

## Application Note #13

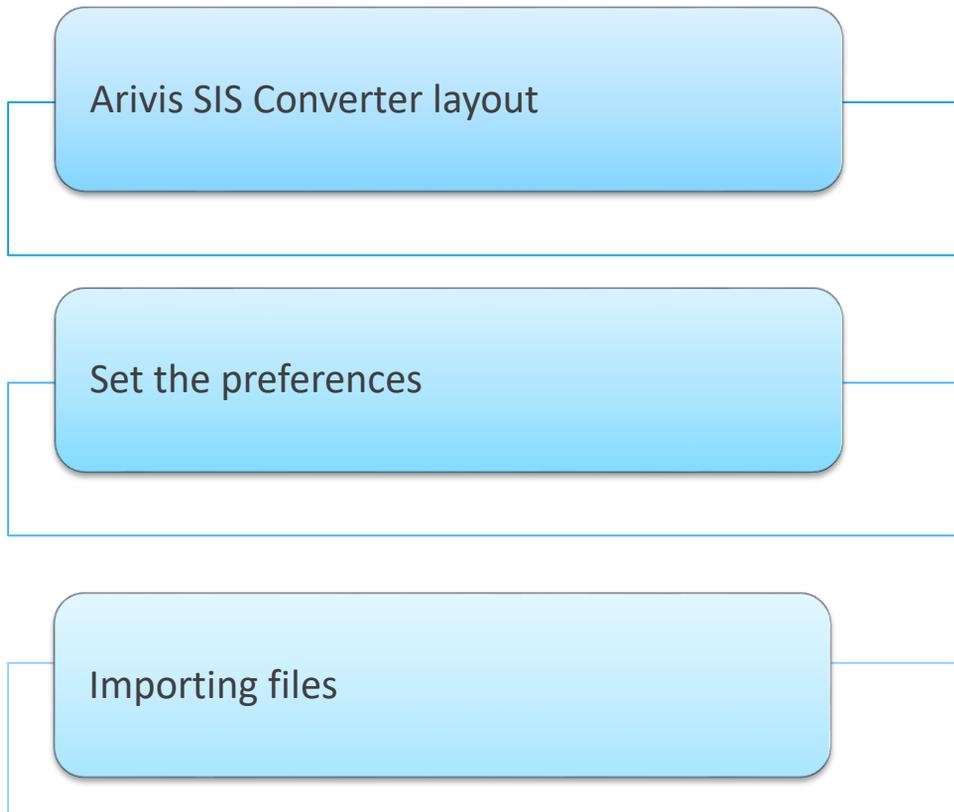
### How to use : «arivis SIS Converter»

The application-note purpose is to guide the user in using the arivis SIS Converter / Converter Pro.

arivis SIS Converter provides a simple solution for importing data from single image files or collections of files.

*“The quantitative analysis of the images represents the art of transforming a visual sensation into its schematic and discrete form allowing its univocal description, classification and mathematical and logical interpretation of its spatial and temporal components”*

## Application Flowchart



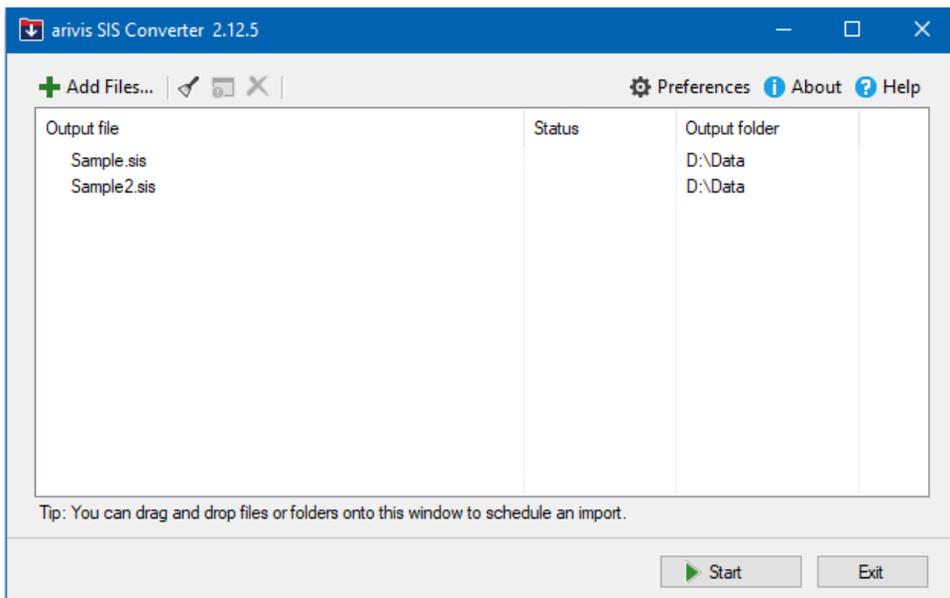
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# 1. Arivis SIS Converter layout

