://www.mediamonkey.com/support/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=150

Network Interruptions from Other Programs on the Communication Port Can Cause Overlord/IN Cell Communication to Fail
To recover from such interruptions, stop the outside program from using the port and then select **Retry** on the Overlord main screen. If necessary, change to a port number other than 9999 using the following setting in the IN Cell main configuration file:

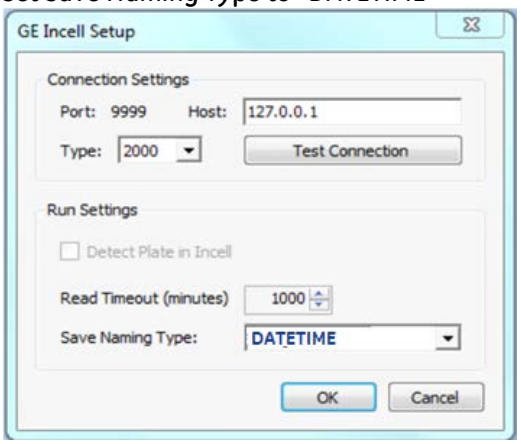
```
<!-- Automation server socket -->
<automation_server_socket host="localhost" port="9999" />
```

A similar configuration change will be required for Overlord.

Communication Timeouts Due to Network Attached Storage
Slow communication with Network Attached Storage (NAS) systems can cause communication timeouts between Overlord and IN Cell. The chances of this occurring will increase as the number of files and folders in the destination folder on the NAS increases. To reduce the likelihood of failure, apply as many of the following workarounds as possible:

- Upgrade to driver version 1.0.3.18.
- Increase the necessary driver timeout value(s) in " Overlord.Main.exe.config" (only possible if using 1.0.3.11 or higher). Times are in milliseconds. The ClientSendTimeout and ClientReceiveTimeout are the most effective timeouts.
- Set the "Save Naming Type" to "DATETIME" rather than "UNIQUE".
  Generating unique folder names can be very time consuming (on the order of 10-60 seconds) when working with certain types of remote file storage (see "Network Attached Storage (NAS) performance").

Set Save Naming Type to "DATETIME"



Overlord Timeout During Long Scans (Driver Version < 1.0.3.10)
Scans that last longer than the Overlord "Read Timeout" value may result in a communication failure between Overlord and IN Cell. To work-around this problem, increase the device communication ***Read Timeout*** value to a value that is larger than the time required to scan a plate. Using a large timeout such as 1000 minutes will prevent a communication problem between the IN Cell acquisition and Overlord software. Prior to driver version 1.0.3.21, the maximum allowed timeout value was 1000 minutes, which corresponds to 16.7 hours. Scans lasting longer than 16.7 hours (including Review Scan procedures) would trigger the timeout.

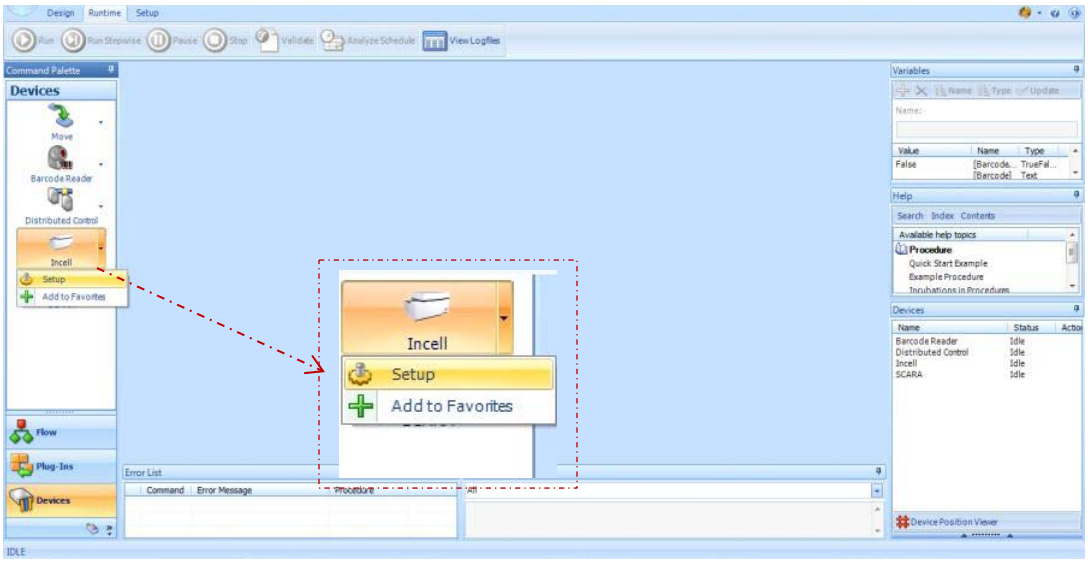
1. Open the ***Overlord*** software by selecting the desktop icon or navigating to:

