

Arcturus® Laser Capture Microdissection System

Arcturus^{X™} Microdissection Instrument

Software Release Notes

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Arcturus[®] Laser Capture Microdissection Systems SOFTWARE RELEASE NOTES

Arcturus^{XT™} Microdissection Instrument
Operating Software version 3.1
November 2008

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Installation Instructions:

1. Create a complete copy of the current Arcturus^{XT} operating software folder.
C:\Program files\Molecular Devices\ArcturusXT
2. Rename the folder "Copy of ArcturusXT X.XXX". This will allow you to revert back to the previous version in the event that there is an issue with the new version installation.
3. Uninstall the current Arcturus^{XT} software.
4. Click on the link found on the Life Technologies website* or run from the installation CD if provided.
5. The Arcturus^{XT} application and all files will be automatically saved and updated with settings saved from your previous version.

*The current release version software can be found in the "Software Updates" section of the Arcturus^{XT} Literature and Downloads page www.appliedbiosystems.com.

Release v3.1 (November 2008):

The primary goal of release version 3.1 is to include support for motorization on the Arcturus^{XT} instrument and to provide improved utility for the AutoScanXT software module. This version also improves Arcturus^{XT} system usability and fixes bugs identified in operating software release version 3.0. Below is a list of new features and bug fixes included in the latest software release.

Note: Arcturus^{XT} operating software supports all Arcturus^{XT} instruments based on the TE2000U and Eclipse Ti-E microscopes.

New in Release v3.1:

1. Support of Arcturus^{XT} Motorization

Arcturus^{XT} instruments based on the Nikon Eclipse Ti-E microscope (released March 2008) may be configured with motorized system components. These motorized options, described below, will be supported as part of operating software version 3.1.

Note: TE2000U based instruments are not compatible with motorization. These motorized features will be available only on the Eclipse Ti-E models of the Arcturus^{XT} instrument.

There are three available motorized features:

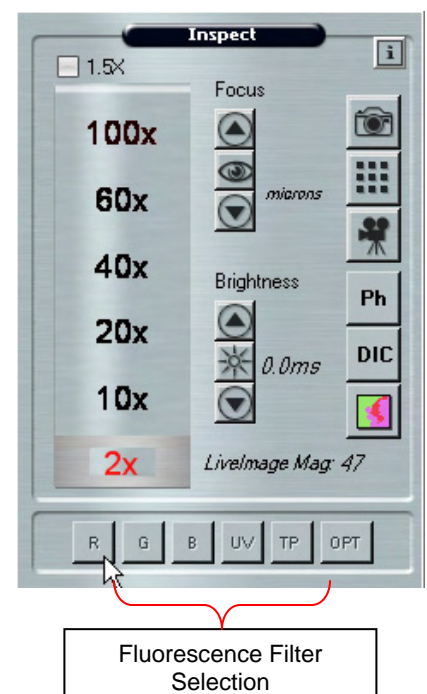
1. Motorized Fluorescence Filter Turret
2. Motorized Phase Contrast
3. Motorized Differential Interference Contrast (DIC)

Motorized options are activated and configured in the Hardware (HW) Configurator (see Section 5; Hardware Configurator Updates). The instructions below assume the options have been activated and configured in the HW Configurator.

1.1 Motorized Fluorescence

The manual fluorescence filter turret is replaced by a mechanized turret which is controlled through the software. Available filter cubes are represented by an icon within the Inspect pane of the operating software. Filter cubes are selected by simply clicking on the desired icon. Red, Blue and Green filter cubes remain the standard inclusion with the purchase of the Fluorescence package. Optional cubes, including UV and Triple Dichroic, may be defined within the HW Configurator as needed. Users may introduce their own cubes (see fluorescence cube specifications), and are defined as "OPT" within the HW Configurator.

- R = Red Filter Cube
- G = Green Filter Cube
- B = Blue Filter Cube
- UV = UV Filter Cube
- TP = Triple Dichroic Filter Cube
- OPT = Optional User Defined Cube



The standard fluorescence workflow still applies when using the motorized components, except that the filter cube selection may now be done by the click of a software icon. Please see the Arcturus^{XT} user manual for complete fluorescence operational instructions.

Note: Only five filter cubes should be allowed at any time, since one blank position is needed for bright field imaging.

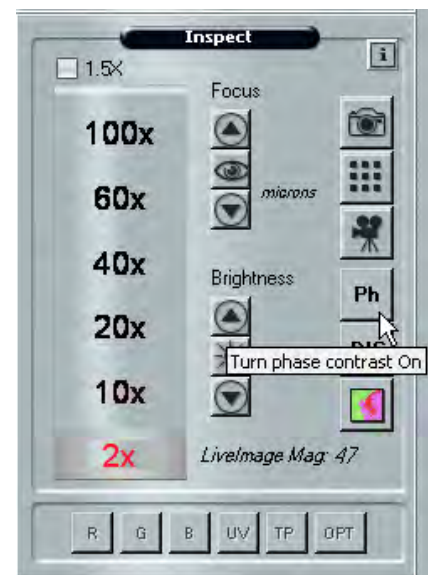
When a filter is selected, the Arcturus^{XT} fluorescence turret will move to the selected filter position, as defined in the HW Configurator. The selected filter cube icon will change color to indicate it is in position. All available filter cube icons, as designated in the HW Configurator, will be bold. Unavailable filter cubes will be grayed out and unavailable for selection in the operating software.



1.2 Motorized Phase Contrast

Phase contrast illumination requires that the proper phase annulus plate be in position, in accordance with the objective in use. Further, for use on the Arcturus^{XT}, the diffuser must be in the “Out” position. Without the motorized options in place, the user must rotate the condenser manually to select the proper phase annulus plate and must go into the appropriate location within the operating software to change the diffuser position. The motorized condenser option provides control of these functions through a single click of a button in the operating software.

Within the Inspect pane, there is a “Ph” icon (if the option is not active the icon is grayed out and unavailable). When this icon is clicked, the diffuser automatically moves to the “Out” position (if required), and the condenser rotates to the appropriate phase annulus plate, according to which objective is in place.



- PhL: 4x
- Ph1: 10x, 20x
- Ph2: 40x, 60x

To return to brightfield illumination, click the “Ph” icon again. The diffuser will return to the position it was in prior to enabling Phase Contrast. If it was “In”, it will return to that position automatically. If it was “Out” prior to using Phase Contrast, it will remain in that position. The condenser will also rotate back to the “A” position for brightfield illumination.

Note: The motorized condenser option automates the movement of Phase Contrast components. Remember to ensure that the Arcturus^{XT} is properly set up for Phase Contrast illumination prior to use.

- i. Ensure both field and condenser apertures are fully open.
- ii. Rotate in the Bertrand Lens (B), located in the eyepiece turret of the binoculars.
- iii. View the phase plate (black ring) through the microscope oculars. If needed, focus the ring by rotating the screw located on the eyepiece turret, to the right of the Bertrand lens selection.

See the Arcturus^{XT} user manual for more detailed information on the user of Phase Contrast illumination.

1.3 Motorized Differential Interference Contrast (DIC)

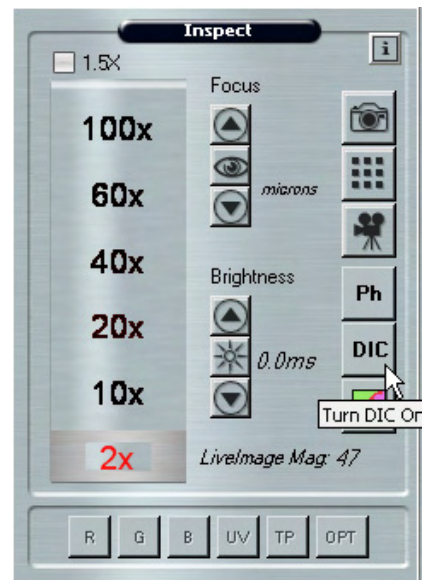
DIC illumination requires that a number of items be put into place.

- i. Move the Polarizer into position
- ii. Move the Analyzer into position
- iii. Rotate the condenser to the “DIC N1” position
- iv. Move the Diffuser to the “Out” position

The motorized condenser option provides control of some of these functions through a single click of a button in the operating software.

