

NIS-Elements Viewer

User's Guide

Publication date 25.08.2020

v. 5.21.00

No part of this publication may be reproduced or transmitted except with the written permission of Laboratory Imaging s.r.o. Information within this publication is subject to change without notice. Changes, technical inaccuracies and typographical errors will be corrected in subsequent editions.

Laboratory Imaging s.r.o.
Za Drahou 171/17
102 00 Praha 10
Czech Republic

Table of Contents

1. Abilities	1
2. Installation	3
3. Observing a file	5
3.1. Viewing modes	5
3.2. Image window toolbar tools	5
3.3. Control Bar	5
3.4. LUTs Tools	7
3.4.1. Auto Scale Settings	8
4. Command Reference	9
4.1. File Menu	9
4.1.1. File > Open	9
4.1.2. File > Open Report	9
4.1.3. File > Export ND Document...	9
4.1.4. File > Save/Export to TIFF Files	10
4.1.5. File > Print	11
4.1.6. File > Recent Files	11
4.1.7. File > Recent Folders	11
4.1.8. File > Image Properties	11
4.1.9. File > Exit	11
4.2. Window Menu	11
4.2.1. Window > Next	11
4.2.2. Window > Previous	11
4.2.3. Window > Close All	11
4.2.4. Window > Close All but Current	11
4.2.5. Window > Close	11
4.2.6. Window > Show LUTs Window	11
4.2.7. Window > Cascade	11
4.2.8. Window > Tile Horizontally	11
4.2.9. Window > Tile Vertically	11
4.3. Help Menu	11
4.3.1. Help > Contents	11
4.3.2. Help > Search	11
4.3.3. Help > How To Buy	11
4.3.4. Help > About	12

1. Abilities

NIS-Elements Viewer is a software created to open and view all file formats created by NIS-Elements:

Features

Image Sequence Playback You can play the ND2 image sequence as a movie or browse it frame by frame.

Views Four different views are available: *Main View*, *Slices View*, *Volume View*, *Tiled View*.

Note

Availability of the Slices, Tiles and Volume Views depends on the document's dimensions.

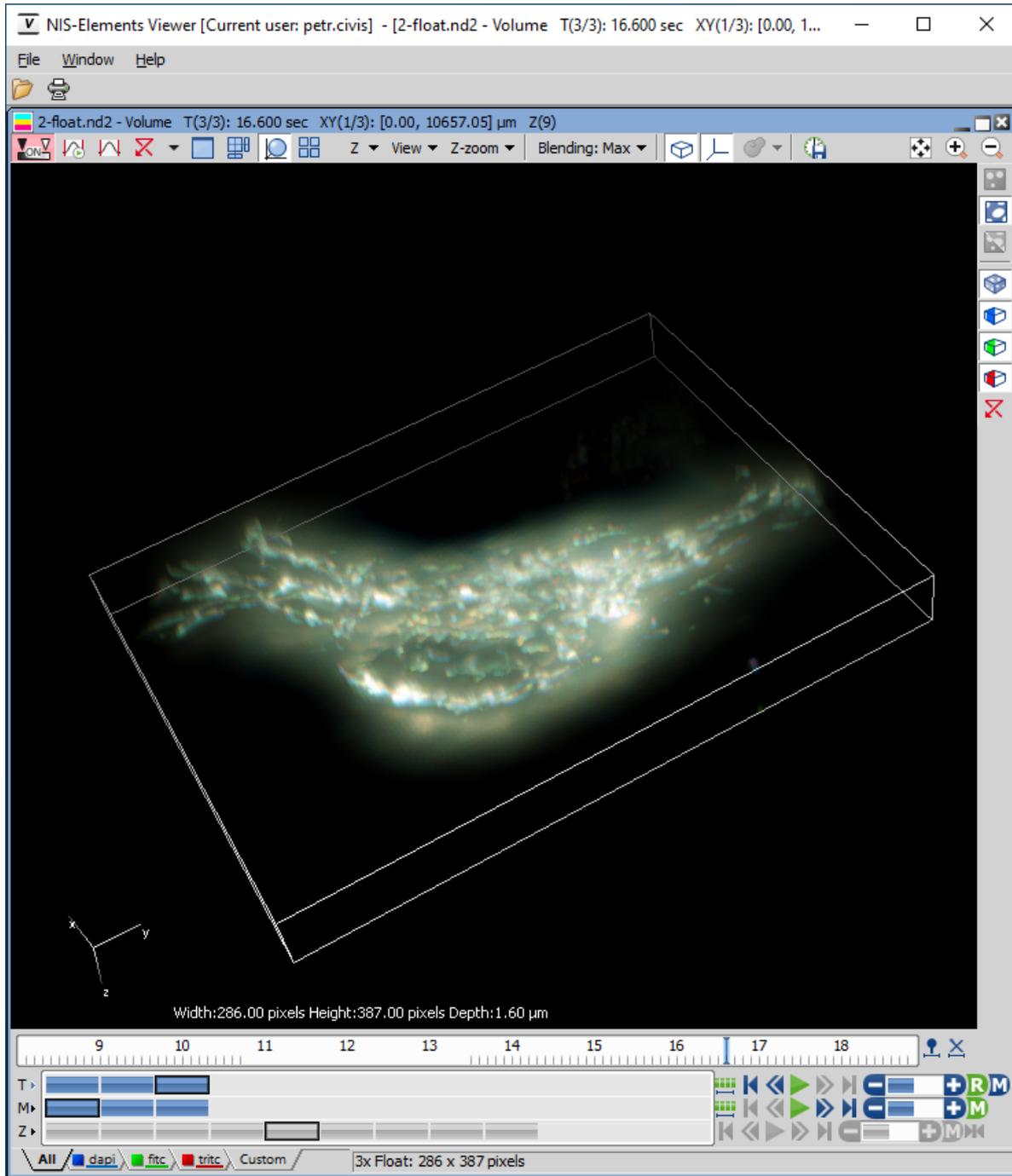
Attachments Attachment files can be opened by clicking the icon from the toolbar or inside the image context menu.