   C:\Users\incell\AppData\Local\Programs\PAA\Overlord3\Overlord.Main.exe.

   The ***Overlord*** console opens.

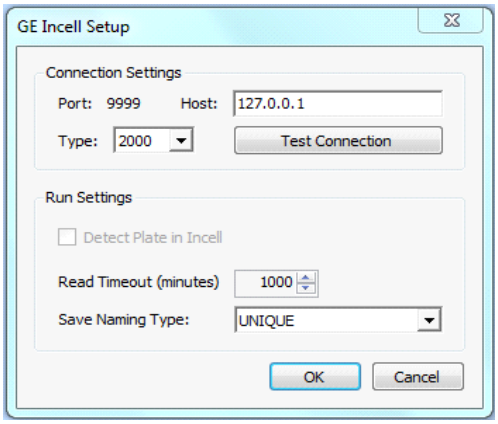
2. Under ***Devices***, right-select ***Incell*** and select ***Setup*** from the pop-up menu.

   Select Setup



3. On the ***GE Incell Setup*** dialog, increase the ***Read Timeout*** interval to *1000* minutes, or longer if using a driver version above 1.0.3.20.

Increase Read Timeout Value



4. Select ***OK*** to save and close the dialog.

Communication Buffer Limit

The Overlord IN Cell driver has a limited buffer size for accepting protocol lists returned from the remote control message <m:ImagerStatus>. Prior to version 1.0.3.12, the limit was 8Kb. Starting with version 1.0.3.12, the limit was increased to 64Kb. To work-around this limit, reduce the number of acquisition protocol files (.xaqp files) stored in the AQP folder and then restart the IN Cell software. In the case of the 2200, the AQP folder path is:

"C:\ProgramData\GE Healthcare\IN Cell Analyzer 2200\AQP"

Problem Parsing Special Characters

Acquisition protocol file names that contain unusual characters like "&" may cause communication problems between IN Cell and Overlord. The symptom of this problem is a parsing error reported in the Overlord log file. Error messages will contain terminology like "unrecognized token". The parsing failure will also cause Overlord to disconnect from the TCPIP socket. The IN Cell client will then report that the remote control client has disconnected. To avoid this issue, use .xaqp file names with simple alphanumeric characters. Do not use characters like "&" or "%".

List of Changes

Patch 2, 4.6-12218:

ID	Brief Description	Additional Comments
854 1016 1036	Vibration of the lens turret caused mechanical problems on some systems in certain situations.	The motion control firmware was modified to reduce vibration caused by the lens turret and polychroic changer. Version 6.0030 of the motion control firmware is now included within the installation package. Where appropriate, the firmware can be installed by GE service. The firmware file can be found at: "C:\Program Files\GE Healthcare\IN Cell Analyzer XX00\scanner_software\N3Box_60030_Sil_Any.hex"
1007	Lid Heater check box turns off automatically	Only update the lid heater check box if it's disabled. This prevents it from switching when you don't want it to. Also update the enabled-ness of the check box if user selects "Turn Off" on the plate heater dialog at the end of a run.
1046	AVI movie "Save As" fails after multiple runs.	A threading problem caused the movie "Save As" feature to fail after multiple uses. The bug appears to have existed long before v4.6. Also fixed the way the dialog boxes are layered on the display. The proper dialog box should now be on top.
1047	The DataReview tool's "Save As JPG" fails after multiple runs.	Java was not releasing memory in the expected way. The code was modified to avoid the memory problem.
1051	Remote control "Enable"/"Disable" button responds to the enter key	Pressing the enter key will toggle the state of the remote control dialog's "Enable"/"Disable" button. If the operator presses enter to wake up the screen, then the remote control socket could be closed in the middle of a run. The enter key has been disabled for this dialog box.
1060	Protocol designer and dashboard use a different, maximum allowed temperature set-point for the plate heater.	The dashboard will now use the same range as the protocol designer.
1069	Online cell counting not resetting properly between wells.	