Within the Inspect pane, there is a “DIC” icon (if the option is not active the icon is grayed out and unavailable). When this icon is clicked, the diffuser automatically moves to the “Out” position (if required), and the condenser rotates to the “DIC N1” position.

If the additionally optional DIC Analyzer Cube has been purchased and installed in the fluorescence filter turret, when the DIC icon is clicked, the analyzer moves into position.



The user is required to move the Polarizer into position manually (located above the condenser), and if the DIC Analyzer Cube is not in use, the Analyzer must also be pushed into position (located below the objective nosepiece).

To return to brightfield illumination, click the “DIC” icon again. The diffuser will return to the position it was in prior to enabling DIC. If it was “In”, it will return to that position automatically. If it was “Out” prior to using DIC, it will remain in that position. The condenser will also rotate back to the “A” position for brightfield illumination. If the DIC analyzer cube is in use, the fluorescence filter turret will also move back to an empty position.

Note: The motorized condenser option automates the movement of DIC components during use. Remember to ensure that the Arcturus^{XT} is properly set up for DIC illumination prior to use.

- i. Ensure both field and condenser apertures are fully open.
- ii. Ensure the condenser is properly aligned (extinction point achieved).
- iii. Ensure that the DIC sliders are installed beneath each objective to be used for DIC illumination.

See the Arcturus^{XT} user manual for more detailed information on the user of Phase Contrast illumination.

2. Manual Phase Contrast and DIC Updates

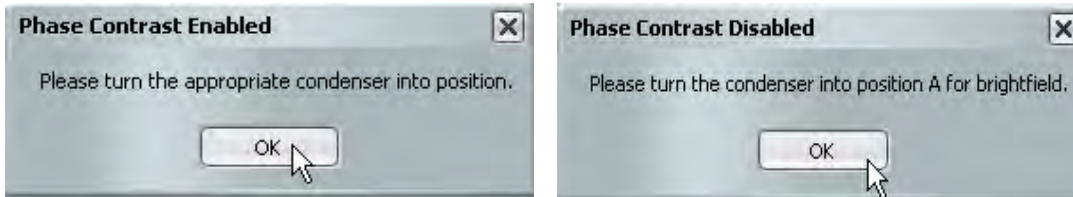
The “Ph” and “DIC” icons may be used in the absence of the motorized components or when using the TE2000U based instruments. When clicked, the diffuser moves to the “Out” position, as required for proper phase contrast and DIC visualization. Alternately, the user may still access the diffuser “In/Out” button through the Inspect pane, within the Illumination tab.

2.1 Phase Contrast

When the “Ph” icon is clicked, the diffuser moves to the “Out” position (if required). A pop-up window will appear telling the user to remember to move the condenser to the required position, appropriate for the objective in place.

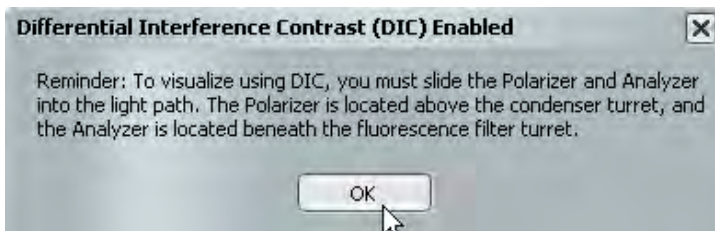
- PhL: 4x
- Ph1: 10x, 20x
- Ph2: 40x, 60x

When the “Ph” icon is clicked again to disable Phase Contrast, the diffuser moves back to the “In” position (if required), and another pop-up window appears reminding the user to move the condenser back to the “A” position.

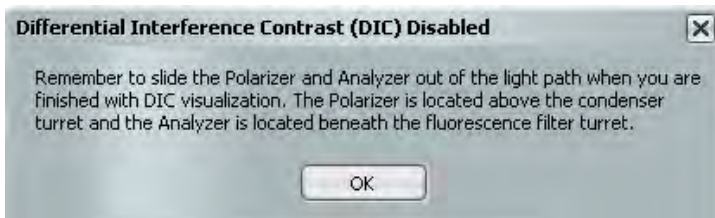


2.2 DIC

When the “DIC” icon is clicked, the diffuser moves to the “Out” position (if required). A pop-up window will appear telling the user to remember to move the condenser to the required position (DIC N1), and to move the Polarizer and Analyzer into position.



When the “DIC” icon is clicked again to disable DIC, the diffuser moves back to the “In” position (if required), and another pop-up window appears reminding the user to move the condenser back to the “A” position and to move the Polarizer and Analyzer out of the light path.



3. User Login Report

Released in operating software version 3.0, the User Login feature provides administrative privileges for the Arcturus^{XT} and allows for the creation of user IDs with password protection so that users can save settings for future microdissection sessions. Operating software version 3.1 now includes a User Login report. The User Login report records the user, the time of Login and Logoff, as well as the total time spent while logged onto the system. The report contains a running log of users and times of use.

The User Login report is automatically saved at "C:\data\UserLogs\" folder.

Example User Login Report:

```
2008/10/16 16:11:52 [Login] schu
2008/10/16 16:18:56 [Logoff] schu (time: 00:07:03)
```

4. Tiled image and whole cap scan in AutoScanXT

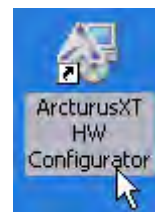
AutoScanXT is a purchasable option available only for the Arcturus^{XT} instrument. The AutoScanXT software module is an image analysis program that automatically identifies areas for microdissection based on user-defined criteria. AutoScanXT has been updated to allow image analysis of larger tiled images and the whole LCM Cap area. The previous version allowed analysis of one field of view at a time. This improved version allows for much faster processing of larger areas.

See the AutoScanXT User Manual for details on the software module and these above mentioned updates.

5. Hardware Configurator Updates

A user login window has been added to the Hardware (HW) Configurator to prevent unauthorized access. HW Configurator access is now limited to administrator and service users.

The HW Configurator has also been updated to support the new motorization components. The options will be configured upon installation by a trained engineer, but the user may need to access this program if a custom filter cube is added to the Arcturus^{XT} instrument. The standard (Red, Green, Blue) and optional (UV, Triple Pass) fluorescence filter cubes will be in place and will have positions already assigned upon system installation if purchased with the original instrument.

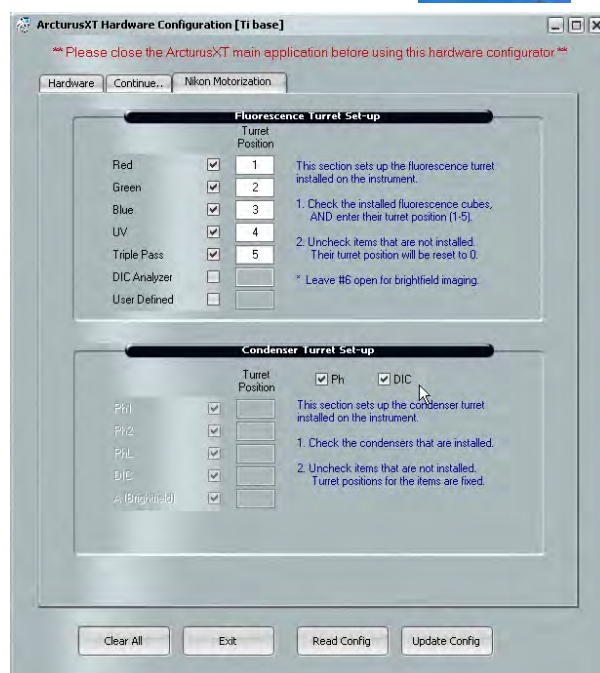


To add a User-Defined fluorescence filter cube:

1. Click on the HW Configurator icon, located on the Arcturus^{XT} operating system desktop.
2. Log into the HW Configurator using the administrator or service information.
3. Click on the “Nikon Motorization Tab”.
4. Check the box next to “User Defined” and enter the position into which the cube will be placed.

Note: One position must remain open in order to use brightfield illumination (recommend position #6).

5. Click “Update Config”.
6. Click “Exit”.
7. Install the fluorescence filter cube into the position defined in the HW Configurator.
8. Log into the Arcturus^{XT} operating software.
9. The “OPT” (Optional) icon will be active in the Select pane. When clicked, the filter turret will move to the position assigned in the HW Configurator.



