ARCOMA

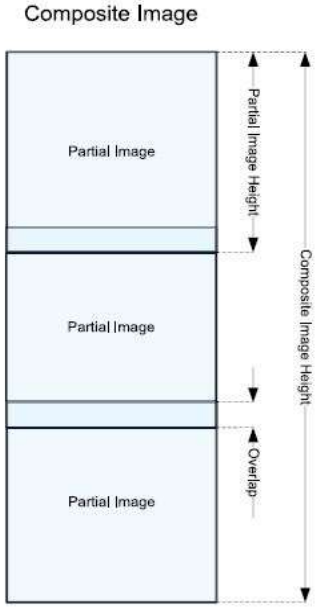
ARCOMA

STITCHING – how-to guide for Precision system

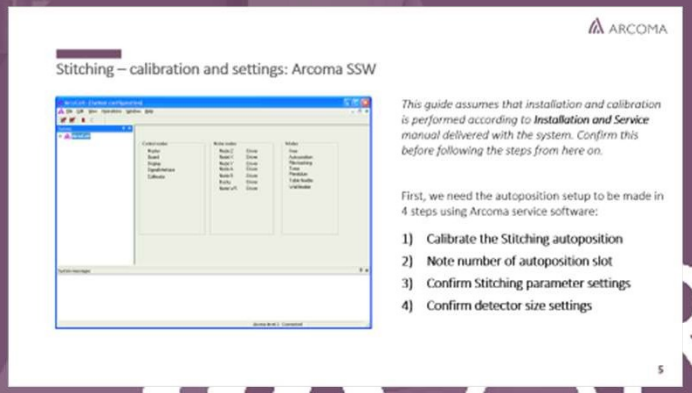
Stitching is the process of combining multiple images with overlapping fields of view to produce a larger image.

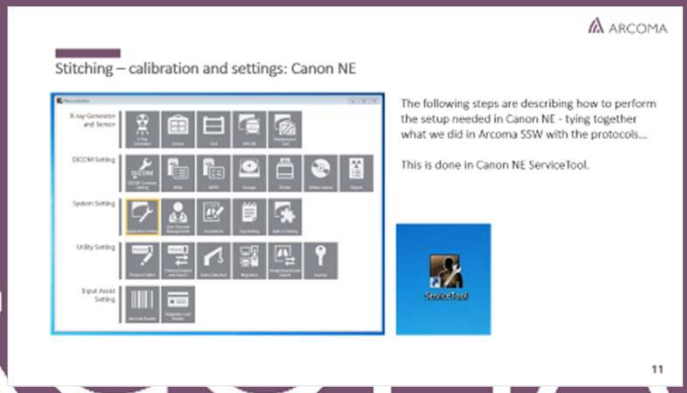
When imaging long parts of the human body, there is need for an image with extended length. In digital radiography the image size is limited due to the sensitive area of flat-panel detectors. In order to produce a large image, images are assembled from multiple exposures with a small, spatial overlap.

Stitching is possible at both Table and Wallstand.

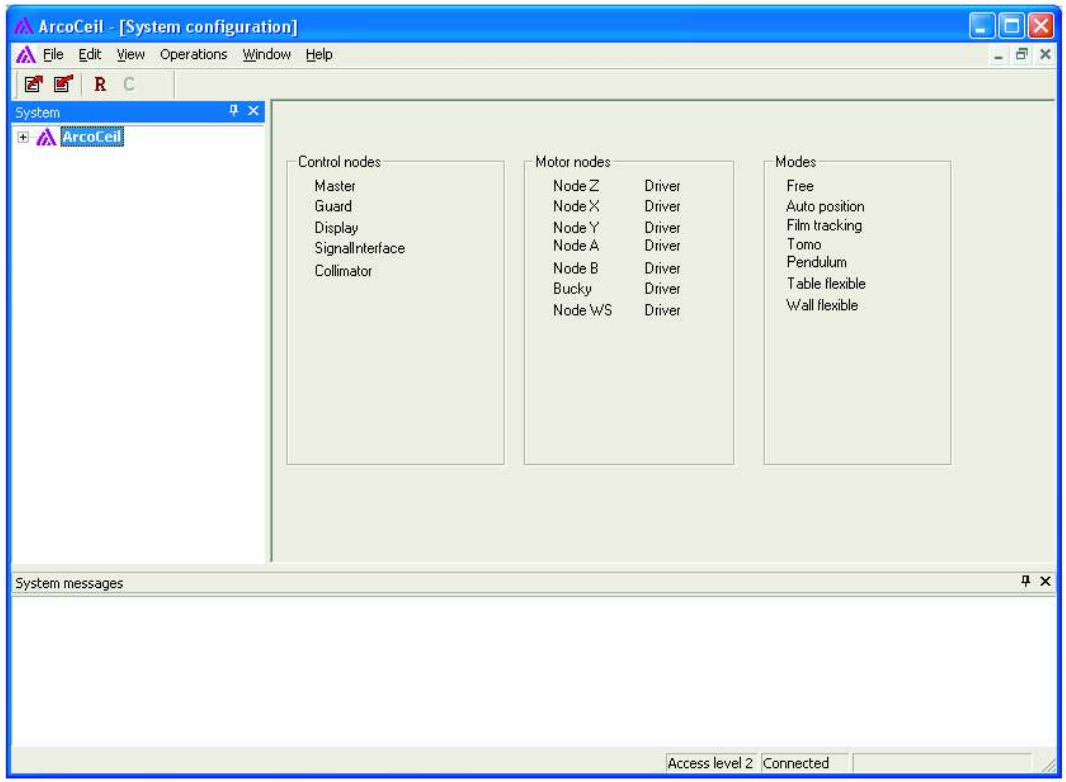


Guide overview





Stitching – calibration and settings: Arcoma SSW

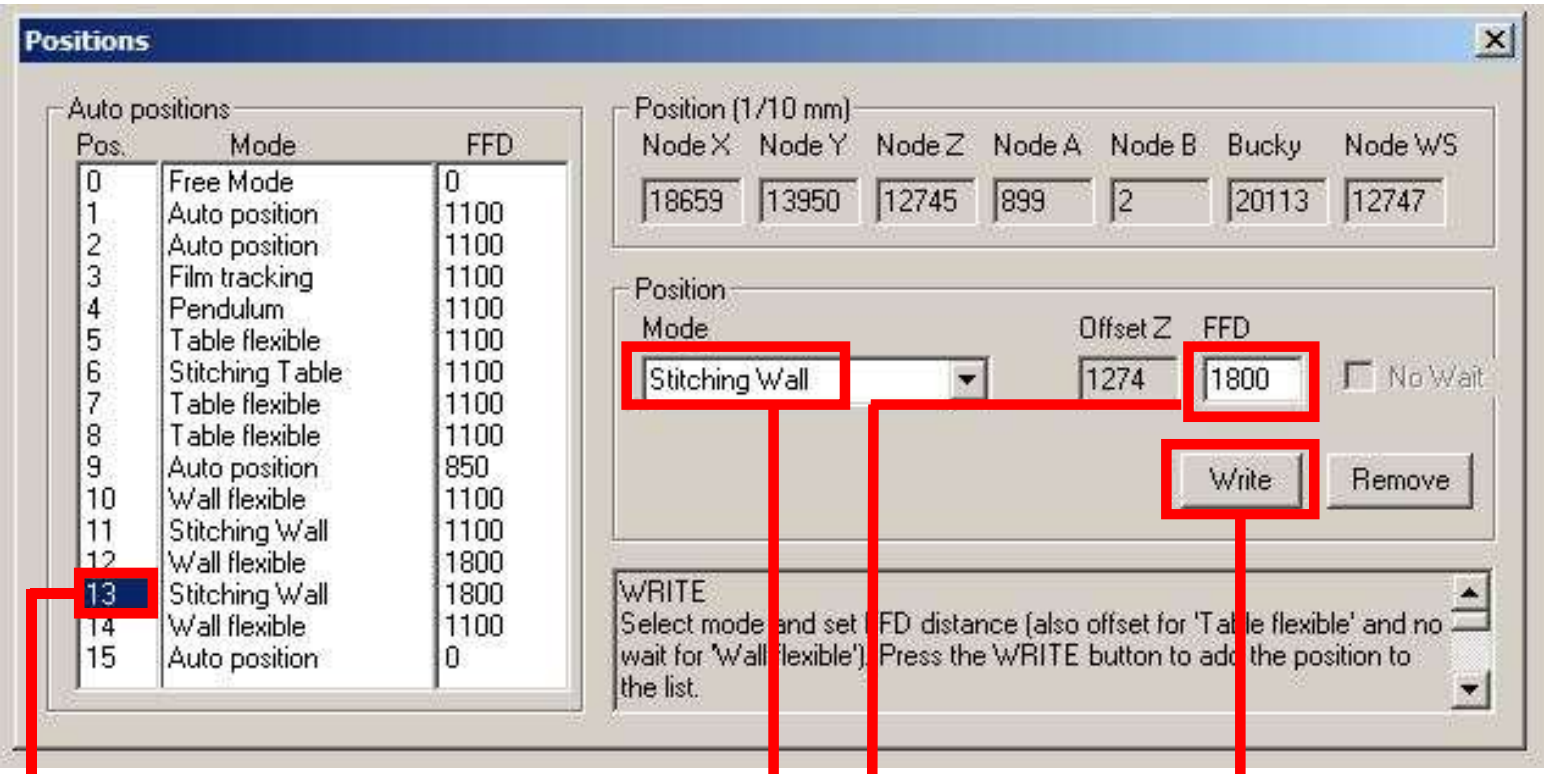


This guide assumes that installation and calibration is performed according to ***Installation and Service*** *manual delivered with the system. Confirm this before following the steps from here on.*

First, we need the autoposition setup to be made in 4 steps using Arcoma service software:

1) Calibrate the Stitching autoposition
2) Note number of autoposition slot
3) Confirm Stitching parameter settings
4) Confirm detector size settings

