Table of Contents

1 Method of Use

The tool is intended for this purpose, as described in point 1.1.

In this process, the module components baremodule 1.1.1 and FPCB (Flex) 1.1.2 positioned horizontally and vertically in relation to each other, while an adhesive hardens between the components at a defined visual strength.

The adhesive layer thickness or the adhesive gap is repeatedly readjusted to each module to be added in order to enable high precision and reproducibility of the adhesive gap.

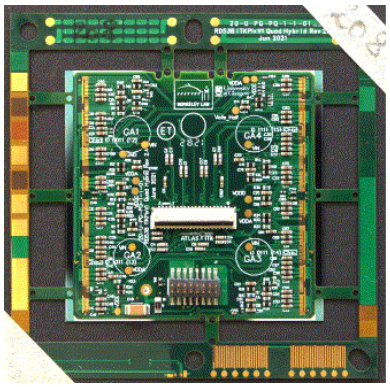


Fig.1 Glued module

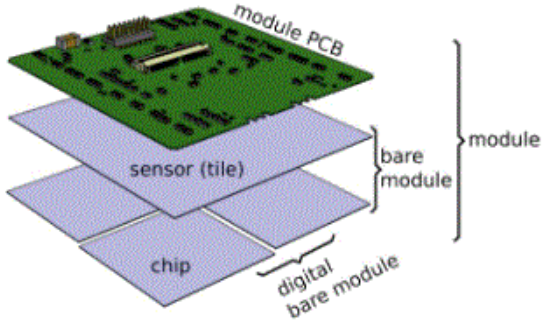


Fig.2 Module components

Important to note:

It should be noted that the thickness of the bonded module, Baremodule thickness + adhesive thickness + FPCB or flex thickness (regardless of the SMD component height) must be in the range of 0.575mm +/-0.150. (see red frame Fig.6 module thickness)

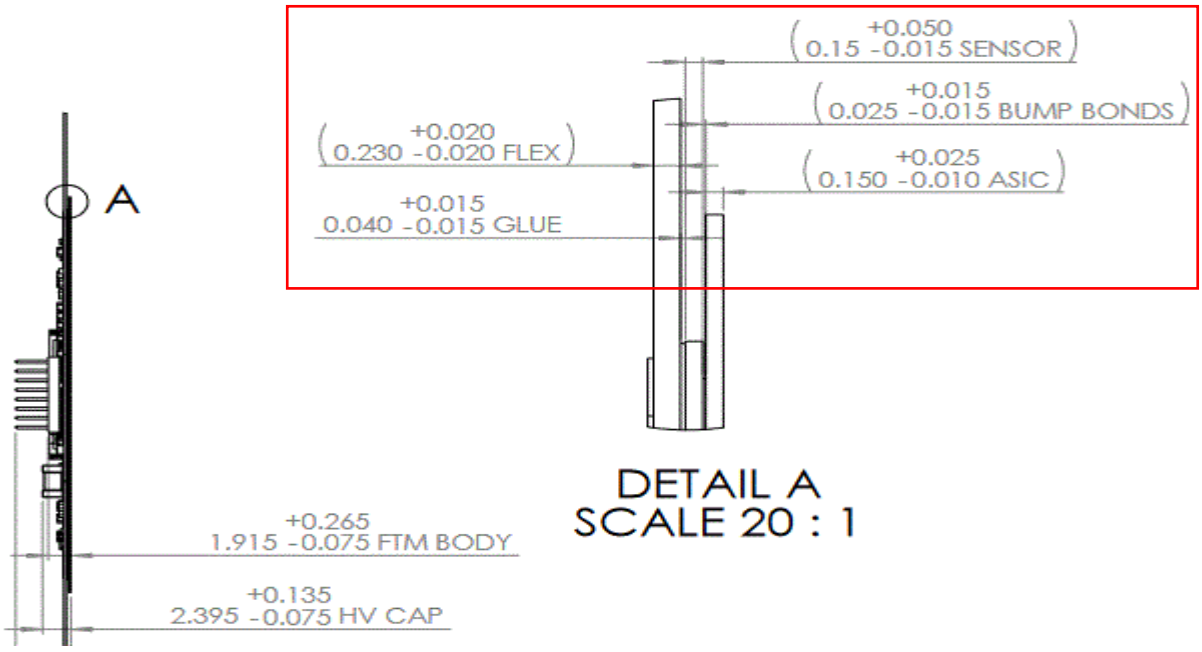


Fig.3 Module thickness

https://edms.cern.ch/ui/file/2363543/5/AT2-0000020505_THICK_UNCOATED_MODULE_v3.PDF

Otherwise, it is necessary to proceed in accordance with point X.X.X.

1.1 Module Components

The tool is intended for the following module components:

1.1.1 Baremodule

ITk Pixel Bare Quad Module 150µm

https://edms.cern.ch/ui/file/1932682/11/2022-05-25_ITk_Pixel_Bare_Quad_Module_150um.pdf

ITk Pixel Bare Quad Module 100µm

https://edms.cern.ch/ui/file/1932682/11/2022-05-25_ITk_Pixel_Bare_Quad_Module_100um.pdf

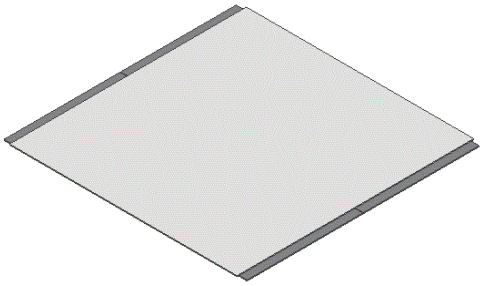


Fig.4 ITk Pixel Bare Quad Module 100/150µm (see attachment for technical drawings)

1.1.2 FPCB (Flex)

RD53B ITKPixV1 Quad Rev3.2

https://gitlab.cern.ch/itk-pixel-hybrid/itkpixv1_quad/-/tree/RD53B_ITKPixV1_Quad_Rev3.2?ref_type=heads

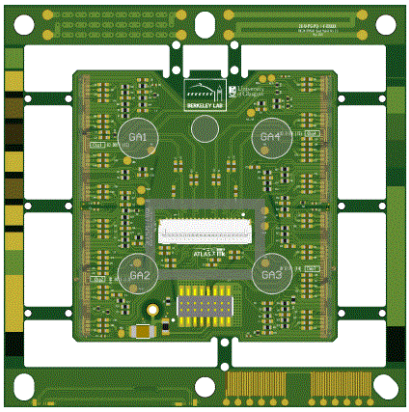


Fig.5 FPCB (see Appendix for technical drawings)

Important to note:

As soon as geometrical changes in the module components, e.g. due to revisions, they must be checked for compatibility with the tool in order to continue to ensure its functioning.

2 Delivery Condition

The delivery status contains all components listed in point 3 as well as in point 7.1. Except for the stencil point 3.1.7.