6. UV Laser Cutting Overlap

Operating software v3.1 has added a small overlap of the UV cut line to ensure complete cutting during microdissection. This overlap compensates for the rare event in which the UV laser initiation is delayed after a long period of system inactivation or following an illumination tower tilt. This overlap of 10µm applies to the first drawing item of any microdissection series only. If there are several items to be cut within one action, only the first will receive the small overlap.

Bug fixes in Release v3.1:

1. The UV laser offset has been updated within the AutoScanXT software harvest function. This will ensure that the UV is offset properly for the respective objective in use, and ensuring that the UV cutting will occur efficiently.
 2. The Arcturus^{XT} operating software has been updated to recognize when possible communication errors occurred. This will prevent the operating software from “freezing” in such instances.
-

Release v3.0 (April 2008):

The primary goal for release version 3.0 is to include support of Arcturus^{XT} instruments based on the Nikon Eclipse-Ti microscope. All versions from v3.0 on will support TE2000 and Ti based instruments. This version also improves Arcturus^{XT} usability and fixes bugs identified in operating software release version 2.0. Below is a list of new features and bug fixes included in the latest software release.

New in Release v3.0:

7. Support for Nikon® Eclipse Ti-E microscope base

The Arcturus^{XT} microscope base has been updated to the Eclipse Ti-E, the latest offering from Nikon. Version 3.0 of the Arcturus^{XT} operating software, and all versions going forward, will support both the Eclipse Ti-E and the TE2000U platforms. The software user interface remains constant between the two versions, but there are various hardware interface changes. Please refer to the Arcturus^{XT} user manual for full details related the Arcturus^{XT}-Ti-specific features and functions. All items below pertain to the use of both the TE2000U and Eclipse Ti-E systems.

8. User Login feature

The User Login feature has been created to provide administrative privileges for the Arcturus^{XT} and to allow for the creation of user IDs with password so that each user can save settings for future sessions. Users are categorized into two groups: Operators and Administrators. Administrators will have access to additional functions such as system calibration windows and user maintenance.

The user Log-In feature is disabled by default. If you desire to utilize this feature, you must first log in as the administrator and activate the feature. Once the feature is enabled, the log-in screen will appear each time you initialize the operating software. See Section 2.4.2 (Enabling the User Login and Guest Login Features) for more details on feature activation.

2.1 Logging in

Once the Login feature has been enabled, users and administrators are required to log in each time the software is opened. Each user and administrator will have a unique User ID and Password. Each time the Arcturus^{XT} operating software is opened, a login screen will appear.

Both the User ID and Password values are "administrator" for the default administrator account.

When the guest user login is enabled (see below), anyone may log in using the User ID "Guest". This User ID does not require a Password.



2.2 Changing Passwords

To change a Password, enter the User ID and current Password, and then check the "Change Password" box. This will open the fields to enter the new Password. Click "OK" to save the new Password.

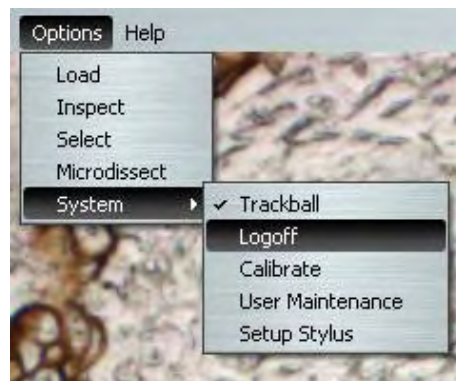


2.3 Logging Off

If you want to end your session and keep the software application running, or if you want to log off for another user to log in, you must go to the Options menu in the task bar and select "Logoff". Once a user logs off, all current settings are stored for that specific user. When a new user successfully logs in, the settings for the new user will be loaded, including the following:

- Capture group settings
- Cut and capture settings
- Visualization settings

Prior to logging off, the user should remember to offload any cap remaining on the slide. If a user logs off with a cap remaining, it will be automatically offloaded to the QC position.



2.4 Administrator Privileges

2.4.1 User Maintenance Window

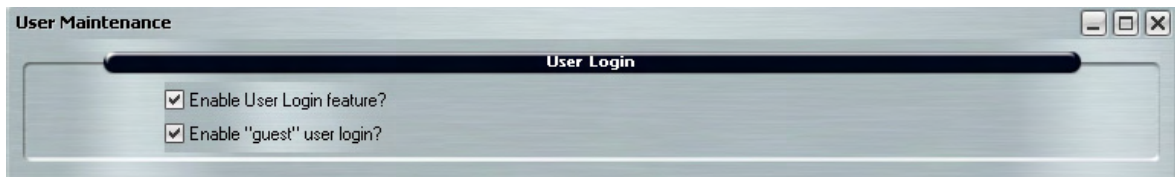
Administrators have access to the User Maintenance window, in which new users may be created and existing users may be removed. The User Maintenance screen can be accessed from the Options drop down menu. The User Maintenance selection is only available when logged in as an Administrator. When the menu item is selected, a login screen will be presented again to prevent unauthorized use.



2.4.2 Enabling the User Login and Guest Login Features

The user Login feature is disabled by default. If you desire to utilize this feature, you must first log in as the administrator and turn the feature on. Once the feature is enabled, the Login screen will appear each time you initialize the operating software. The administrator may also choose to allow guest access to the system by enabling the guest access option. When the "Guest" user login is enabled, anyone can log in under the user ID "Guest". The "Guest" ID is general and uses a common user setting. All users who use the "Guest" ID share the same user settings.

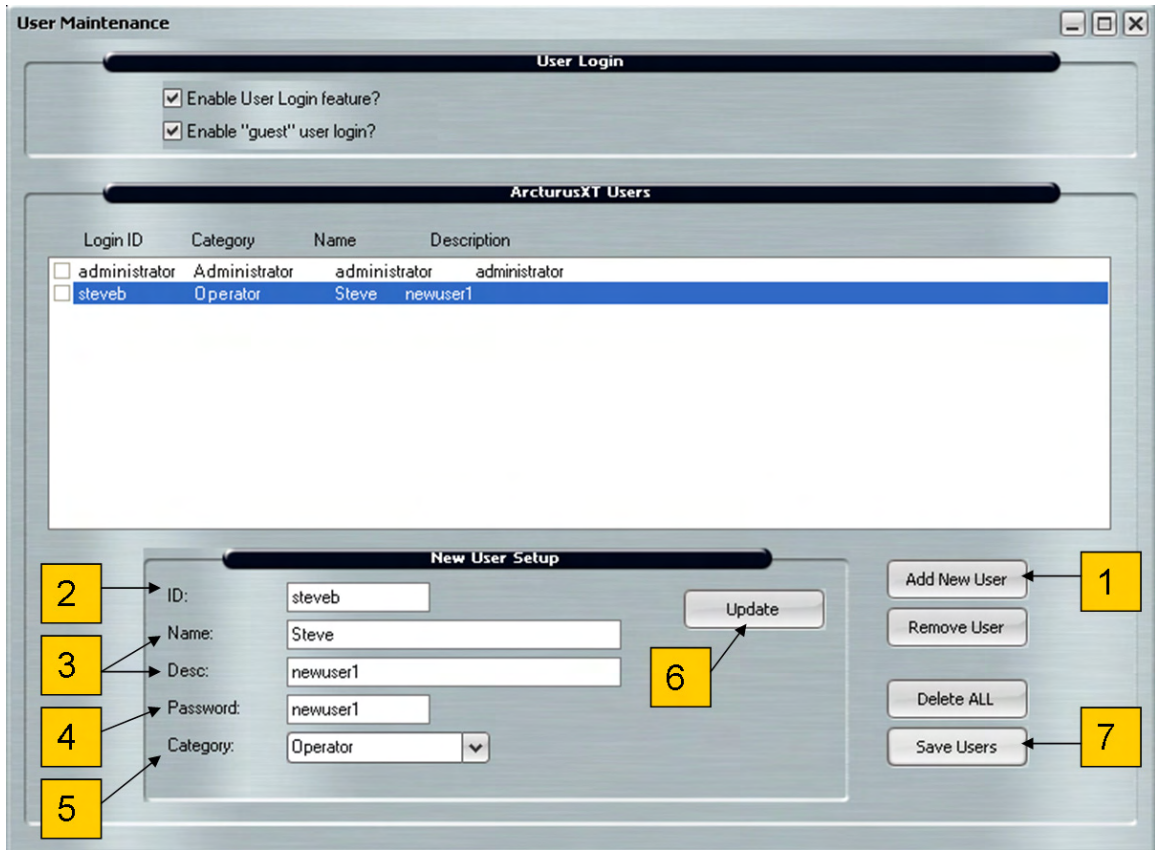
To enable the User Login and "Guest" User Login features, the administrator must access the User Maintenance window and check the appropriate boxes. To activate the Login feature once it is enabled, the Arcturus^{XT} operating software must be restarted.



