



IMAGE  
Information  
Systems Ltd.

For a Better View in Diagnostics!

# iQ-STITCH 1.0

## User Manual

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## 0 CE CONFORMANCE STATEMENT

IMAGE Information Systems Ltd. does not accept liability for the wrong or unprofessional use of the described software (see the End User License Agreement).

iQ-STITCH is certified as a medical device for image processing, diagnosis, archiving, and communication according to Council Directive 93/42/EEC concerning medical devices and according to FDA 510(k).

All patient names used in this manual are completely fictitious.

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## 1 INTRODUCTION

iQ-STITCH is the ideal tool to merge any X-ray images into one big object. Orthopedics and veterinarians require image stitching if the object size exceeds the cassette format. The application is designed as a so-called “software wizard” and guides the user through the 5 steps of the stitching process.

- STEP 1: Order the sequence
- STEP 2: Rotate and/or flip
- STEP 3: Stitch
- STEP 4: Type in the image information
- STEP 5: Release the stitched image

The process will result in creating one single image based on the source images and provide the possibility to handle it at once using normal medical imaging software. iQ-STITCH works with every X-ray vendor and can be used as a standalone application with any PACS, or rather, as an integrated tool of iQ-VIEW® or the iQ-CR ACE acquisition station.

The resulting image is a medical image compliant with DICOM 3.0 - Part 10.

### 1.1 SYSTEM REQUIREMENTS

The minimum requirements are:

- Intel-compatible processor with 1 GHz
- 512 MB memory (RAM)
- 5 GB free capacity on local hard disk
- Monitor resolution 800x600
- Operating system Windows XP or VISTA

Recommended:

- Intel-compatible processor with 2 GHz
- 1 GB memory (RAM)
- 5 GB free capacity on local hard disk
- Monitor resolution 1024x768 or higher
- Operating system Windows XP or VISTA

Furthermore, we recommend the use of up-to-date anti-virus software on the computer on which iQ-VIEW is run. The virus definitions must be updated regularly (they should not be older than 2 weeks).

Note: Due to known issues / incompatibilities (e.g. regarding the blocking of system files and ports), we do not recommend using the software AntiVir as an anti-virus software.

To keep constant the power supply voltage we recommend the use of an uninterruptible power supply (UPS). The interposition of such a device prevents data losses and data inconsistencies that can be produced at the occurrence of fluctuations in the power supply voltage.

## 2 INSTALLATION

### 2.1 STANDALONE INSTALLATION

The application setup can be downloaded from the IMAGE Information Systems download area at <http://www.image-systems.biz>.

To install the application, please follow the instructions given below:

- Download and save the iQ-STITCH setup to a local directory of your choice.
- Start the setup.
- Follow the instructions of the installation wizard.

### 2.2 iQ-VIEW INTEGRATED INSTALLATION

The application is integrated in the iQ-VIEW setup and will automatically be installed during the iQ-VIEW installation. No further steps are required to set up iQ-STITCH with iQ-VIEW. Please refer to the iQ-VIEW documentation to get further information about the installation of iQ-VIEW.

### 3 LICENSING

iQ-STITCH has a system-based license system. The license will generate a hardware fingerprint in order to identify the system. The fingerprint is needed when purchasing the full license of iQ-STITCH.

The application will at first run create a 30-days evaluation license without any functional limitations. A full license of iQ-STITCH can be gained only by purchasing a full license and activating the software.

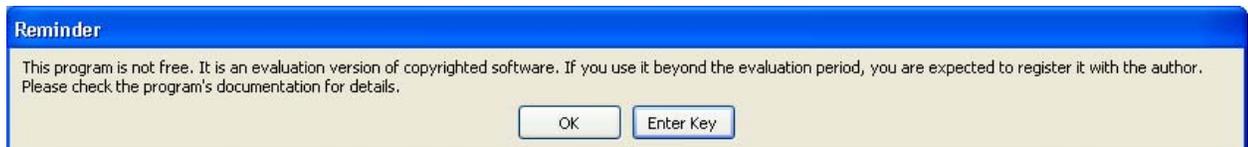
#### 3.1 SOFTWARE ACTIVATION

After downloading and installing the iQ-VIEW software, the application runs by default as an evaluation version limited in time.

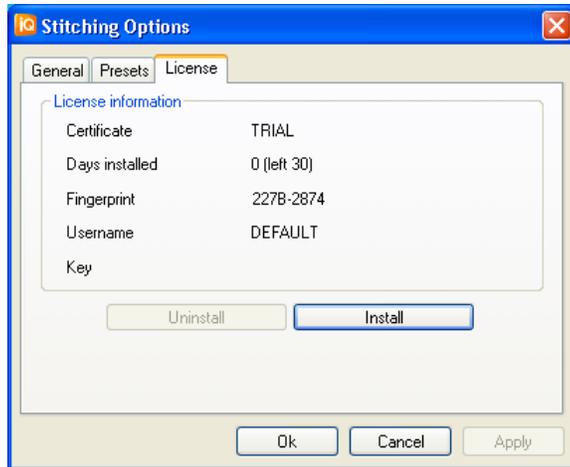
After 30 days the application stops working unless a full license for iQ-STITCH is obtained and the software is activated with a specially created activation key.