Show Binary When active, this function turns on the binary layer previously saved in NIS-Elements.

Exporting All images of an ND2 data-set can be saved as a TIF, Multi-Page TIFF, ND2 or JPEG2000 file. See *File Menu > File > Export ND Document...*

LUTs Adjusting A non-destructive contrast enhancement of the image can be applied using either the LUTs toolbar or the LUTs window. The parameters can be adjusted manually or automatically. Please see 3.4 LUTs Tools.

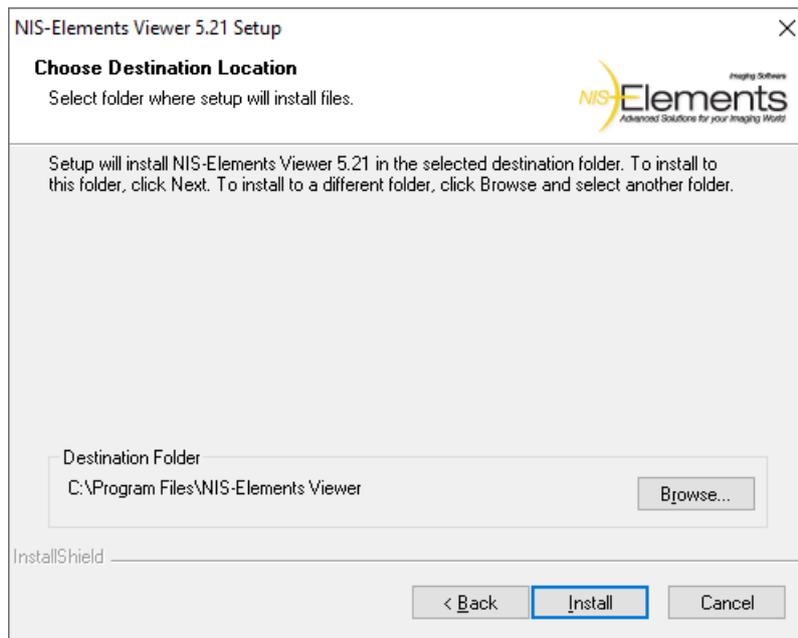
Figure 1.1. Volume View within the NIS-Elements Viewer



2. Installation

- Run the *NIS_Viewer_x.exe* setup file. The installation wizard appears.
- Follow the instructions of the wizard.
- Click **Finish**.