2.4.3 Creating New Users

To add users, select the User Maintenance screen found in the options drop down menu.

1. Click on "Add New User". A new line will appear in the main window showing the new user with generic information.
2. Enter the user "ID" that will be used when logging in.
3. Enter the user's full name and description if desired. If this is not done, the generic identifiers will remain.
4. Enter a temporary password for the new user. If a password is not entered, the generic password will remain.
Note: It is recommended that the default password be changed after the initial login.
5. Enter the user category (Administrator or Operator). Administrator will have full administrative rights. Operator will have access to all functions except User Maintenance and Calibrate.
6. Click "Update" to add the new user to the list. This will update the user line in the main window with the new user information as entered.
7. Click "Save Users" to save all changes.
8. Repeat steps 1 – 6 for any additional new users.
9. When finished, click the "X" in the upper right hand corner to close the window.



2.4.4 Calibrations

Administrators have access to the Calibration window. The Calibrations selection is available only when logged in as an Administrator.

Note: It is recommended that any system calibrations be conducted with the assistance of Life Technologies trained staff. Please contact customer support before performing any calibration functions:

support@moldev.com.



9. Double-click to fire IR laser


The user may now double click the mouse within the live image window to fire the IR laser. This feature may be used to fire selectively over a single spot for capture, or it may be used to locate the IR laser without the need to enter the Select or Microdissect options dialog windows. To locate the IR laser, double click within the live image window to fire the IR laser, and then right click in the center of the IR LCM spot and select "Located IR Spot". The cross-hair will appear to mark the updated location of the IR laser.

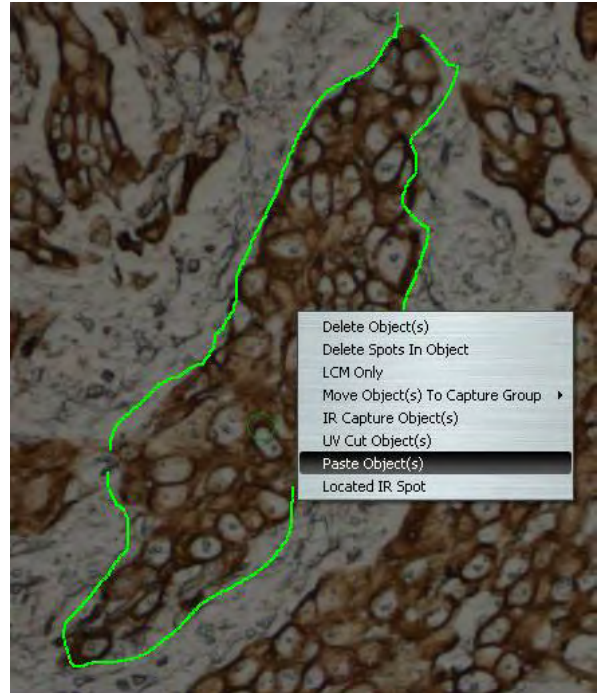


10. Copying and pasting drawing items anywhere

The user may copy and “Paste” any object(s) to any location on any slide. Previous software versions allowed the Paste function only within the same field of view as the original object.

To paste an object:

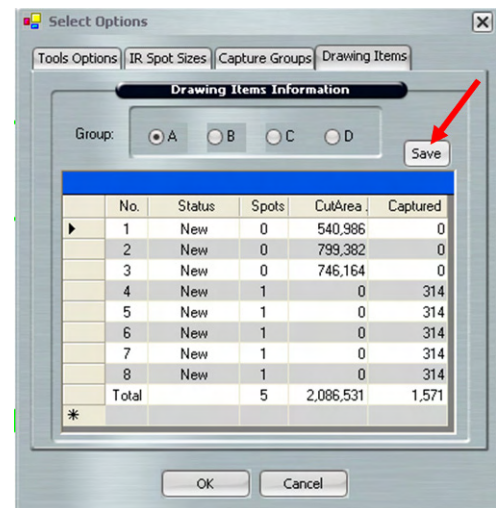
1. Click on the Select Object icon. 
2. Click on the object(s) of interest.
To select multiple objects, hold down the <Ctl> key and click on each object.
Note: *Selecting an object automatically “Copies” that object and makes it available for “Paste”. There is not a separate “Copy” function to select. The selected item will become bold.*
3. Move to the area you desire to paste the object. This can be anywhere on the current slide, or anywhere on the other two slides.
4. Right click and select “Paste Selected Object(s)”.
5. The object(s) will be pasted relative to the center of the live field of view where you selected “Paste”.
6. If you desired to adjust the position of the pasted object(s), select the object and drag to its desired location.



Note: *You may copy and paste objects in batches from a single live field of view so as to make it easier to paste and adjust the positions of those objects.*

11. Export Drawing Items information

The user may export drawing item information from the Arcturus^{XT} operating software into a text file. To export the drawing item information, open the Select Options dialog box and click on the Drawing Items tab. Click the “Save” button.



12. Abort AutoScanXT “Harvest” function

The user may quit the harvest function in the AutoScanXT software module by hitting the Escape <Esc> key. When the harvest function is aborted, the LCM and UV cutting actions will cease. All objects will remain on the Regions list for subsequent harvest through the AutoScanXT module and also remain available for copy into the active Capture Group.

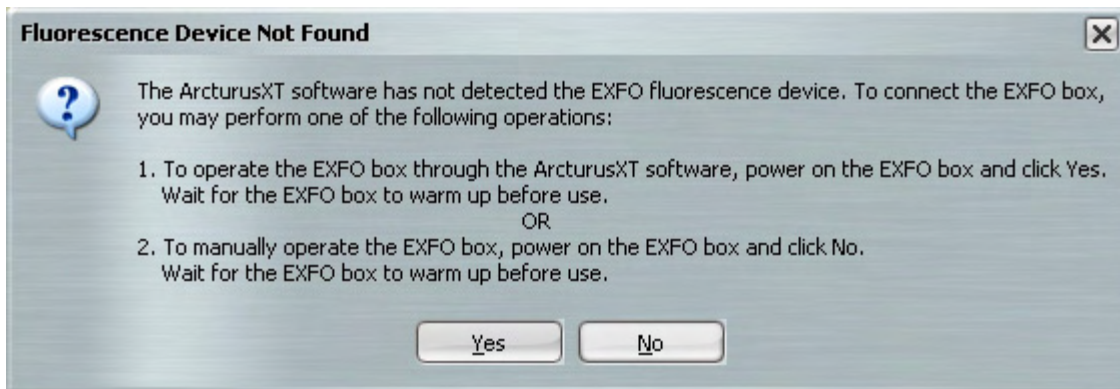
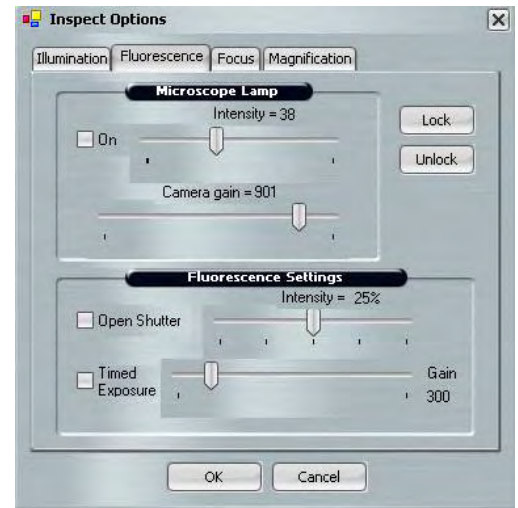
13. Abort AutoFocus

The user may use the Escape <Esc> key to abort the autofocus action. Once the Escape key has been pressed, the system will return to the original z-position.

