

Celigo v3.2 Software Release Notes



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Overview

The following document describes the major changes and bug fixes that occurred for the Celigo v3.2 software version. The software version 3.2 (v3.2.0.31) is a replacement for the prior v3.1.2 software release (v3.1.2.1).

The Automation API has been changed since the prior release, but maintains backwards compatibility with existing automation drivers.

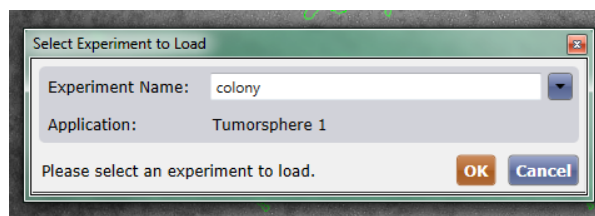
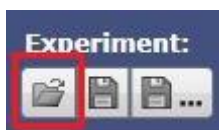
Changes

Expanded Illumination Support

The software now has the ability to control more than 4 illuminations and can drive brightfield and the hardware autofocus through different optical paths.

Load Experiment

The software now provides the ability to load a saved experiment from any tab of the application with the exception of the Results tab. Users should now see a third option next to the Save and Save As experiment buttons which will allow users to load an experiment that was previously saved to the database.



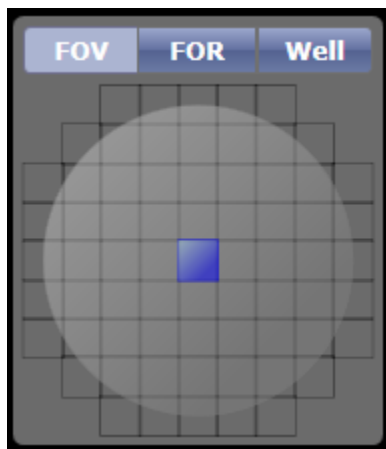
The Load Experiment dialog will only display compatible experiments with the current workspace in its dropdown list.

- In the Scan Tab, all experiments with the same number of rows/columns as the currently loaded plate.
- In the Analyze and Gate Tabs, all experiments with the same number of rows/columns as the currently loaded plate and the same number of channels as the acquired scan.

Analyze Tab

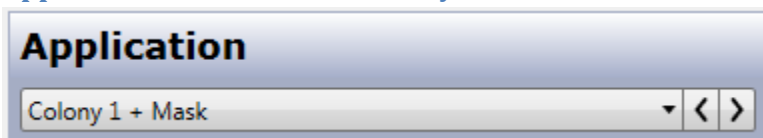
Whole Well Support

For certain applications (Confluence, Colony, Tumorsphere, Embryoid Body), the user can choose what portion of the well they would like to analyze in the Analyze Tab for purposes of setting up and previewing segmentation. The choices have been previously just a single image (FOV - Field of View), or a larger set of images (FOR - Field of Regard). The choices have been expanded now to include Well, allowing users to analyze the entire well to preview segmentation before making the decision to analyze the entire scan.



NOTE: When in well mode, the image resolution will not appear to change when specifying analysis resolution. In addition, well mode does not support previewing processed images.

Application Selection in the Analyze Tab



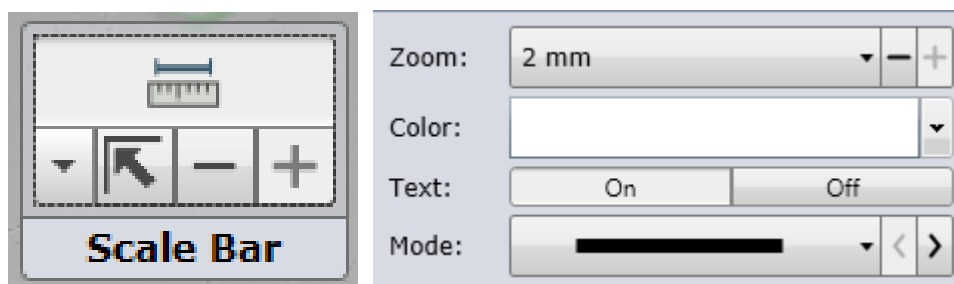
The ability to change application has been added to the Analyze tab. You may only change to another application with the same amount of channels as the scan you are currently working with. For example, if you have a scan that was performed with the Confluence Ratio application, which has two channels, then you may only switch to another application that has two channels (the dropdown list is filtered to only show applications with the appropriate amount of channels).