1) Calibrate the stitching auto position



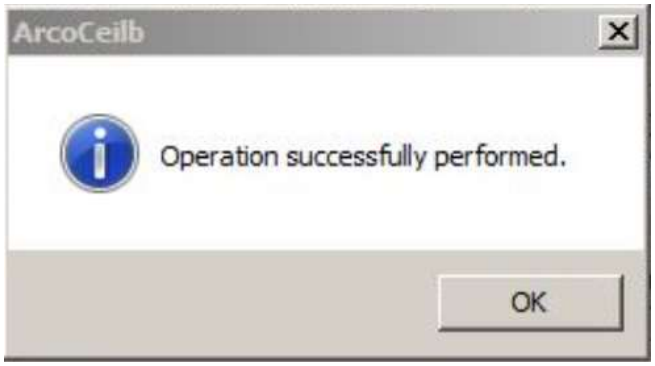
1. Position the system manually in the position to be programmed; align tube and bucky and adjust SID

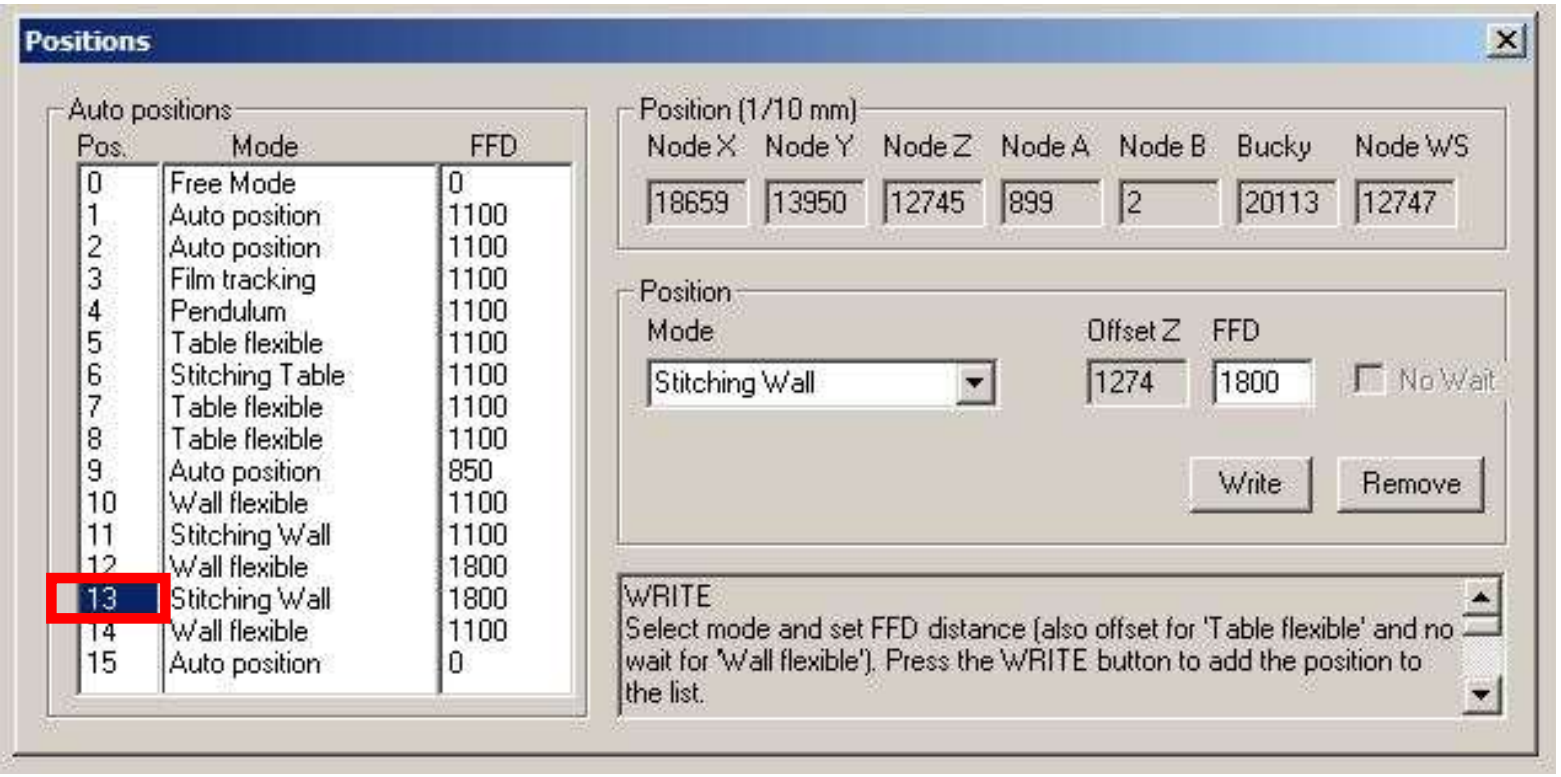
2. Select an auto position slot to be used – in this example position 13

3. Select the mode to be used – in this example Stitching Wall

4. Enter the SID measured in mm where it says FFD – in this example 1800 (FFD = SID)

5. Press Write and wait for confirmation window to appear:





2) Note number of auto position slot

Note the number of the auto position slot – in this example slot 13.

This will be used when defining the protocols in Canon NE.

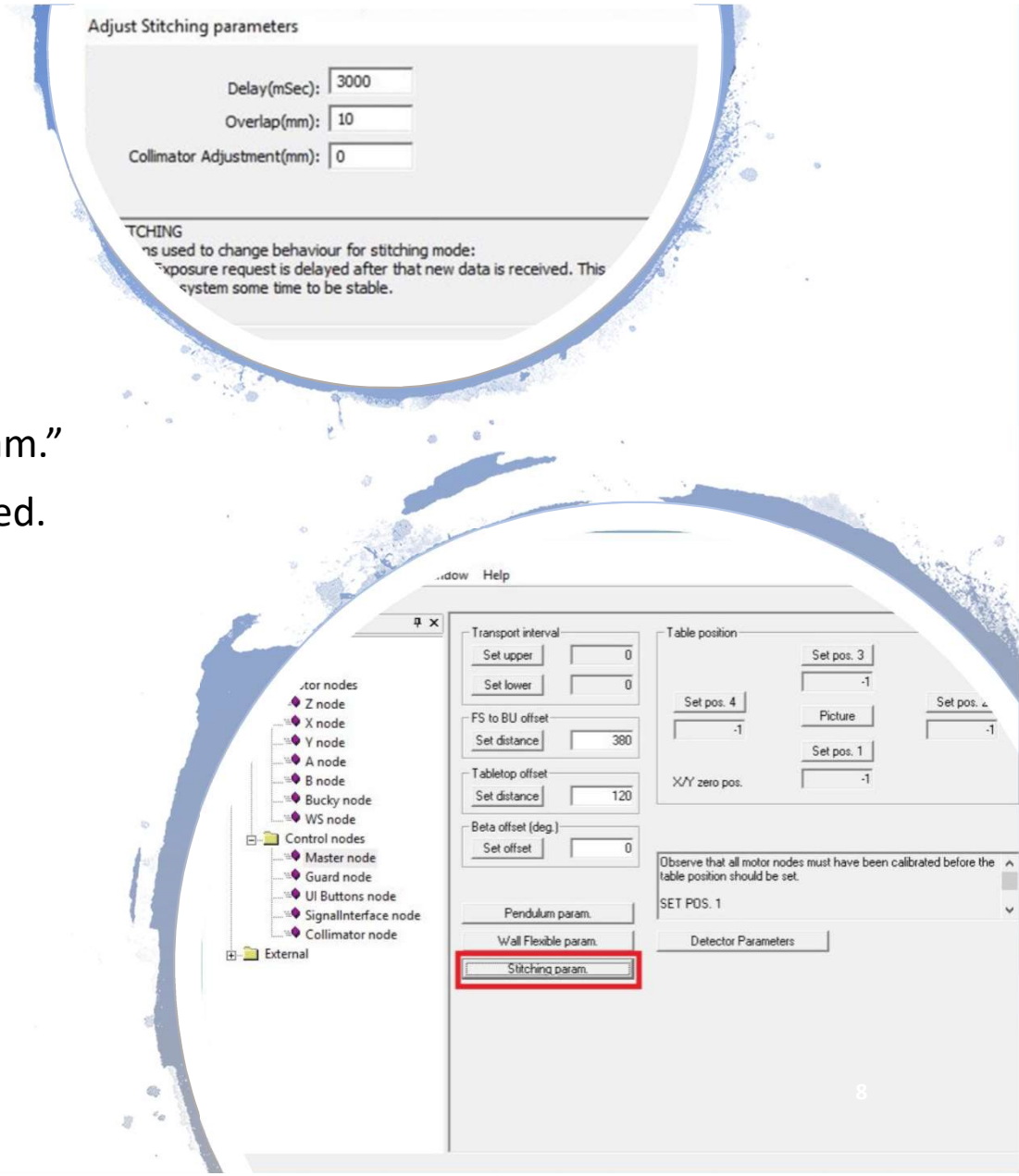
3) Confirm parameter settings:

- Go to Master node view and press ”Stitching param.”
- Press ”Read”, check the values and adjust if needed.
  These are default values recommended:

Delay(mSec): 3000

Overlap(mm): 10

Collimator Adjustment(mm): 0



A brief explanation of the parameter settings on previous page:

- **Delay(mSec): 3000**

This is related to timing between Canon image system and Arcoma positioning system during stitching sequence. Default setting is 3000 and there is normally no reason to adjust this.

- **Overlap(mm): 10**

This is defining an overlap of the images. Meaning a surface in mm that will be radiated twice just to avoid visible stitches (white lines) between the images. Default setting is 10 and there is normally no reason to adjust this.