The tool is delivered assembled and calibrated.

In addition, there are instructions for unpacking and packing the shipping box, as well as the calibration protocols of the baremodule Jig in the shipping box.

Fig.6 Shipping box

Fig.7 First layer shipping box

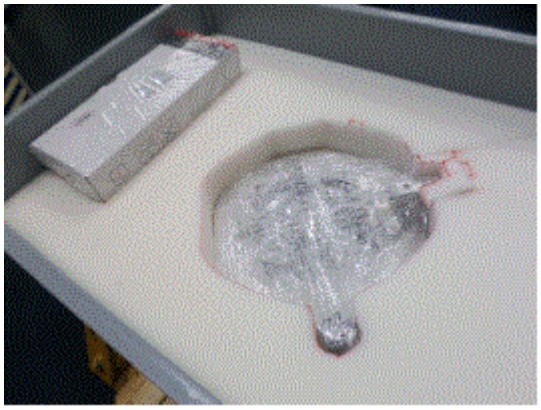


Fig.8 Second layer shipping box

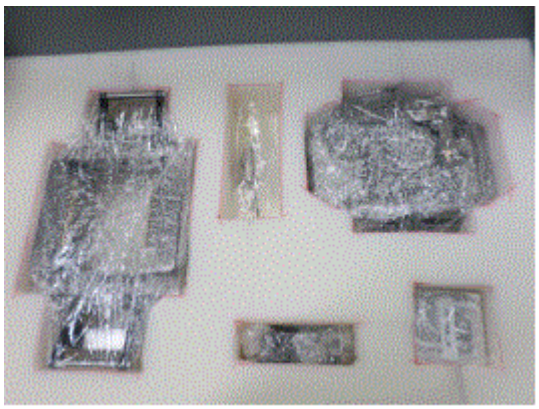


Fig.9 Third layer shipping box

3 Device Description

3.1 Components

3.1.1 Baremodule Jig

Used for positioning and fixing the baremodule, as well as holding the flex jig and adjusting the adhesive gap between the module components.

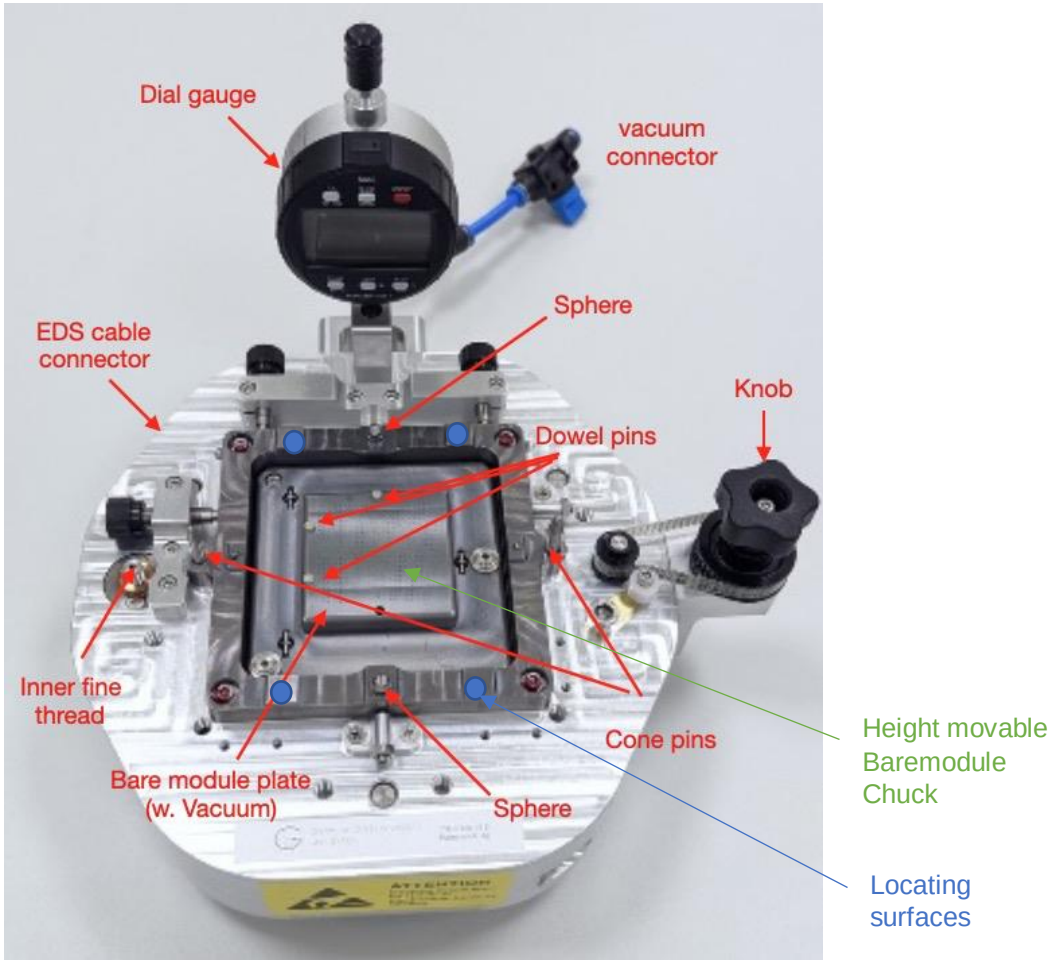


Abb.10 Baremodule-Jig

- The baremodule chuck is movable in height by means of the knob. The final elevation position, or Finally, the adhesive gap thickness between the baremodule and the FPCB, is defined by the fine screw and adjusted by means of the dial gauge.
- The three dowel pins are used to position the baremodule on the baremodule-chuck surface. The baremodulus is fixed by means of a vacuum.
- The two cone pins serve as a positioning aid for setting up the flex jig, both are of different sizes in diameter to prevent the flex jig from being twisted.
- The two balls are responsible for the final positioning of the flex jig.

3.1.2 Dial gauge

Serves as a measuring instrument to measure the adhesive gap thickness between the baremodule chuck and the flex jig. Still needs to be mounted on the baremodule jig after delivery.

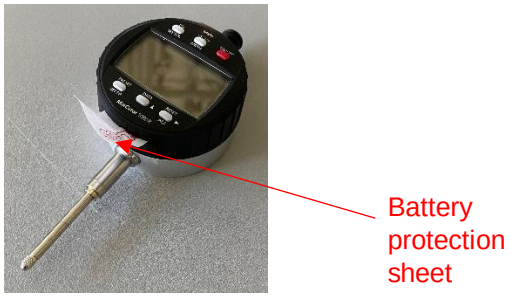


Fig.11 Dial gauge

- The dial gauge can be set to 0 at any position and displays values of 1/10µm
- The function can be found in the manufacturer's data sheet supplied
- The battery insulating sheet must be removed before use

3.1.3 Flex Jig

Used to position and fix the FPCB, as well as to hold the stencil and the stencil tool to apply the adhesive to the FPCB using a spatula.