The activation process is quite simple:

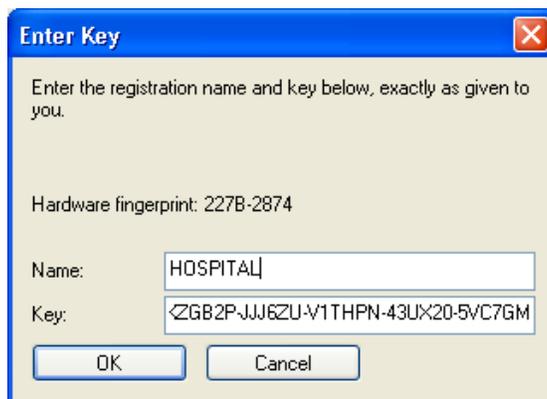
1. Start the application
2. Either open the "Enter Key" dialog in the reminder shown at startup or open the option dialog's license page within the application and look up the hardware fingerprint
  - a. Enter Key dialog



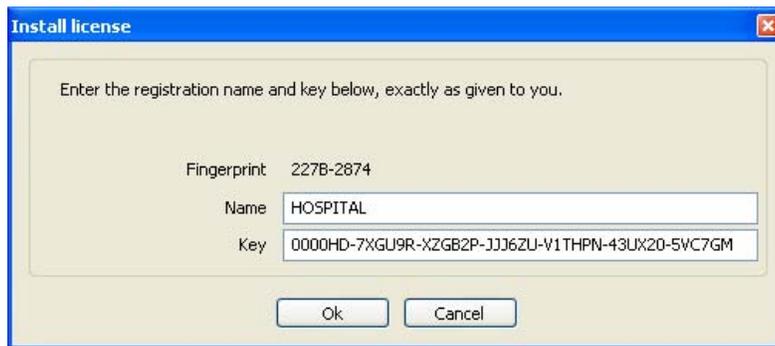
- b. Options license page



3. Purchase a full license of iQ-STITCH
4. Copy and paste the hardware fingerprint into an email and send this email to [license@image-systems.biz](mailto:license@image-systems.biz). Also mention the name for which you would like to register the software as well as the end-user contact data.
5. You will receive an email in return with the registered name and activation key.
6. Enter the information in the respective fields of the "Enter key" or "Install License" dialog
  - a. Enter key dialog



- b. Install license dialog



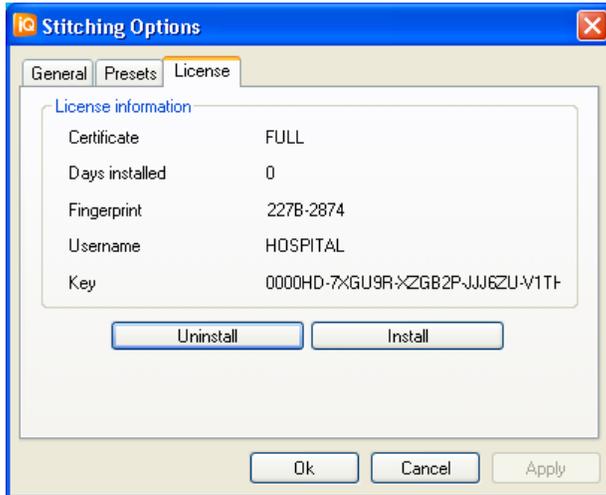
7. Afterwards press 'OK'. The following information will appear:
  - a. Enter key



- b. Install license dialog



8. The key will be stored on your PC and does not have to be entered each time you start the application. Hardware modifications are still possible. The fingerprint will change with each hardware modification, however, the key will remain valid for two times after a change of different components.
9. The current certificate and hardware fingerprint can be looked up on the options license page:



## 3.2 MIGRATING THE LICENSE TO ANOTHER COMPUTER

If you want to move your purchased iQ-STITCH license from one computer to another you need to follow the instructions given here:

1. Install the iQ-STITCH software on the new computer. (Refer to chapter 2)
2. Uninstall the iQ-STITCH license on the old computer. To do that, open the Options dialog license page and click “Uninstall” to deactivate the license key.
3. During the “Uninstall”, a text file is created in the iQ-STITCH installation directory, called “uninstall\_YYYYMMDDhhmmss.txt”. This file contains an uninstall key verifying that the license has been uninstalled successfully. Send this file without any modification together with the hardware fingerprint of the new iQ-STITCH installation by email to [license@image-systems.biz](mailto:license@image-systems.biz). Also mention the version number of the software.

You will receive an email in return with the registered name and activation key.

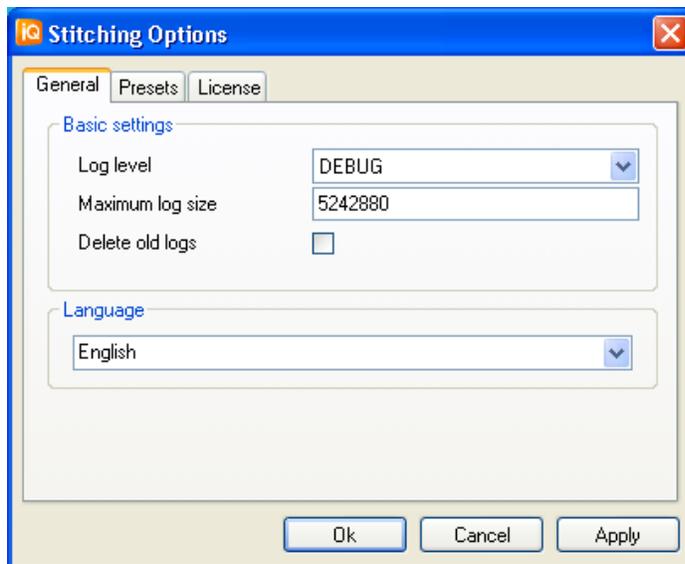
Note: Please keep in mind that replacement keys will only be delivered for a fee. Therefore, please contact your reseller **BEFORE** you transfer your iQ-VIEW license to a new computer!

## 4 CONFIGURATION

iQ-STITCH provides a small set of options that can be configured to make the stitching process more comfortable to the user. All configuration and appearance changes will be stored in the main configuration file “stitch.ini” within the application folder.