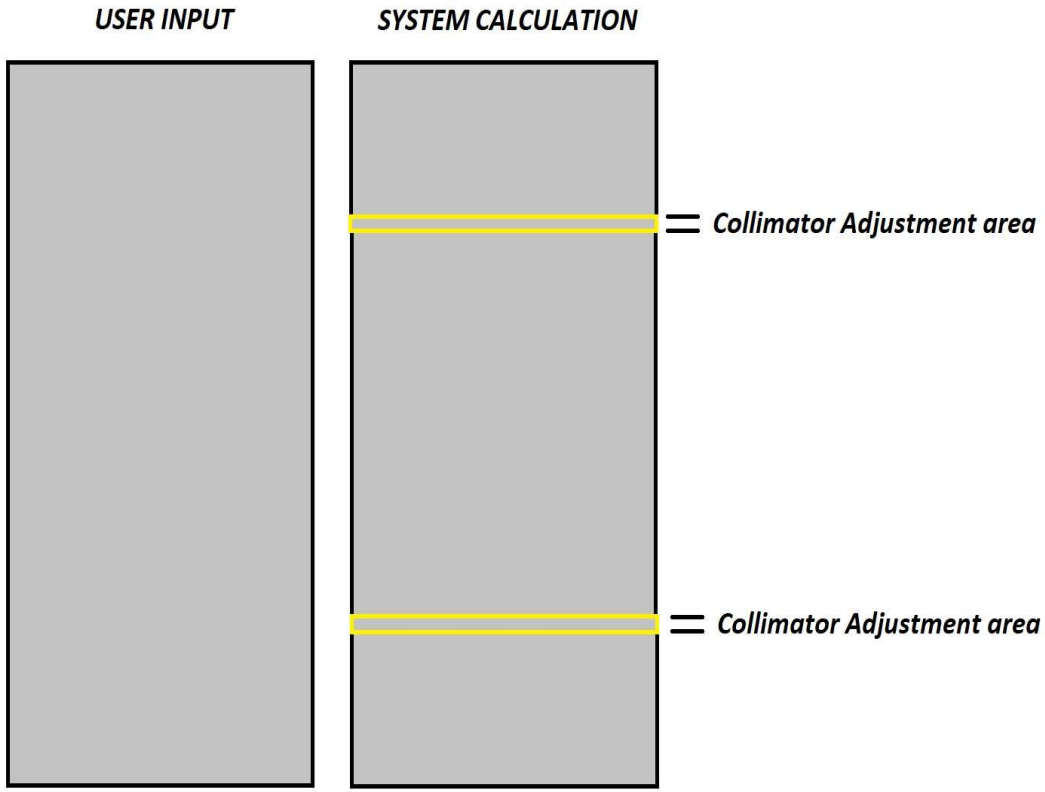
- **Collimator Adjustment(mm): 0**

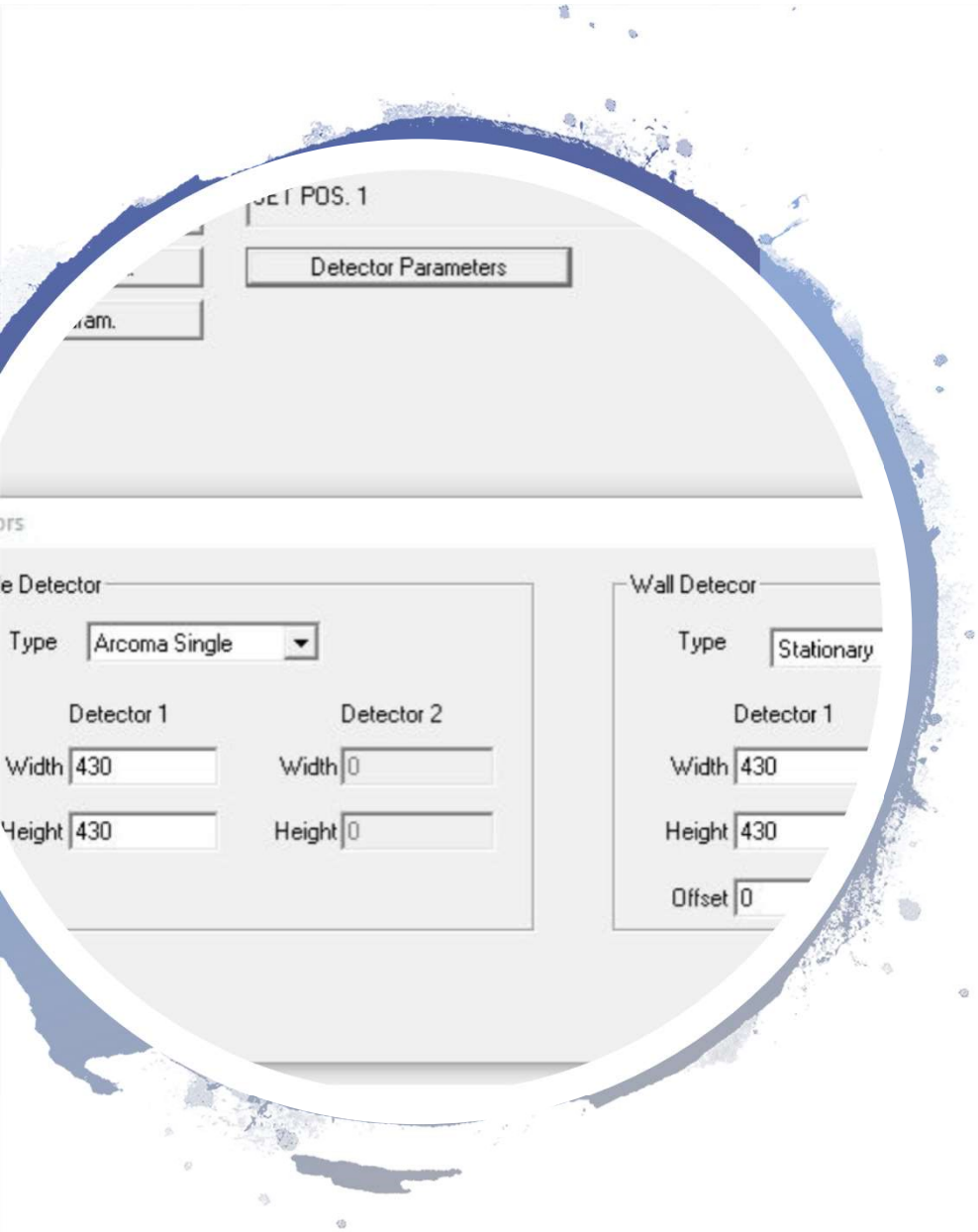
This is an additional setting related to overlap of the images.

If the system is calibrated according to manual and the above parameters are set to default – but still there is visible stitches (white lines) between the images. Then this setting can be increased, to compensate for collimator mechanical tolerances etc.

Example:

Default setting is 0. When changing value to 10 mm the collimator size will be 10 mm larger between images.





4) Confirm detector size settings:

- Go to Master node view and press ”Detector Parameters”
- Make sure the measurements (stated in mm) for Width and Height are corresponding with installed detectors in your system
- Confirm Offset setting:

  For a 43x43 detector it should be 0.

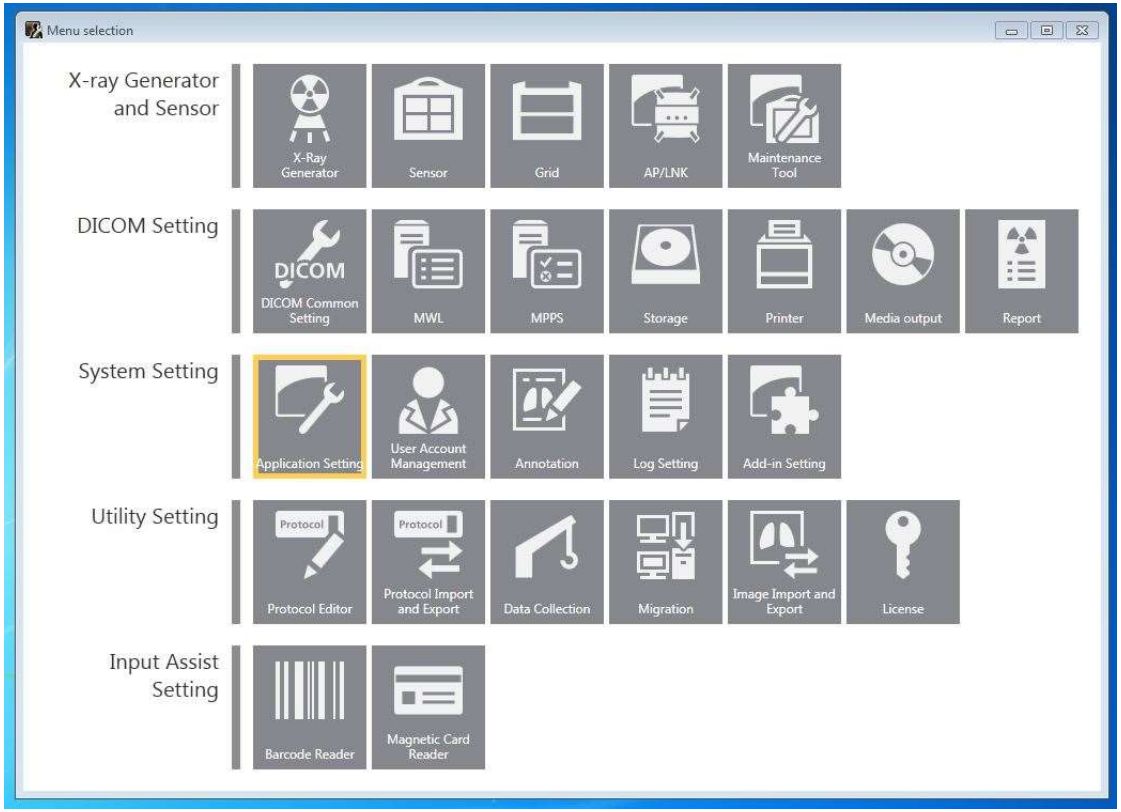
  For a 43x35 detector it should be 38.

NOTE!

Not all detectors are 43X43 or 43x35 cm.