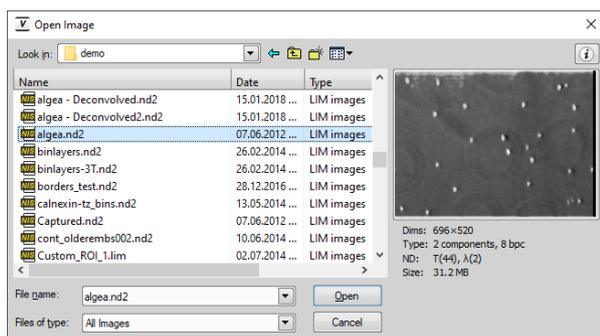
Figure 2.1. Installation wizard



3. Observing a file

1. Run the [Start > Programs > NIS-Elements Viewer > NIS Viewer] command.
2. Call the *File Menu > File > Open* or the *File Menu > File > Open Report* command and select the file to open.

Figure 3.1. Image Open dialog window



3. Choose from different 3.1 Viewing modes and enhance your image with 3.4 LUTs Tools.

3.1 Viewing modes

Depending on the dimensions contained in the ND2 file, you can display other views of the data set. These viewing modes can be switched by four icons on the left of the main tool bar.

 **Split Components** Turns ON a special view, where color channels of the image are displayed separately (tiled).

 **Main View** When you open an ND2 file, it opens in this view.

 **Slices** This view displays orthogonal XY, XZ, and YZ projections of the image sequence (Requires Z or T dimension).

 **Tiles** This view displays frames of the selected dimension arranged one next to other (Requires Z, T or XY dimension).

 **Volume** This view creates a 3D model of the acquired object (Requires Z dimension).

3.2 Image window toolbar tools

Besides the view modes described above, following tools are also available:

 **Open Attachment** Clicking this icon opens the attachment file in an associated program. If the association is missing, user is offered to save the document to a local drive. Attachments can also be opened/saved by clicking *Open Attachment.../Save Attachment As...* inside the image context menu.

 **Fit to screen** Adjusts zoom to view the whole image within the main screen.

 **Best Fit** Adjusts zoom to fit the image window in one direction but to fill the screen.

1:1 **1:1 Zoom** Adjust zoom so that one pixel of the image matches one pixel of monitor.

 **Zoom In** Increases magnification of the image.

 **Zoom Out** Decreases magnification of the image.

Custom zoom Custom zoom value can be selected from the combo box.

 **Show Scale** Places a scale bar into the current image.

3.3 Control Bar

Figure 3.2. A T/Z/multi-channel image with a few selected loops (highlighted green)



When an ND2 file is opened, its structure is pictured at the bottom of the image window.

1. There is a time line with all captured images indicated by gray markers. The blue-highlighted marker indicates the currently observed image frame. You can browse the ND2 file by clicking inside the time line.
2. Below the time line, loops of each dimension are indicated by blue rectangles. Loops can be selected by mouse while holding **Ctrl** or **Shift** keys and are highlighted green.

Note

In case of a simple single channel time-lapse ND2 image, one time loop = one image frame = one blue rectangle. In the T/Z/MCH ND2 image (displayed

above), one time loop contains several Z loops and each Z loop contains 3 color channels.

Note

ND2 files may contain a very large number of frames. It may be useful to omit some of the frames from the selection. See Selection Context Menu.

- Each dimension can be browsed frame-by-frame or you can use the playback controls on the right side.
- User events can be pinned to any frame of an ND2 image in order to highlight a remarkable scene or action. Use the buttons in the event bar to insert, browse and manage them.

In specific cases the ND2 file control bar looks differently. If the number of channels exceeds 10, the image is considered to be a spectral image and a *lambda* dimension is displayed instead of the standard channel tabs.

Figure 3.3. T/Z/multi-channel image containing 11 channels and the time line hidden



Figure 3.4. HDR multi-exposure image



Figure 3.5. Multi-channel image containing 11 channels



Playback Controls

Select All Frames Selects all frames of the dimension and highlights them green.

