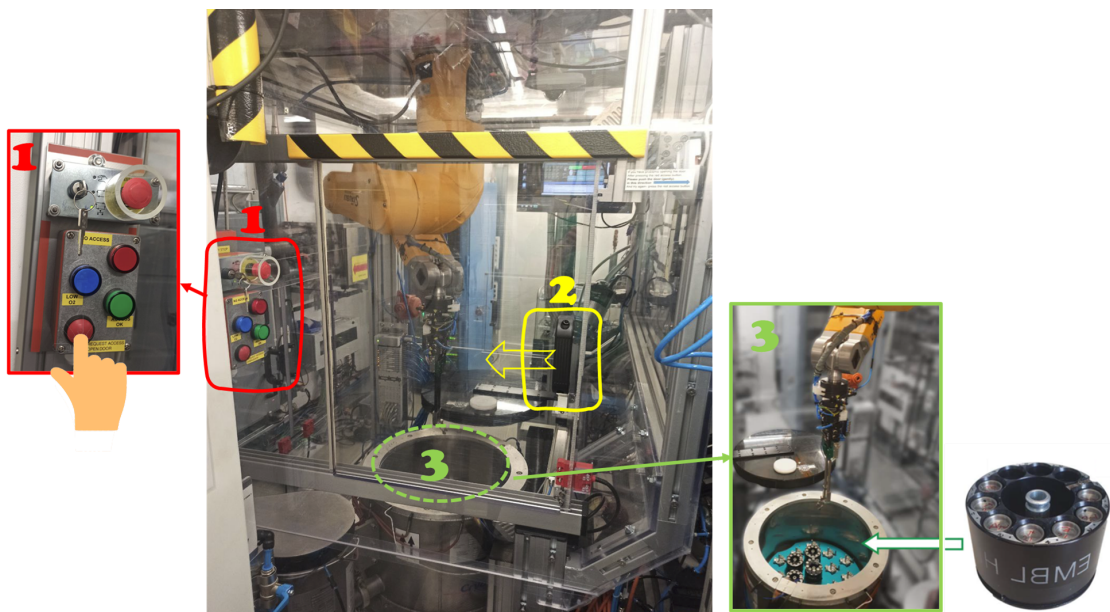


P14 Imaging Manual for Users

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1. Loading samples in Marvin



1. Press the button “Request access Open door”
2. Pull the door to the left. Act with care, Marvin has gentle sensors in the door and harsh moves might harm them.
3. Load pucks inside starting with the position 1 aligning the recess at the puck's side with the pin inside the robot
 - Keep track on which puck goes in which position
 - Do not put pucks in the central position
 - After you are done, make sure all Marvin doors are closed

2. Searching the hutch

Your card should be first activated by the local contact.

1. Tap the card (Fig.1)
2. Enter Hutch (Fig.1)
3. Press green button I (Fig.2)
4. Press green button II (Fig.2)
5. Press yellow button (Fig.2)
6. Exit hutch (Fig.2)
7. Close the door (Fig.3)
8. Press green button III (Fig.3) (Wait until the door is fully closed before pressing)
9. Tap the card (Fig.3)