## Step 1

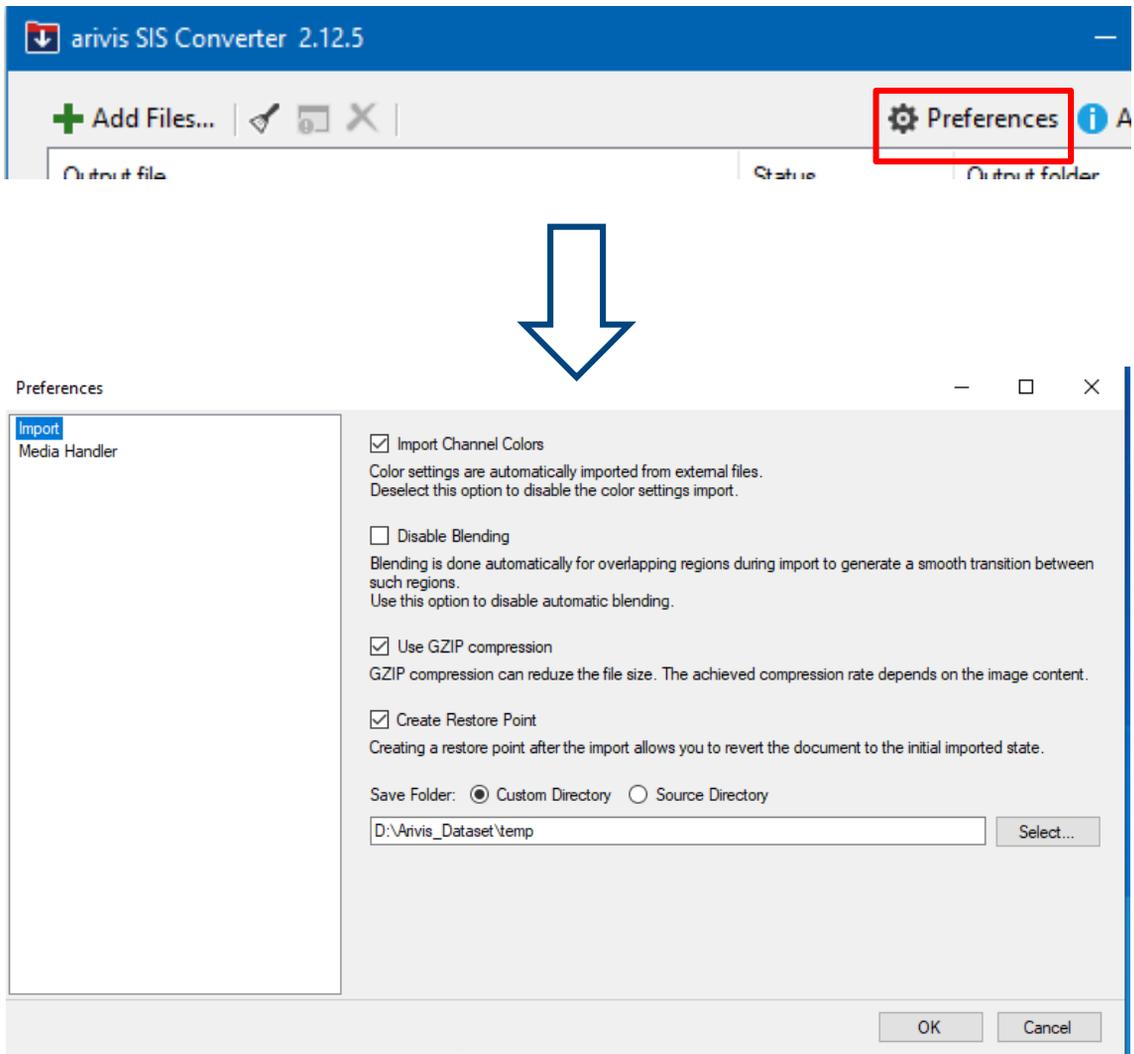
Execute arivis SIS Converter clicking on the related icon on the desktop.



## 2. Set the preferences

### Step 2

From the main dialog, select the Preference item.  
The Preferences dialog is open



### Step 2.1

## 2. Set the preferences (continue)

### Step 2.1

**Import Channel Colors:** (On by default).

If enabled and supported by the corresponding media handler, color settings are transferred from the source file to the SIS file. If disabled, or enabled and not supported by the corresponding media handler, no special color settings are applied to the SIS file. The default color settings are as follows:

- Color range according to bit depth
  - 8bit: 0 - 255
  - 16bit: 0 - 65535
  - 32bit float: 0 - 1
- Channel colors according to number of channels
  - One channel: Gradient from black to white
  - Two channels:
    - Channel 1: Gradient from black to red
    - Channel 2: Gradient from black to green
  - Three channels:
    - Channel 1: Gradient from black to red
    - Channel 2: Gradient from black to green
    - Channel 3: Gradient from black to blue
  - More than three channels:
    - The first three channels are the same as "Three channels" above.
    - All other channels are the same as "One channel".

## 2. Set the preferences (continue)

### Step 2.3

**Disable Blending:** (OFF by default).

Enable this option, if you don't need blending on tile borders, e.g. you sliced a big image into smaller tiles for easier transfer.

Disabling this option ensures that tiled input files have smooth tile borders after the import is finished.

### Step 2.4

**Use GZIP compression:** (ON by default).

If enabled, image data will be compressed without loss of information to reduce the file size.

This is especially useful for environments with limited disk space or transfer bandwidth. The compression rate depends on the image content.