Play Sequence Plays all images of the dimension at a defined speed. If a selection is applied, only the selected images are included in the playback.

Stop Playing Stops playing the sequence at the last displayed frame.

Previous Position, Next Position Displays the previous/next frame of the dimension.

Decrease Playing Speed, Increase Playing Speed Changes the playback speed by one step down/up.

Real Time Playing Speed On Sets the playing speed to real-time (as the image was captured).

Maximum Playing Speed for Every Frame On Sets the playing speed to maximum while the display of every frame is guaranteed (when the speed is set to maximum by the + button, some frames are usually omitted when playing the sequence depending on your graphics card).

Home Position Displays the frame of the Z dimension that was set as “home” during the acquisition.

Selection Context Menu

Right-click a loop (blue rectangle) to display the selection context menu. There are the following commands:

Note

The placeholder X is the name of the current (clicked) dimension, i.e.: T, Z, M, ...

Select All Frames in X Selects all frames within the current dimension. The *Select Every* option is reset to *Every* automatically.

Select Frames in X Opens a dialog where the user can define a range of frames to be selected.

Invert Selection Inverts the current selection while preserving the *Select Every* option.

Select Every Every Nth frame of the selection is used. First make a selection of frames either by mouse (while holding down **Shift** or **Ctrl**) or select all frames using the **Select All Frames** command or the **Select All** button. Then choose the *Select Every* option. Selection is changed to every Nth frame of your previous frame selection.

Note

Once this option is turned on, it is applied all over again even after making a different frame selection. To turn this function off, switch it to *Every* or **Select All** frames.

Keep Selected Frames in X, Delete Selected Frames in X When one of these commands is called, a new image file is created containing only the selected/deselected frames.

Select Frame (N) Selects the clicked frame and de-selects all other frames of the current dimension.

Delete Frame (N) Deletes the clicked frame of the current dimension and also the custom selection of frames/loops of the other dimensions.

Note

If you want to keep all frames/loops of other dimensions, make sure you applied the **Select All Frames** command to them.

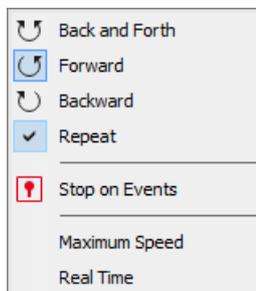
Tips

- Detailed info about dimensions will be displayed after you click the leftmost button of the control bar (T>, Z>, ...).

- Place the cursor over one of the dimensions. A tool-tip which displays statistics of the dimension appears.

Playing options

Right-click the speed bar to display the following context menu and select the playing mode.



Back and Forth, **Forward**, **Backward** Define the direction how the image sequence will be played.

Repeat Sets the repetitive infinite playback.

Stop on Events When you select this option and then press the **Play Sequence** button, a dialog window appears once the first user event is reached. The dialog window displays information about the reached user event. Use the **Continue** button to continue playing to the next event, or press the **Stop** button to stop the playback at the current frame. Within the window, you can also select the *Do not ask again in this session (Always stop)* option. Playing will then stop automatically on every user event but the window will not be shown.

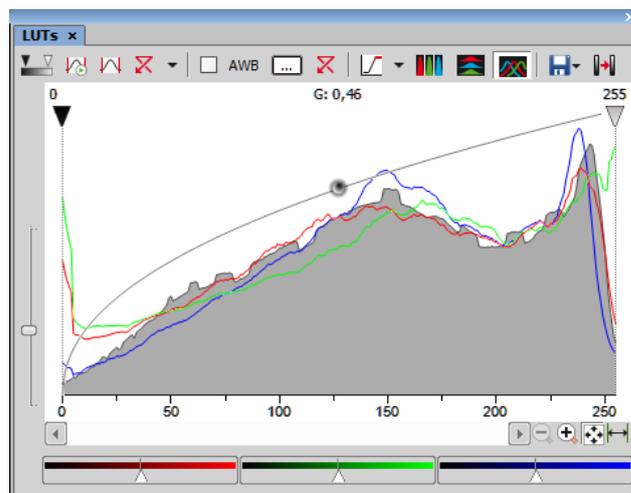
Maximum Speed This command corresponds to the **Maximum Playing Speed for Every Frame On** button described above.