Patch 1, 4.6-12159:

ID	Brief Description	Additional Comments
1043	FFC measurement and dark image acquisition failed due to a "camera timeout".	Procedures that use dark imaging fail due to a camera initialization problem. The camera is now properly initialized when acquiring dark images. Only the measurement part of the FFC mechanism was affected. Existing flat-field calibration files were OK.

Original Release, 4.6-12002:ID	Brief Description	Additional Comments
327	Error and status reporting while in remote control mode is inadequate.	Lots of diagnostic information has been added to the GUI log when operating in remote control mode.
571	Protocol names may not contain special characters.	Avoiding special characters will avoid mysterious problems within INCell and will reduce the number of unexplained problems with downstream software.
575	A heater status icon on the toolbar would be helpful.	Added to the icon tray. See #748.
615	Saving to a network drive should provide better feedback.	Some improvements have been made to the information reported in the log file and in the processing queue.

736	Java memory allocation needs to be more intelligent.	Fixes memory allocation problems with laptops and certain WinXP computers. The allocation options are limited, though. Installers will still need to be aware of JVM memory settings.
740	Loading xdce files from disk is slow.	The load operation was inefficient and occurred twice per request.
746	Automatically save the analysis results to a CSV file.	Applies to ReviewScan Analysis "ObjectThresholding".
747	Create improved focusing methods.	The "FocusFinder" provides semi-automated autofocus.
748	Add icon tray for displaying instrument status.	Status icons now displayed in the lower right corner of the GUI.
756	Problem editing user preferences.	Under certain conditions, the "Alt" key was inadvertently activated.
757	Incorrect field-of-view size in the Plate View.	Probably a result of #920 and/or #935, which have been fixed.
761	Fully saturated images should appear as white rather than black.	
764	Vague error message "Socket Connection Lost" needs improvement.	
769	Mouse wheel control doesn't always work properly.	Improved control software for better GUI control.
773	Processing queue display contains a lot of blank lines.	New display is easier to read.
774	Toolbar buttons should be inactive when in Remote Control mode.	Appropriate icons are now disabled and grayed-out when in remote control mode.
777	Field separation is incorrect after loading protocol.	Probably a result of #920 and/or #935, which have been fixed.
783	Enabling remote control mode during a scan causes an error.	
785	New, modified, and unsaved protocols can confuse remote control.	
787	Thumbnails display performance needs improvement.	In certain situations, thumbnail display was a bottleneck.
790	Log file can grow to unmanageable size.	GUI log files will now rollover at run-time. Old logs will have a time/date stamp.
791	Better method of getting the essential system status files.	Look for "Capture Log Files" in the Start menu.
795	Need a warning message if network storage is not keeping up with acquisition.	
799	Possible changes to the remote control protocol.	No changes were made to the standard behavior, but new options are available. See GUI configuration file.
801	XDCE file missing after Incell scan, due to hitting Windows path length limit of 256 characters.	
802	SaveToNetwork can fail to copy file.	Fixed. An extremely rare condition in previous versions.
803	save_to_network needs to be more configurable.	See GUI configuration file.
804	Need Review Scan Analysis without an additional scan.	The analysis can be useful even if there is no follow-on scan.
805	Allow Review Scan with save_to_network=true	
807	Add confocal settings to XDCE file.	
809	Improved acquisition frame rate.	Use Z sectioning with Z step size=0.