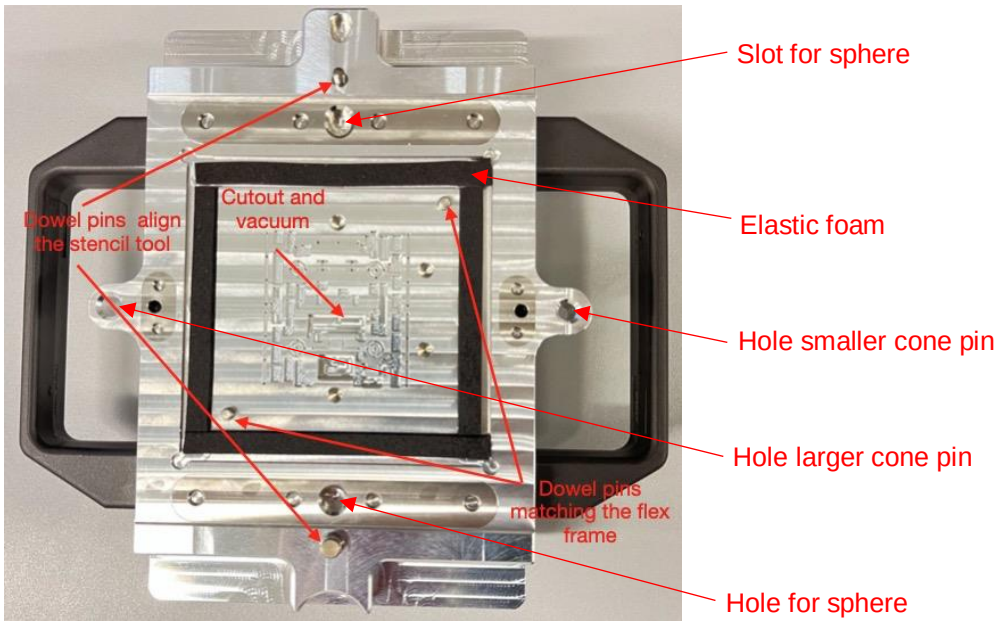


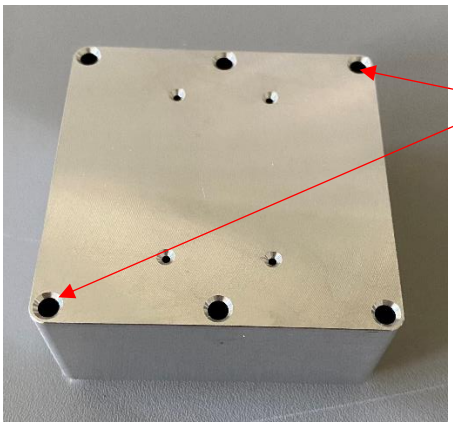
Abb.12 Flex jig

- The fittings are used to position the FPCB by means of its frame and diagonal holes. Accordingly, the FPCB is fixed there by means of a vacuum pattern
- The fittings are used to hold the stencil and stencil tool, both are of different sizes in diameter to prevent twisted insertion of the stencil and stencil tool
- The two outer holes are used to guide the cone P into the baremodule jig and the slotted hole as well as the bore are used to position the balls on the baremodule jig.
- The vacuum and ESD connection are located on the back of the flex jig
- The "Elastic Foam" is used to hold the stencil up after taking the stencil tool, so that the stencil does not fall into the applied adhesive pattern

3.1.4 Loading

Used to weigh down the FPCB on the suction surface of the flex jig to allow the FPCB to be aspirated and fixed on the flex jig.

Fig.13 Loading upper side.



14 Loading bottom side

- The loading has a bore pattern, which is used for free holes and alignment holes for the piping pins of the FPCB

3.1.5 Stencil Tool

Used to fix the stencil on the flex jig, as well as to press and guide the spatula during the squeegee process.

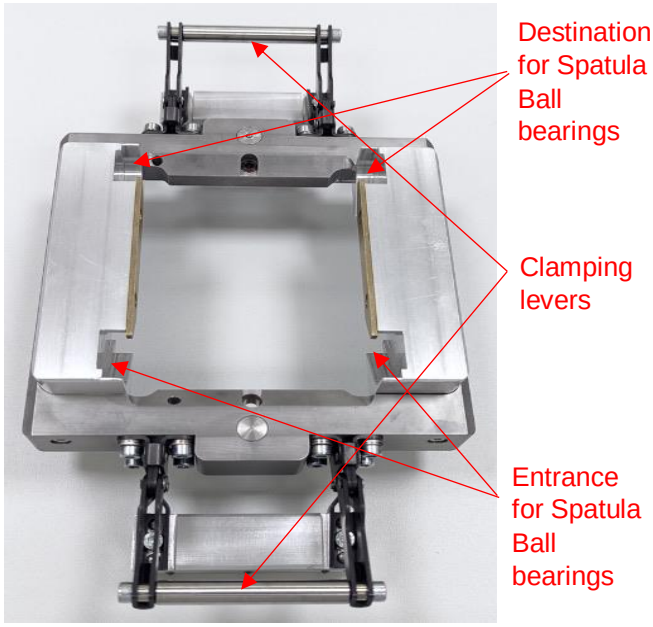


Fig.15 Stencil tool on the upper side

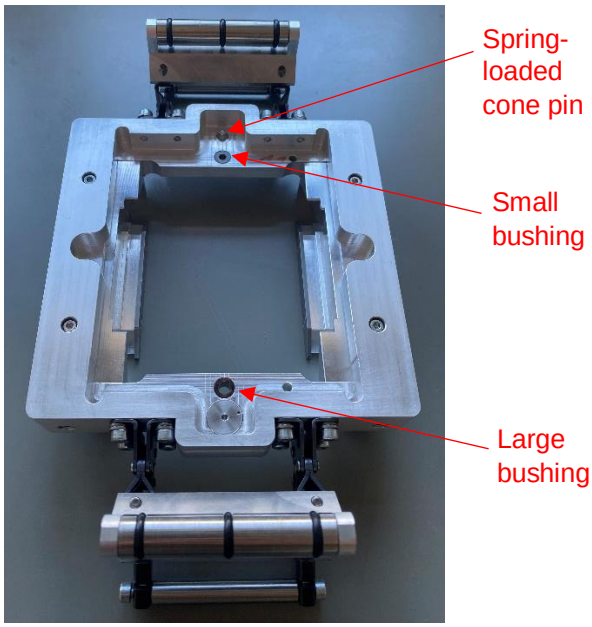


Fig.16 Stencil tool on the bottom side

- The two differently sized bushings are used for positioning on the flex jig
- The spring-loaded cone-Pin is used to clamp the stencils
- The guides are used to insert, position and guide the spatula and the resulting contact pressure of the spatula on the stencil or FPCB
- The levers are used to clamp the stencil tool on the flex jig

3.1.6 Spatula

Used to press the glue into the pattern of the stencil.