For example full size Canon compacts actual size is 415 x 426. In that case, stating 430 x 430 as Width and Height in service software will result in incorrect calculations and failure to stitch images properly!

Stitching – calibration and settings: Canon NE



The following steps are describing how to perform the setup needed in Canon NE - tying together what we did in Arcoma SSW with the protocols…

This is done in Canon NE ServiceTool.

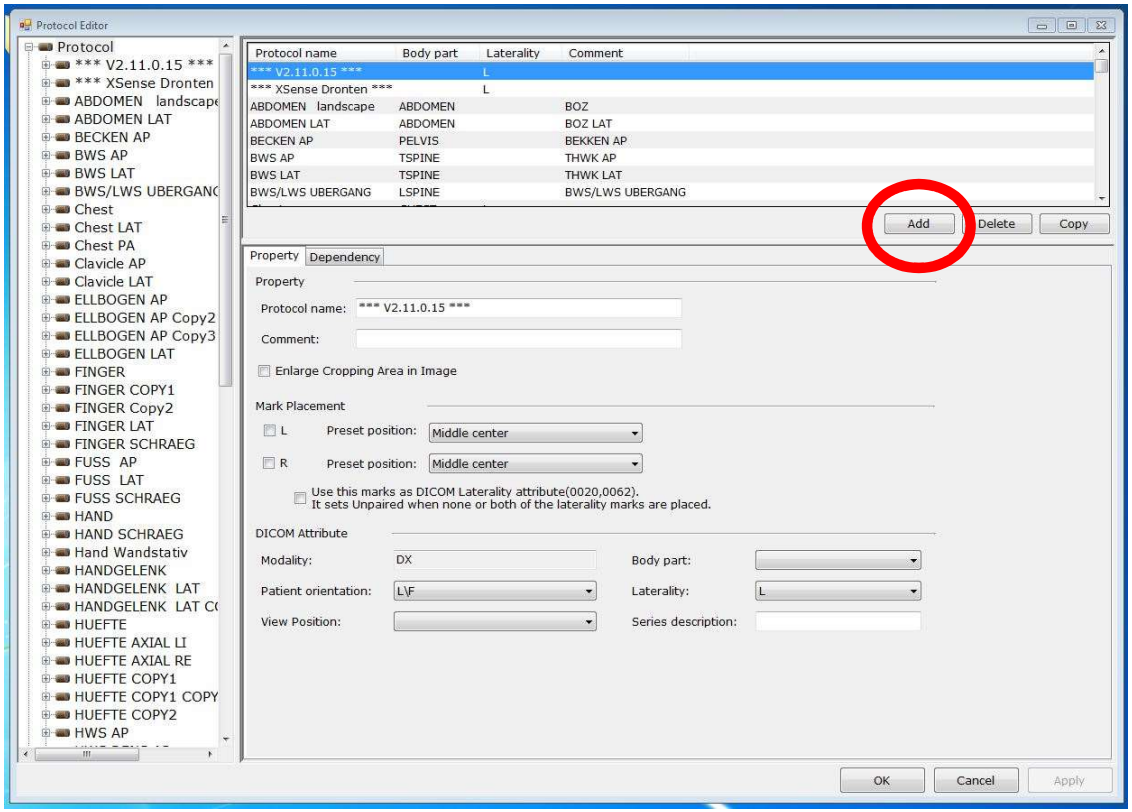
Create a new protocol for stitching

We will now create a new protocol that supports stitching functionality.

(Note though, there might be stitching protocols created already that can be used for this. If hesitant, consult responsible application engineer)

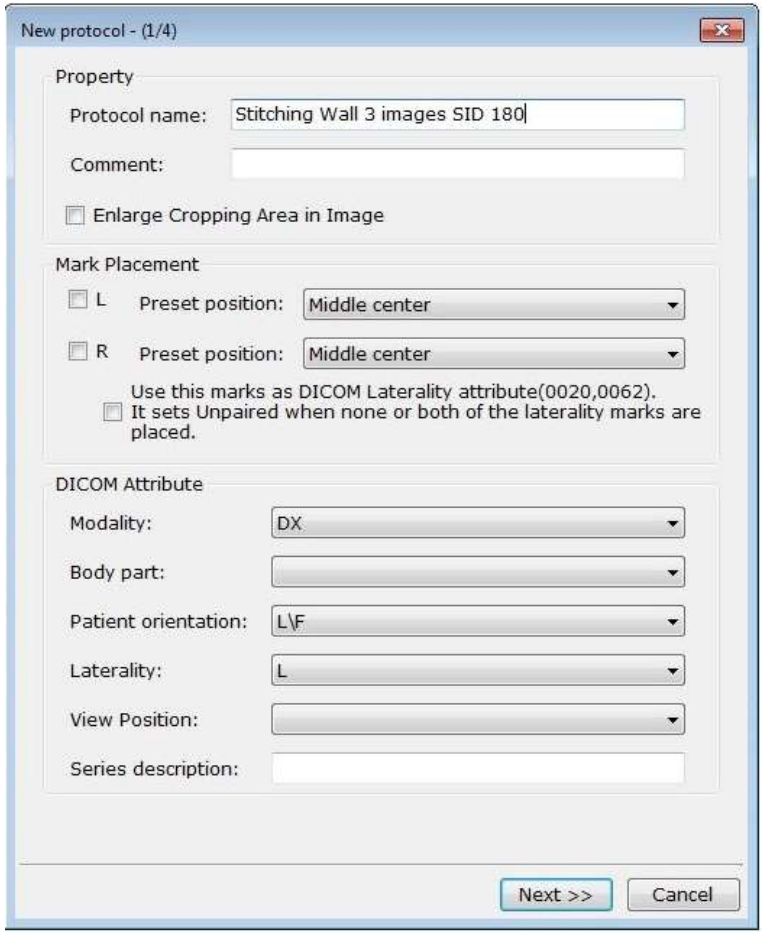
Select Protocol Editor

Create a new protocol for stitching



Press ”Add”

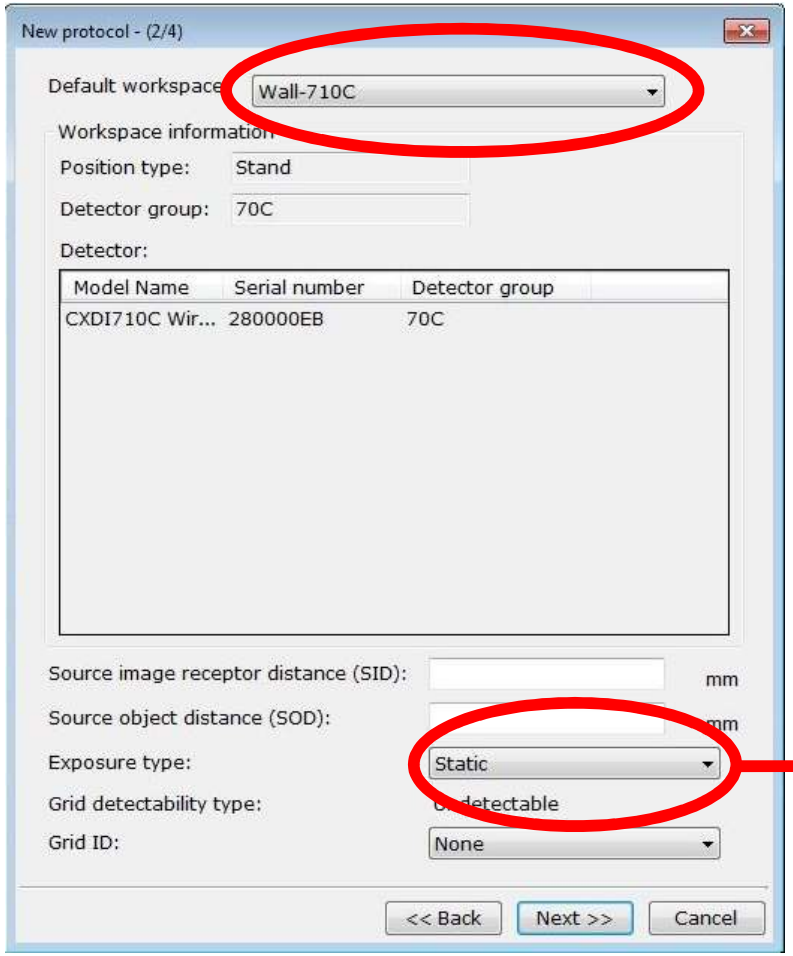
Create a new protocol for stitching



Type an appropriate protocol name (in this example *”Stitching Wall 3 images SID 180”)* and confirm settings are according to this picture

Press ”Next”

Create a new protocol for stitching

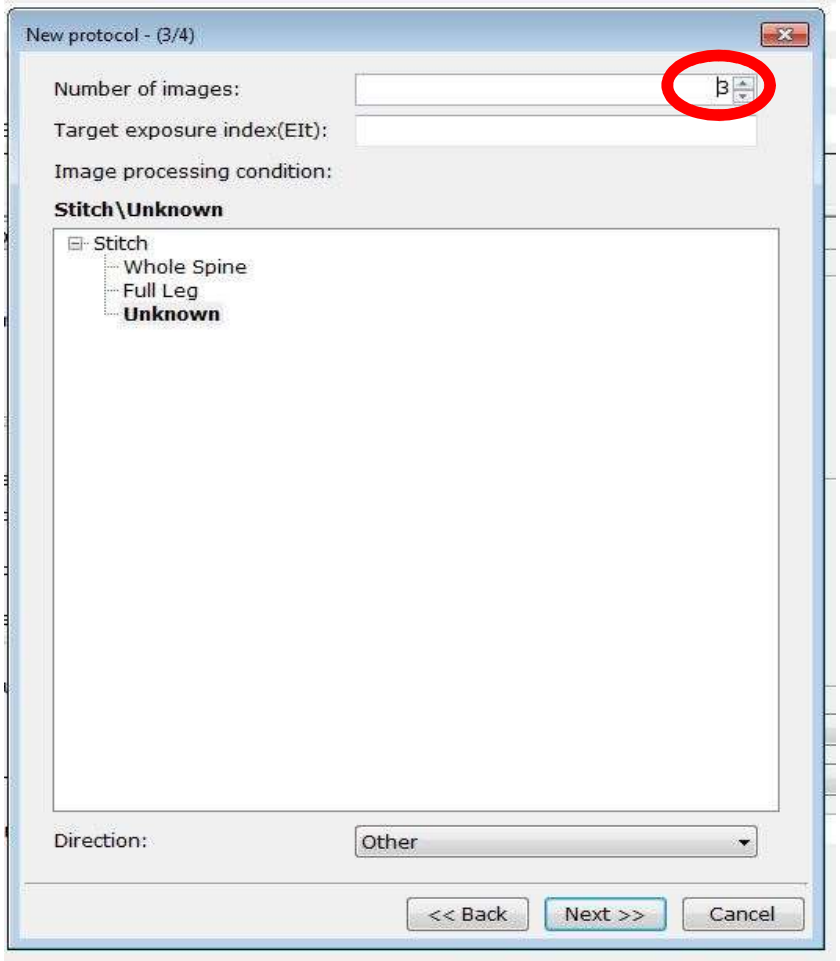


Select the workspace (detector) to be used in this protocol

Change Exposure type from ”Static” to ”Stitch”

Then press ”Next”

Create a new protocol for stitching



Select number of images for this protocol.