If the yellow sign did not turn on - repeat the search

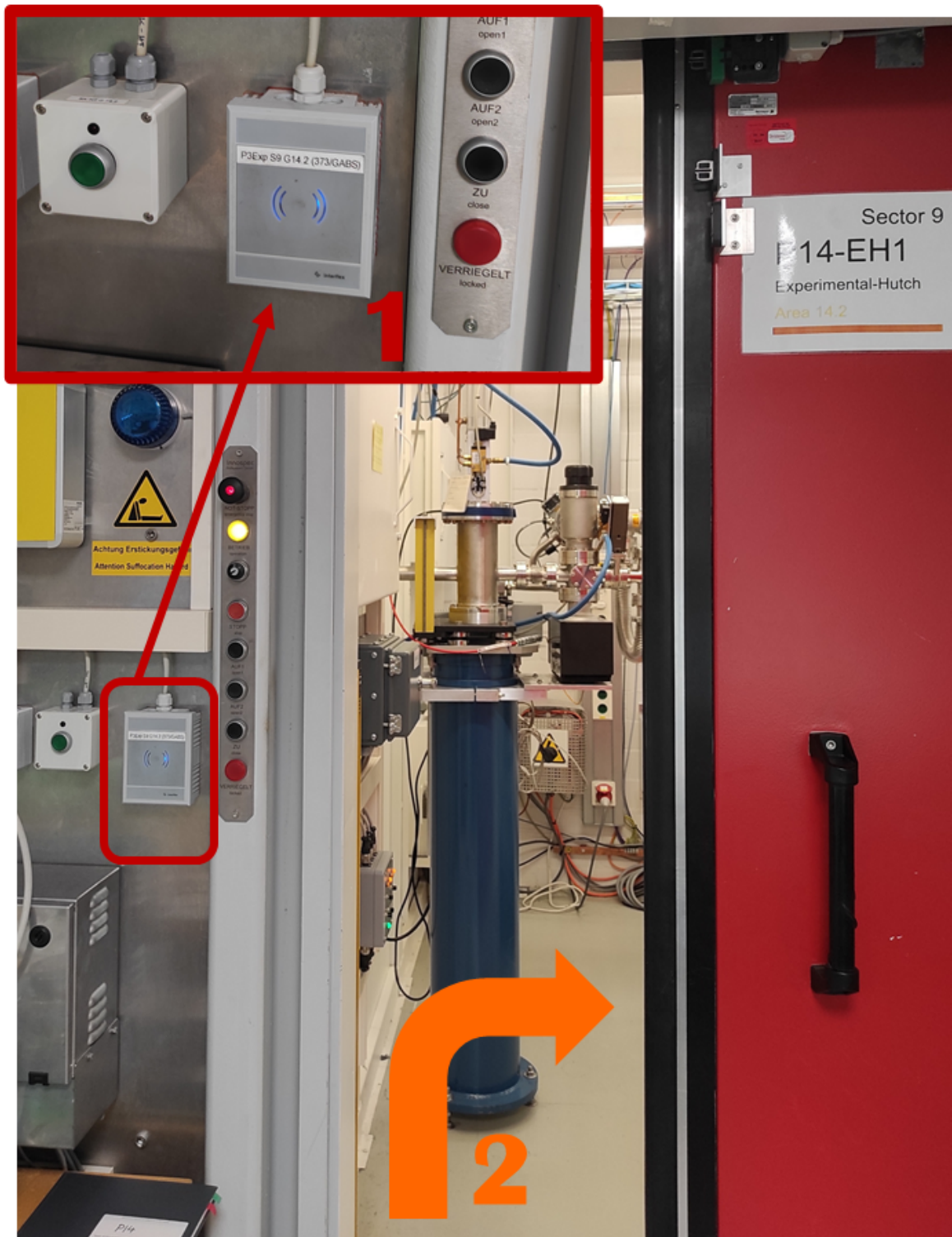


Fig. 1



Fig.2



Fig.3

3. Starting scanning

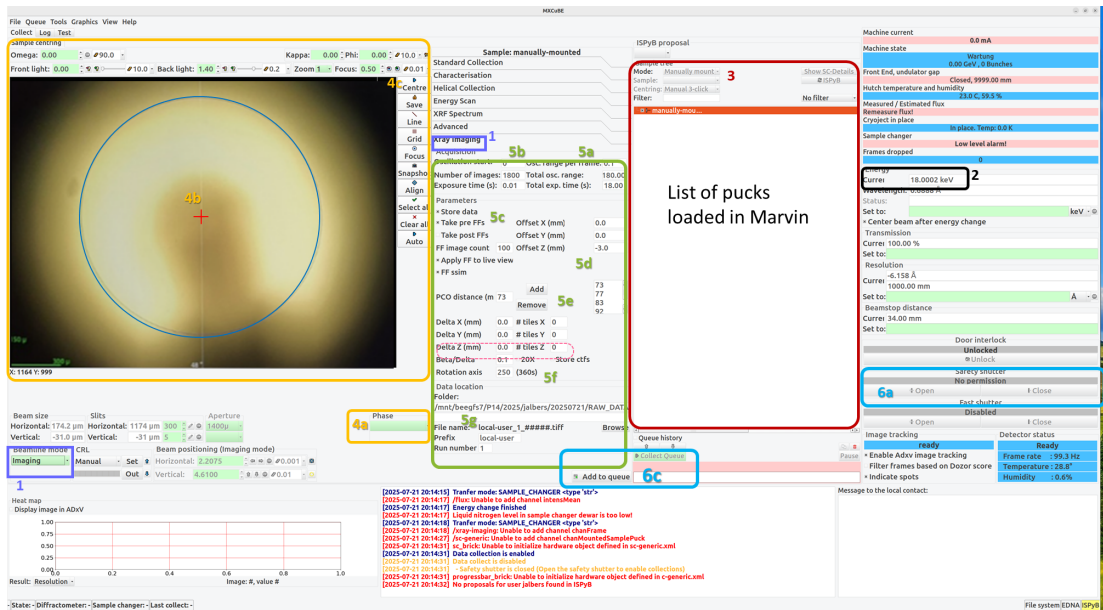
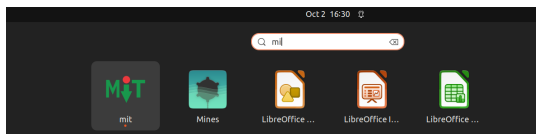


Fig.4

- I. Login in the computer. p3l-username and password can be found at the bottom of the A-Form.

- II. Start MXCube , adxv  and MIT 

If you do not see the icons in the vertical panel on the left monitor, press Windows key on the keyboard and type the name in the search bar on top:



Start live viewer from MIT: press *Open Viewer*

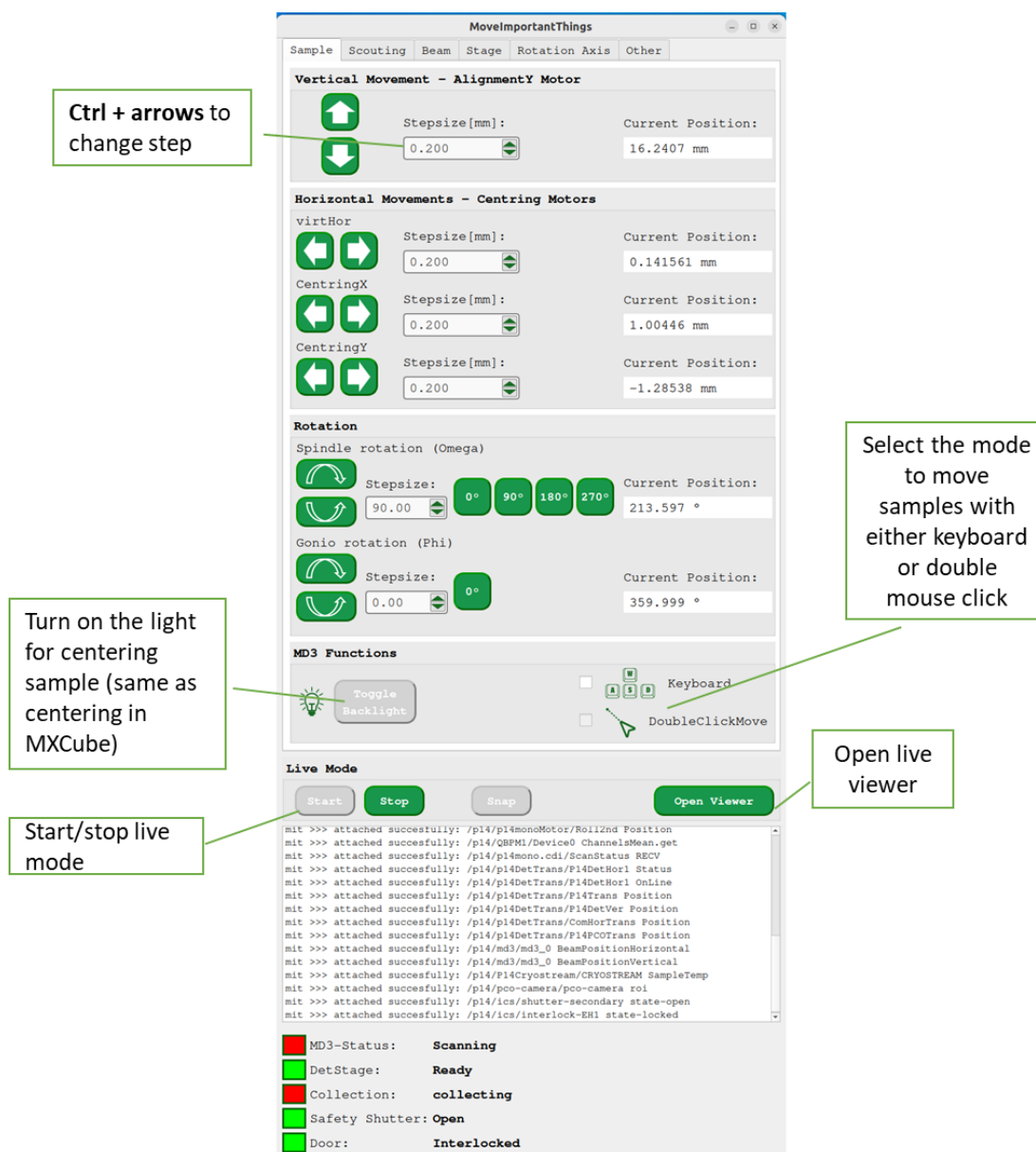


Fig. 5

Note: There is a possibility for some movements to be done both in MIT software and MXCube. Note that these two softwares can not communicate with each other. For example if you lower the sample via MIT and then click Centering in MXCube, the sample will go back to the heights MXCube remembers it to be.

- III. In MxCube choose X-ray Imaging, and beam mode: Imaging (Follow corresponding color frame on Fig.4)
 1. Choose X-ray Imaging, and beam mode: Imaging
 2. Check if the Energy is one you need (normally 18 keV)
 3. Mount the sample
 - a. If you are not using robot, choose mode: Manually mount and put the sample on MD3
 - b. If you are using a robot, choose mode: *Sample changer*.

Choose desired puck and sample number and the window below

Right click on the sample in the list and click "Mount"

Wait until Marvin puts the sample on and MD3 returns to the vertical position.

You can track the progress on the live view camera at the right top screen

4. Center the sample

- a. Choose Phase: *Centering* / *toggle backlight* in MIT
- b. You might need to lower the sample before it is visible by on MXcube screen, to do this click above the red cross in the middle of the screen and track the movements on the live view camera at the right screen / Vertical Movement arrows on top of MIT
- c. Choose Centre at the right side of the MXCube screen and perform 3-click centering: Aim in the middle of the sample, after each click sample rotates 90 degrees. Repeat until you are happy with the result.

5. Fill in all the parameters for the scan

- a. Osc. per frame 0.1
- b. Number of Images 1800 or 3600
- c. Tick "store data" and "take pre FF"
- d. Make sure the offset is correct (normally Offset **Z(mm)** -3.0)
- e. Add the distances (normal settings: 73, 77, 83, 92)
- f. Fill in the sample name

6. Scanning

- a. Make sure the safety shutter is open
- b. Check the flux on the little screen to the left of the hutch door
- c. Click add to queue => Collect the queue
- d. Monitor the scan with the ffc- live viewer
- e. After the scan is finished, wait for the message "Reconstruction done" and open the image in Tomo-viewer

4. Live mode

Live mode is useful for big resin/paraffin embedded samples, which you can not clearly see on the MXCube screen for centering.

