Tool specification:

- Substrate size: 1” up to 4”
- Mask size: Standard 2”x2” up to 5”x5”
- Alignment: X,Y±5mm, theta-5°
- Alignment Accuracy: Top side alignment - < 0.5µm
  Back side alignment - < 5µm (2µm under special process condition)
- Exposure modes: 1. Soft contact
  2. Hard contact
  3. Low vacuum contact
  4. Vacuum contact
  5. Gap exposure
- Exposure area: Min-1 inch
  Max-3 inch

SUSS MJB4 Mask Aligner

1. Lamp house
2. TSA microscope manipulator
3. Microscope focus setting
4. TSA microscope
5. TGA/IR illumination
6. Electronics ON/OFF key
7. Main switch with emergency off function
8. Alignment stage
9. Monitor for microscope video image (option)
10. Pneumatic settings
11. Display/touch screen
12. Pneumatic gauges
Step by step procedure to turn on the tool:

- Turn on the nitrogen valve
- Turn on the main switch(7)
- The machine should have the following pressure values:
  - Compressed air: 5.5 bar
  - Nitrogen: 1.5 bar
  - Vacuum: -0.8 bar (0.2 bar absolute)
- Press the ON/OFF button (6)

Lamp house:

- Ignite the lamp by pressing the POWER ON button
- Press CP button
- Press start button

Loading the mask:

For safety reasons press the Mask vacuum is on button for few seconds on the main screen. Place the mask on the mask holder against the stop pins. Load and Clamp the Mask Holder with the top side facing up, push the mask holder into the alignment station and then fasten it in the mask holder frame using the knurled screws.
Loading the substrate:

Pull out the transport slide as far as it is possible. Insert a suitable substrate chuck with the substrate resting on the stop pins. There is a hand valve on the front right side of the transport slide that switches on the transport vacuum for the contact and vacuum chuck. Carefully insert the transport slide until it reaches the end stop.

- Select the desired recipe and vary the parameters.

- Do the WEC settings for the desired mask and substrate.
At the touch screen appears:

- **Close contact lever** Move the substrate towards the mask by pushing the contact lever forwards. Afterwards turn the thickness setting upwards (counterclockwise) until the information **WEC setting OK** appears on the display.

**Aligning the substrate for TSA:**

**Setting the TSA Microscope**
The splitfield switch must be set to the middle position for the M604 microscope. If a video camera or monitor is not available, then you have to look through the microscope eyepieces.

**Microscope Illumination**
The illumination has to be **Incident light** which has to be set in the **Parameters**. Set the brightness using the left/right potentiometers on the left front plate. The left and right aperture diaphragms on the microscope allow you to set the illumination on the left and right separately.

**Mask Level Focusing**
Coarse focusing is possible using the TSA Z-motion located behind the TSA microscope. Fine focusing is set separately on the microscope. To do this, use the OBJECTIVE FOCUS FINE MANUAL knob on the microscope.

**Set the TSA Microscope to the Mask Alignment Crosses.**
The right/left microscope is set to the right/left mask alignment crosses with OBJECTIVE XSEPARATION.

**Aligning the Substrate:**

**Substrate Level Focusing**
For fine lens adjustment, use the OBJECTIVE FOCUS FINE MANUAL knob on the microscope.

**Alignment (menu in the display: Align substrate...)**
Use the X, Y and Theta micrometer screws on the alignment table for this. Align the substrate alignment crosses so that they are centrsymmetrical to the mask alignment crosses.
**Substrate Alignment with IR Illumination:**
For IR substrate alignment, special IR cameras and special IR lenses are required for the Opaque area. The following example explains the necessary steps for IR alignment and exposure with manual mask loading, soft contact exposure and wedge error compensation in contact mode. With the machine in its initial state, the following procedure steps must be carried out.

The option **IR transm. light** is selected in the Parameters and fix the special IR lenses. Set the brightness using the left/right potentiometers on the left front plate. Make separate illumination settings for right/left using the right/left aperture diaphragms on the microscope.

**Adjusting the Microscope:**
**Setting the TSA Microscope**
The splitfield switch must be set to the middle position for the microscope and the lever for the IR camera opening must be in the IR position. The left/right camera frame or the splitfield can be set in the Parameters menu.

**Focusing the Mask Level**
Coarse focusing is possible using the TSA Z-motion located behind the TSA microscope. Fine focusing is separately set on the microscope. To do so, use the OBJECTIVE FOCUS FINE MANUAL knob on the microscope.

**Setting the TSA Microscope to the Mask Alignment Crosses.**
The right/left microscope is set to the right/left mask adjusting crosses with OBJECTIVE XSEPARATION.

**Aligning the Substrate:**
**Focusing the Substrate Level**
For fine lens adjustment, use the OBJECTIVE FOCUS FINE MANUAL knob on the microscope.

**Adjustment(menu in the SUBSTRATE ADJUSTMENT display)**
Use the X<Y and Theta micrometer screws on the alignment table for this. Align the substrate alignment crosses so that they are central symmetrical to the mask alignment crosses.

**EXPOSURE**
Once the substrate is aligned and brought to the exposure position using the SEPARATION LEVER, press the **Exposure** button to perform the exposure.

- Open the contact lever to see the following screen

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Exposure menu
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- Exposure depending on the requirement(TSA or BSA to be done before exposure if required).
Switching Off the Machine:

- The machine is switched off using the Electronics ON/OFF button.
- Press ON/OFF button longer than 2 sec to switch off the lamp and the electronics.
- The lamp power supply is switched off immediately and the MJB4 electronics switches off automatically after the cool down phase is complete (10 minutes).