### 4.1 General Settings

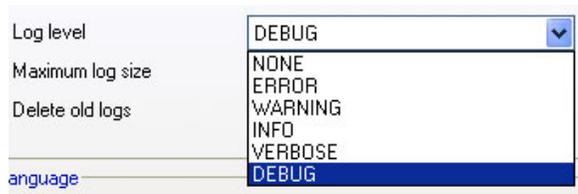
The “General” options page offers the possibility to make basic application settings as well as to select the language of the interface.



#### 4.1.1 Basic settings

1. Log level:

The log level defines the amount of information stored in the log file of iQ-STITCH. The log file is called “stitch.log” and can be found in the installation folder of iQ-STITCH. iQ-STITCH provides six (6) different log levels from “None” to “Debug”.



2. Maximum log size:

The maximum log size defines the maximum file size of the log file. When the maximum size is reached, a new file will be created to keep the newer information.

3. Delete old logs:

This option, if enabled, deletes the old log file when the maximum size of the log file is reached and a new file is created. The old log file will not be deleted but renamed with a time stamp if this option is disabled.

#### 4.1.2 Language settings

iQ-STITCH provides a multilingual interface. The language system consists of individual language files for each language. The language files are stored in the “lang” subfolder of iQ-STITCH. The application will scan the folder at startup and provide the available languages in the “Language” box.

Select a new language and click on “Apply” or “Ok” in order to change the language. The application will automatically apply the new language terms to all captions, messages and information within the whole application.

Note: The log system of iQ-STITCH is not based on the language system and will always use English when storing information to the log file.

## 4.2 Preset settings

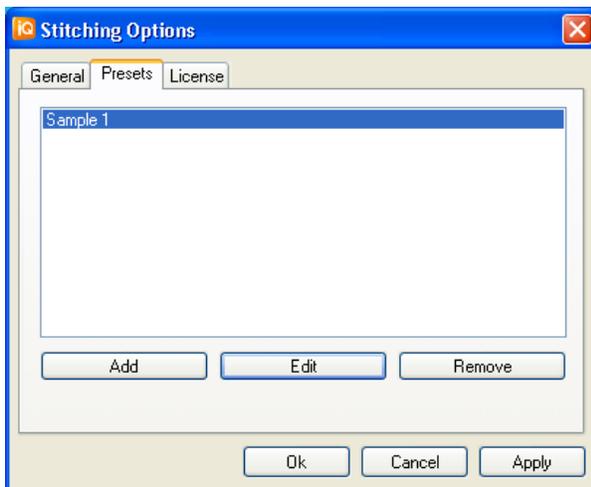
iQ-STITCH provides so-called presets to make the stitching process more comfortable to the user. A preset contains several values that describe how the images were positioned to each other during their acquisition. Especially when used with fixed film cassettes, e.g. in a portable frame, a preset keeps the post-processing very simple. The preset can be selected in step 1 of the stitching process and will be available throughout the whole process.

A preset consists of the following values:

- Name (alias)
- Distance of the plates in millimeter
- A scaling value (in case the films cassettes are overlapping)
- The value for "empty" regions
- The encoding format of the result image (DICOM 3.0-conform syntax)

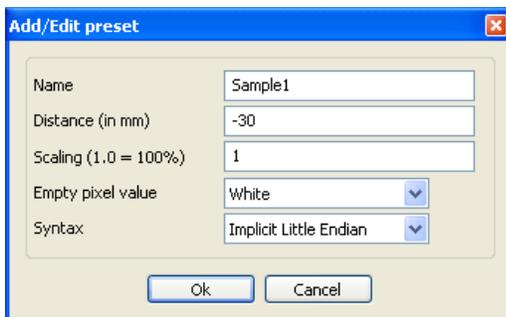
iQ-STITCH has no limitation for the number of presets.

The iQ-STITCH option dialog gives access to the configuration of the presets.



Throughout the preset page, the user can add, modify or remove presets. A simple double-click on an entry in the list will open the modify dialog of the selected element.

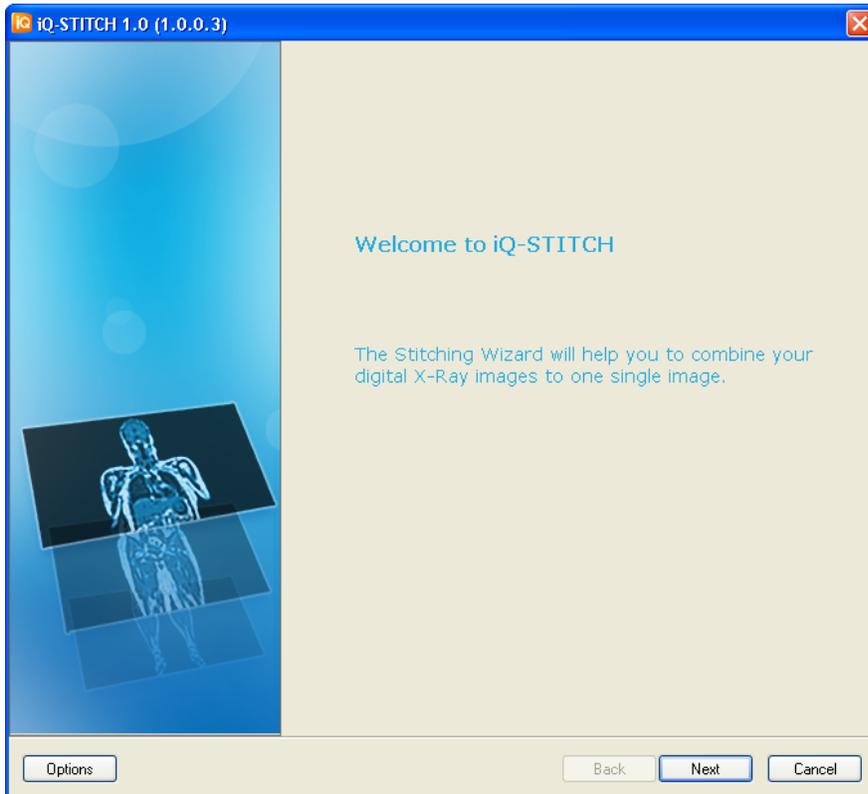
The add/modify dialog offers access to the elements of a preset.