### Step 2.5

**Create Restore Point:** (ON by default).

Enabling this option will create a restore point right after the import process is finished. Using this option enables you to revert any changes to the state after the import and before any changes were made.

### Step 2.6

**Save Folder:** This option sets the default folder for any file you wish to import. It is still possible to change the folder on a case by case basis.

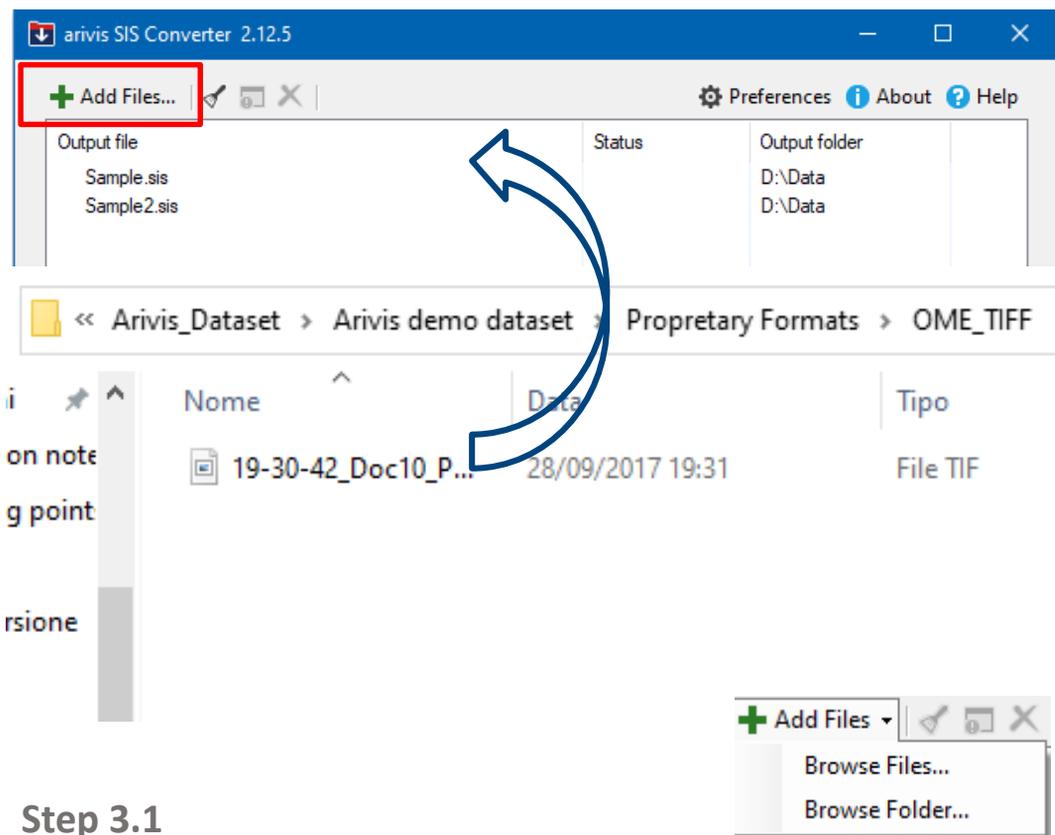
**Custom Directory:** Sets the directory to save the output file in to a folder of your choice.

**Source Directory:** Sets the directory to save the output file in to the folder of the input file.

## 3. Importing files

### Step 3

To import images, simply choose Add Files... from the main menu, or drag and drop files or folders onto an open arivis SIS Converter window. You will be guided through the import process and be able to work with your data after the import process finishes.



### Step 3.1

To import your images you can do either of the following:  
Choose File > Import... from the main menu and select the files you wish to import.

Choose File > File Browser... from the main menu and select the files you wish to import.

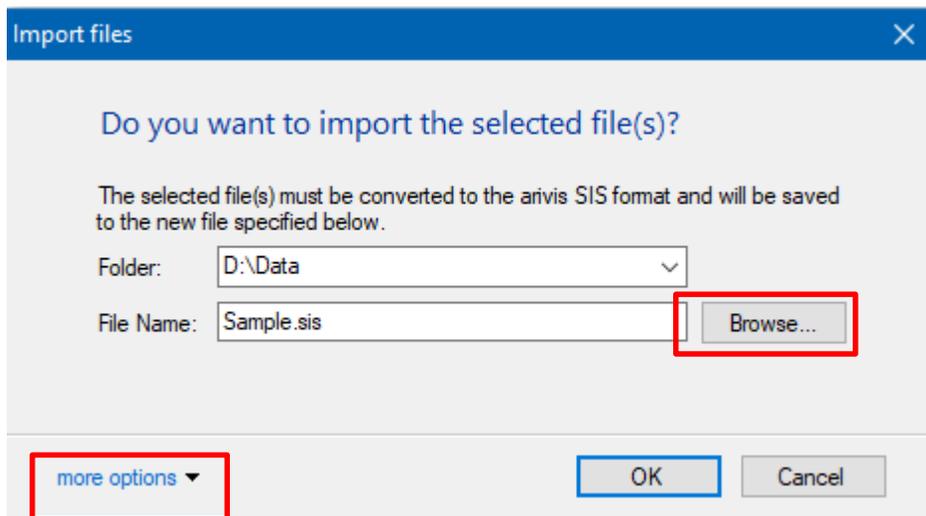
Drag and drop files or folders from your file explorer directly onto a arivis SIS Converter window.