Real Time This command corresponds to the **Real-Time Playing Speed On** button described above.

3.4 LUTs Tools

LUT (look-up table) is a useful tool for image color and brightness modifications. You can use LUTs to enhance images for observation purposes so the color modifications will be non-destructive to the image data. LUTs settings are saved along with the image file. Adjust LUTs settings within the central tool bar.

Figure 3.7. LUT's Control Panel



Enable/Disable LUTs This button applies LUTs to the current image.

Keep Auto Scale Press this button to run the auto scale procedure permanently (on the live image). When you turn this button OFF, the settings remain as if the *Auto Scale* button was pressed only once.

Auto Scale This button adjusts the white slider position of all channels automatically with the purpose to enhance the image reasonably. If you have selected the *Use Black Level* option from the *Settings* pull-down menu, the black slider will be affected too.

Reset All Components Discard all LUTs settings and turn LUTs OFF by pressing this button.

Settings pull-down menu Display the pull down menu and select one of the following commands:

- **Brightfield Opacity** - You can change opacity of a brightfield channel. Define the opacity in the *Brightfield Opacity* dialog window that appears after you run this command.
- **Use Black Level** - Check this item to ensure that the black slider will be affected by the auto scale functions.
- **Settings** - opens the *Auto Scale Settings* window. See 3.4.1 Auto Scale Settings.

Keep Auto White Balance Check Box Check this option to switch the Auto White Balance functionality permanently (on the live image).

AWB Press this button to perform the Auto White Balance operation once.

Auto White Balance Color (...) This button Opens the *AWB Color* window and enables you to select a color shade which the system shall eliminate (make white).

 **Reset AWB** If *Keep Auto White Balance* or *Auto White Balance* function is applied, this button turns it off.

 **Color Oversaturation** Switch this button ON and the system highlights all pixels with values reaching maximal values. Select colors to highlight the pixels with in the pull-down menu.

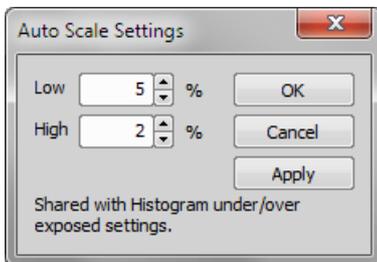
 These buttons arrange histograms of single channels next to each other horizontally or vertically.

 This button arranges histograms of single channels overlapped. Use sliders at the bottom of the graph window to amplify or reduce the green/red/blue component display in the view.

 **Save/Load LUTs** This pull-down menu enables user to handle LUTs settings in various ways. They can be saved to a *.lut file and loaded later. Or, LUTs settings saved along with an image can be loaded directly from this image by the *Reuse LUTs from File* command. Or you can copy/paste the settings within the documents opened in *NIS-Elements*.

3.4.1 Auto Scale Settings

Press the down arrow next to the  *Reset LUTs* button and a pull-down menu appears. Invoke the *Settings* command.



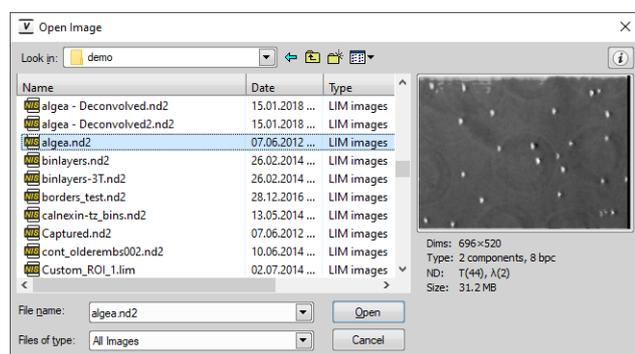
The *Low* and *High* fields determine how many of all pixels of the picture are left outside the sliders when *Auto Scale* is applied (0-10%).

4. Command Reference

4.1 File Menu

4.1.1 File > Open

You can load one or more images to the application. The *Open Image* dialog-box appears. Multiple files selection can be performed holding the **Ctrl** or the **Shift** key.