Image Displayer

Scale Bar



A scale bar was added to the image displayer on the Scan, Analyze, Gate, and Results tabs.



A scale bar options group was added to the headers of all the tabs as well. The scale bar options control contains options to allow the user to toggle on and off the scale bar, adjust the current level of the zoom, return the scale bar to its default position, change the bar's color, toggle on and off the unit text, and to change the display mode of the scale bar. Three display modes available are: bar, line, and ticks.

The scale bar displays the actual length of sections of the acquired image. The units range from 5 μm to 10 mm and can be modified via the scale bar options. When zooming in, if the scale bar width exceeds half the visible width of the image displayer, then the scale bar will automatically adjust its units and size to stay below that bound. When zooming out, if the scale bar width drops below 50 pixels, then the scale bar will adjust its unit and size. If an increment or decrement to the zoom would cause the size of

the scale bar to violate either of these bounds, then the respective button in the scale bar options control will be disabled to prevent it.

Displayed images saved from clicking the 'Save Image' button on any tab will include the scale bar in the image if it is toggled on.

Quick Zoom

The ability to quickly zoom in and out of certain image displays was added in this version. This new feature is available in the Gate tab, Results tab, and the whole well view of the Analyze tab.

To utilize this new feature, simply double-click anywhere on the image displayer. If you are not zoomed in to the level at which outlines appear around Areas of Interest (AOIs) then you will be zoomed in to that point and the image displayer will center on the point at which you double-clicked. If you are currently zoomed in further than the point at which outlines appear then you will be zoomed out to the point at which the whole image fits within the bounds of the image displayer and the image will be centered as well.

Editable Scale

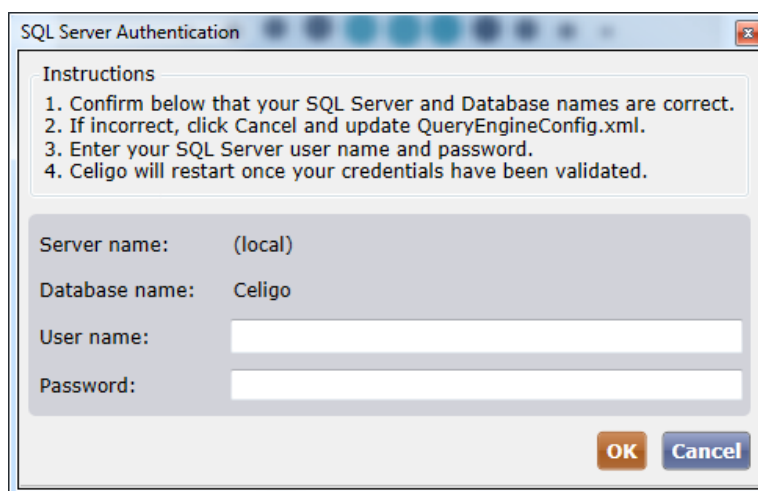
The micron per pixel scale value can now be manually adjusted. The minimum (most zoomed in) is set to $1/16^{\text{th}}$ micron per pixel, and the maximum (most zoomed out) is set such that the calculated value would not allow the image's width to become less than half the width of the image displayer.

A numeric up/down textbox has been added to the status bar for inputting the micron per pixel value. Also, the zoom slider – previously in a blue widget on the image displayer – has been moved to the status bar alongside the input textbox. The two controls' values are bound to each other so modifying either one will adjust to the appropriate value on the other.