## 3. Importing files (continue)

### Step 3.2

The selected files are analyzed and, depending on the number and structure of the input files, a dialog box appears.

If your import file is a single, simple image file, the following dialog box is displayed:



The imported file will be located at the displayed location. To change the destination file, modify the path manually or use the **Browse** button to display a file save dialog.

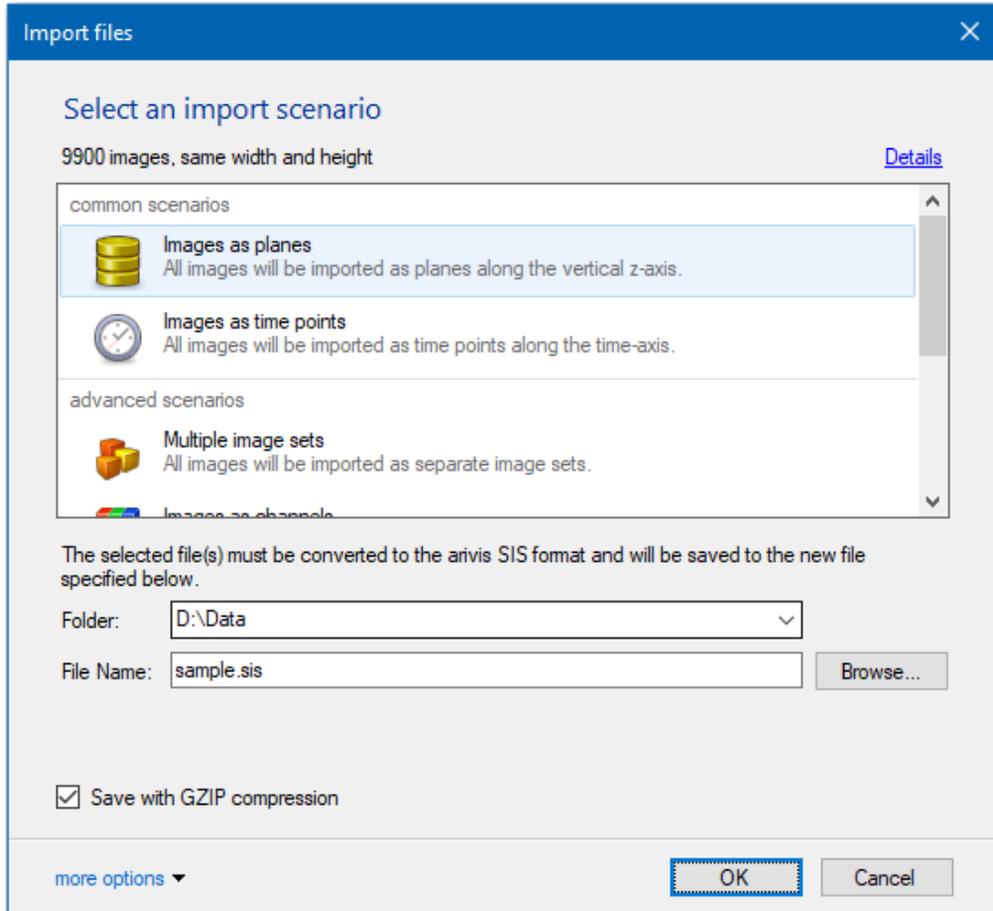


Click on **more options** to change the Target Pixel Type or Show file information

## 3. Importing files (continue)

### Step 3.3

If your input file is complex, or you wish to import multiple input files, different scenarios are suggested in the following dialog:



The imported file will be located at the displayed location. To change the destination file, modify the path manually or use the **Browse** button to display a file save dialog.