## 5 USING THE APPLICATION

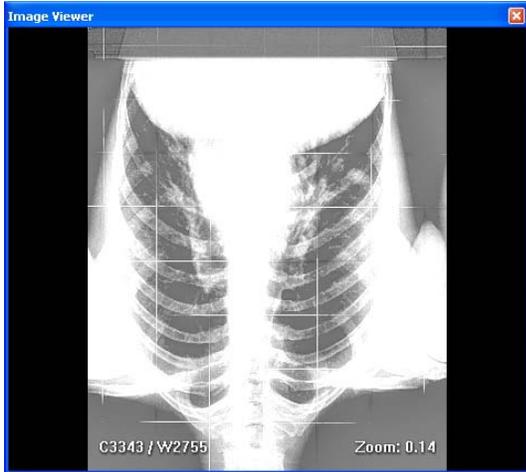
The application is designed as “software wizard” and guides the user through the whole process. Each step will provide a page with the necessary information and provides a “Next” button to proceed to the next step.

After starting the application the user will see the welcome page.



Clicking on “Next” will open the page to select the images.

Note: Whenever an image is shown, the user may wish to use window level functions. A simple double-click on the image will open a resizable image viewer dialog that allows the user to change the window width and center. Changes made in the viewer will appear throughout the whole further process. (Refer to chapter 5.7)



## 5.1 BASIC STITCHING SETTINGS

The first page will provide the possibility to load the images and select a proper preset for the stitching process.

Note: The iQ-VIEW-integrated mode will preload the images selected in iQ-VIEW. The images will directly appear on the list without requiring any action from the user. Nevertheless, the user can still modify the image list.

Note: iQ-STITCH can only load images of the same type, e.g. CR or CT, with the same characteristics (representation, bit depth and bit-per-pixel). iQ-STITCH will show an error message if the user tries to load images that do not follow those restrictions.



The upper list will display the loaded images by file name. iQ-STITCH can load up to five (5) images within each process. The image information and a preview will appear in the area below when selecting an image from the list by means of a mouse click.

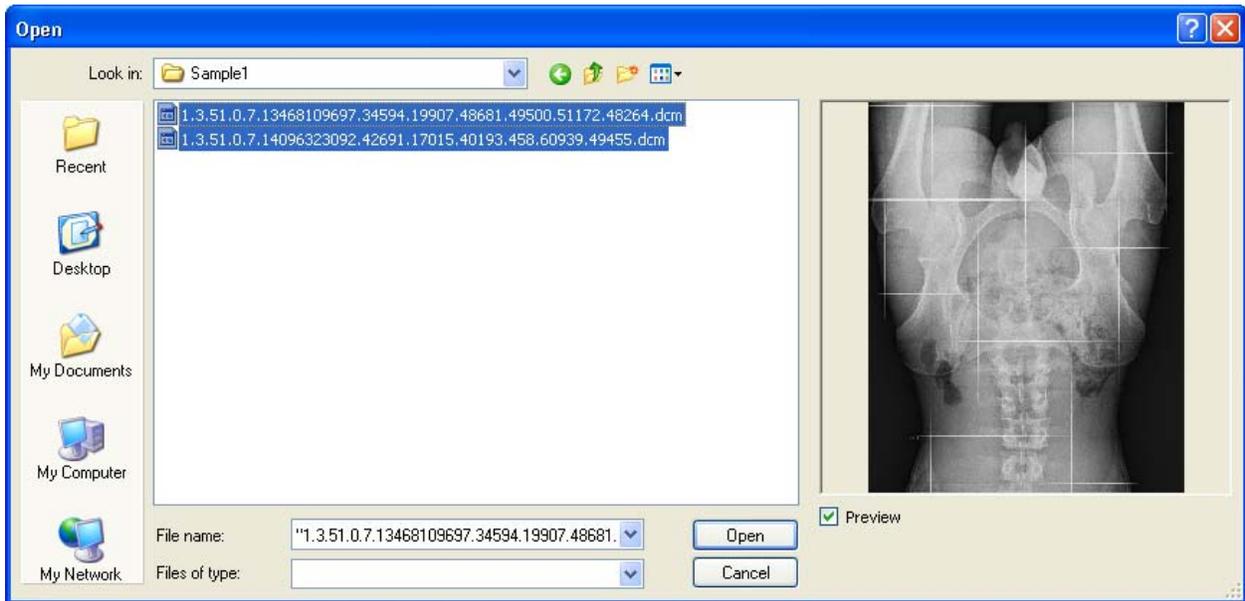
It is possible to load additional images by clicking on the “Add” button.



The “Remove” button allows removing the selected image from the list.

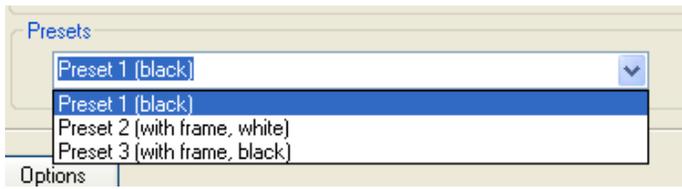


The open dialog will allow adding multiple images.



