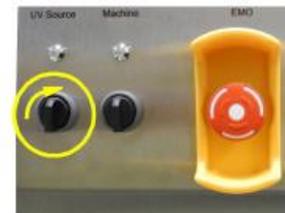


# Suss Mask Aligner MA/BA6 Gen4 User Manual

**Follow Step 1 and 2 only when the equipment is off and you are the first user.**

## 1. Switching On

- The monitor must be switched on
- Check the main switch which is located at the right side of the machine – should be in „ON“ position.
- Switch on the machine -Turn the rocker switch for the machine located at the front plate clockwise. The machine is operable, the indicator light is on.
- Start the software
  - After switching on the machine the PC will be booted automatically.
  - On the desktop double click the icon “MAC”
  - As soon as the program is loaded the User GUI of the MA/BA Gen4 will be displayed
- Switch on the UV Source  
Turn the rocker switch for the UV Source at the front plate clockwise. The indicator light is on. The corresponding power supply becomes operable.



## 2. Initialization

After software start the button **[Initialize]** is the only active key.

Click the button to start Initialization of all sub-assemblies and components.

*Initialization is only possible if the transport slide is loaded and clamped. If this is not the case the user guidance prompts to do so.*

During initialization the user guidance shows: "Machine is initializing"

"**[Back]** to cancel Initialization" - with **[Back]** initialization can be stopped at any time.

## 3. Recipe Selection

- After completing initialization, the user guidance shows:
  - [Light Measurement]** Start Light Measurement
  - [Initialize]** Initialize Machine
  - Select Recipe and **[Change Tools]**
  - Select Recipe and **[Start Process]**
- Click the desired recipe in the recipe list to select it for the process.
- If you want to change tools (e.g. the mask or chuck) click the button **[Change Tools]** to get access to the dialog frame "Change Tools".
- Click the button **[Start Process]** if your tools are already loaded. The process for the selected recipe is started.

*The recipe in use cannot be modified during process. All other recipes can be edited, stored or deleted in the recipe view.*

*The process start with **[Start Process]** is only possible if:*

- ▶ Adapter frame, mask holder and mask are loaded correctly and the top side microscopes are swivelled in. If this is not the case the user guidance prompts to do so.

#### 4. Load Recipe for Process

- After initialization, the list of all available recipes is displayed at the left side in process view. The list is displayed in alphabetic order.
- Click a recipe from the list. The recipe is selected (with blue background of recipe name). In case you cannot find the recipe, you can search for it, using the search field on top of the recipe list.



#### 5. Edit Recipes

Editing of a recipe is possible if you are logged in as Application (Password: Application).

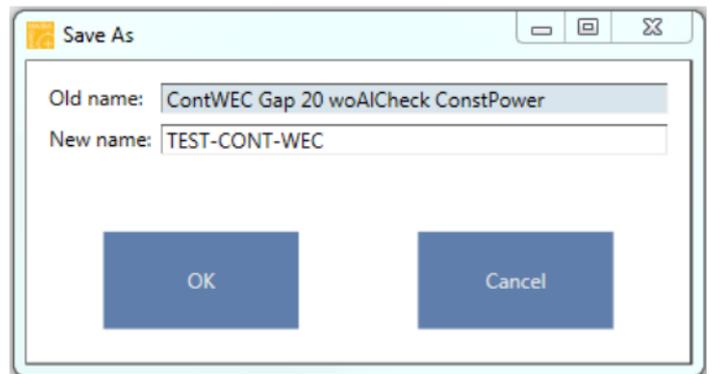
Editing of an active recipe is only possible if the process is not yet started or currently running.

Recipes that are not active (running) are able to be edited in recipe view at any time.

- Click the tab "Recipes".
- Select an existing recipe.
- Adapt the parameters to your needs.
- Click the button **[Save]**. All changes are now saved to the selected recipe.

#### 6. Create a New Recipe

- Click the tab "Recipes".
- Select a recipe from the recipe list.
- Adapt the parameters to your needs.
- Click the button **[Save As]**.
- Type the desired name for the new recipe in the free text field.
- Confirm with **[OK]**.
- The new recipe is now part of the recipe list can be selected for process.

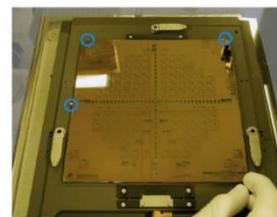
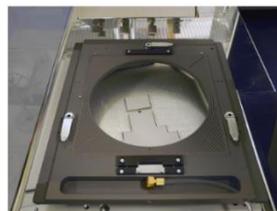


#### 7. Load Mask and Mask Holder

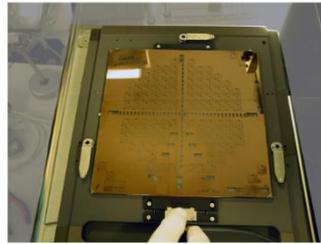
Load the correct tools (mask holder, chuck) for the process. Load substrate.

Click the button **[Change Tools]** at the start screen to switch to the dialog frame for mask changing.