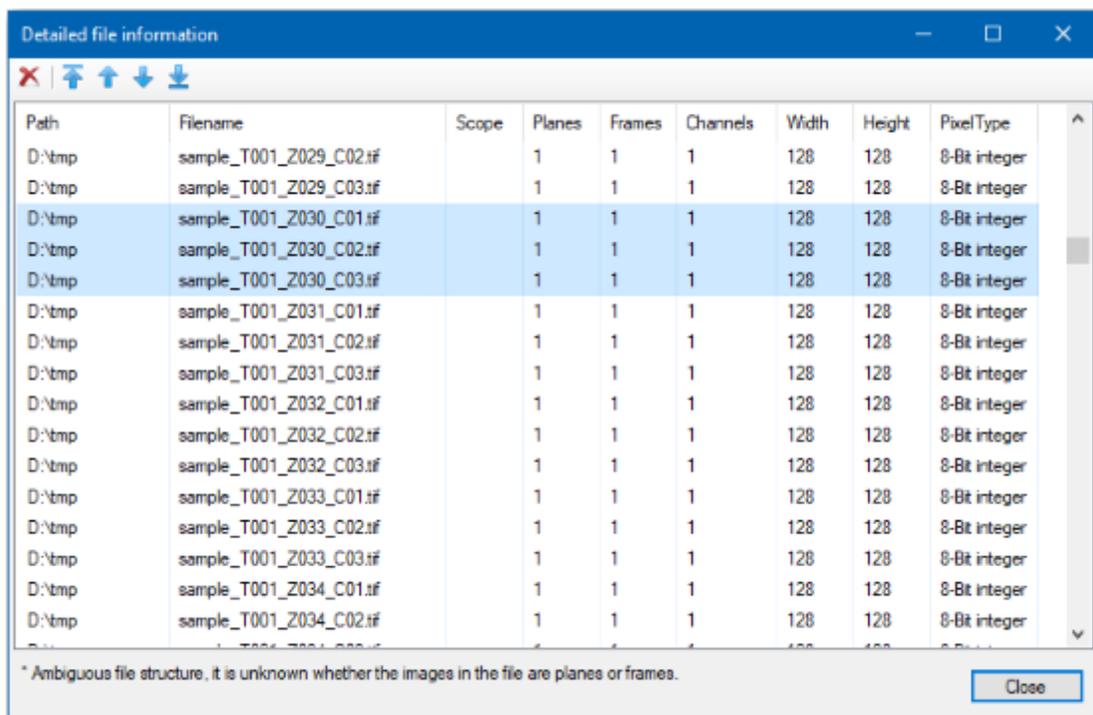


Click on **more options** to change the Target Pixel Type or Show file information

## 3. Importing files (continue)

### Step 3.4

Open the File Information Dialog (can be found under *more options* in every import dialog box) to modify the list of files for your import scenario. You can remove files from the import list and freely change the order in which the input files are imported.



## 4. Complex Import

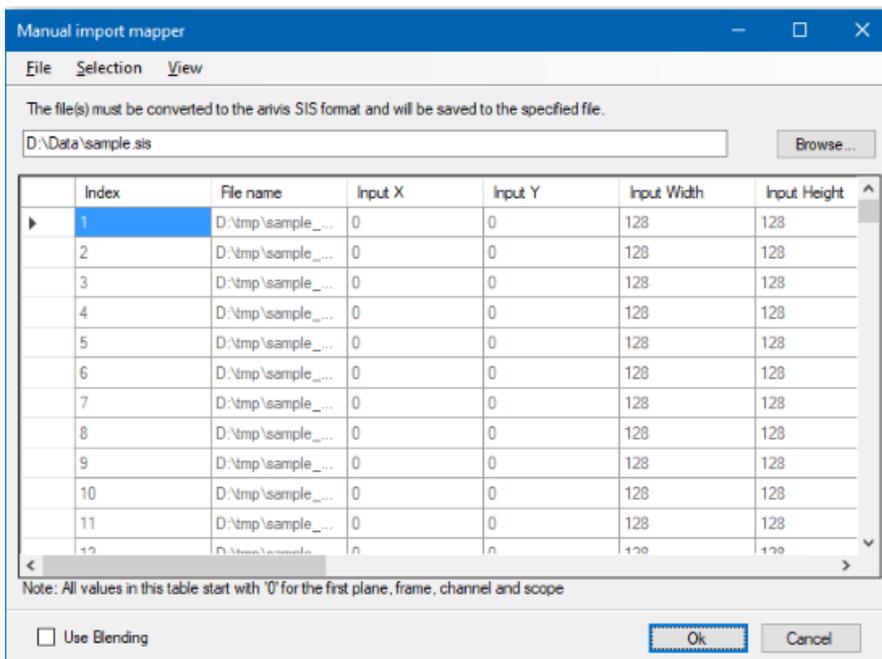
### Step 4

To import complex, unknown, image structures, select the **Custom Import** scenario.

It enables you to freely define your import scenario in detail. If the suggested scenarios do not fit your need, this dialog is your partner in defining your import scenario.

#### Step 4.1

The **Manual Mapper** displays a table with information about what regions of the input files are mapped to what regions in the destination file. Initially, each channel of the input data is specifically mapped to the destination file and will be presented as one line in the mapping table.



