1. Purpose
This document provides a brief overview of new features and improvements in Living Image 4.7.1. This release adds acquisition support for the new Lumina X5 instrument on instrument controllers running Windows 10 64-bit. It is not intended as a general update to Living Image 4.5.x, and does not support instruments other than the Lumina S5 and X5. The Living Image 4.7.1 release also provides improvements to existing software features and bug fixes.

2. New Features
Windows 10 Support for Acquisition
The 64-bit version of Windows 10 is now fully supported for acquisition using the following instrument models:

- Lumina S5
- Lumina X5

MVI-2 Accessory
The new MVI-2 accessory is fully supported with this version of Living Image. This accessory holds one or two mice and rotates during imaging to enable acquisition of multiple subject views (360° surface scanning).

3. Other Improvements
Fixes to reported issues

- Disable the User Preferences during acquisition to prevent an issue with displaying the wrong color scale when acquisition completes.
- When aborting initialization immediately after starting it, close the camera connection properly so it's possible to re-initialize without re-launching Living Image.
- Notify the user of the steps to restore connectivity if the connection to the camera is lost.
- Highlight overlapping excitation and emission filters in red in the Imaging Wizard, regardless of the Windows theme used.
- Resolved a crash that could occur when retiring and reactivating an image in a sequence after adding a line profile to the image.
- Changing the color in the ROI properties window displays the correct color in both the 3D view and slice views.
- If Scanned IDs are manually sorted, that sorting is not lost after scanning a new ID.

4. Known Issues

USB devices can temporarily interfere with instrument communication
If a USB thumb drive or other USB device is inserted or ejected from the controller after the instrument has been initialized, a warning may appear in the activity window indicating that a USBIO problem occurred, e.g. the stage temperature could not be read. This is a transient warning, and should not affect normal operation of the instrument.

Quantum/ Spectrum co-registration with carbon bed
Registration of a Quantum µCT image with the structured light surface from an IVIS Spectrum is facilitated by a hardware bed with a custom designed fiducial. In some cases, unexpected deflection in the hardware bed makes it algorithmically challenging to detect the fiducial. A modified hardware bed is available upon request.

Access to network locations on Windows 8
Living Image requires administrative privileges to run on Windows, which can cause conflicts with User Account Control (UAC) when accessing network resources on Windows 8. Drive letters that correspond to network locations will not be visible to Living Image when it is run as an administrator. To access network locations from within Living Image, specify the UNC path to that location instead of using the mapped drive letter. For more information, see https://support.microsoft.com/en-us/kb/937624.

Windows 8/10 on high DPI displays
On “high DPI” displays, that is, displays with better than 96 dpi, Windows 8 and Windows 10 will default to scaling buttons and other UI elements to make them larger. This can cause display problems with certain parts of Living Image, such as the tool palette. To avoid these problems, click the Control Panel link to “Make text and other items larger or smaller” and then set the scaling to “Smaller – 100%” on Windows 8 or move the slider all the way to the left to the “smaller” setting on Windows 8.1. After changing that setting, you will need to log out of the computer and log back in for the changes to take effect.

On Windows 10, in the “Display” Settings panel, set the value of the “Change the size of text, apps, and other items” slider to 100%. After changing that setting, you may need to log out of the computer and log back in for the changes to take effect.
3D settings on computers with dual graphic cards
If your computer (mostly laptops) is equipped with dual graphic cards, please follow the next figure to default the high-performance graphics card for the Living Image software. Otherwise, Living Image 3D viewer, especially with the 3D Multi-Modality tool, may not function correctly when running on low-end integrated graphics hardware. The image below shows an example of a laptop with both Intel integrated graphics and NVIDIA graphics. Open the NVIDIA control panel and click on “Manage 3D settings.” In the “Program Settings” tab, add the Living Image executable (livingimage.exe) as the program to customize and then set the preferred graphics processor to “High-performance NVIDIA processor.”

![NVIDIA Control Panel](image)

5. Analysis PC System Requirements
**PC:**
Windows 7 32-bit
- 2GHz Core 2 Duo or higher processor recommended
- 4GB RAM

Windows 7/8/10 64-bit
- 2GHz Quad Core (i5, i7) processor
- 8GB RAM recommended for IVIS Spectrum CT data analysis

**Mac:**
OS X/macOS* 10.10 to 10.12
- 2GHz Core 2 Duo or higher processor recommended
4GB RAM or higher recommended for IVIS Spectrum CT data analysis

*Note: Support for Mac OS X 10.9 and earlier has been discontinued in Living Image 4.7. MacOS 10.13 is not yet fully supported in Living Image 4.7.

* OS X/macOS is supported for the analysis module only. A Mac computer equipped with an ATI Radeon video card or certain Intel Iris Graphics chipsets is required for 3D Multi-Modality support on OS X.

6. Video Card Requirements

3D Multi-Modality tools require that the graphics processing unit (GPU) meet the minimum specifications shown below. If the appropriate license is not installed or the GPU does not meet these specifications, the 3D Multi-Modality tools will not appear in the tool palette.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OpenGL Version Requirement*</td>
<td>OpenGL 2.0 and above</td>
</tr>
<tr>
<td>OpenGL Extension Requirement*</td>
<td>GL-EXT-Texture3D</td>
</tr>
<tr>
<td>Graphics Card Memory:</td>
<td>Recommended: 1GB (Dedicated)</td>
</tr>
</tbody>
</table>
| Consumer Graphics Cards (Desktop/ Mobile, Windows/Mac) | Supported:  
- NVIDIA® GeForce® 8 Series and above (8, 9, 100, 200, 300 and 400 series)  
- ATI Radeon™ HD 4000 Series and above (4000 and 5000 series)  
- Intel HD 3000 and above and Intel Iris/Iris Pro Graphics (Mac)  
  Recommended:  
  - Desktop - NVIDIA GeForce GT 240 and above  
  - Mobile - NVIDIA GeForce GT 230M and above |
| Workstation Graphics Cards (Desktop/ Mobile, Windows/Mac) | Supported:  
- NVIDIA® Quadro® NVS Series and Above (NVS & FX series)  
- ATI FireGL™ V5600 and Above (FireGL, FirePro & CrossFire series)  
  Recommended:  
  - Desktop - Quadro FX 1800 and above  
  - Mobile - Quadro FX 880M and above |

*If these specifications are not met, the 3D Multi-Modality tools will not appear in the tool palette.