Maximum images for one Stitching examination on Wallstand is 4 and Table is 3.

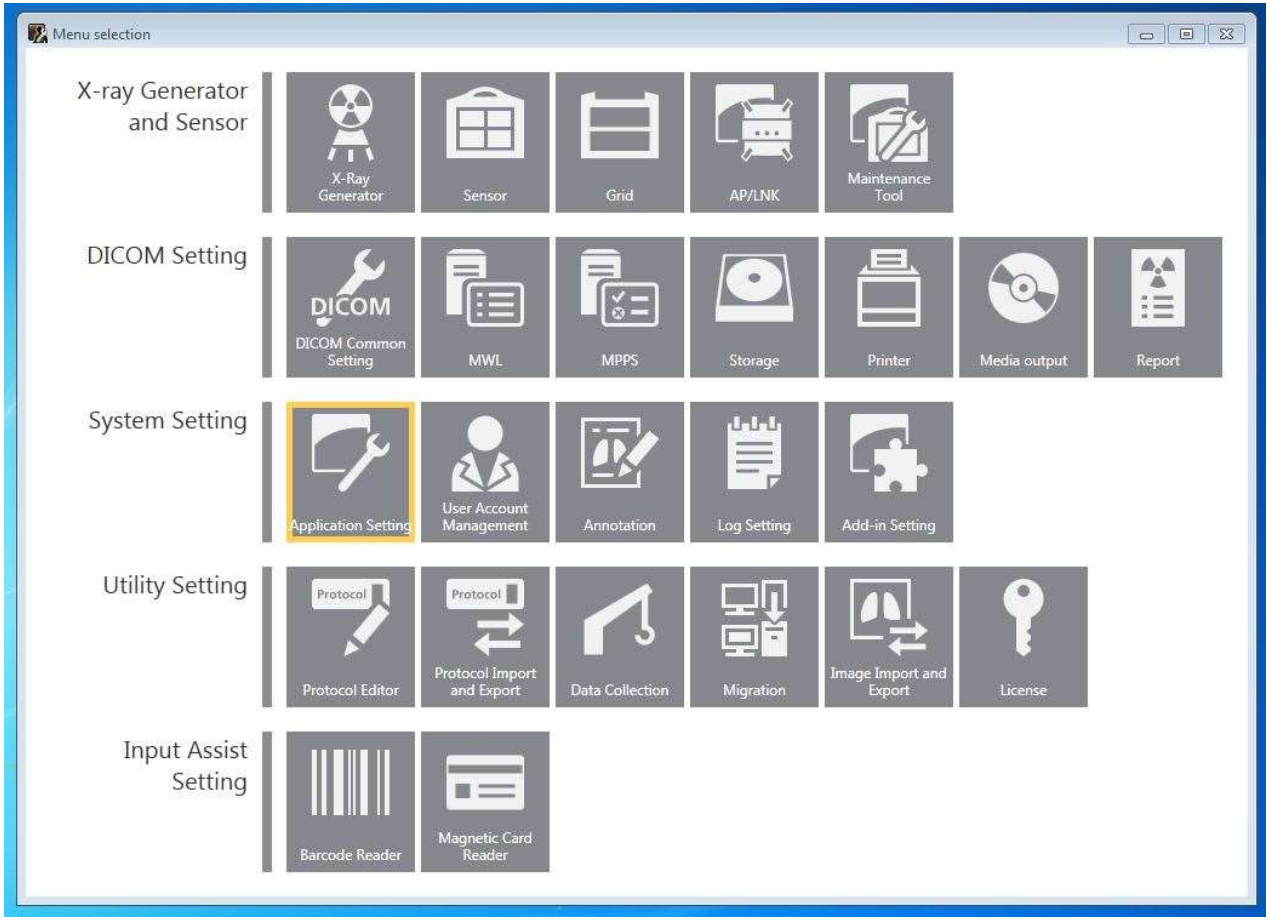
Note! If uncertain on how many images are required, always select one more image rather than one too less. This since it will determine maximum allowed images in the examination – if on the other hand the last image is not needed, it can be cancelled.

Then press ”Next”

Create a new protocol for stitching

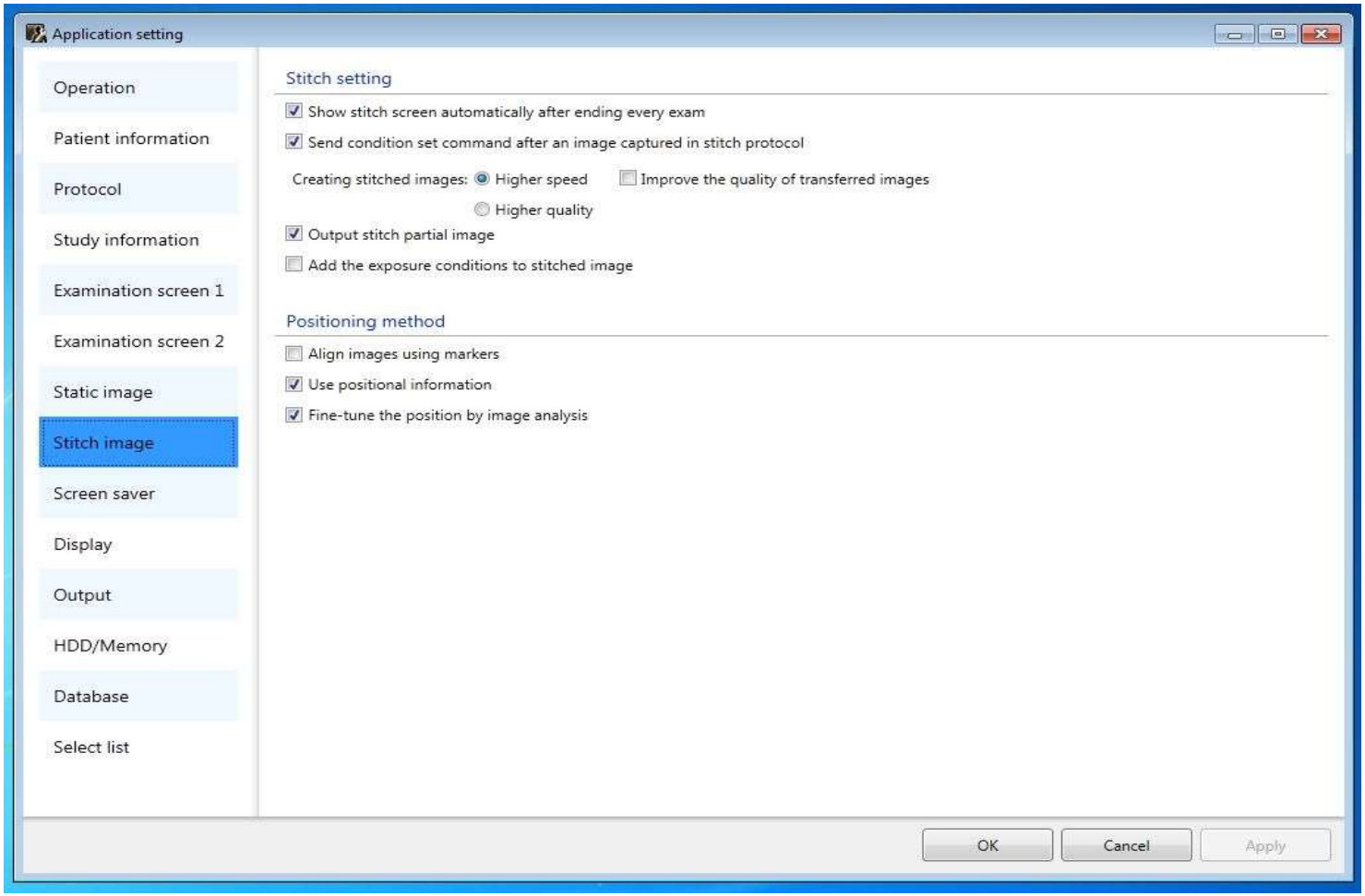
Confirm the settings are according to your previous selections (according to this picture) and press ”Finish”

Create a new protocol for stitching



Return to Menu selection and go to ”Application Setting”