### 5.1.1 Select a preset

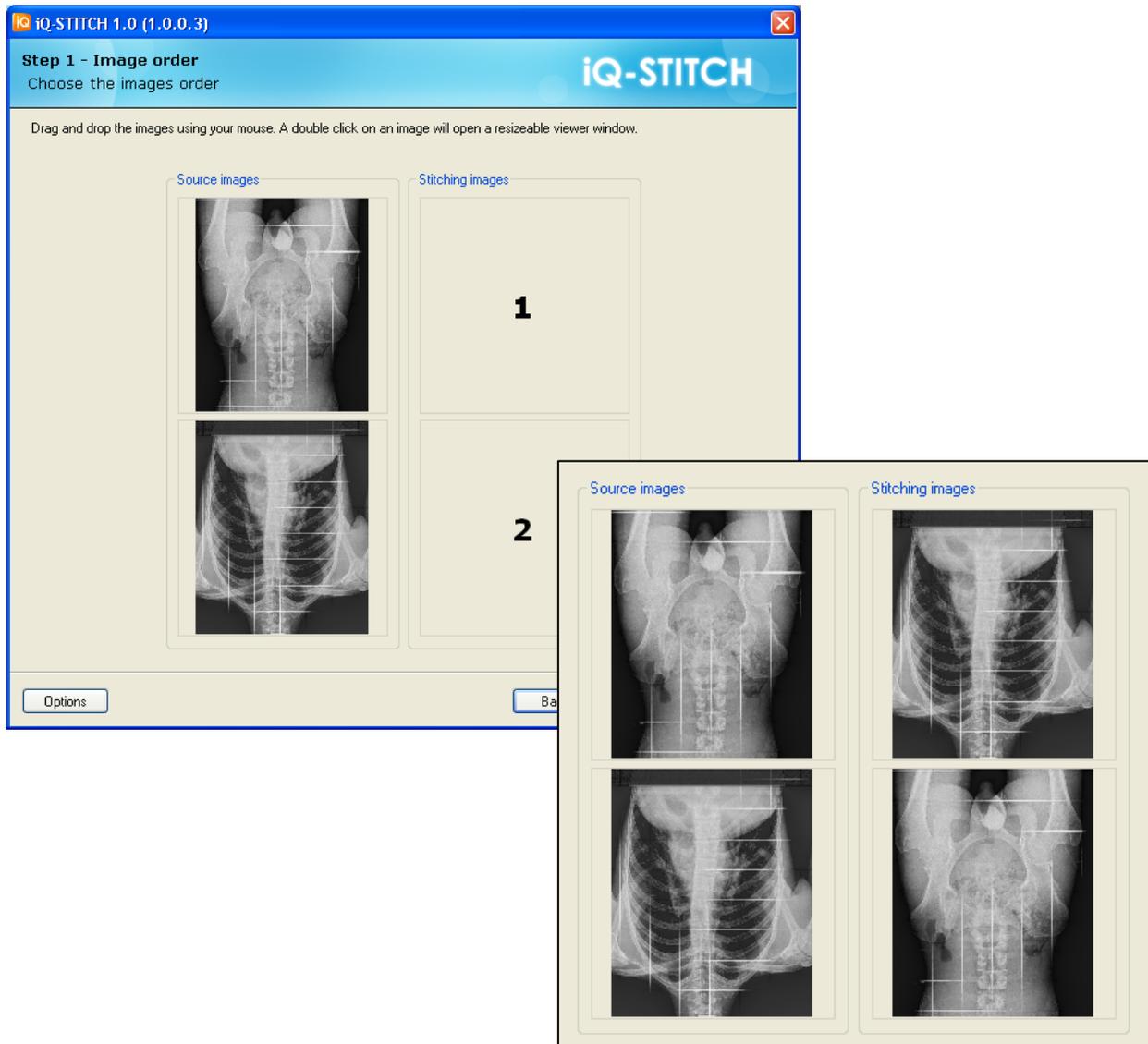
You may select the used preset. The application will remember the choice and select the same preset the next time.



The user can still open the option dialog and modify the presets. Changes made within the option dialog will be applied in this step.