14. Power on or off the fluorescence illumination source at any time

The user may now power on the fluorescence illumination source (EXFO box) at any time during the session. Previous software versions required the EXFO box to be turned on prior to initializing the Arcturus^{XT} operating software in order to control the functions through the software.

If the EXFO box is not turned on prior to initializing the software, and the user clicks on either the Fluorescence icon or opens the Fluorescence tab in the Inspect Options dialog box, a pop-up window will appear asking if the user would like the Arcturus^{XT} software to take control of the EXFO box. The EXFO box can then be turned on and the user can choose “Yes” take control through the Arcturus^{XT} software, or “No” to maintain manual control of the EXFO box.



Bug fixes in Release v3.0:

1. In previous versions, the IR laser did not fire for copied and pasted items. Version 3.0 corrects this so that the IR laser properly fires for all pasted objects.
2. Stage moves are now suppressed when removing a stored position. Previous versions would move the stage to the next stored position when one was removed, causing confusion. Upon deleting a stored position, the stage remains in its current position, while the number associated with the next stored position appears in the active window. To jump to that position, click on the number, or to move to other stored positions, use the forward and reverse arrows per usual function.
3. AutoScanXT training files are updated properly when a new one is created. Version 2.0 did not properly refresh the training file list.
4. In previous versions, drawing items that had already been cut and captured and were then copied and pasted, were cut and captured again. Version 3.0 has corrected this behavior so the copied items remain in the complete status and not cut and captured again. To reactivate those original objects, follow the standard procedures outlined in the user manual.
5. Software code has been updated to fix the handling of errors such as stage bump, eliminating the potential for software crashes during this event.
6. The calculation of captured areas has been updated to accurately perform the function after certain properties have been changed, e.g. deleting IR spot, change LCM Only property, etc.

7. Software code has been updated to address errors that caused the appearance of a red "X" in the cap load and QC position.
8. In previous versions, LCM spots were still added inside drawing items, even with SpotsPerCutLength = 0. Version 3.0 has updated this so that no spots will be placed if this value is zero.
9. In previous versions, the stage would move to a slide other than that in the live field of view after closing Load dialog. This action has been updated so that when the Load options dialog box has been closed, the live image will remain on the current slide position.
10. Changes have been made in the calibration window to apply updated values for stage offsets and pixel-micron immediately. This eliminates the need to restart the software for the new values to apply.
11. The Hardware configurator has been implemented so that users no longer need to manually edit XML files when changing objectives or making any modifications to the system configuration. For details on the Hardware Configurator, please contact Life Technologies technical support.

Release v2.0 (November 2007):

The primary goal for release version 2.0 is to release the AutoScanXT Image Analysis Software module. This version also improves Arcturus^{XT} usability and fixes bugs identified from the operating software release version 1.2. Below is a list of new features and bug fixes included in the latest software release.

New in Release v2.0:

1. AutoScanXT

AutoScanXT is a purchasable option available only for the Arcturus^{XT} instrument, and can only be activated with operating software version 2.0. The AutoScanXT software module is an image analysis program that automatically identifies areas for microdissection based on user-defined criteria. This program performs optimally with high contrast samples and is simple and straightforward to use. With the software controls, the user first selects typical regions of interest (ROI's) and background areas, and then AutoScanXT employs these parameters to automatically identify areas in the sample for the microdissection process. The information used to identify the areas for microdissection is stored in an AutoScanXT analysis file and can be used subsequently on other areas from the same sample or on other similarly stained tissue samples. AutoScanXT also allows the combination of multiple analysis files, enabling the complex analysis of samples with differences in staining intensities, tissue thickness and variations in light intensities.

You may download Arcturus^{XT} operating software version 2.0 on the Arcturus^{XT} Literature and Downloads page of the website: www.appliedbiosystems.com.

See the AutoScanXT User Manual for details on the software module.

2. 1.5X magnifier

The Arcturus^{XT} microscope base has an option that allows you to increase the magnification of the current 1.0 objective to 1.5X. The dial for this setting is located on the right side of the instrument, above the manual focus knobs. You must tell the Arcturus^{XT} software you are using this feature on your microscope for the instrument to work correctly.

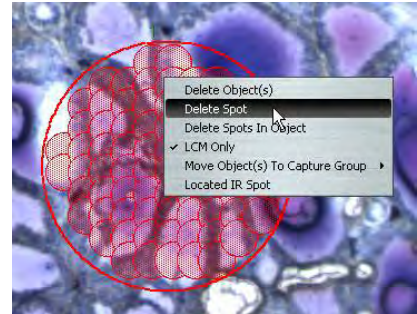
To improve the feature usability, a checkbox has been added to the top level of the GUI, in the Inspect panel. Check the "1.5X" box when the manual knob on the instrument has been rotated into place,



ensuring the two are properly synchronized. Previous versions required the user to open the Inspect Options dialog to access the 1.5X selection. This addition has simplified the process.

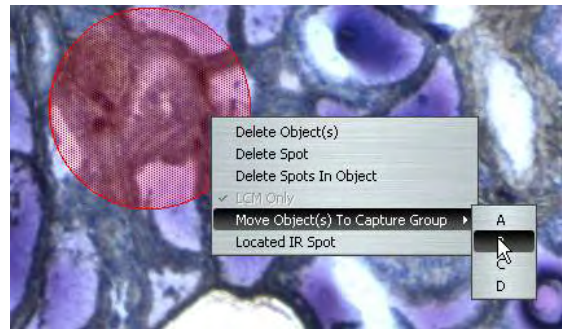
3. Delete single spots in LCM Only object

The user may now delete a single spot within an LCM only object. Right click on the spot to be deleted and select “Delete Spot”. Previous versions of software did not allow single spot deletions within LCM only objects.



4. Move IR Spots to Different Capture Group


The option to “Move Objects to Capture Group” has been added to the IR spot right click context menu. The user may click on a single IR spot and choose to move it to another Capture Group. Previous versions of software did not allow this option for individual IR spots.



5. Diffuser Position Saved

The diffuser position is now saved upon exiting the Arcturus^{XT} application. Previous versions of software defaulted to the “Diffuser In” position when opening the software application. With this release, if the diffuser is “Out” it will remain out when the application is restarted.

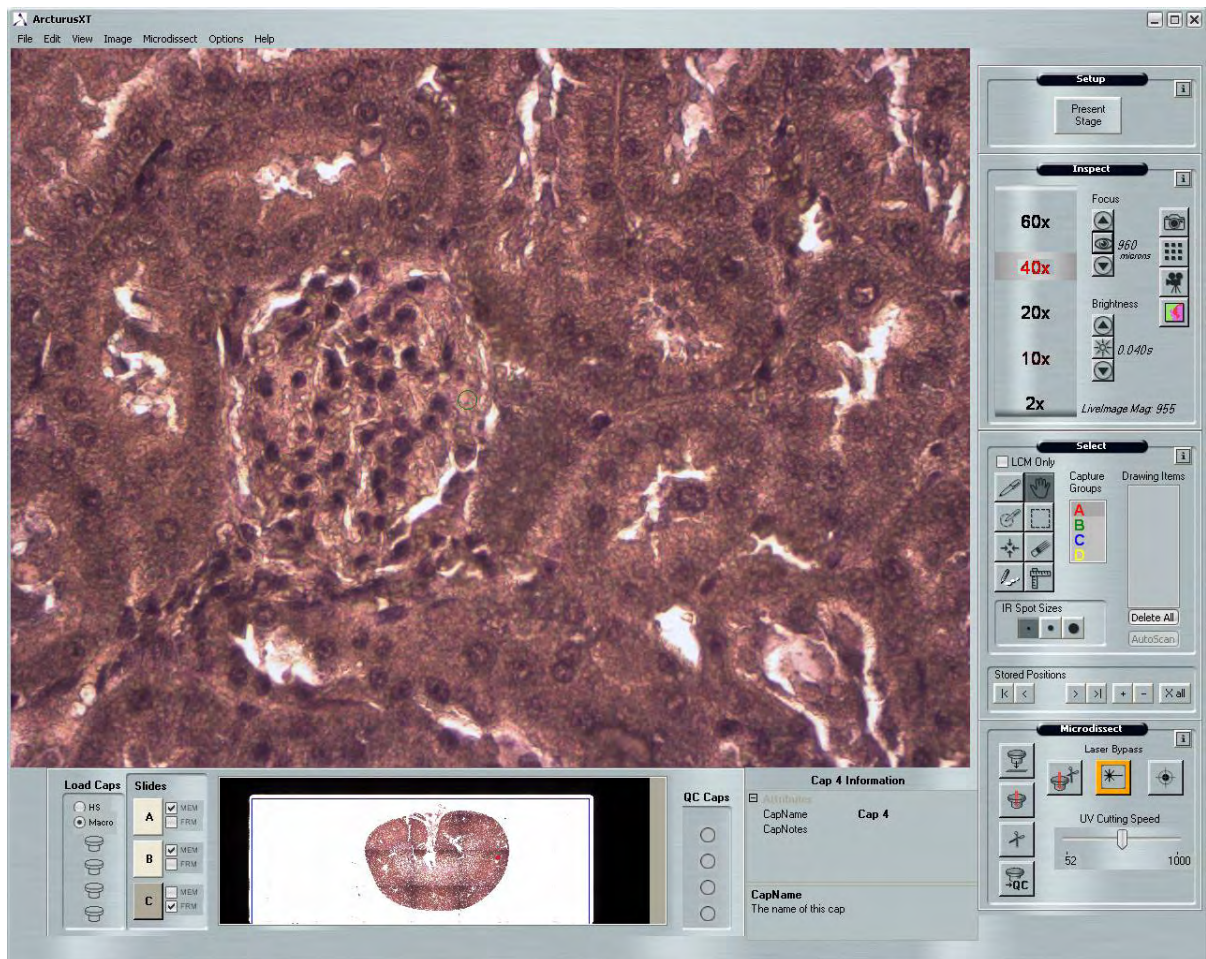
Bug fixes in Release v2.0:

- Version 1.2 operating software moved the LCM “Tack Points” in from the UV cut line, reducing the potential for collateral pick up. It was noted in v1.2 that very small spot sizes were still being placed too close to the UV cut line and therefore improvements were made to move them further interior.
Note: The distance the spot is placed inside the UV cut line is based on the diameter of the LCM spot. Therefore, ensure the accurate spot size is input within the Microdissect Options Dialog Box.
- The v1.2 Cut/Capture function (icon on top level in Microdissect panel) was performing cut and capture on items that had been copied to other areas, even when the original object had already been cut and/or captured. The correct behavior is for only the new objects to be cut and captured. This behavior has been corrected so that if an object that has already been cut and captured is copied and pasted to another area, only that newly pasted object is available for cut and capture using the Cut/Capture icon. To cut and capture the old copied object, the user must select the proper function from the drop down Microdissect menu bar at the top of the GUI screen. 
- A bug was identified in v1.2 that prevented UV cutting when the user activated the Laser Bypass button with caps in load position. This bug has been fixed and the laser bypass function works properly.
- Capture group changes in the Select Options box were not being updated in the InfoBox (top level GUI). This has been updated so that any changes will be reflected in both areas.
- Spacing between IR spots was not correct when the spot radius was very small. This has been updated to reflect correct spacing for all spot sizes.

6. Certain commands require the objective to change to 2X, so as to avoid collision with the stage. Previous software versions did not restore the objective position after returning to the slide after these actions. Changes were made to restore the current objective position after returning to the slide position.
7. The commands to drive the cap move sequence have been updated so that the focus is properly lowered at all times that it should. This change eliminates the potential for the objective to crash into the underside of the stage.
8. There was an update to improve the action of moving to the center of a slide, ensuring the proper location per the calibration settings.
9. A fix was put in place to ensure the slide border on the slide overview is properly drawn at start of program.
10. Updates were made to impose restrictions for the PresentStage command, preventing the possibility of an objective crashing into the stage.

Release v1.2 (August 2007):

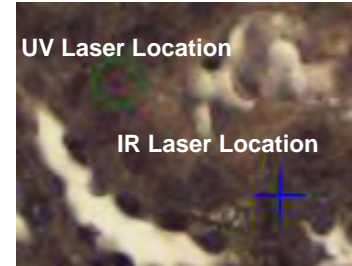
The primary goal for release version 1.2 is to improve Arcturus^{XT} usability and address issues brought forth from the original instrument release version 1.1.0.0. Below is a list of new features and bug fixes included in the latest software release.



New in Release v1.2:

1. IR and UV Laser Location Indicators

The IR and UV laser locations are now indicated by markers on the live video screen. The green circle and blue cross mark the UV laser and IR laser locations respectively.



2. Locate IR Laser from Top Level

This feature allows the user to locate the IR laser from the top level, without the need to enter the Microdissect Options Dialog box.

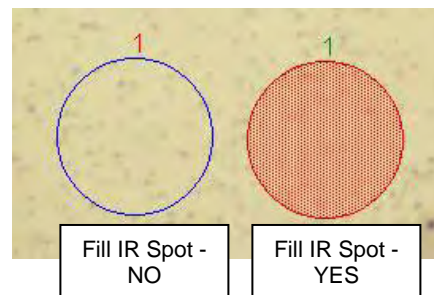
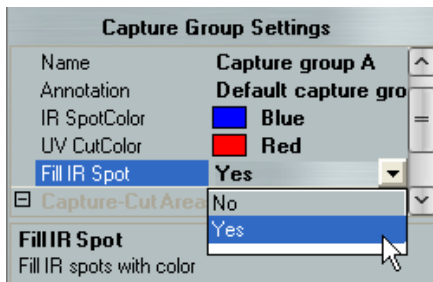
- 2.1 Pulse the IR laser using the "IR Capture Test Fire" button in the Microdissect pane.
- 2.2 Right click at the center of the IR LCM spot and select "Located IR Spot". The cross-hair will appear to mark the updated location of the IR laser.



3. More prominent drawing items

- 3.1 UV Cut lines have been made thicker to be more noticeable upon the live image.
- 3.2 Color filled IR laser spots.

The user may choose to "Fill IR Spots". This can serve to make IR spots more prominent on the live video screen and to differentiate the IR spots from a circle shaped UV cut object. This selection can be made in the Capture Group Settings window, accessible on the top level after clicking on a Capture Group letter, or within the Select Options Dialog Box, under the Capture Groups tab.

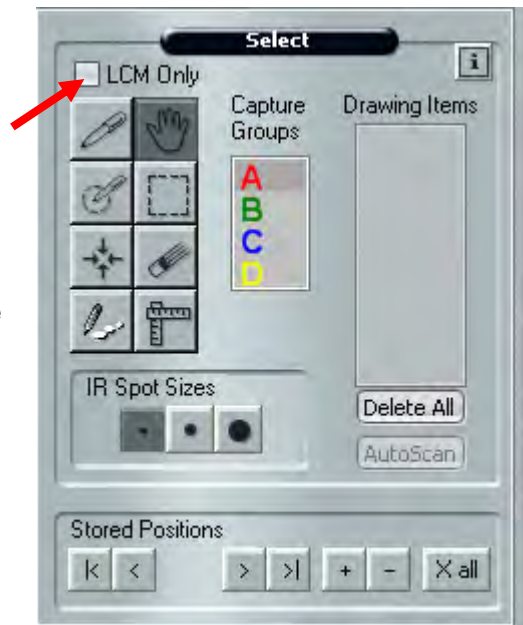


4. LCM Only

The user can select to designate an object as “LCM Only”, such that will fill in the object with IR-LCM spots, independent of slide type being used. The user may also choose to change an object that has already been drawn from UV-cut and IR-capture (LCM) to “LCM Only”, or from “LCM Only” to Cut and Capture.

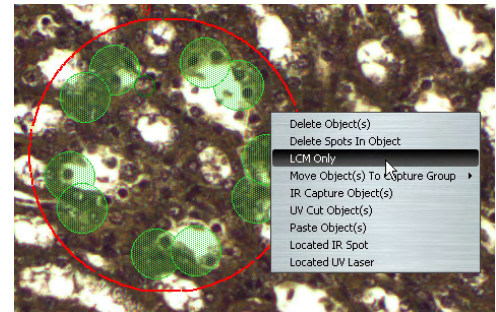
4.1 Select LCM Only on the Top Level

If a membrane slide (glass or frame) is being used, and indicated as such in the materials information, the software defaults to make any objects drawn as UV-cut items, with IR spots placed as tack points within. The user may now designate objects to be captured using IR-LCM spots only by checking the “LCM Only” box, located in the Select Pane on the top level.