Create a new protocol for stitching

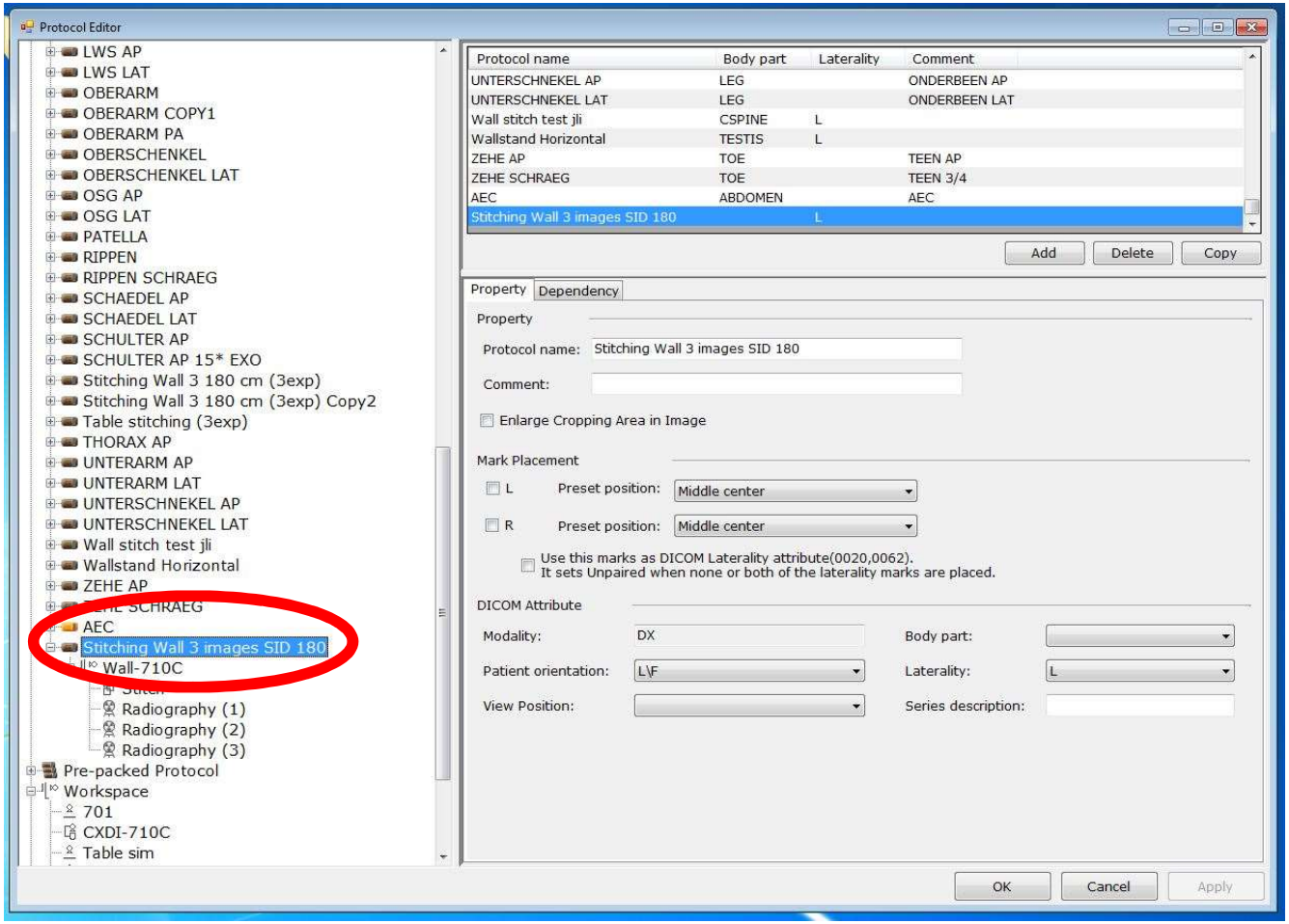


Select ”Stitch image” and confirm that settings are according to this picture

Create a new protocol for stitching

Return to Menu selection and go to ”Protocol Editor”

Create a new protocol for stitching

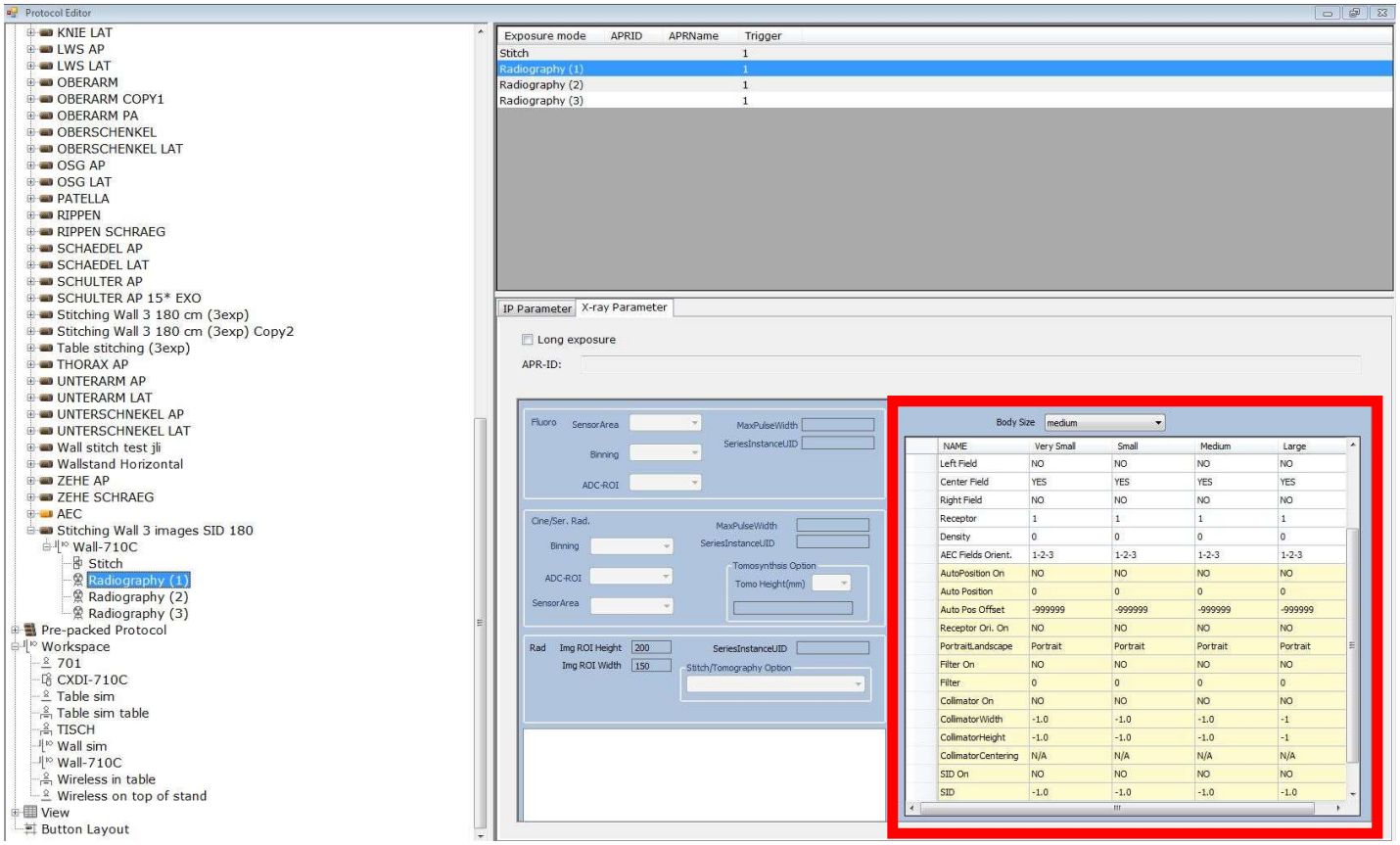


Select the protocol we just created - in this example ”Stitching Wall 3 images SID 180”.

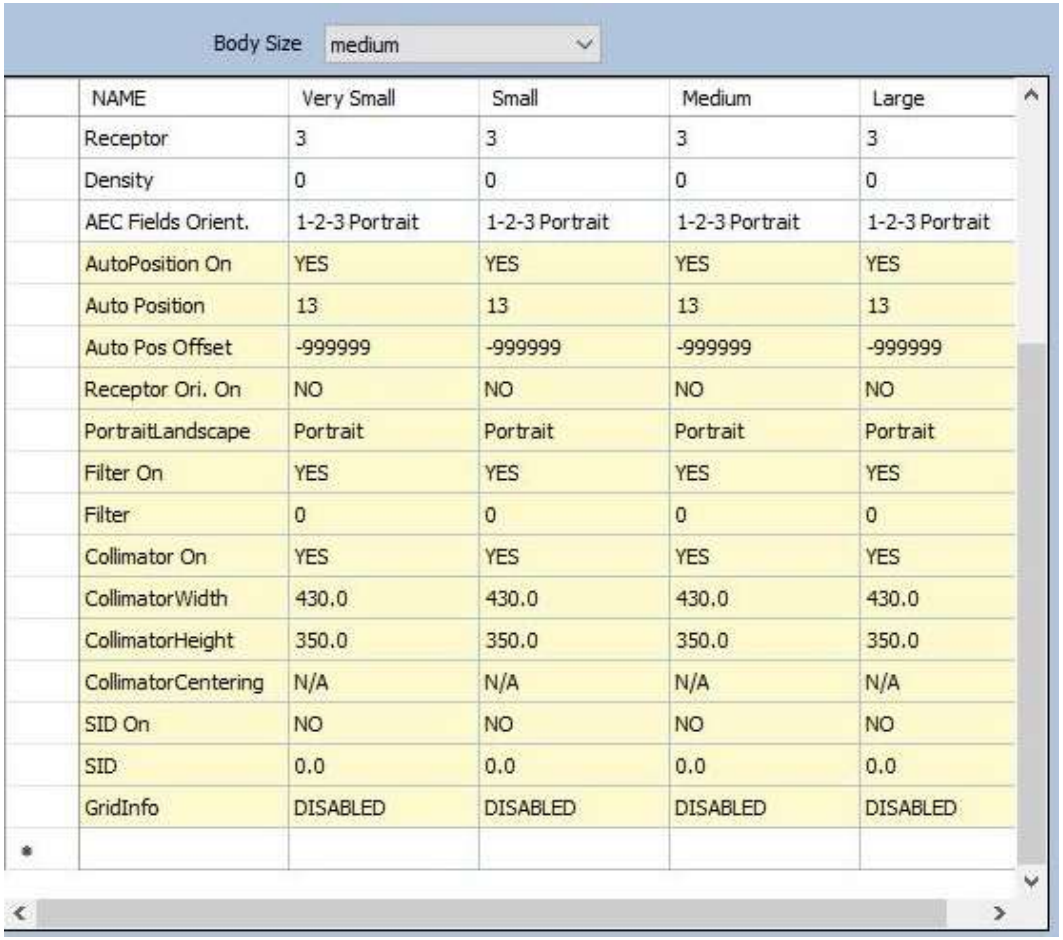
Now as you can see there are 3 submenus called
Radiography (1)
Radiography (2)
Radiography (3)
These are one menu for each image.