## 5.2 STEP 1 – ORDER THE SEQUENCE

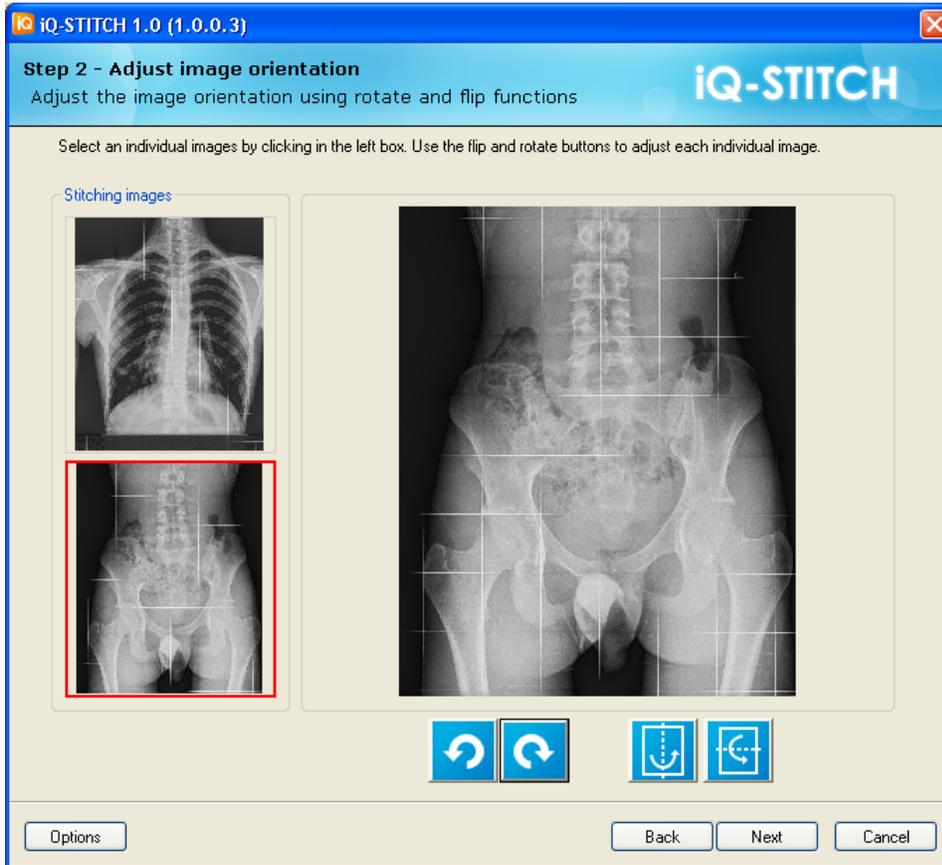
In STEP 1 the user may select the image order. Depending on the number of loaded images the page will offer two boxes. The left box, "Source images", is filled with the loaded images. The right box, "stitching images", contains the fields for ordering. Drag and drop the images from the left box into the right box by using the mouse.



Click on "Next" to proceed with STEP2 – image orientation.

### 5.3 STEP 2 – ROTATE AND/OR FLIP

Due to flipped or rotated scans of image cassettes, single images may show a wrong orientation after their acquisition. In STEP 2 the user can adjust the image orientation of each individual source image.



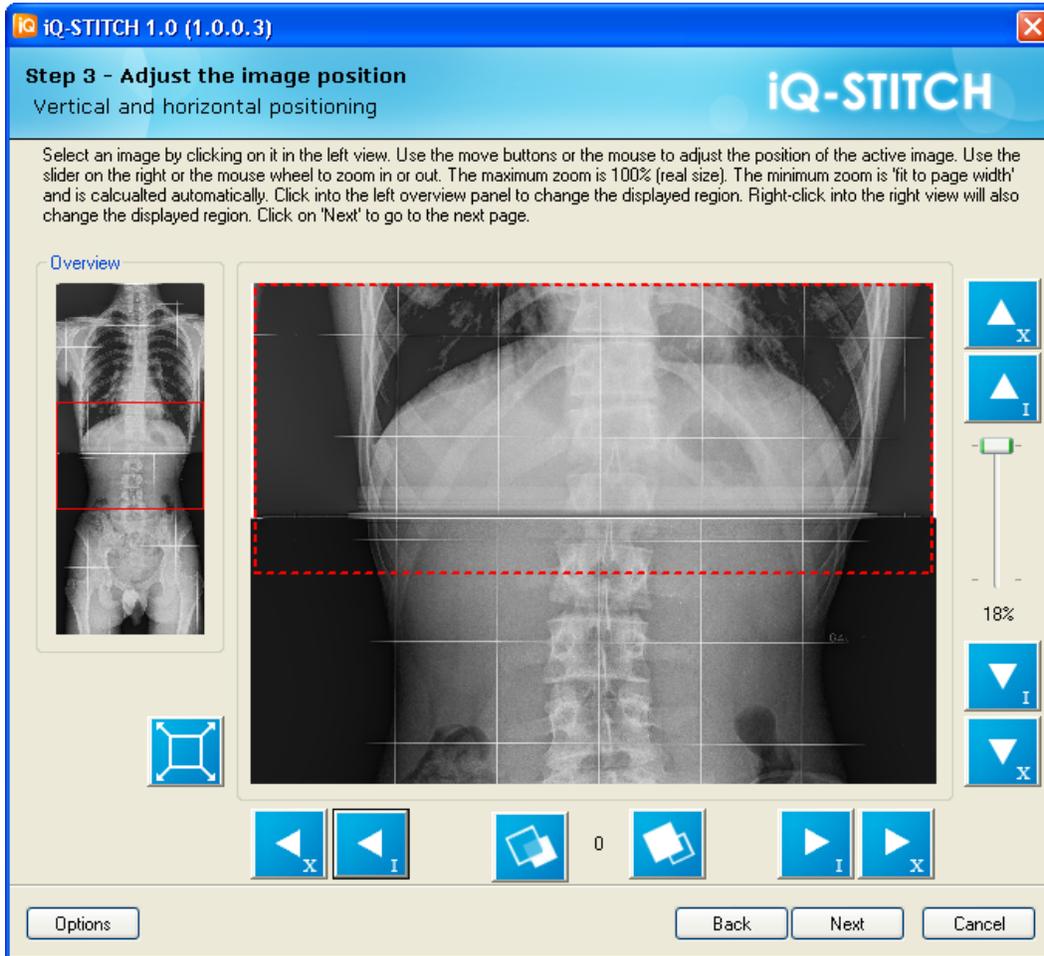
Select the individual image by clicking into the left box. The selected image will be marked by a red frame. After selecting the image, the user can use the rotate or flip buttons.



After adjusting all images, click on “Next” to proceed with STEP 3 – POSITIONING.

## 5.4 STEP 3 – STITCH

The most challenging step of the stitching process is to define the final position of the source images to each other. iQ-STITCH provides a lot of flexibility in order to allow an easy image positioning.



The page of STEP 3 is divided into two areas:

- The preview panel on the left side
- The main stitching panel in the middle including the buttons

After finishing the positioning, click on “Next” to proceed to STEP 4.