- Put mask holder on parking station with vacuum plane up.
- Load mask (chrome side up)
- and push it against the three stop pins



- Clamp the mask with the mechanical clamping



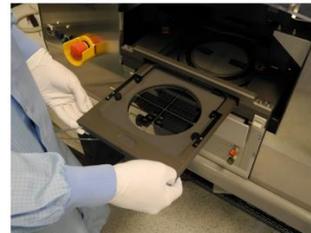
- Plug in the connecting hose for mask vacuum into connector "Top Substrate Outer Vacuum".



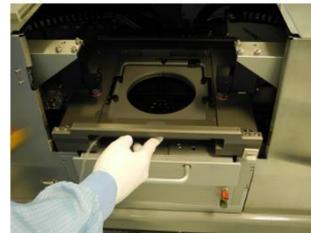
- Click the key **[Mask Vacuum]** to switch on the mask vacuum. The mask is now fixed on the mask holder. The LED „Mask Detected“ in the dialog frame „Change Tool Set“ is green.



- Load mask holder into mask holder frame in the machine.



- Load the mask holder all the way to the stop.



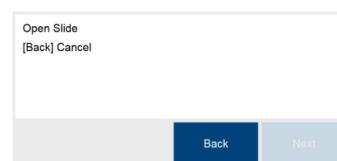
- In dialog “Change Tool Set” activate the clamping for the mask holder with the key **[Clamp Mask Holder]**. The mask holder is now fixed in the adapter frame. The LED “Mask Holder Detected” in the dialog frame “Change Tool Set” is green.
- Click the key **[Next]** to leave the dialog frame and to return to the start screen.

## 8. Start Process

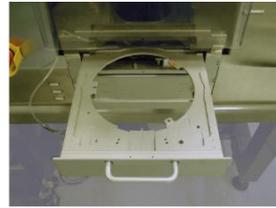
- Click the button **[Start Process]**.
- The process for the substrate with the selected recipe will be started.
- Once the process will be finished and the substrate is unloaded a new process can be started.
- The last used recipe has a grey background and remains selected until a different recipe will be selected.

## 9. Load Chuck and Substrate

- Open transport slide (pull forwards).  
After process start the user guidance shows:  
“Open Slide”  
“**[Back]** Cancel”



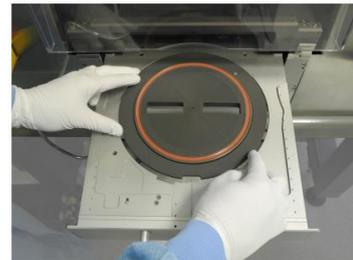
- Pull transport slide with handle forward.



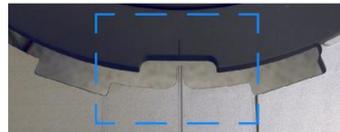
- Load chuck and substrate onto the transport slide.  
The user guidance shows:  
“Put Chuck and Wafer onto Slide”  
“**[Back]** Cancel”  
“**[Next]** Switch on Wafer Transport Vacuum”



- Load the chuck on the transport slide.



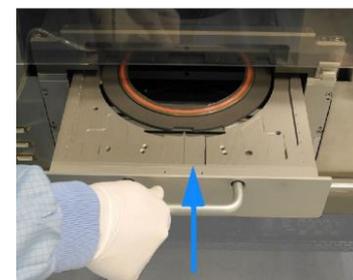
- Take care that the marking on the chuck is adjusted to the marking of the transport slide.



- Put the substrate onto the chuck.



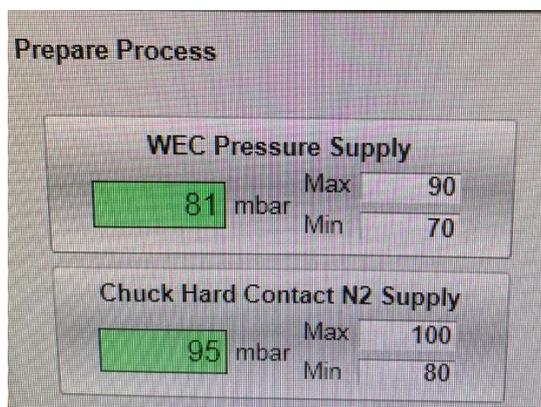
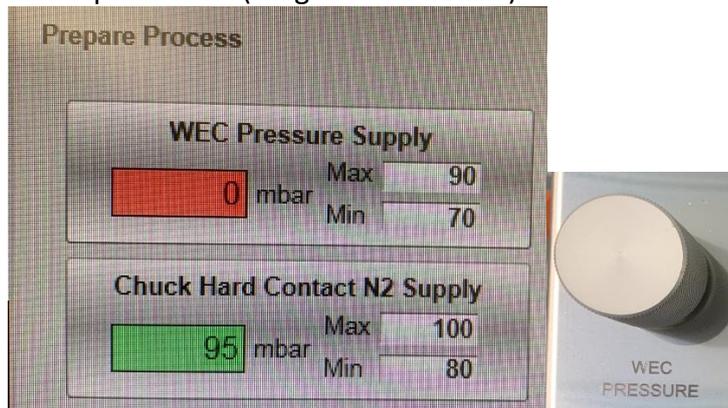
- Click button **[Next]** The transport vacuum is switched on and the wafer is fixed on the chuck.  
(This prevents the wafer from shifting during transport)
- Close transport slide (push backwards).  
The user guidance shows:  
“Close Slide”  
“**[Back]** Switch off Wafer Transport Vacuum”
- Push transport slide with handle backwards. Be sure to move the slide all the way back to the stop.