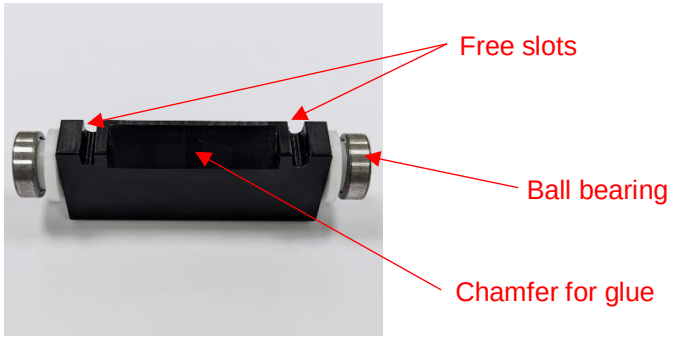


Fig.17 Spatula

- The ball bearings are used for wear-free guidance of the filler along the guides in the stencil tool
- The bevel serves as a function for the adhesive and generates the appropriate force to embed the adhesive into the stencil pattern
- The grooves serve as free space for the protruding pins of the FPCB positioning from the flex jig

3.1.7 Stencil

Serves to leave a defined glue pattern on the FPCB, corresponding to the cut-outs in the sheet metal.

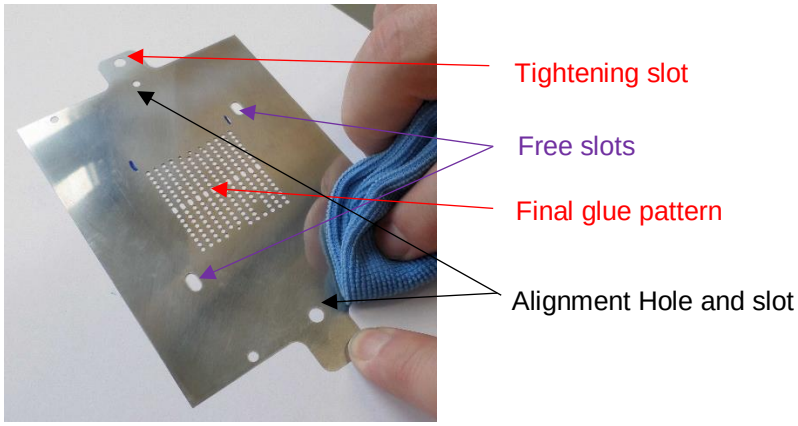


Abb.18 Stencil

- The uppermost hole is used to preload the stencil by means of the spring-loaded cone from the stencil tool
- The slotted holes serve as free space for locating pins of the FPCB positioning from the flex jig and as anti-rotation protection
- The pattern will be used for the final glue samples at the FPCB

3.1.8 Fastening screws with shims

They are used to fix the flex jig with the baremodule jig during the curing process of the glue.

Fig.19 Fastening screws with washers

3.2 Functionality

Shown is the function of the ITkPixToolV2.0for joining the ITkPix modules. Under point 7 you will find a detailed description of the operation

3.2.1 Positioning and fixing module components

1. Baremodule Pos.3 is used on the baremodule jig Pos.2 or positioned and fixed on the baremodule chuck surface (Fig.2 0)

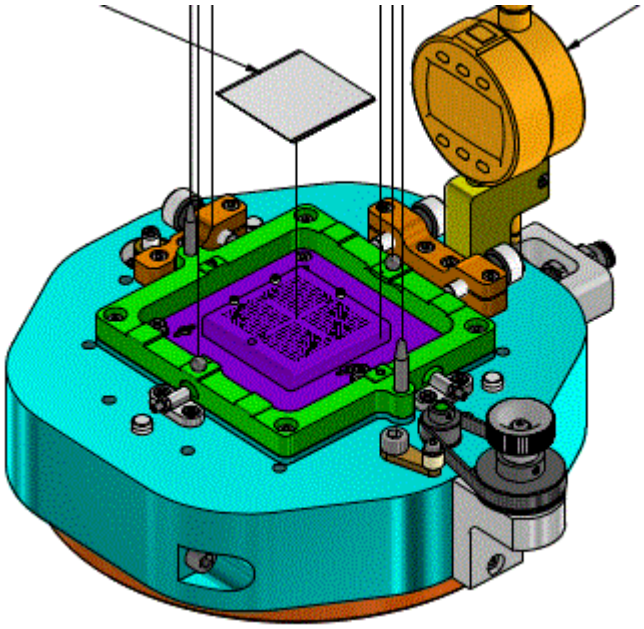


Abb.20 Baremodule jig with baremodule

2. FPCB Pos.4 is positioned and fixed on Flex-Jig surface Pos.1 (Fig.2 1)

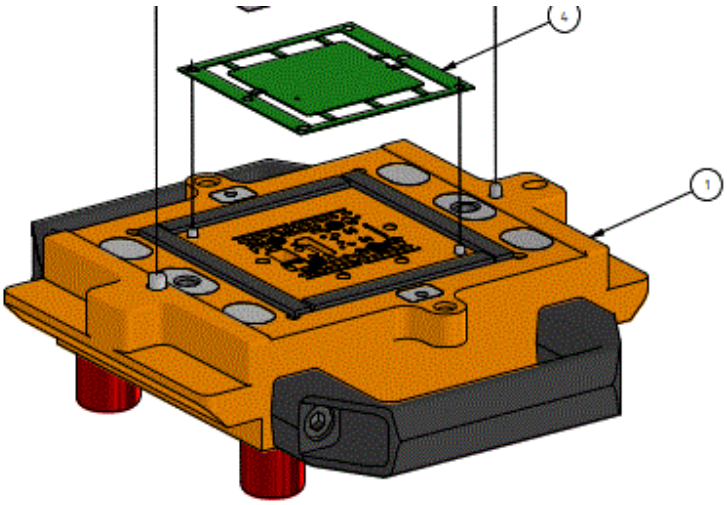


Fig.21 Flex Jig with FPCB

3.2.2 Apply glue to FPCB

1. Position and fix FPCB Pos.4 on Flex-Jig Pos.1 (Fig.22)
2. Position Stencil Pos.5 on Flex-Jig Pos.1 (Fig.22)
3. Position and clamp Stencil-Tools Pos.2 on Flex-Jig Pos.1 (Fig.22)
4. Glue applied to the stencil pos.5 (Fig.23)
5. Apply glue to FPCB with spatula pos.3, according to the (Fig.23)
6. Remove the stencil tool pos.2 and stencil pos.5 of the (Fig.22)