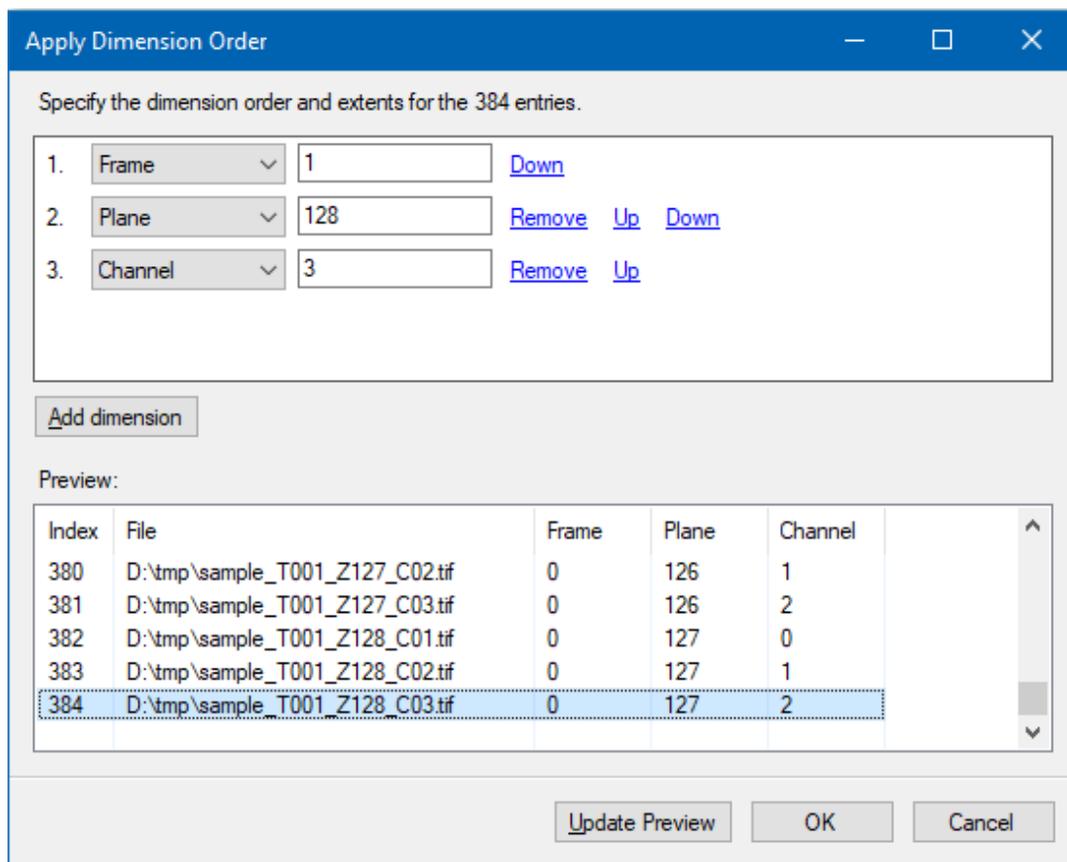
For a large number of files, the **Manual Mapper** approach is not suitable.

## 4. Complex Import (continue)

The **Selection** menu provides you with easy-to-use wizards to perform different tasks in order to create custom mappings. Before accessing a specific wizard, please mark all lines inside the mapping table that you want to change. You can press CTRL-A to mark all input files at once.

### Step 4.2

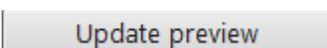
By **Applying Dimension** templates to your input files, you can easily define how your images are arranged in the different dimensions which the internal image model provides. If you have, for example, input files for two channels that should be organized as a result dataset with 10 time points and 20 planes, you can configure the dimension order as shown in the following screenshot:

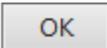


## 4. Complex Import (continue)

### Step 4.3

The order of the template elements defines in which order your input files are arranged dimensionally. Setting the time point dimension to a value of 5 means: Take every 5th image and add it to a new time point.

Press **Add Dimension**  to add a new selector to the current template. Click Remove to remove an element. Click Up or Down to change the order of the dimensions. Press **Update preview**  to display a preview of how the current template affects your import scenario in the lower preview panel.

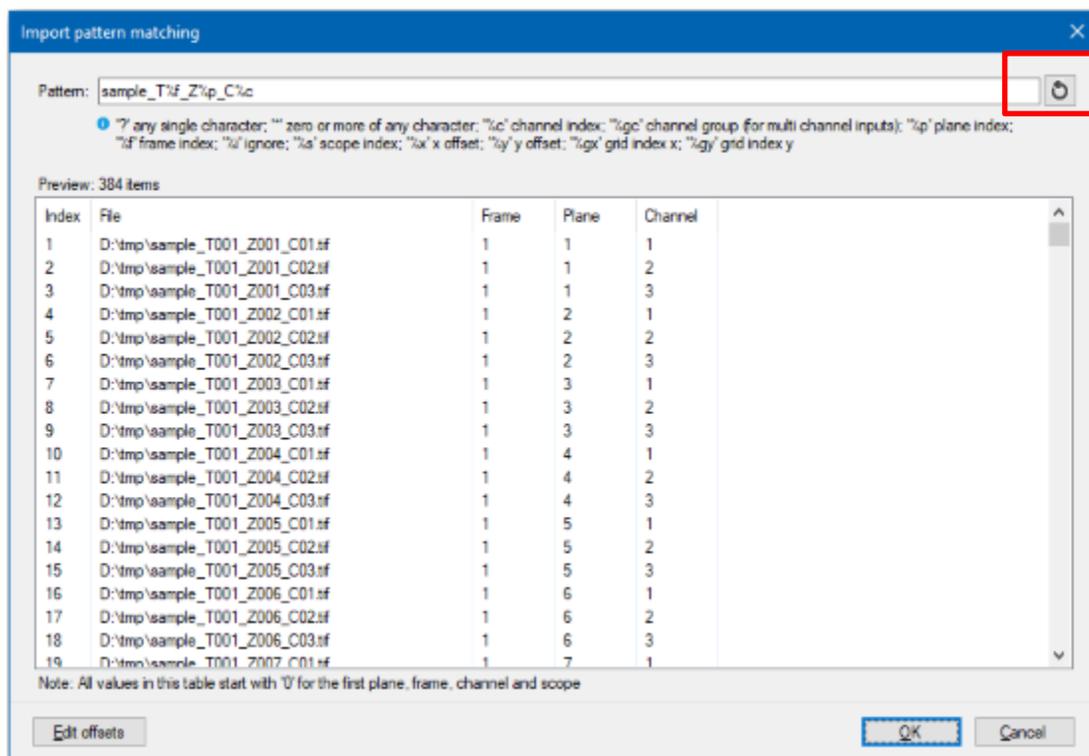
To apply the current template and change your current mapping, press 

### Step 4.4

#### **Pattern Matching:**

Sometimes the filenames contain information that define on which dimension each image has to be located in the resulting image. Choose Selection > Pattern matching... to open the import pattern matching dialog. Here you can define a pattern that contains specific identifiers that mark parts of the input filename as a locator for an image dimension.