SQL Account Authentication

SQL account authentication can now be used in place of Windows authentication. To enable this mode, the `IsSqlAuthenticationMode` will need to be added to the `QueryEngineConfig` file with a boolean value set to true. Once that is set, the next time the Celigo software is started, the user will be prompted to enter their SQL account username and password.



Upon validation, the software will restart and the user will have access to the database. Note: the credentials must be entered in this method, because following validation after input, their password will be encrypted and stored in the config file.

Export & Import Modifications

New Default Locations

All non-automation exports and imports have new default locations.

All Settings have the following default save folder: *C:\Users\<username>\Documents\Celigo\Settings*.

All archive exports and imports have the following default save folder:

C:\Users\<username>\Documents\Celigo\Archives.

All image exports have the following default save folder:

C:\Users\<username>\Documents\Celigo\Image Exports.

All result exports have the following default save folder: *C:\Users\<username>\Documents\Celigo\Result Exports*.

Automatic Directory Creation

During an export or import operation, file system directories related to exports will now be created if they did not previously exist or were deleted during the lifetime of the application.

Optional Resolution Downgrade for Image Exports

When exporting images from Celigo, whether using automation, batch, or interactive mode, users will now have the ability to downgrade the resolution. This will be useful if users do not want the export process to take as long and do not mind a lower quality/resolution image. Users will be able to select a resolution value between the acquired image resolution and 16 microns per pixel for the image exports. In interactive mode (Results tab) we will dynamically check if the well(s) can be exported as the user

adjusts the export parameters such as file type, desired resolution, and whether they want the images stitched together or not. In the batch screens, users will now have the option to export images at the originally acquired resolution versus a downgraded resolution. Since there are potentially multiple, differently-sized scans being exported, we will show and hide warning text if any of the queued scans that are marked for image exportation will not be able to be exported under the current parameters (file type, desired resolution, and stitched vs. unstitched). If using the downgraded resolution option, the target resolution's numeric up/down range will automatically adjust itself so that none of the exported images will fail. Automation will now be able to handle a desired export resolution parameter and will just throw an exception a well cannot be exported under the current parameters.

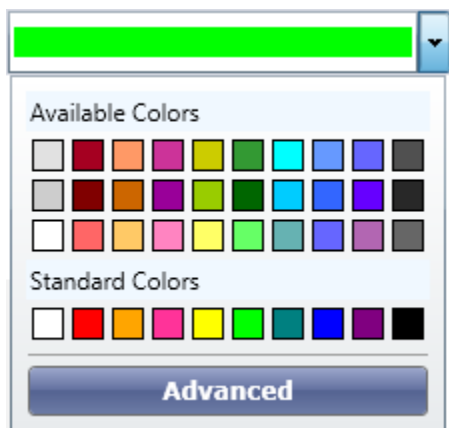
Improved Limit Checking for Image Exports

When interactively exporting images the software will now check to see if the images are too large to be exported for the file type (TIFF, BMP, & JPG) limitations under the current settings. In the case that the images are too large for the current settings (file type, whether stitched or unstitched, and target resolution), the software will adjust the target resolution's numeric up/down range so that export will succeed.

User Interface Improvements

Improved Color Picker

A new color picker was chosen to replace the old color picker. In addition, a specific set of colors were chosen as the available and standard colors on the initial screen. However, you are still able to choose any color of the rainbow by clicking the Advanced button.