### 5.4.1 Preview panel

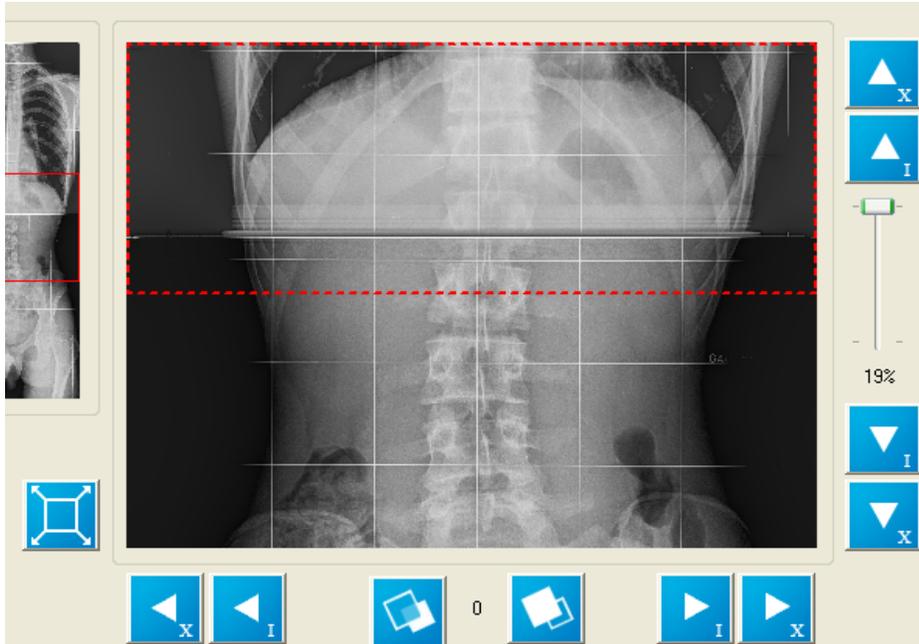
The preview panel gives you an overall preview displaying the current positioning and indicating the current view in the stitching panel by means of a red frame. Depending on the zoom level, the red frame can differ in size.



By left-clicking into the preview panel, you may adjust the displayed area appearing in the stitching panel.

## 5.4.2 Stitching panel

The stitching panel shows the current area of the stitching image using the current zoom level.



The mouse buttons will provide you with several functions. In addition, the function buttons around the stitching panel will provide zooming, positioning, layering and scaling functions. See a list of all functions below.

### 5.4.2.1 Mouse functions

#### *Left mouse button:*

When left-clicking into the stitching area, the image below the mouse cursor will be selected for the topmost position. If there are no images below the cursor, the current selection will not be changed.

Clicking on an image and moving the mouse while holding the left mouse button pressed will move the selected image according to the changes of the mouse cursor position.

A left double-click on an image will open the image viewer.

#### *Right mouse button:*

A right-click will center the displayed area according to the mouse cursor position.

#### *Mouse wheel:*

Moving the mouse wheel will change the current zoom level.

### 5.4.2.2 Keyboard functions

The cursor keys will change the position of the selected image by 1 pixel (like the I-position buttons, refer to chapter 5.4.2.3). Keeping the SHIFT key pressed while using the cursor keys will change the position of the selected image by 10 pixel (like the X-position buttons, refer to chapter 5.4.2.3).

### 5.4.2.3 Button functions

The I-Position buttons:



Move image to the left by 1 pixel.



Move image to the right by 1 pixel.



Move image to the top by 1 pixel.



Move image to the bottom by 1 pixel.

The X-Position buttons:



Move image to the left by 10 pixels.



Move image to the right by 10 pixels.



Move image to the top by 10 pixels.



Move image to the bottom by 10 pixels.

The layer buttons:



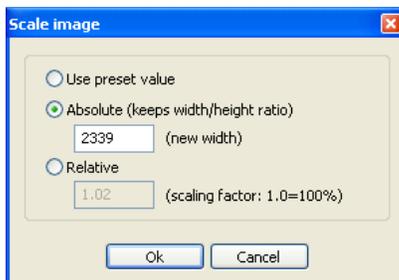
By using the layer buttons you may change the z-order of the images. Especially, when images are partly overlapping, the user may control which image is on top of the other. The number will show the z-position of the selected image. At startup all images will be initialized with z-order 0.

#### The Scale button:



The scale button will open the scaling dialog. The user may select one out of 3 scaling methods:

1. Scaling using the preset value.
2. Absolute scaling using a value for the new width (the new height will be calculated using the image aspect ratio)
3. Relative scaling (similar to absolute but with a factor; 100% is 1.0 and means no scaling; values below 1.0 will result in a "smaller" image, values higher than 1.0 will result in "bigger" images)



#### The Zoom control:



The zoom slider will indicate the current zoom level. The minimum zoom level is relative to the width of the stitching panel compared to the real width of the resulting stitching level (say the real stitching images have to fit into the stitching panel). The maximum zoom (100%) is showing the image 1:1 with its real pixel size.

Note: Changing the position of the images can result in a different overall size of the resulting stitching image and will therefore change the zoom level. Changing the positions will force the application to recalculate the available zoom levels.

## 5.5 STEP 4 – TYPE IN THE IMAGE INFORMATION

On this page you may specify which series the new image will belong to as well as define, if applicable, a new series description.

The screenshot shows the 'iQ-STITCH 1.0 (1.0.0.3)' application window. The title bar includes the application name and a close button. The main content area is titled 'Step 4 - Set the DICOM information' and contains the following elements:

- Series creation:** Two radio buttons are present: 'Create new series' (unselected) and 'Add to existing series' (selected).
- Dropdown menu:** A dropdown menu is open, displaying two options: '1: Anonymized' and '2: Anonymized'.
- Series information:** A text input field labeled 'Series description' contains the text 'Anonymized'.
- Navigation:** At the bottom of the window, there are four buttons: 'Options', 'Back', 'Next', and 'Cancel'.