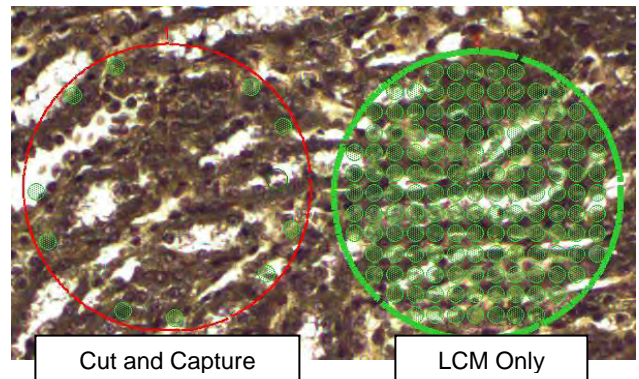
4.2 Changing an Object from Cut and Capture to LCM Only

Within an object drawn for cut and capture, right click and select “LCM Only”. The “LCM Only” line will be checked and the object will fill with LCM spots. The peripheral line will change to the color of the IR spot, indicating the UV laser will no longer cut along this line.



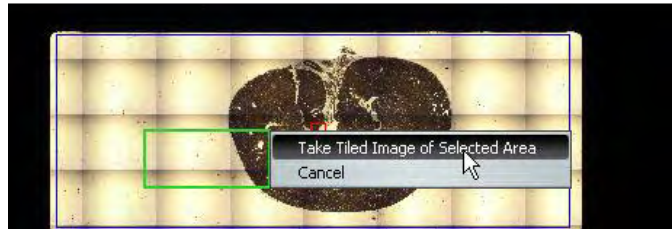
4.3 Changing an Object from LCM Only to Cut and Capture

If an object is already designated for “LCM Only” (either by indication of a glass slide in use or by checking the “LCM Only” box in the Select pane (see 4.1 above), right click within the object and select “LCM Only”. The “LCM Only” line will be UN-checked. The object will remain filled in with spots, but the peripheral line will change color to the UV CutColor, indicating the UV laser will now cut along this line. If the user wishes to remove the spots, they may right click “Delete Spots in Object” (See #6 below) and then place individual tack points as desired.



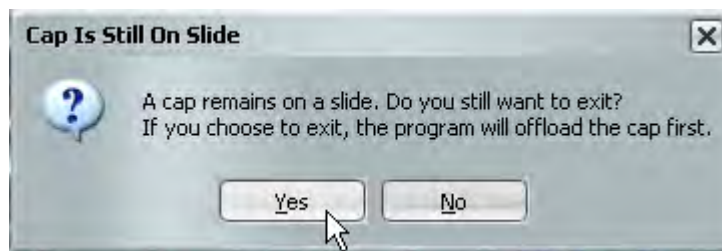
5. Improved tiled image tool

The user can now highlight the desired area for tiled images from any direction. The previous release version allowed only top-left to bottom right drawing. The user may now highlight an area in any direction from the starting point.



6. Abort Quit if there is still a cap on the slide

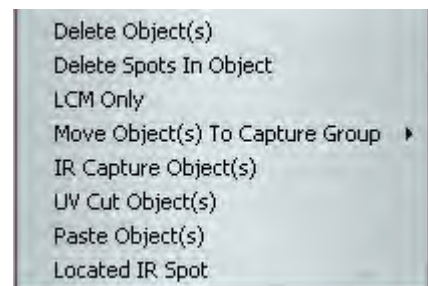
If the user tries to close the Arcturus^{XT} application when an LCM cap is in place, a pop-up window will appear to provide the option to abort the application closure.



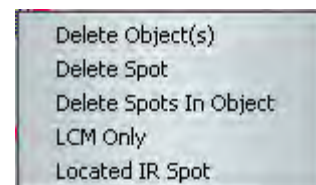
7. Deleting spots from right click context menus

The user can now select to delete a single LCM spot or all spots within an object by using the Right Click context menu.

7.1 When the user right clicks within an object, but outside an LCM spot, there is the option to delete all spots ("Delete Spots In Object") or delete the entire object ("Delete Object(s)").



7.2 When the user right clicks on a spot (single spot or within an "LCM Only" object), there is the option to delete that single spot ("Delete Spot") or the entire object ("Delete Object(s)").

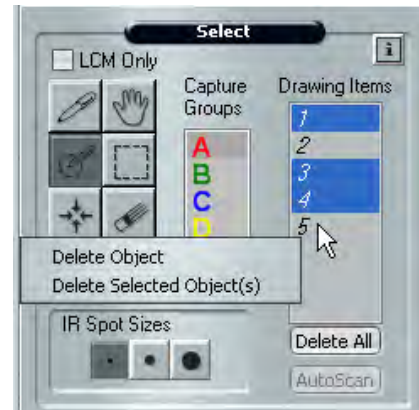


8. Allow user to delete items with Delete key

The user may use the “Delete” key on the keyboard, in conjunction with the select tool icon, to delete items on the live video image.

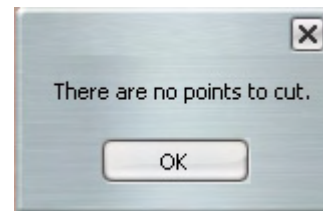
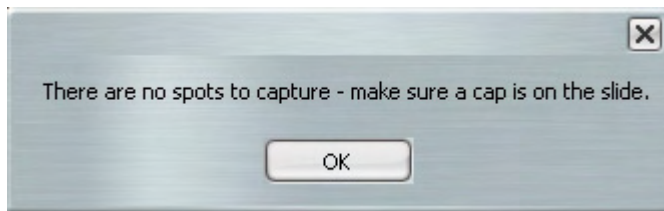
9. Allow selection of multiple Drawing Items

The user may select multiple objects within the Drawing Items list in the Select pane or on the live image in conjunction with the Select icon. To select multiple items, hold down the “Ctrl” key on the keyboard while using the mouse or interactive pen to click on multiple objects in the live image or multiple numbers in the Drawing Items list. Once selected the user may delete only those selected items in the Drawing Items list.



10. Pop-up warning message if there is nothing to cut or capture

A message will appear indicating that there are no objects to cut and/or capture if that action is requested without any items drawn.