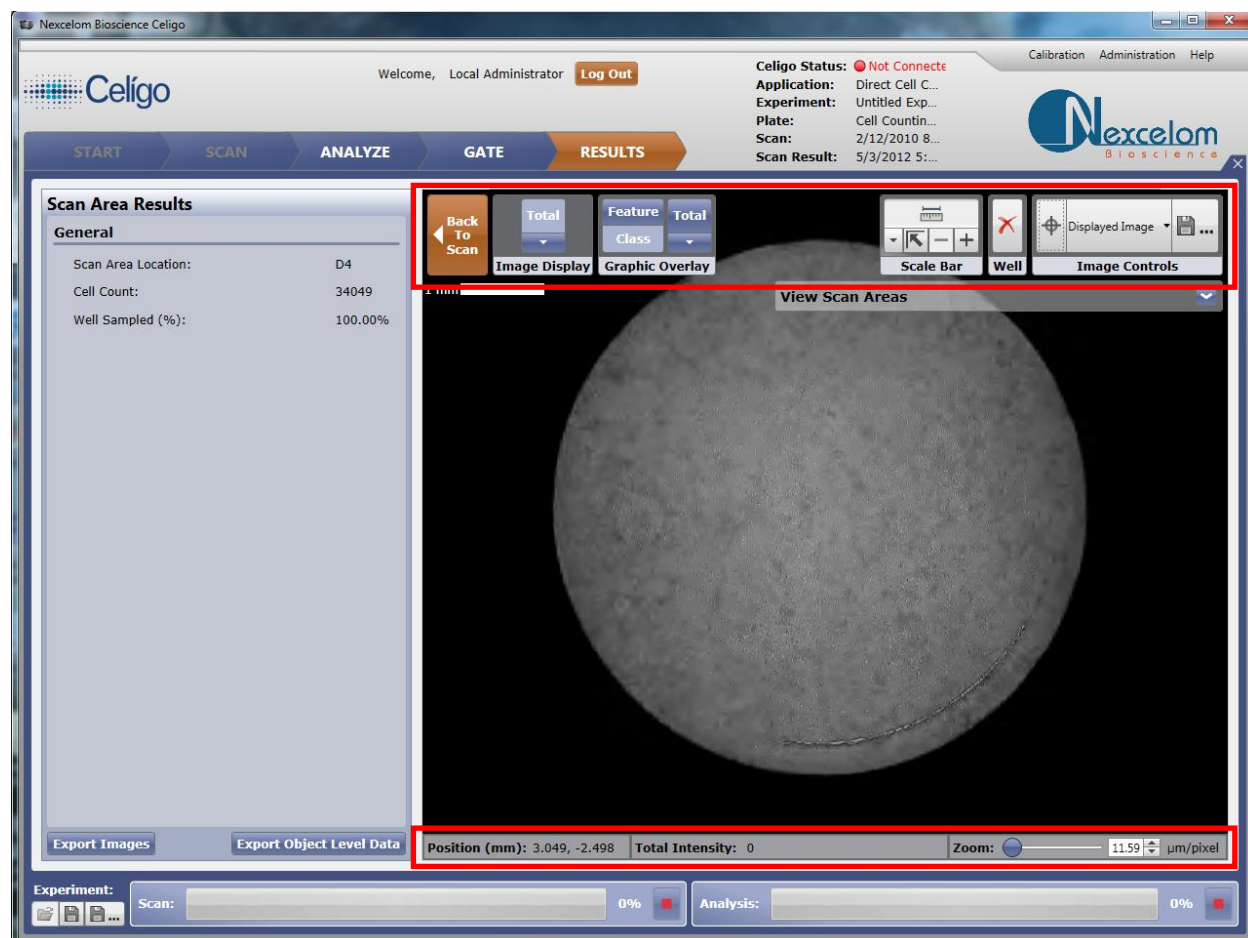
Improved Numeric Up Down

The numeric up down control was updated throughout the application. The new control provides additional functionality and resolves several bugs that were seen in the prior version of the control.



Updated Image Displayer Design

The header and foot controls for the image viewer have been redesigned to cover up less of the image shown in the image viewer and provide more usable space. The footer has also been modified to display intensities across all tabs. These changes are present across all tabs that contain an image viewer (Scan, Analyze, Gate, Results).