The user has two (2) possibilities:

1. Create a new series for the stitching image and set its series description
2. Add the stitching image to a series of the source images

Note: When creating a new series, the application will use some basic data of the first image. Nevertheless, it will create a new series instance UID for the series.

## 5.6 STEP 5 – RELEASE THE STITCHED IMAGE

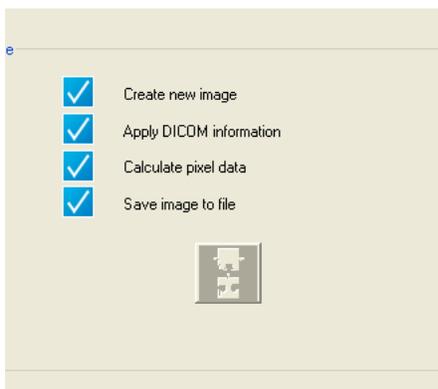
STEP 5, the last step, creates the stitching image.



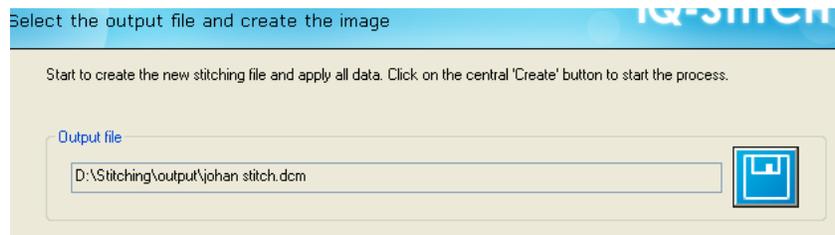
Click on the “Create” button in order to start the creation.



The status of the creation steps will be displayed in the blue boxes.



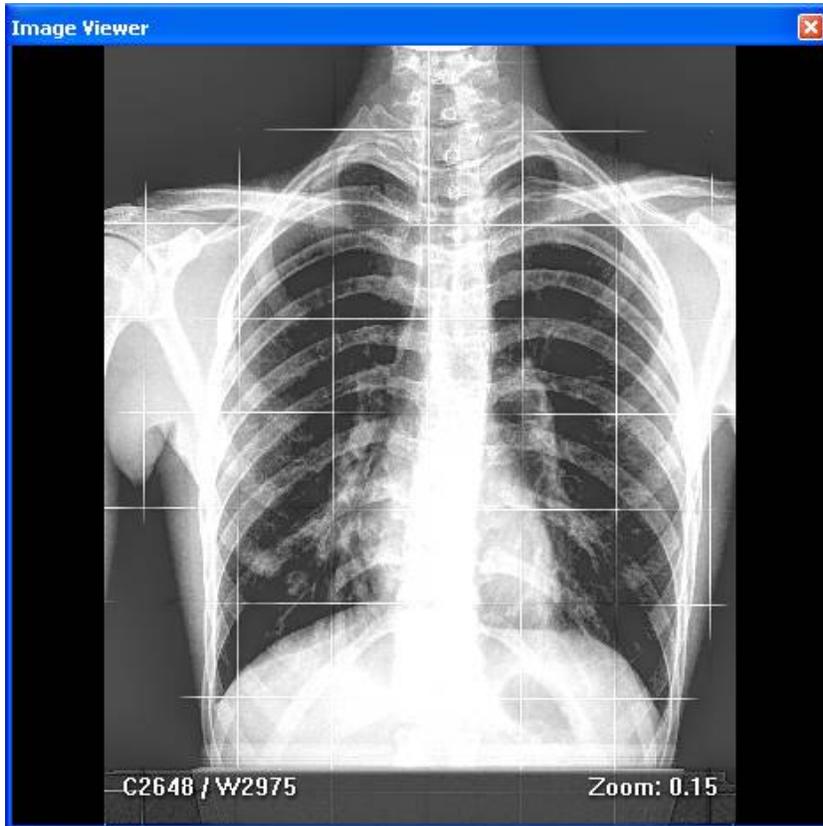
Note: The appearance will be different depending on whether the application is running in standalone or integrated mode. In standalone mode the user will see an output box to define the location and filename of the final stitching image. (see screenshot below)



## 5.7 IMAGE VIEWER

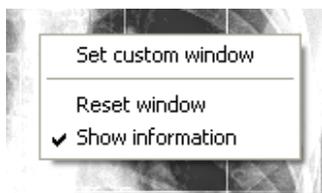
On every page, the user can click on any image to open a resizable image viewer. It is possible to change the viewer's window settings, which will then be used throughout the whole stitching process.

Note: The size of the image viewer will be saved within the iQ-STITCH configuration. A new size will be used the next time the dialog is displayed.



Real-time window leveling is possible by moving the mouse left/right and up/down, holding the left mouse button pressed. The current window settings will be displayed in the lower left corner.

Right-clicking into the image opens a pop-up menu where you can make use of additional functions.

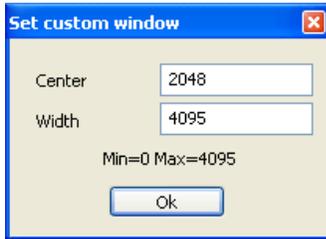


1. Set custom window

2. Reset window
3. Show information (enable/disable)

### 5.7.1 Set custom window

This function allows entering individual values for window center and width.



Note: The "Min/max" values stated in the dialog are calculated values based on the image characteristics.