## 4. Complex Import (continue)



The identifiers match numeric values (including leading zeros). Use the wildcard identifiers \* and ? to ignore other numeric values. If your input files start counting a dimension at 100, Edit offsets helps you set a new start for counting. E.g. if your first input file is named "input\_plane0100\_frame010\_channel01", and you don't adjust the offsets, your resulting file may contain empty data. To alleviate this change the plane offset to -100, the time point offset to -10, and the channel offset to -1. Now your resulting file will only contain the data you set up to import. Press  to refresh the preview of how the current pattern affects your import scenario in the lower preview panel.

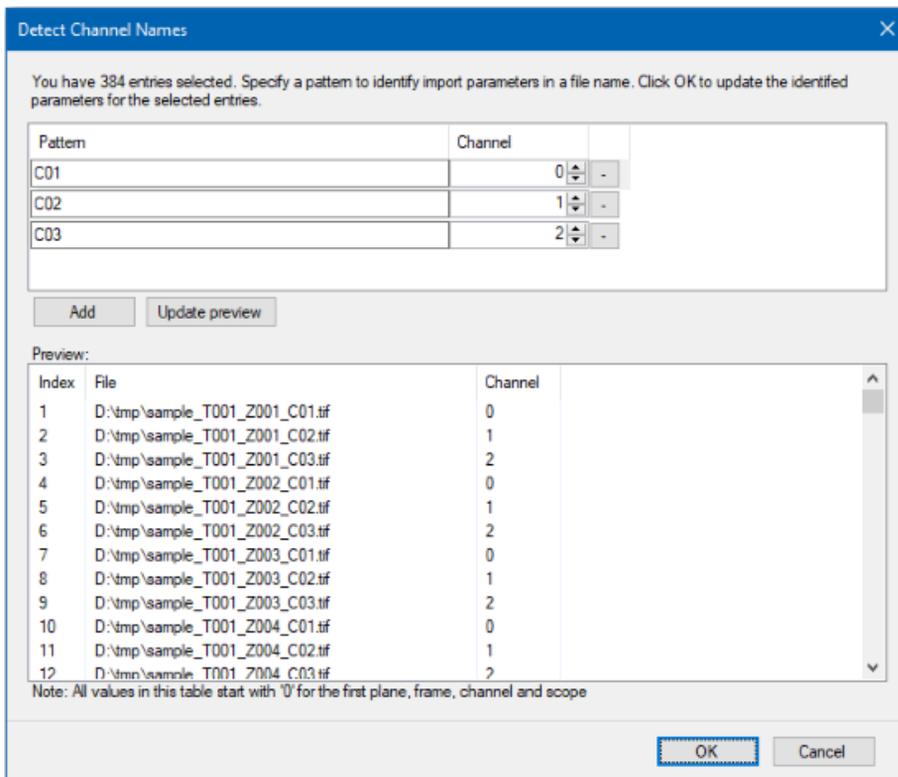
## 4. Complex Import (continue)

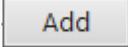
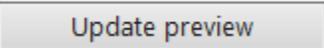
### Step 4.5

#### **Detecting Channel Names:**

Sometimes the filenames contain information about channel names. Choose Selection > Detect Channel Names... to open the channel name detection dialog box. Here you can define a pattern that matches a channel name and map it to a resulting channel.

You can use this mechanism to import multiple input files with a single channel into a single file with multiple channels.



If your import data contains more than one channel use  create another channel for your import result. Use Update preview  to check, if your channel patterns match with your import data.

## 4. Complex Import (continue)

### Step 4.6

#### Saving Import Scenario Definitions

To store your import scenario definition, you need to open the Custom import dialog box (by pressing **More options...** And **Perform custom import...**). After checking that the mapping table reflects your import scenario, choose File > Save import scenario... in order to save this import scenario to a file on your computer.

## 5. Supported Image Formats.

### Step 5

**arivis SIS Converter** supports a large number of image formats. Media handlers are extension plug-ins which enable arivis SIS Converter to import and export files in various file formats. For instance, the importers and exporters use these media handlers.

The following media-handlers are available in your **arivis SIS Converter**:

#### Step 5.1 Amira-Mesh Media Handler

The Amira-Mesh media handler enables the import of Amira-Mesh files, containing uniform lattice data. Amira-Mesh files can contain different types of data, for instance spatial graphs or stacked lattices. This media handler is not able to read these special data types.

The Amira-Mesh media handler allows you to import images of the following file format: Amira-Mesh (\*.am)

## 5. Supported Image Formats (continue)

### Step 5.2 Aperio Media Handler

The Aperio media handler allows you to import images of the following file format: Aperio (JPEG) (\*.svs) , Aperio JPEG2000) (\*.svs)

### Step 5.3 Metamorph Media Handler

The Metamorph media handler is part of the Bio Media Handler Module which enables the import of some common image formats used in biology-related working areas.