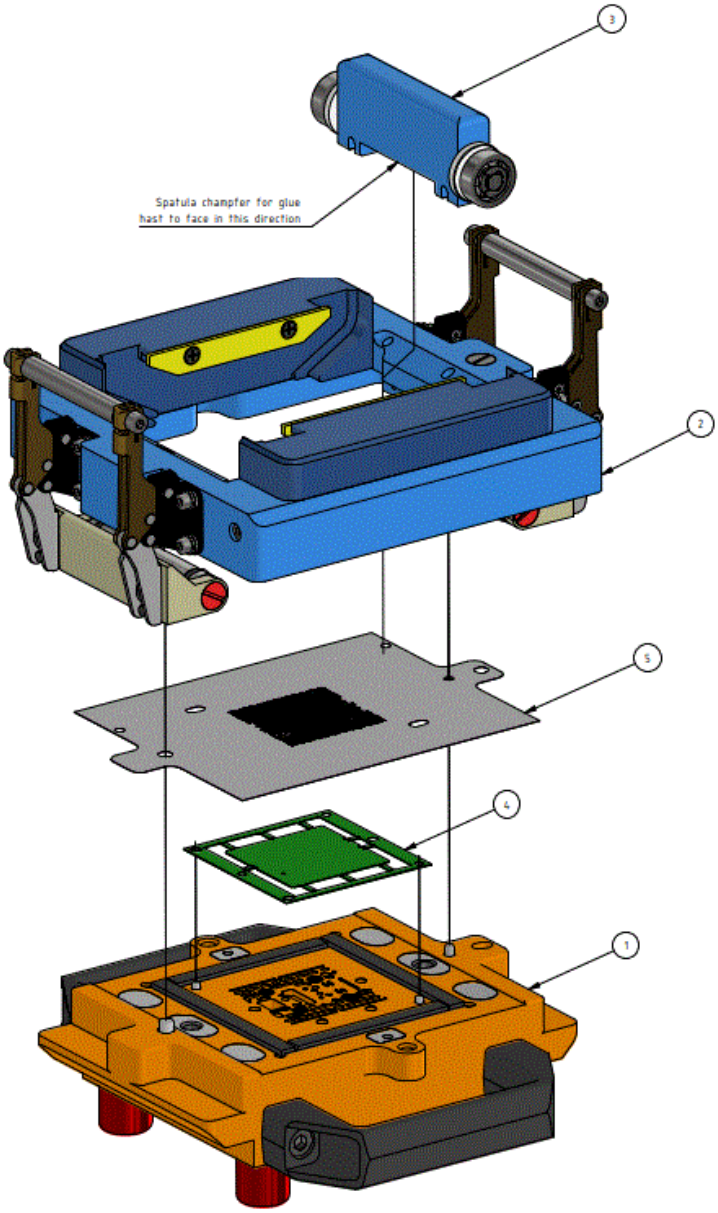


Fig.22 Glue application process

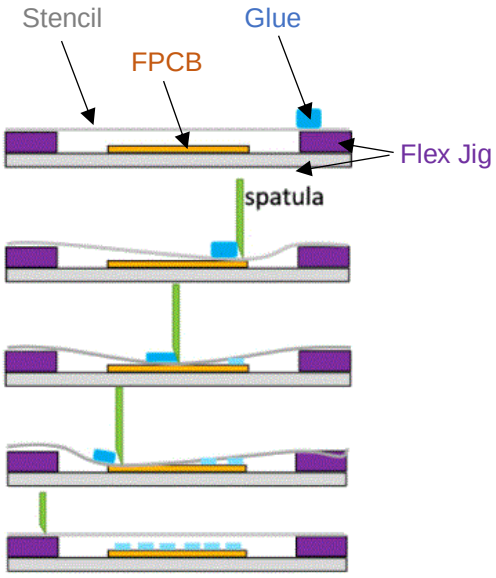


Fig.23 Adhesive application to FPCB

3.2.3 Adding Module Components

1. Fixed baremodule pos.3, on the island of the baremodule jig pos.2, move freely downwards in Z-axis (Fig.24)
2. Position Flex-Jig Pos.1 with fixed FPCB Pos.4 incl. applied adhesive pattern on baremodule jig Pos.2 (Fig.24)
3. Fix both jigs with screws & washers pos.5 and 6, pay attention to torque (Fig.24)
4. Driving baremodule pos.3 under FPCB pos.4 (Fig.24)

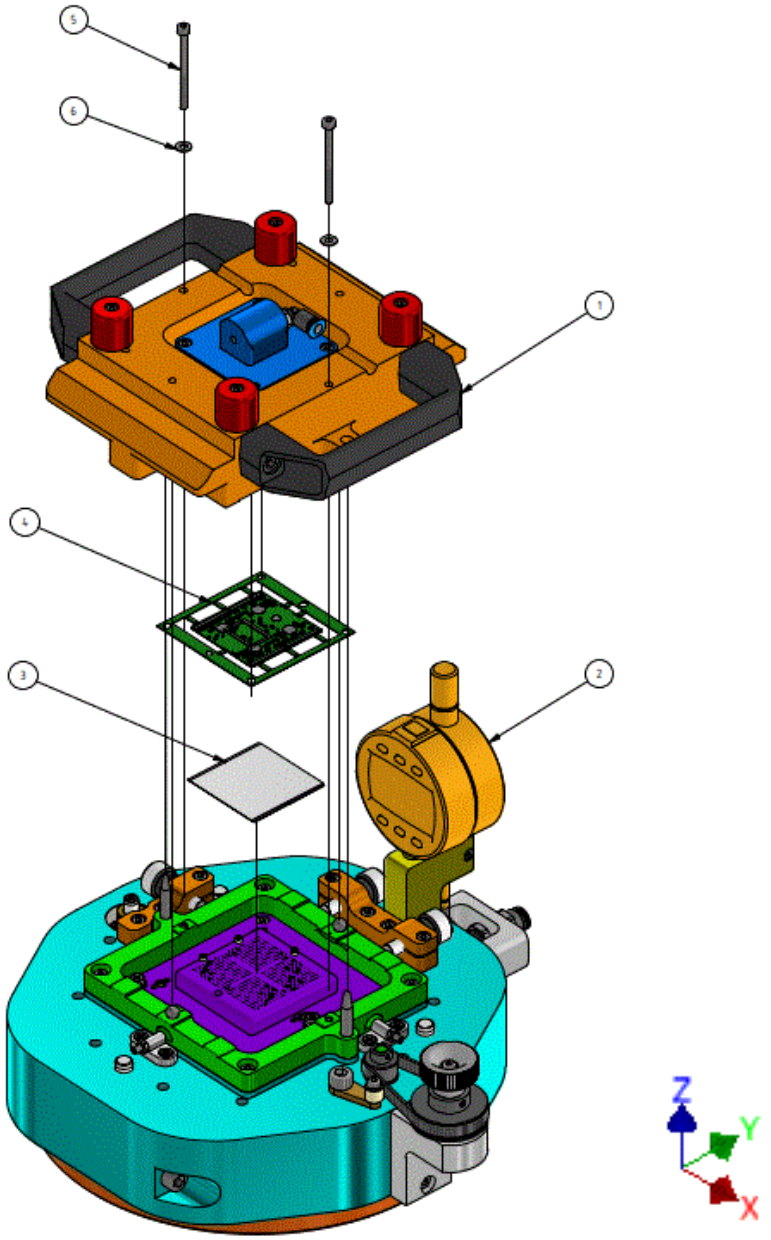


Fig.24 Baremodule jig with flex jig joining process

The detailed handling of the bonding process can be found in point 7 Operation.