Information Image properties of the selected file can be displayed by pressing this button (in the top right corner).

File name Typing in this edit box, you are offered files that matches the already-typed characters pattern.

Files of type Select an image format or *All Images*. Only the files of the selected format will be displayed in the upper window.

Note

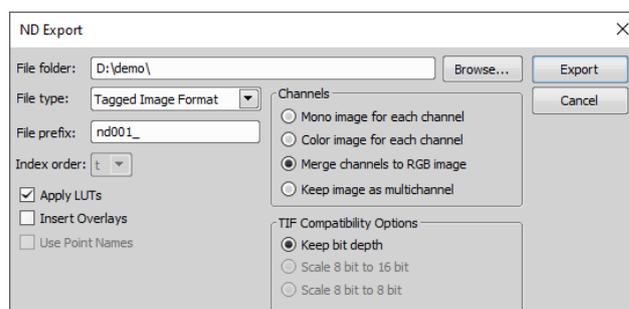
Time Step Definition: Some ND2 files do not have the time step defined properly. When you are opening such ND2 document, a dialog window appears, where the proper time step between the frames shall be defined.

4.1.2 File > Open Report

Opens a report (*.rpt) file.

4.1.3 File > Export ND Document...

Figure 4.2. ND Export dialog window



This command opens the export dialog window with following options:

Export Options

File folder Select the folder to where the images will be saved.

File type Select the image format from the menu.

File prefix Specify the prefix which will be used to name all files of the sequence. Dimension names and numbers will be appended to this prefix.

Index order You can specify the order of dimensions. Select the This will influence the naming of the images.

Apply LUTs Select this box to apply the current LUTs settings to the images.

Note

Image data in the final format will be modified according to the current LUTs settings.

Insert Overlays This option merges all visible layers (binary, annotations,...) and inserts it to the underlying image data. If this option is used, the images are always exported as RGB images.

Use Point Names XY point names are used if this function is checked.

Channels There are the following ways to save color channels:

Mono image for each channel Each channel is exported as a mono image and indexed "c1, c2, ...".

Color image for each channel Each channel is exported as an RGB image preserving the channel color and indexed "c1, c2, ...".

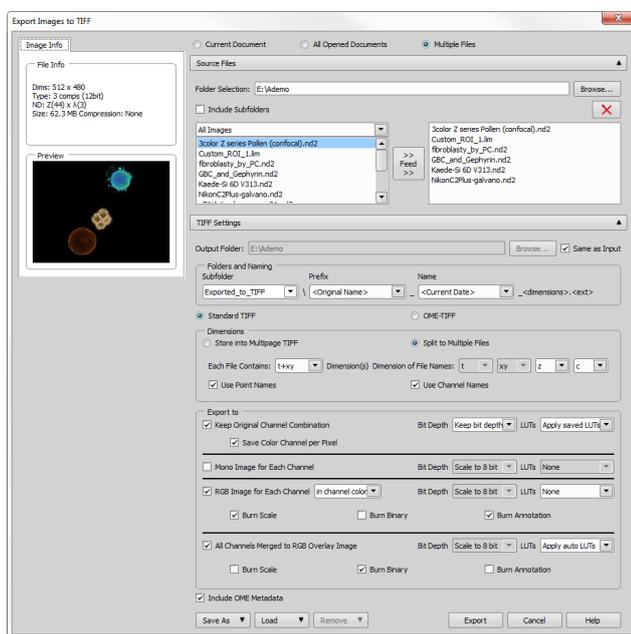
Merge channels to RGB image Each multichannel image will be converted to a single RGB.

Keep image as multichannel This option keeps the channels layout of the original ND2 file.

TIF Compatibility Options When saving a tif file, you can choose to keep the original bit depth of the new file, or to increase/decrease it.

4.1.4 File > Save/Export to TIFF Files

Figure 4.3. Export Images to TIFF dialog window



Dialog Window Options

Image Info Displays basic information about the currently selected image file together with its preview.

Current Document, All Opened Documents, Multiple Files Determines which images will be exported to TIFF.

Source Files Displays/hides additional options when exporting *Multiple Files*.