The Metamorph media handler allows you to import images of the following file format: Metamorph (\*.stk)

### Step 5.4 The DeltaVision media handler

The DeltaVision media handler enables the import of Applied Precision's DeltaVision image files.

The DeltaVision media handler allows you to import images of the following file format: DeltaVision (\*.dv)

### Step 5.5 Dicom Media Handler

The Dicom media handler enables arivis SIS Converter to read DICOM containers or DICOMDIR files. These files describe the structure of a DICOM dataset (Digital Imaging and Communications in Medicine) that is most commonly used in medical working areas. The Dicom media handler allows you to import images in the following file formats: Dicom (\*.dcm) , DICOMDIR (\*.dicomdir)

### Step 5.6 Hamamatsu Media Handler

The Hamamatsu media handler allows you to import images of the following file format: NDPI (\*.ndpi) , Virtual Microscope Specimen (\*.vms)

## 5. Supported Image Formats (continue)

### Step 5.7 FreeImage Media Handler

The FreeImage media handler enables the import for most of the common image formats.

The FreeImage media handler allows you to import images of the following file formats:

JPEG / JFIF (\*.jpg;\*.jpeg;\*.jif;\*.jfif;\*.j;\*.jpe)

TIFF Tagged Image (\*.tif;\*.tim;\*.tiff)

Windows Bitmap (\*.bmp;\*.rle;\*.vga;\*.rl4;\*.rl8;\*.sys)

Portable Network Graphics (\*.png)

CompuServe GIF (\*.gif;\*.giff)

JPEG-2000 (\*.jp2)

High Dynamic Range Image (\*.hdr)

### Step 5.7 ICS Media Handler

The ICS media handler allows you to import images of the following file format: ICS 1.0 (\*.ics) , ICS 2.0 (\*.ids)

### Step 5.8 Imaris Media Handler

The Imaris media handler enables the import of the Bitplane Imaris file format. The Imaris media handler is using the HDF5 Library.

### Step 5.9 Imaris Media Handler

The Imaris media handler enables the import of the Bitplane Imaris file format (IMS). The Imaris media handler is using the HDF5 Library.

### Step 5.10 JPEG Media Handler

The JPEG media handler enables an optimized import of JPEG image files.

The JPEG media handler allows you to import images of the following file format: JPEG (\*.jpg, \*.jpeg)

## 5. Supported Image Formats (continue)

### Step 5.11 Leica Media Handler

The Leica media handler enables the import of Leica image file formats.

The Leica media handler allows you to import images of the following file formats: Leica Image File Format (\*.lif) , Leica LCS (\*.lei)

### Step 5.12 LSM Media Handler

The LSM media handler enables the import of the LSM file formats.

### Step 5.13 Mirax Media Handler

The Mirax media handler enables the import of the Mirax SlideAC file format. This image format originates from Carl Zeiss Mirax Slide scanner systems and is based on image pyramids.

The Mirax media handler allows you to import images of the following file format: Mirax SlideAC (\*.mrxs)

### Step 5.14 NifTI Media Handler

The NifTI media handler enables the import of the NifTI (Neuroimaging Informatics Technology Initiative) image file formats.

The NifTI media handler allows you to import images of the following file formats: single-file(combined data and meta-data)(.nii) ,single-file gzip-compressed (.nii.gz) , dual-file(separate data and meta-data, respectively)(.img/.hdr)

## 5. Supported Image Formats (continue)

### Step 5.15 Nikon Media Handler

The Nikon media handler enables the import of data created by the Nikon imaging solutions.

The Nikon media handler allows you to import images of the following file format: Nikon ND2 (\*.nd2)

### Step 5.16 Olympus Media Handler

The Olympus media handler enables the import of the Olympus OIB/OIF file formats.

The Olympus media handler allows you to import images of the following file formats: Olympus OIB (\*.oib) , Olympus OIF (\*.oif)

### Step 5.17 RAWInfo Media Handler

The RAWInfo media handler enables the import of raw image files by using a control (\*.rawinfo) file that contains dimension information.

The Raw media handler allows you to import images of the following file formats: RawInfo (\*.rawinfo)

### Step 5.18 Slide Book Media Handler

The Slide Book media handler enables the import of the Slide Book file format.

The Slide Book media handler allows you to import images in the following file format: Slide Book (\*.sld)

### Step 5.19 Tiff Media Handler

The Tiff media handler enables the import of TIFF (Tagged Image File Format) based image file formats. TIFF is a commonly used format to store images.

The Tiff media handler allows you to import images of the following file formats: TIFF (\*.tif, \*.tiff) , OME TIFF (\*.tif, \*.tiff)

## 5. Supported Image Formats (continue)

### Step 5.20 VOL Media Handler

The VOL media handler enables the import of VG Studio VOL images.

The VOL media handler allows you to import images of the following file format: VOL (\*.vol/\*.vgi)

To import a VG Studio VOL dataset both files (.vol & .vgi) are needed!

### Step 5.21 Zeiss ZVI Media Handler

The Zeiss ZVI media handler enables the import of Zeiss image data.

The Zeiss ZVI media handler allows you to import images of the following file formats: Zeiss ZVI (\*.zvi) , Zeiss ZISRAW/CZI (\*.czi)



Contact the arivis application support to receive additional technical details about the topic described in the application note, or how to adapt the application workflow to your requirements.

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