812	Feedback from Users, 19-Nov-2013	1. If you select the acquire color image button (with no plate in place), you get an error and you have to restart the software. 2. If a second scan is run with more than one field of view, only 1 FOV will be measured. This was only observed with the 2000 software; the 6000 ran all fields as expected. 3. When running analysis of object level data (form factor, intensity, and area), the image processing step required more time than it took to read the plate. Would be good to speed that up by allowing processing to occur during imaging or allowing more cores to process images. 4. Oddly, if you set up a review scan protocol with no active wells for re-imaging, the system will run a second generic 96-well plate instead of moving on to a new plate.
813	Feedback from Users, 20-Nov-2013	A. The Save to File output is jpeg in a highly compressed format. Would it be possible to add an option to choose the compressed? After acquiring a fused image from the Dashboard (highly appreciated by the way), we compare the quality of the image displayed in the software and the saved jpeg and the difference is strong and makes the image unusable. B. Customer asked to name well "A – 01" instead of "A – 1" to be easily sorted by name and retrieved from another program. C. Time remaining function (even if it's not highly accurate but to have a rough idea).
816	Top menu locking issue for 2000/2200 (but not 6000).	
818	Continuous acquisition problem when running linestats.py (6000).	
819	Add Laser Power to 6000 aperture calibration.	Needed for proper exposure during aperture calibration.
820	INCell 6000 multi-wavelength aperture calibration improvements.	Added needed controls for properly configuring the instrument during calibration. 1. When Calibrating the UV channel, we should set the EM channel to FITC. (Currently set to DAPI.) 2. The laser power settings used during calibration are too high (line saturating). Add lower default and add laser power control to calibration screen. 3. Add confocal mode with aperture size to calibration screen (further reduces intensity to prevent saturation). 4. Add text in calibration window alerting user to adjust laser power/confocality settings in addition to focus and exposure settings.
825	Add XDCE Exporter to start menu.	Certain installation packages may have been missing this feature due to a packaging problem.
826	Pin is missing in microscope mode from top drop-down displaying focusing bar.	
827	Acquisition build 4.5 INCA2000 lamp timer not 3 mins.	Apparently caused by a bug involving WinXP & Java 1.7.
828	INCA2000 Acquisition build v4.5 - power of 40x objective 1% (10% in config. file).	Probably fixed as part of #898.
829	Acquisition build v4.5 OLCC not working correctly on 2200.	Not reproducible. Possibly an issue with the sample. The OLCC code has not changed.
835	Need to offer a well-naming option that creates file names that sort properly.	Added support for names like "A01" rather than "A1". Padding with zeros is the default. The old style is still possible. See "Preferences".
836	Confocal options on dashboard not disabled for Brightfield	

840	Add ability to start analysis jobs after each well rather than at the end of scan.	Improves ReviewScan analysis performance.
844	Deadlock at start of high-performance threading due to access lock not being released.	Bug caused a 1/10000 chance of a stall when starting a plate scan.
856	.xaqp file filter listed twice on Open dialog.	
857	Allow Simulator to load an image stack programmatically.	Load an XDCE file instead of an XAQP file! Useful for training, debugging, V&V, etc.
869	Layout problem with View Chain Button on Review Scan protocol page	
870	Old GUI configuration files do not contain all supported objectives.	Fixed as part of #898.
872	Missing labels in Microscope mode/SWAF.	
874	Problems setting the CFP channel and filter settings.	Reported by VM.
876	Digitize button is displayed as Di in Protocol Wizard / Channel Settings.	
877	Modify the door button so that it can also close the door.	Improves workflow, especially when combined with the FocusFinder.
881	Use absolute timestamps in ICS log.	Helps diagnose problems that occurred at known times.
882	Active ics log timestamp doesn't match error_log timestamp.	
883	Simplify licensing setup.	It is no longer necessary to modify the configuration file. Copying the license file(s) into the correct folder is the only requirement.
884	Change the default short range LAF settings.	Use a better setting for the default, short-range LAF.
886	Provide a status message history as a tool tip.	The last 10 status messages can now be viewed by hovering over the message area.
889	Time series protocol page improvements.	Requests from the v4.5 feedback session: 1. Allow multiple select/deselect of channel on/off toggles. 2. Allow different methods of specifying the time series (start/stop/interval, start/stop/#, start/#/interval). 3. Allow input as hh:mm:ss in addition to secs.
890	Color acquisition button ("Miniscan") does not need to measure the camera bias.	Color acquisition from the Dashboard is now faster.
892	Objective offsets handled inconsistently near scan limits.	
898	GUI configuration file changes to resolve installation & upgrade issues.	Fixes some long-standing issues.
906	Initial zoom level of DataReview mode results in a tiny image.	An annoying bug that happens after every scan.
908	Field overlap should be allowed to go negative.	Negative overlap is an easy way to create spacing.
913	Problems with PlateManager when nothing is selected.	
918	Uninitialized correction collar setting can lead to Z offset being off by 1um.	The 1um difference was annoying and strange.
920	Enabling and then disabling OLCC leads to subsequent failure when creating a new protocol.	The new protocol is silently corrupted. Probably related to 757 and 777.
926	Special characters in AQP file names can break remote control clients (e.g. Overlord).	New file names with special characters will not be allowed. Existing file names with special characters will generate warnings.
930	Continuous acquisition can be difficult to stop.	
933	ReviewScanProtocol file name gets unexpected initialization if AQP file contains a blank name.	
938	Preview scan exposure time is not initialized to a reasonable setting.	