Folder Selection Target folder for the exported TIFF files.

Include Subfolders Even images in the subfolders are listed in the window below.

>> Feed >> Moves the selected images from the left file list to the right. Only images in the right list will be exported to TIFF. To remove an image from this list, click .

TIFF Settings Displays/hides additional TIFF settings.

Output Folder Defines where the TIFF files will be saved. *Same as Input* can be checked to save the files into their source folder.

Folders and Naming These combo boxes define subfolder and file naming of the newly created TIFF files.

Standard TIFF/OME-TIFF Enables to switch between different TIFF formats.

Store into Multipage TIFF A multi-page TIFF file will be created containing its dimensions in one file.

Split to Multiple Files Dimensions are dismembered to create multiple TIFF files.

Each File Contains Defines the basic dimension(s) of the multi-page TIFF file.

Dimension of File Names Order of the dimensions used for file naming.

Use Point Names Names of XY multipoints present in the image will be used.

Use Channel Names Names of the channels present in the image will be used.

Keep Original Channel Combination If checked, channel combination of the source image is preserved.

Bit Depth Original bit depth of the new file can be maintained, or the file can be rescaled to 8- or 16-bits.

LUTs LUTs of the source image can be ignored (*None*), automatic LUTs can be applied (*Apply auto LUTs*) or LUTs saved with the image can be applied (*Apply saved LUTs*).

Save Color Channel per Pixel Color channels can be saved per pixel to improve the TIFF file compatibility.

Mono Image for Each Channel Each channel will be used to create a monochrome image.

RGB Image for Each Channel Each channel will be used to create an RGB image *in channel color* or *in grayscale*.

Burn Scale Inserts scale into the final image. The scale becomes part of the image and cannot be removed.

Burn Binary Inserts the binary data into the final image. The binary data become part of the image and cannot be removed.

Burn Annotation Inserts annotations into the final image. The annotations become part of the image and cannot be removed.

All Channels Merged to RGB Overlay Image One RGB image is created from all channels available in the source image.

Note

Bit depth conversion cannot be used with spectral images.

Include OME Metadata OME metadata can be saved with the TIFF file to increase the TIFF file compatibility (e.g. proper channel designation).

Save As Saves the dialog window settings into the database (*New...*) or .xml file (*Save to XML file...*).

Load Loads the dialog window settings from the database or .xml file (*Load from XML file...*).

Remove Removes the selected dialog settings from the database.

Export Starts the TIFF exporting process.

Cancel Closes the dialog window without applying any settings.

Help Opens this help page.

4.1.5 File > Print

This command displays the default *Print* window which enables you to select a printer and send the current image to it.

4.1.6 File > Recent Files

Displays a pop-up menu containing the list of recently opened files.

4.1.7 File > Recent Folders

Displays a pop-up menu containing the list of recently opened folders.

4.1.8 File > Image Properties

Displays the Image Information window with Image Fields, Experiment Data, Recorded Data and Acquisition Details. It is also possible to open this window from the brief information label.

4.1.9 File > Exit

Exits the program.

4.2 Window Menu

4.2.1 Window > Next

Switches to the next opened image.

4.2.2 Window > Previous

Switches to the previous opened image.

4.2.3 Window > Close All

Closes all opened images.

4.2.4 Window > Close All but Current

Closes all images except the currently selected one.

4.2.5 Window > Close

Closes the current view.

4.2.6 Window > Show LUTs Window

Displays the LUTs Control Panel. See 3.4 LUTs Tools.

4.2.7 Window > Cascade

All opened images will be aligned in a cascade.

4.2.8 Window > Tile Horizontally

All opened images will be tiled horizontally.

4.2.9 Window > Tile Vertically

All opened images will be tiled vertically.

4.3 Help Menu

4.3.1 Help > Contents

Opens the NIS-Elements Viewer help file.

4.3.2 Help > Search

Opens the search tab of the help file.

4.3.3 Help > How To Buy

This command is an Internet link to the site with more information about NIS-Elements. The address is:

<https://www.microscope.health-care.nikon.com/products/software/nis-elements>

4.3.4 Help > About

Opens a window with information about the currently used version of NIS-Elements Viewer.