Select the first one - ”Radiography (1)”

Create a new protocol for stitching



Create a new protocol for stitching – Radiography (1) - first stitching image



Body Size: medium

NAME	Very Small	Small	Medium	Large
Receptor	3	3	3	3
Density	0	0	0	0
AEC Fields Orient.	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait
AutoPosition On	YES	YES	YES	YES
Auto Position	13	13	13	13
Auto Pos Offset	-999999	-999999	-999999	-999999
Receptor Ori. On	NO	NO	NO	NO
PortraitLandscape	Portrait	Portrait	Portrait	Portrait
Filter On	YES	YES	YES	YES
Filter	0	0	0	0
Collimator On	YES	YES	YES	YES
CollimatorWidth	430.0	430.0	430.0	430.0
CollimatorHeight	350.0	350.0	350.0	350.0
CollimatorCentering	N/A	N/A	N/A	N/A
SID On	NO	NO	NO	NO
SID	0.0	0.0	0.0	0.0
GridInfo	DISABLED	DISABLED	DISABLED	DISABLED

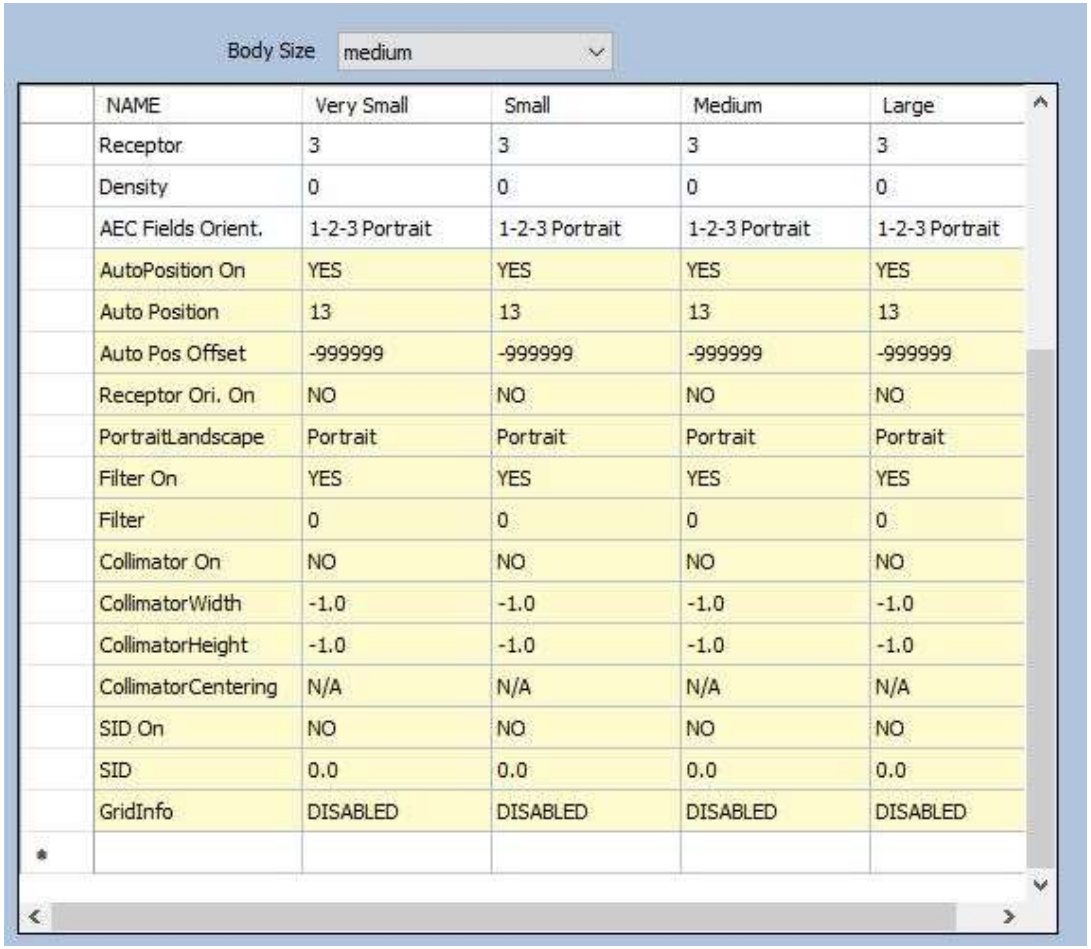
The stitching specific parameters that needs to be adjusted for ”Radiography 1” and the correct values are:

AutoPosition ON	YES	YES	YES	YES
Auto Position	13	13	13	13
Collimator ON	YES	YES	YES	YES
Collimator Width	430	430	430	430
CollimatorHeight	350	350	350	350

(Note: Width/height is depending on size needed for examination and limited by actual detector size)

Adjust settings accordingly, press ”Apply”, save changes and go to ”Radiography(2)”

Create a new protocol for stitching – Radiography (2) - second stitching image



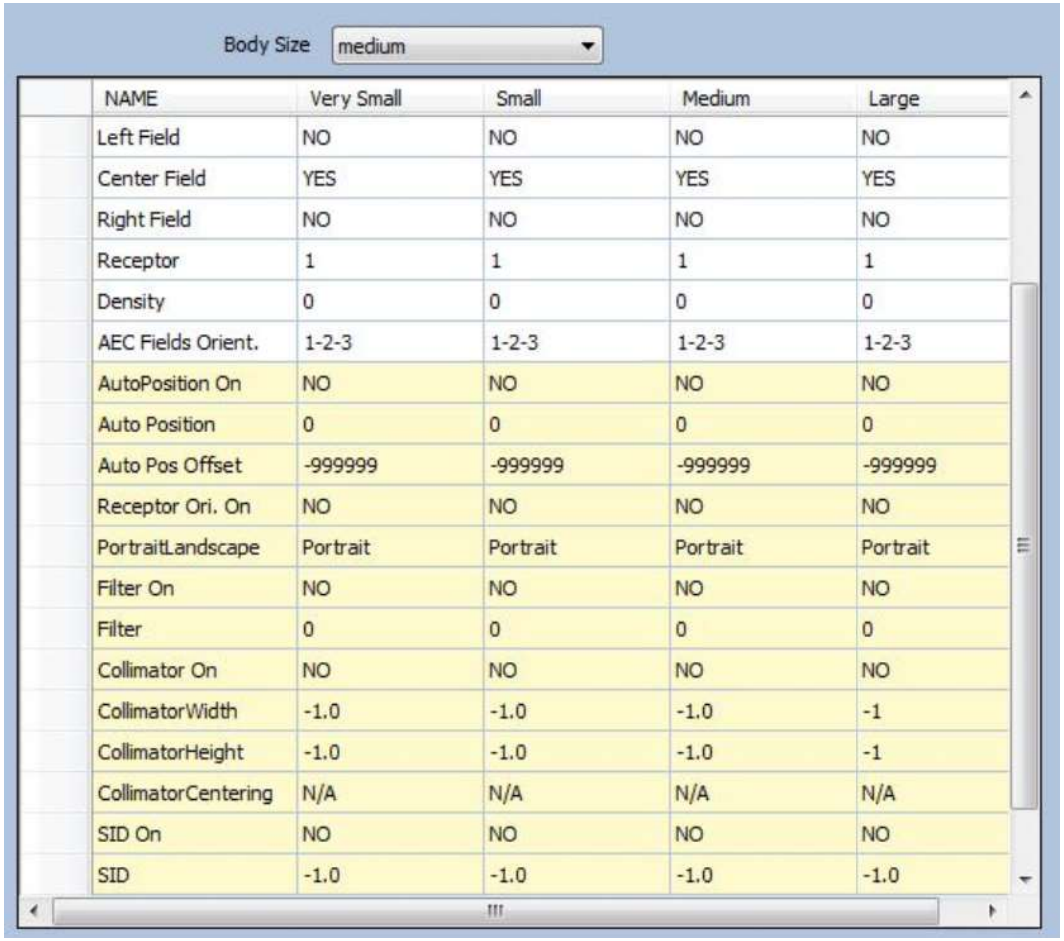
NAME	Very Small	Small	Medium	Large
Receptor	3	3	3	3
Density	0	0	0	0
AEC Fields Orient.	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait
AutoPosition On	YES	YES	YES	YES
Auto Position	13	13	13	13
Auto Pos Offset	-999999	-999999	-999999	-999999
Receptor Ori. On	NO	NO	NO	NO
PortraitLandscape	Portrait	Portrait	Portrait	Portrait
Filter On	YES	YES	YES	YES
Filter	0	0	0	0
Collimator On	NO	NO	NO	NO
CollimatorWidth	-1.0	-1.0	-1.0	-1.0
CollimatorHeight	-1.0	-1.0	-1.0	-1.0
CollimatorCentering	N/A	N/A	N/A	N/A
SID On	NO	NO	NO	NO
SID	0.0	0.0	0.0	0.0
GridInfo	DISABLED	DISABLED	DISABLED	DISABLED

The stitching specific parameters that needs to be adjusted for ”Radiography 2” and the correct values are:

AutoPosition ON	YES	YES	YES	YES
Auto Position	13	13	13	13
Collimator ON	NO	NO	NO	NO
Collimator Width	-1.0	-1.0	-1.0	-1.0
Collimator Height	-1.0	-1.0	-1.0	-1.0

Adjust settings accordingly, press ”Apply”, save changes and go to ”Radiography(3)”

Create a new protocol for stitching – Radiography (3) - third stitching image



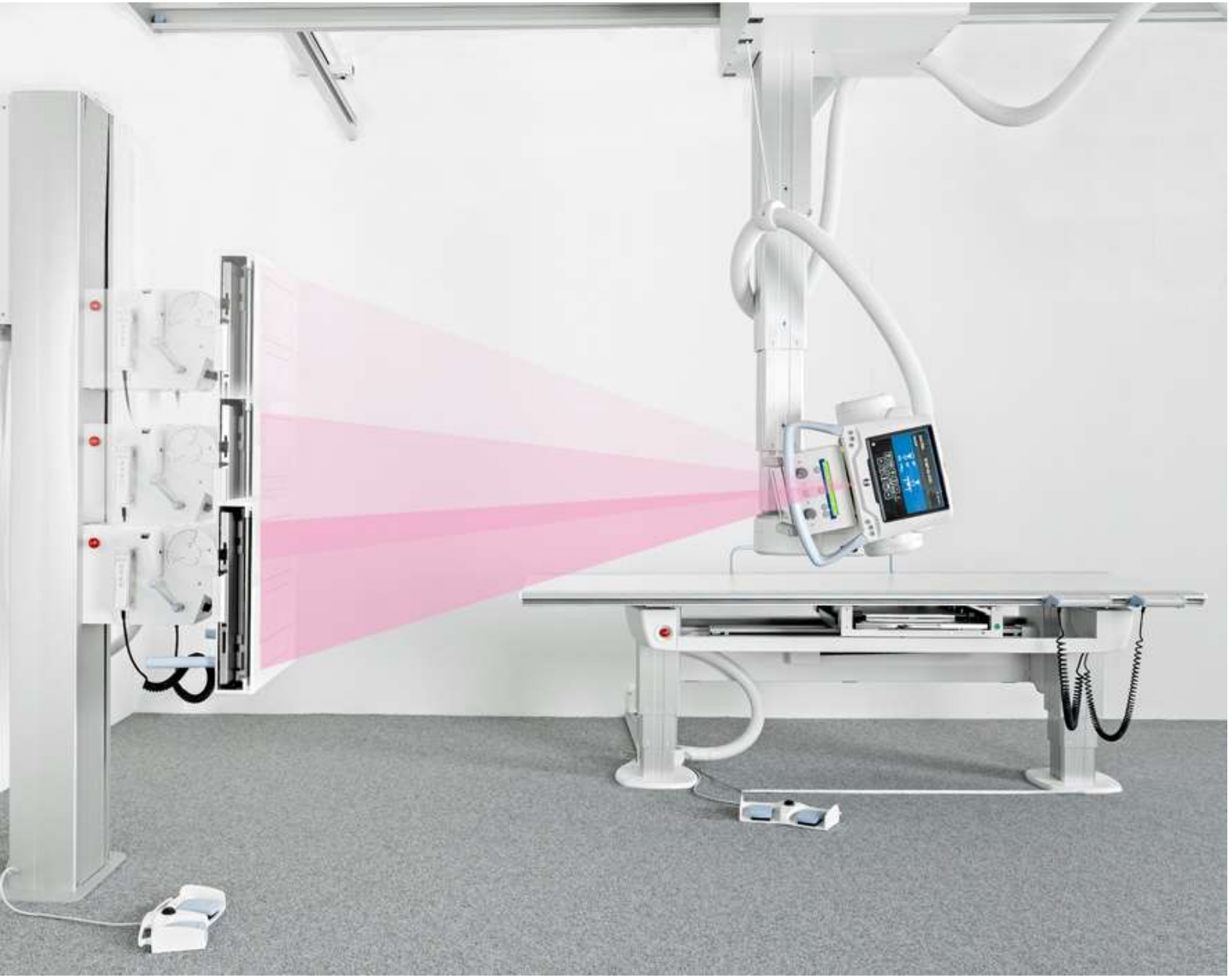
Body Size: medium

NAME	Very Small	Small	Medium	Large
Left Field	NO	NO	NO	NO
Center Field	YES	YES	YES	YES
Right Field	NO	NO	NO	NO
Receptor	1	1	1	1
Density	0	0	0	0
AEC Fields Orient.	1-2-3	1-2-3	1-2-3	1-2-3
AutoPosition On	NO	NO	NO	NO
Auto Position	0	0	0	0
Auto Pos Offset	-999999	-999999	-999999	-999999
Receptor Ori. On	NO	NO	NO	NO
PortraitLandscape	Portrait	Portrait	Portrait	Portrait
Filter On	NO	NO	NO	NO
Filter	0	0	0	0
Collimator On	NO	NO	NO	NO
CollimatorWidth	-1.0	-1.0	-1.0	-1
CollimatorHeight	-1.0	-1.0	-1.0	-1
CollimatorCentering	N/A	N/A	N/A	N/A
SID On	NO	NO	NO	NO
SID	-1.0	-1.0	-1.0	-1.0

The stitching specific parameters that needs to be adjusted for ”Radiography 3” and the correct values are:

AutoPosition ON	YES	YES	YES	YES
Auto Position	13	13	13	13
Collimator ON	NO	NO	NO	NO
Collimator Width	-1.0	-1.0	-1.0	-1.0
Collimator Height	-1.0	-1.0	-1.0	-1.0

Adjust settings accordingly, press ”Apply” and save changes



ARCOMA

Stitching –

How to perform the examination

WARNING!

The Wallstand detector holder will move during stitching. This may cause danger for the patient.

Select a *Stitching Wallstand mode* examination.

The System display will display the following.

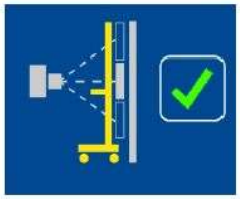


Fig. 4-18 Patient protection

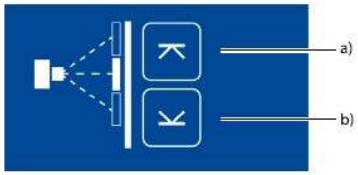


Fig. 4-19 Stitching Wallstand mode examination

The following buttons and information are located in the display, see *Fig. 4-19 Stitching Wallstand mode examination*

a *High position* , b *Low position*

1. Activate the mode by pressing the *servo* button.
   - The servo mode indication light will flash until both limits are defined.
   - The OTC will automatically move to its programmed position.
   - The System will beep when position is reached.
2. Install a patient protection in front of the Wallstand.
3. Invite the patient and position the patient in front of the Wallstand.
4. Verify that the patient protection is placed in front of the Wallstand by pressing the*green check* button on the display.
5. Move the focus point to the middle of the planned composite image. This could be done by moving the tube in Z direction.

6. Rotate the x-ray tube in order for the lower edge of the collimator light field to indicate the lower limit for the composite image.
7. Press the button to indicate the lower limit. The button turns green.

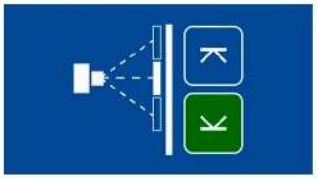


Fig. 4-20 Lower limit indication

8. Rotate the x-ray tube in order for the upper edge of the collimator light field to indicate the upper limit for the composite image.
9. Press the button to indicate the upper limit.
   - The button turns green to indicate that the limit is set.

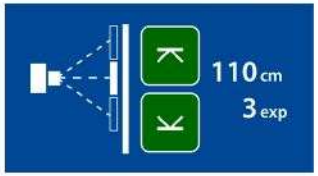


Fig. 4-21 Stitching mode — upper and lower limit set

   - When both limits have been defined the total length of the composite image and the number of exposures will be shown.
   - The servo mode indication light will be fixed.
10. Modify the exposure settings if necessary.

Note!

For a stitching procedure, a change of the patient size or change of exposure parameters for the first image included in the sequence, is not kept for the following included images.

11. Activate the *Exposure* button and keep it activated during the procedure.

- The starting position is always at the top edge of the composite image. Activate the *Exposure* button and keep it activated until the exposure procedure is completed.
- The System will move to the correct starting position.
- When the System is in the correct position for the first image, the first image is captured.
- After exposure, the System moves to the next, correct position and the second image will be captured.
- This is repeated until all images for the composite image has been captured.
- The System will beep when the sequence is finished. Release the button.

4.7.4 Stitching Table Mode (Option)

Note!

Stitching Table Mode is not available according to the described procedure with CR systems.

Select a *Stitching Table mode* examination.

The system display will display the following, see *Fig. 4-13 a) Left position and b) Right position.*

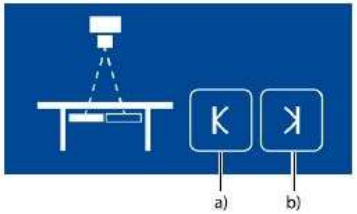


Fig. 4-13 a) Left position and b) Right position.

Activate the mode by pressing the servo button.

- The servo mode indication light will flash until the left and right positions are specified.
- The OTC will automatically move to its programmed position.
- The system will beep when position is reached.

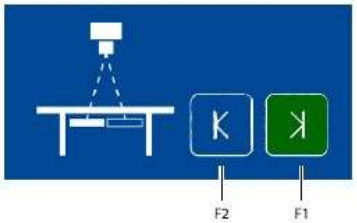
Invite the patient and position the patient on the table.

Move the focus point to the middle of the planned composite image. This could be done either by moving the tabletop or by moving the column in X (or Y) direction.

Rotate the x-ray tube in order for the right edge of the collimator light field to indicate the right limit for the composite image.

Press the button (F1) to set the right limit, see *Fig. 4-14* .

- The button turns green to indicate that the limit is set.



ARCOMA

STITCHING – end of presentation