4 Technical Data

4.1 Dimensions & Weight

The tool components listed in point 2.1 have a working range of approx. 2m x 1m x 0.6m (length x width x height).

Main Component	**Weight**	**Dimensions** (LxWxH)
Baremodule jig Point 3.1.1	5.0kg	25c m x 25cm x 20cm
Flex-Jig Point 3.1.3	1.3kg	16cm x 18cm x 6cm
Stencil Tool 3.1.5	1.3kg	20cm x 15cm x 8cm

4.2 Device Number

The device number and manufacturer's address are stored on each of the main assemblies.

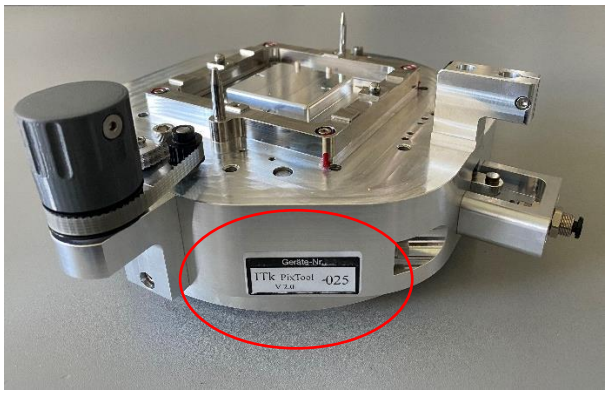


Fig.25 Baremodule jig

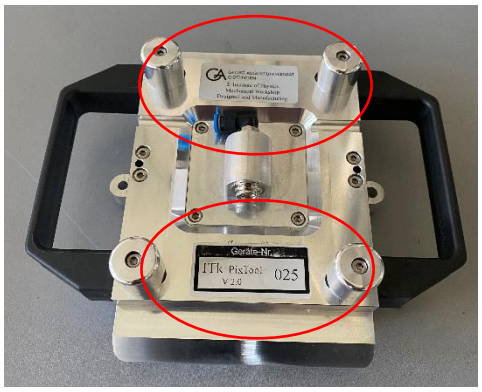


Fig.26 Flex jig

(Image)

Abb.27 Stencil-Tool

4.3 Precision

Precision indicates the positioning accuracy of the tool, without considering the module components used in point 1.1 and their geometrical tolerance deviations.

4.3.1 Horizontal Position Accuracy

This is used to determine the position of the center of the Flex-Jig Pos.3.1.3 Fig.12 to the position of the center of the island of the baremodule jigs pos.3.1.1 Fig.10 in the X and Y axes.

σ=5µm [Test basis: Cp value=1.00; @3σ] in the X and Y axes

4.3.2 Vertical Positioning Accuracy

This is used to determine the position of the contact surface of the baremodule on the baremodule chuck Pos.3.1.1 Fig. 10 to the FPCB contact surface on the flex jig Pos. 3.1.3 Fig.12 described in the Z-axis.

This determines the nominal gap thickness between the module components to be bonded.

1µm Vertical Positioning Accuracy of the Baremodule Chuck Point 2.1.1 in the Z-Axis

4.3.3 Parallelism of the slit

Parallelism between baremodule chuck bearing surface pos.3.1.1 Fig.10 for the baremodule and FPCB bearing surface of the flex-jig pos.3.1.3 Fig.12.

This determines the homogeneity of the gap thickness between the contact surfaces of the module components.

σ=2.7 µm [Test basis: Cp value=1.00; @3σ] in slit parallelism

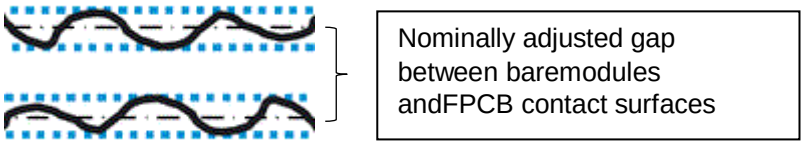


Fig.28 Parallelism deviation by given glue gap Punk1 Fig.3 (glue thickness)

4.4 Spring-loaded Baremodule Chuck

When delivered, the force with which the baremodul chuck pushes upwards is 525g (tolerance +/-50g).

This force is applied by a spring, which is mounted in the baremodule jig below the baremodule chuck. If the island is moved downwards, the spring force increases by approx. 2.1 N/mm.

This force acts only in the period when the medium (i.e. glue) is pressed in the gap to the desired layer thickness. As soon as this is reached, the force only acts on its defined point of application and no longer on the medium and the module components.

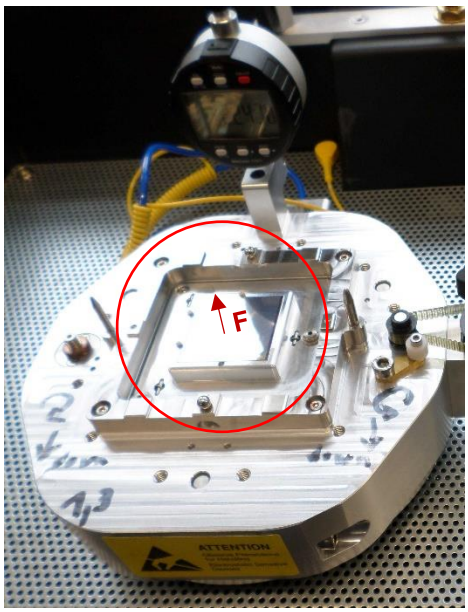


Abb.29 Force visualization baremodule chuck

Important to note:

In the case of a significant change in the module thickness, it should be noted that the kinetic force with which the adhesive is compressed to the desired layer thickness increases accordingly and the resulting force acting on the module for a short time increases.

4.5 Ambient Conditions

4.5.1 ESD Requirements

When using the tool, the specified ESD requirements of the module components must be complied with in order not to damage the module components due to electrostatic charge.

4.5.2 Cleanroom Requirements

When using the tool, the specified cleanroom requirements according to ISO7 must be complied with as well as appropriate work measures to ensure the function of the tool and its accuracy.

5 Installation and Commissioning

5.1 Installation Dial Gauge

The dial gauge is guided with its shaft into the bore of the holder as far as it will go, the display is turned in the user's direction and fixed with the transverse screw Metric3mm by means of 1Nm torque.