Applications

New Applications

The Expression Analysis Suite has been updated to include 5 channel variants. As a result, 3 new applications were generated.

- Target 1 + 2 + 3 + 4 + 5
- Target 1 + 2 + 3 + 4 + 5 (Merge)
- Target 1 + 2 + 3 + 4 + Mask

Updated Applications

No applications were updated with this release.

Bug Fixes

The following section lists the user facing bugs that were addressed in this release.

ID	Title
<u>89</u>	Population color selection also performs a class assignment
<u>663</u>	Manage Data: Vertical scroll bar in tables hidden and requires being horizontally scrolled to
<u>382</u>	Need to change segmentation outlines colors twice before it works
<u>1333</u>	Start Automation Mode menu option sometimes incorrectly disabled
<u>1636</u>	Plots do not display in the gate tab when using remote desktop
<u>790</u>	Manage Data: Automatic resizing of the description column causes application to freeze
<u>1582</u>	Pressing enter after typing a new z position does not move the motor
<u>493</u>	Uninstall the software does not remove desktop shortcut
<u>1329</u>	Manage Data: Resizing the description column in causes a flicker
<u>471</u>	Manage Data: If failure happens during archive exporting, allow the system to skip over the current plate and move on to next, with report of failure
<u>1393</u>	Manage Data: Folder Column Resizing
<u>1454</u>	Save image button initially disabled in the scan tab until user clicks snap
<u>827</u>	Manage Data: Exporting and deleting settings not performing proper refreshing action
<u>1785</u>	Satellite: Closing software does not expire user sessions
<u>835</u>	Change error message on loading scans with no scan areas
<u>743</u>	Prompt not properly displayed for terminated user sessions
<u>1703</u>	Celigo installer unable to perform maintenance mode operations
<u>1727</u>	Scan Area Results - Export Object level data does not display a default file name
<u>838</u>	Data migration fails when a Q:\ drive is present (drive is created by Microsoft Office 2010 Starter)
<u>742</u>	If a user is prevented to login (due to a locked user session), user cannot tell how much longer the lock will last
<u>1503</u>	Celigo Satellite Installer fails to install if SQL Server Agent is not installed
<u>1706</u>	Installer attempts to install c++ 2015 redistributable even if it is already installed
<u>726</u>	Moving a single item that you do not have permission to move does nothing and shows no warning
<u>740</u>	Manage Data: Locked plate stays locked even if unloaded by the locking user
<u>1689</u>	Analysis Resolution can be lower than the acquired scan resolution
<u>1504</u>	Celigo Automation Installer fails to install unless connected to a network
<u>779</u>	Celigo Installer upgrade prompt fails to install/upgrade correctly
<u>1946</u>	Manage Data: Deleting data with tags causes an error
<u>1633</u>	Some scans show a gray image for certain images (first few) causing no analysis to occur for those wells
<u>2005</u>	FAR-Red illumination channel should show up purple instead of red
<u>2047</u>	Automation Sample Application results in error if performing ImageExport async command
<u>2056</u>	Increased Image Displayer activity causes image loading to slow down or halt
<u>2030</u>	Celigo Automation crash due to automation status change when leaving automation
<u>732</u>	Data export progress grows with plate id (barcode) length
<u>1630</u>	Analysis resolution max should not be 100
<u>2111</u>	Manage Data: Settings export and delete throws an error

<u>2075</u>	Calling Eject more than once via Automation API causes plate holder to retract
<u>2129</u>	margin differences in progress bars between satellite and celigo applications
<u>1779</u>	Switching from well to well in Result tab cause only every other well to refresh and appear
<u>1983</u>	SQL Agent Job - Celigo Database Status job is sometimes not set to run
<u>1515</u>	RAW image type incorrectly recognized during archive import
<u>2239</u>	swapping scans with same application, but different illuminations, default channel colors are not correctly set