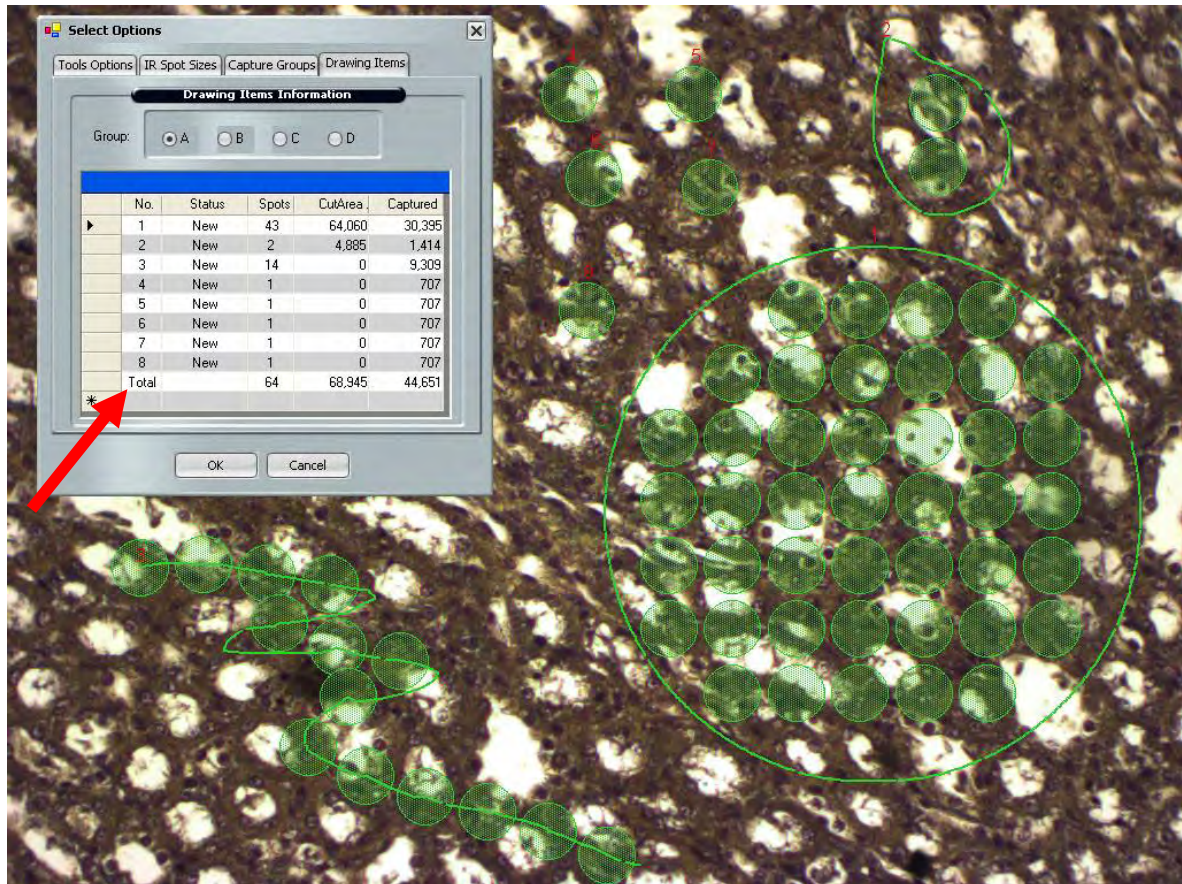


11. Glass slide defaults to “LCM Only”

If a glass slide is selected as the slide type, the software will default the microdissection method to “LCM Only”.

12. View total cut and capture areas in Drawing Items list

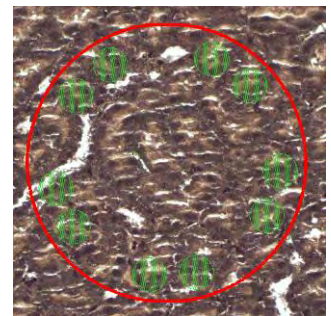
Total cut and capture areas (μm^2) have been added to the Drawing Items tab in the Select Options Dialog Box. Individual items are listed along with the total areas for the cut and captured items.



13. LCM "Tack Points" moved in further from the UV cutting line

The previous release version placed the IR "Tack Points" (LCM Spot within a cutting object) right next to the UV cut line. This caused occasional pick up of unwanted material due to the actual LCM spot spilling outside the UV cut line. The algorithm has been updated to place the tack points more interior, further away from the UV cut line, eliminating the potential for collateral pick up of material.

Note: The distance the spot is placed inside the UV cut line is based on the diameter of the LCM spot. Therefore, ensure the accurate spot size is input within the Microdissect Options Dialog Box.



14. Support dual operation of LC and LCM objects

Objects tagged as "LCM only" will not be presented for cutting. This feature gives the user the flexibility to set this tag On/Off.

15. UV Laser Bypass

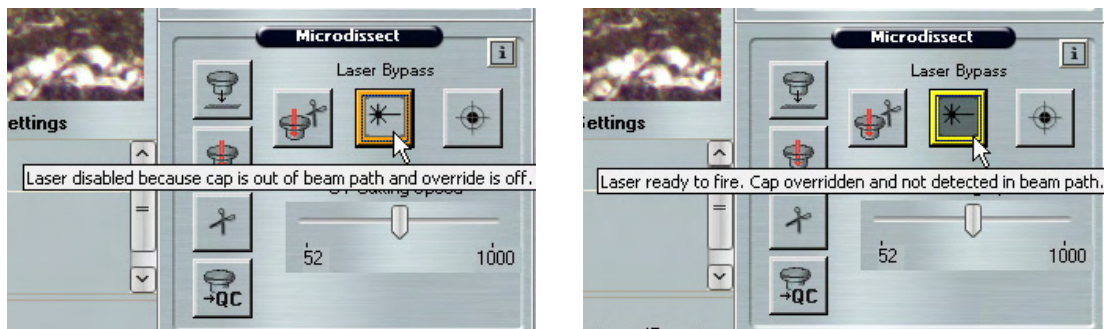
For safety reasons, the UV laser is disabled when outside of the cap area. However, there may be applications for which the cap is not required or desired. The previous release version did not allow

activation of the UV Laser Bypass. The Laser Bypass function has now been enabled to allow UV cutting when a cap is not on a slide.

To activate the UV Laser without a cap on a slide:

- 15.1** Ensure the Bypass “Key” is in place in the back of the instrument. The Laser Bypass will be orange, indicating the bypass key is in place in the back of the instrument, but the Laser Bypass icon has not been activated.
- 15.2** Click on the Laser Bypass icon, located in the Microdissect pane on the top level. The icon will turn yellow, indicating the UV laser is ready to fire.

Note: For more information regarding the Laser Bypass feature and UV safety considerations, refer to the Arcturus^{XT} User Guide, section 7.10.



16. Diffuser position saved

The diffuser position is saved when using the “Remember Settings” and used when taking the overview image.

17. Simplified software installation

17.1 Automatic XML update

This utility will make it unnecessary to manually backup and restore existing XML files to preserve instrument calibrations. All files are updated automatically upon running the executable file.

17.2 Hardware Configurator

This utility eliminates the need to edit XML files during new software installation and makes easier the update of objective configurations once the software is already in place.

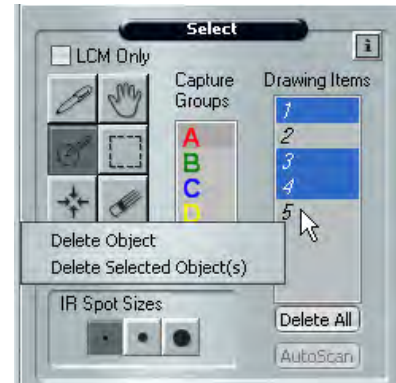
18. Find UV focus tool

This utility makes it easier to calibrate the UV focus during manufacturing and service.

Bug fixes in Release v1.2

1. General application performance and responsiveness has been improved.
2. The IR and UV locate sequences have been improved to ensure brightness settings remain constant during process.
3. Ambiguity has been eliminated in the process of deleting items from drawing items list. There are now two selections in the right click context menu: 1) "Delete Object" will delete the drawing item to which the cursor points and 2) "Delete Selected Object(s)" will delete all highlighted object(s) within the list.

In the example to the right, selecting "Delete Object" will delete item #5, whereas selecting "Delete Selected Object(s)" will delete items #1, 3 and 4.



4. The image brightness settings have been improved to ensure the settings remain when the user cancels out of the camera properties set-up dialog window.
5. The ruler position has been fixed to appear in the correct position when using digital zoom.
6. The code handling the placement of LCM spots has been improved in several instances.
 - 6.1 The algorithm has been improved to ensure all LCM spots fall inside freehand and circle tool drawing objects.
 - 6.2 The edit function has been updated to ensure LCM spots fall inside object line after editing when using the circle drawing tool.
 - 6.3 The LCM Line tool has been improved to ensure the intervals between spots are consistent when drawing the line.
7. The drawing tool now reverts to the "grabby-hand" after completion of any operation within the Microdissect Tool pane, i.e. cut, capture, etc.
8. Improvements have been made to eliminate the potential loss of focus position when clicking around within the slide overview.
9. The command to move to stored positions has been modified to check first if the current objective is allowed at the stored position and then to change to a lower objective if necessary. This eliminates the potential for the objective to run into the underside of the stage when moving to the stored position.
10. The bug has been fixed that prevented the selection of an object or drawing item in specific conditions.
11. The software step to check if the video driver is OK has been moved to precede the hardware initialization steps (home stage, focus, etc.).
12. The bug has been fixed which caused the UV laser to not power on in some situations (i.e. after tower tilt condition).
13. A fix has been implemented to eliminate cap handling errors when a cap is placed too close to the left edge of a slide.
14. The eraser tool has been corrected to properly handle erasing of parts of a LCM Lines.
15. The calibration window has been updated to correct the position of the crosshairs in related windows, in which they were slightly off-center.
16. The function of the microdissect button has been updated so that the cap will not be picked up and moved if all drawing items are within the cap area.
17. Clicking on an item in the item list should always move that item to the center of the screen, regardless of the number of objects in the list.

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