1. Activate live mode in MIT
2. Move the block up/down left/right using MIT buttons, until you find the right position
3. Stop live mode
4. Start scanning

Note1: During live mode your sample is continuously exposed to the X-rays. Do not use it for samples in liquid or any other sensitive samples

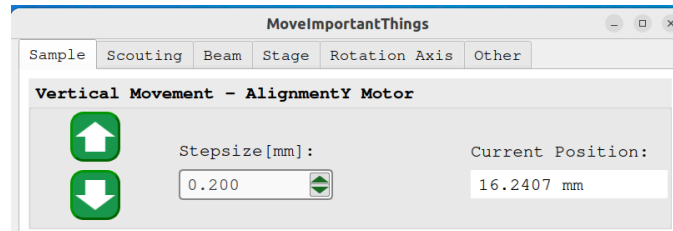
Note2: Live mode has limited time, at some point you need to restart it

Note3: MIT and MXCube do not communicate. If after adjusting sample position in MIT in live mode you click *Centering* in MXCube, the sample will return to the initial position'. Use *toggle backlight* in MIT instead

5. Stitched scans (new, MIT)

5.1 Z-stitches (vertical)

1. Center the sample at the lowest position
2. Put 0.9 in the Stepsize window in MIT (Top window Vertical Movement)



3. Go up with 0.9mm steps until you see the upper edge of the sample, count the steps
4. Fill in fields *Delta Z* and *tiles Z* in MXCube, for example, 0.9 and 4 (see pink frame on Fig. 4). **Note:** *tiles Z* in MXCube corresponds to the amount of motor steps needed to scan the whole sample and is 1 less and the actual amount of tiles.
5. Start scanning from the lowest position

5.2 X&Y Stitches

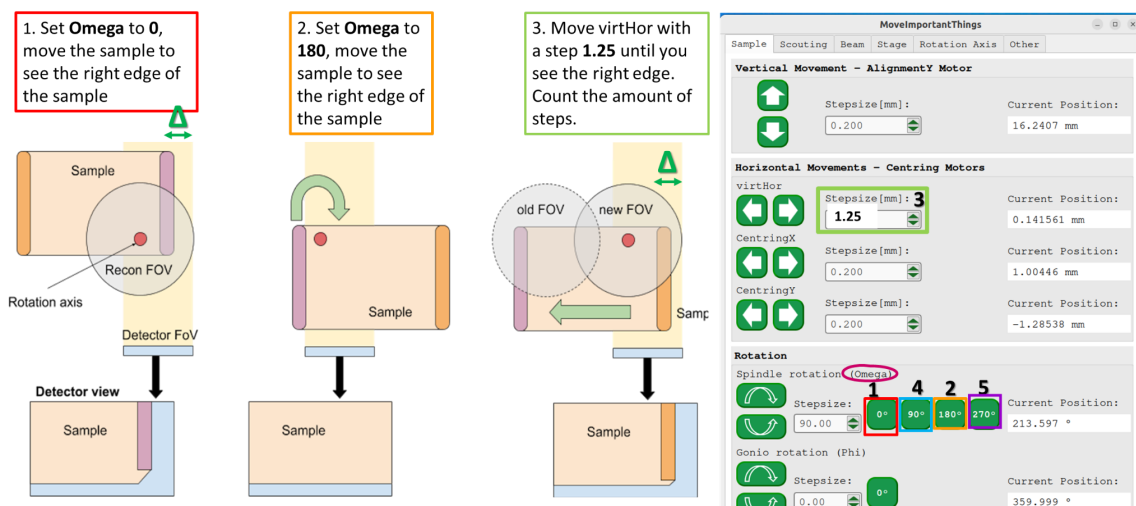


Fig. 6

1. Set **Omega** to 0, move the sample to see the right edge of the sample
2. Set **Omega** to 180
3. Move virtHor with a step 1.25 until you see the right edge. Count the amount of steps.
Tip: The right edge of the sample should be approximately at the same place on the screen for 0 and 180 (same Δ)!
4. Go back to Omega 0 (Now you will not see the right edge of the sample, no more horizontal moves)

5. Repeat steps 1-3 for 90&270: Set **Omega** to **90**, move the sample to see the right edge of the sample
6. Set **Omega** to **270**, move the sample to see the right edge of the sample (mind )
7. Return to Omega 90
8. Fill in fields *Delta X/Y* (1,25) and *tiles X/Y* in MXCube.. **Note: tiles X&Y in MXCube correspond to the amount of motor steps needed to scan the whole sample and are 1 less and the actual amount of tiles.**
9. Start scanning!