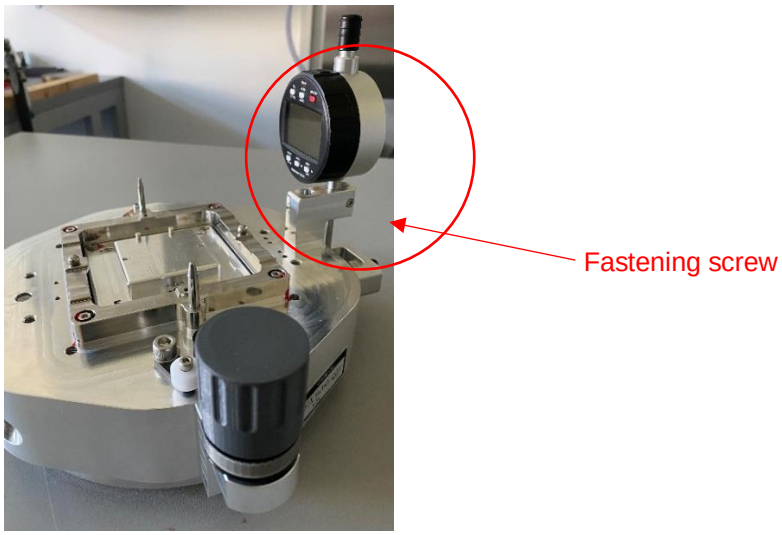


Fig.30 Dial gauge on baremodule jig

5.2 Vacuum Fittings

It must be ensured that a system vacuum of 70mbar is guaranteed on the two jigs during operation with a vacuum volume flow of 2m³/h to ensure an appropriate fixation of the module components.

The tool has the following vacuum connections for hoses with an outer diameter of 4mm. Each jig must be able to be evacuated and ventilated separately through this connection.

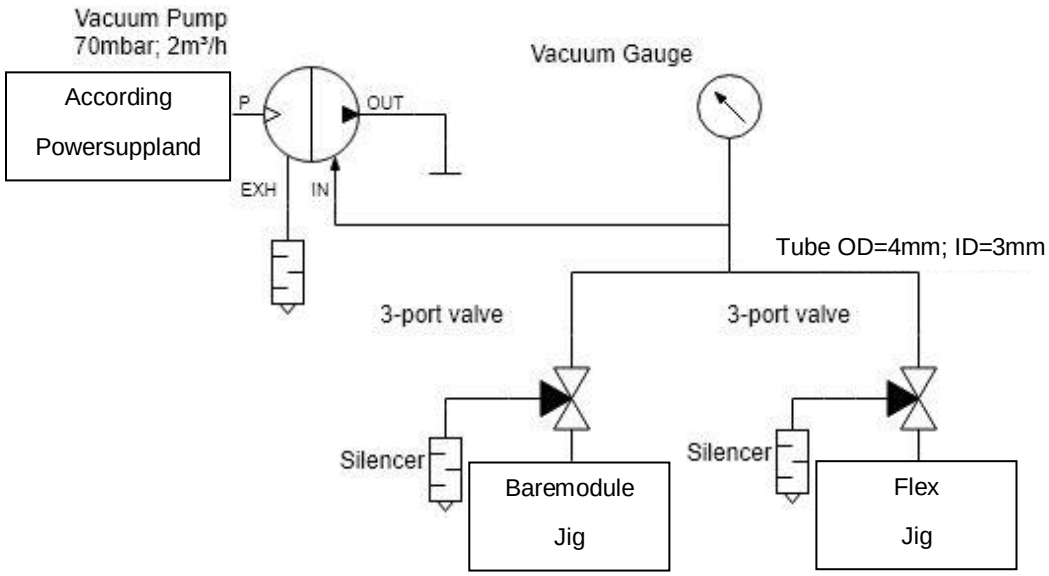


Fig.31 Vacuum plan (see also appendix)

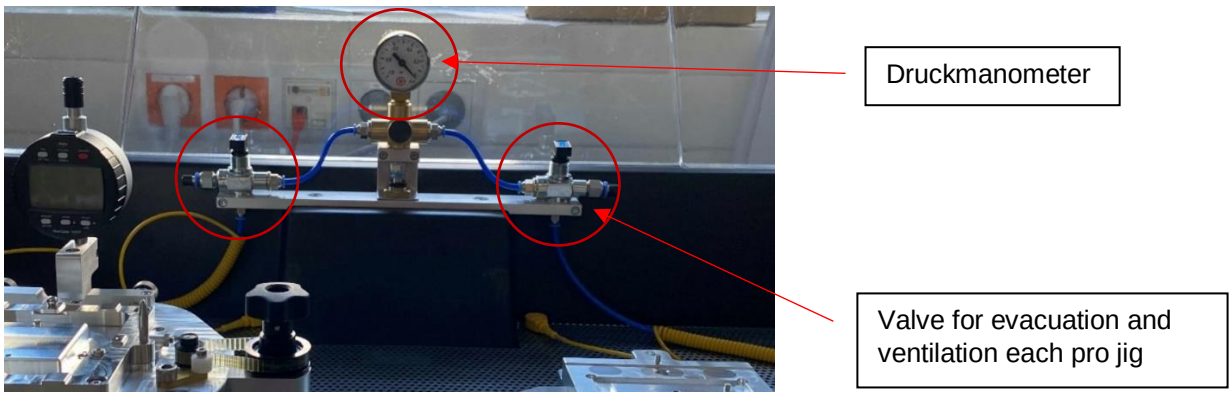


Fig.32 Vacuum fittings

Fig.33 Vacuum pump

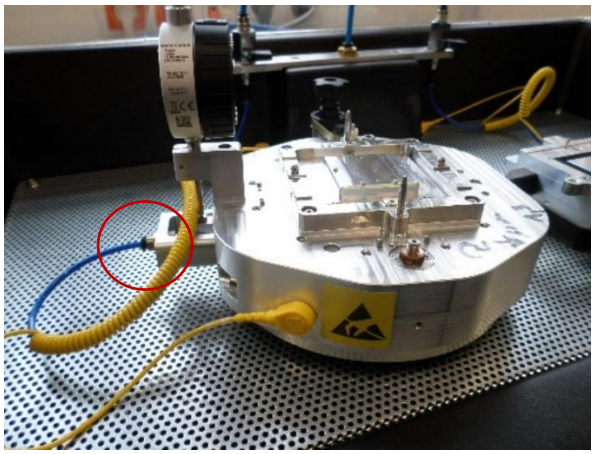


Fig.34 Vacuum connection baremodule jig

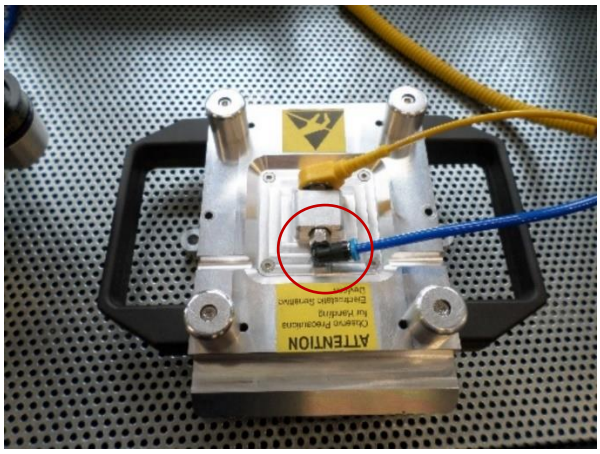


Fig.35 Vacuum connection flex jig

5.3 ESD-Safety

It must be ensured throughout the workplace that the specified ESD safety is guaranteed.