944	Color acquisition button doesn't work if base folder is set to a network drive.	
945	Loading protocol with bad lens id leads to blank error message.	
947	Image will not update after select 'Load image from Tiff' in Data Review Mode.	
949	GUI starts but doesn't display.	A strange condition that can result from using multiple monitors.
951	Add a user accessible method of saving the LAF trace to a CSV file.	
954	Channel labels wrong on visuals panel.	
960	Display the actual Z position while scanning.	
961	User defined wavelengths are not displaying name correctly.	
962	Too many queue size status messages are shown.	
963	Initial laser power setting incorrect.	Laser power is now set to the default value when creating a new protocol.
965	Robotics status requests from a Hudson robot can interrupt scanning.	This bug affects sites that use a Hudson robot.
966	Review Scan analysis protocol installation/configuration issue.	Some sites that use batch processing with Investigator will modify (manually) the ANP folder location in the GUI preferences INI file. RS analysis files always get installed to the local ANP folder, which means that none of the measurement tools will be found at run-time. The workaround for previous versions is to manually copy the analysis files from the local ANP folder to the folder specified within the preferences INI file. Version 4.6 uses a separate folder called "ReviewScanAnalysis" for RS analysis files. The location of the ReviewScanAnalysis folder will not be adjustable.
967	Z Section spinner on DR toolbar may become inoperable.	
968	Hide INCell Miner export dialog for standard configuration.	The "Run" dialog is now much cleaner. See the GUI configuration file to re-enable support for Miner.
969	Position of status text with image intensity statistics jumps around.	Fixing the position of the numbers is good.
972	Empty timepoint leads to null pointer exception.	
977	Warn the user if the compound & imaging plates don't have the same number of wells.	
979	Review Scan Folder field is not refreshed after running a review scan.	
983	Save last LAF trace from every well during plate scans	Select "Ctrl-Alt-D" to enable the diagnostic menu. Select "Save LAF Traces". Use with discretion.
986	DataExport help file (DataExport.htm) needs to be added to the installation package	
991	Thumbnails can disappear when contrast adjustment setting is moved all the way to the left.	
992	Thumbnails aren't always being displayed in PlateView	
993	Remove ReviewScan temp files before installation to avoid "overwrite" confirmation dialogs.	
994	Polychroic moves to unexpected position.	The polychroic doesn't always track the protocol settings in the expected way.

995	Possible installer problem with the 2000 rpm.	Instrument controller rpms don't always get installed on the 2000, because of a premature time-out. The issue only affects tools used by service and manufacturing. The problem does not affect the normal mode of operation.
996	License manager within versions 4.0 & 4.5 expects license files with exact file names.	Starting with version 4.0 the license manager requires exact license file names. Prior versions of the license manager could find licenses in any file that ended in ".lic". Upgrading the software on older systems requires manual license file renaming (right?). Version 4.6 will restore the old behavior by looking for licenses in all files ending with ".lic".
997	Set the minimum allowed Z step size to 0.	Needed for Z-stack fast acquisition mode.
998	V4.6 Feedback: Crosshair cursor isn't appearing in Preview mode.	
999	V4.6 Feedback. 'Starting analysis...' message is misleading.	
1000	V4.6 Feedback: ts_receive_time, ts_acq_time, etc. are blank in xdce data exporter.	
1001	Old Start menu items need to be removed before installation.	
1003	Thumbnail won't display in DataReview if imaging only 1 well.	
1004	From V4.6 Feedback: Warn user if copy to remote device fails.	
1008	Remote control mode doesn't handle ics errors properly.	Remote control needs to be immediately disabled if the instrument controller encounters a low-level hardware error (e.g. an encoder error). IN Cell should not indicate "ready for next plate" if the ics stops running.

Customer/Technical Support

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