- Clamp transport slide.  
The user guidance shows:  
“**[Next]** Clamp Slide and Continue”  
“Open Slide to Unload”
- Click button **[Next]** - Clamping of the transport slide is activated.  
Once the transport slide is clamped, the z-axis will drive upwards, transfers the chuck with the wafer and wedge error compensation (WEC) will be performed.

To perform a wedge error compensation (WEC) the wafer must be pressed against the mask with a specified force. The WEC pressure must be adapted to the size and the weight of the used chuck and wafer.

- The pressure for the WEC-head can be adjusted individually to corresponding process requirements (range: 0 - 100 mbar)



The chuck with the substrate stops in alignment gap. The graphical user interface displays following screen:

- Use the joystick to adjust
  - Left button on top – change stage microscopes
  - Right button on top – change speed – use max 50% to avoid colliding microscopes
  - Change focus and rotate the stage

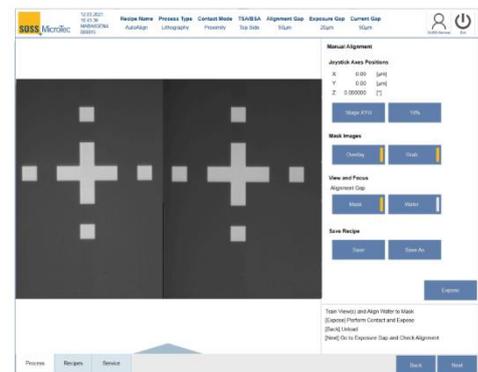


Fig. 4 - 3: Graphical User Interface - Manual Alignment View

## 10. Expose

During that stage it is advised to turn away from the equipment and the UV light.

## 11. Unload Chuck and Substrate

After Exposure:

Unload substrate, Unload process tooling (chuck, mask holder).

Once exposure is finished, the z-axis with chuck and substrate will move downward and the clamping of the transport slide will be released.

- Open transport slide (pull forward).
- The user guidance shows: "Open Slide to Unload"
- Pull transport slide at the handle forward. Be sure to move the slide all the way out.

*From this moment the active recipe is no longer blocked for process and can be edited freely.*

- Unload substrate - Remove the substrate from the chuck using tweezers.
- Return to Start Page and Remove chuck.
  - If a new process shall be started using a different wafer/ substrate size or a different contact process which needs a special chuck, the chuck can now be exchanged.
  - Click **[Back]** to return to start page and to terminate the current process.
  - Remove/ Exchange the chuck.
  - Select a new recipe, load tools and start a new process or unload the mask holder and mask, terminate the software and shut down the machine.
- Restart the loaded process and load a new substrate onto the chuck/ transport slide.
  - If the next substrate shall be processed using the same process and chuck, the process with the loaded recipe can be restarted.
  - Click the button **[Next]**.
  - The user guidance shows:
    - “Put Chuck and Wafer onto Slide”
    - “**[Back]** Cancel”
    - “**[Next]** Switch on Wafer Transport Vacuum”

## **12. Unload Mask Holder and Mask**

- Click the button **[Change Tools]** at the start screen to open the dialog frame for mask changing.
- In Dialog “Change Tool Set” release the clamping for the mask holder by clicking the button **[Clamp Mask Holder]**.
- The clamping for mask holder with mask in the adapter frame is now released.
- The LED “Mask Holder Detected” in dialog frame “Change Tool Set” turns to grey.
- Pull mask holder carefully forward out of the mask holder frame.
- Put mask holder with bottom side up onto the park station. Open the mechanical clamping for the mask (pull it back).
- Click the function button **[Mask Vacuum]** to switch off the mask vacuum.
- The mask is now loosened on the mask holder.
- The LED “Mask Detected” in dialog “Change Tool Set” turns to grey.
- Remove the mask carefully from the mask holder.
- Remove the connecting hose for the mask vacuum from the machine.
- The mask holder can now be removed for save storage.

## **13. Switching Off**

Before switching off the mask aligner make sure:

- ✓ the program is in idle mode.
- ✓ no substrate is in the machine.
- ✓ mask/ upper substrate has been unloaded.
- Terminate the software - In the title line of the GUI click the button in the right edge. The software will be terminated immediately.
- Switch off the machine
  - Turn rocker switch of the machine at the front plate counterclockwise. The machine is switched off.
- Switch off the UV light
  - Turn rocker switch for the UV light at the front plate counterclockwise.