Accordingly, male cable interfaces (6 mm OD) are provided on the baremodule jig and the flex jig ESD and must be connected with a female cable adapter (6mm ID) with grounding source in accordance with the ESD directive.

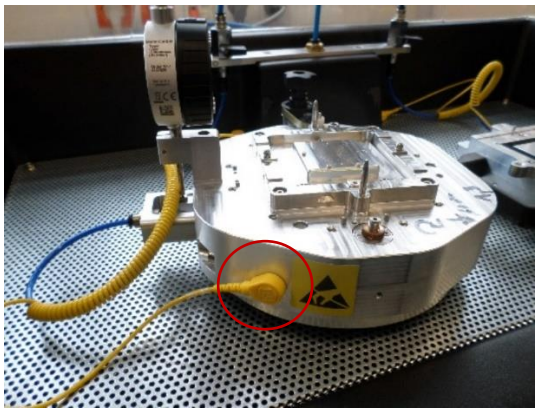


Abb.36 ESD-Anschluss baremodule jig

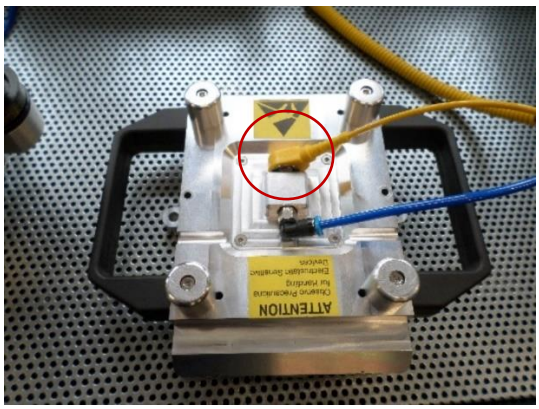


Abb.37 ESD-Connector Flex jig

5.4 Cleaning Tool

After the tool has been delivered, the tool components must be cleaned accordingly before commissioning in order to ensure the necessary cleanliness of the relevant surfaces after shipping.

The following procedure is to degrease or wipe the respective contact surfaces with isopropanol and lint-free cloth and blow them off with compressed air (approx. 1 bar). Please refer to the following pictures.

Fig.38 Cleaning baremodule jig contact surface

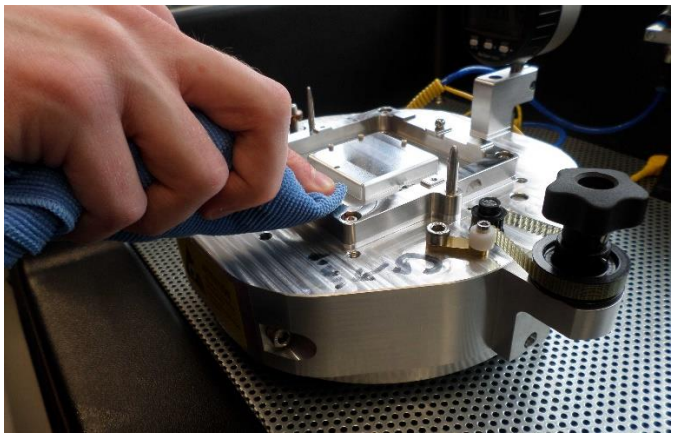


Fig.39 Cleaning flex jig contact surfaces

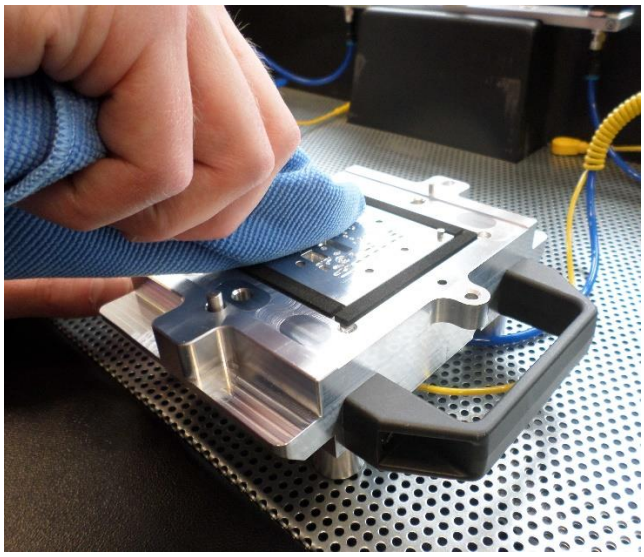


Fig.40 Cleaning surface FPCB (Flex)

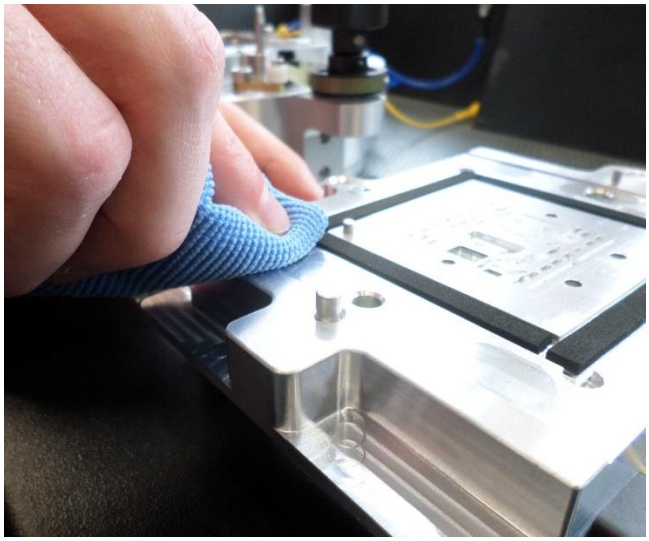


Abb.41 Locating stencil tool

(Image)

Abb.42 Locating surfaces stencil tool

6 Required Tools

The following tools, including the tool components mentioned in point 3.1, are required for the operation of ITkPixToolV2.0:

6.1 Included tools

- Allen SW 1/16 inch for adjusting the gap (adhesive gap) between baremodule and flex jig

Fig.43 Allen SW 1/16inch

6.2 Tools not supplied

- Vacuum gripper for gripping and moving the module components

Fig.44 E.g. Vacuum gripper

- Torque screwdriver with 0.3Nm torque incl. corresponding bit SW 2.5mm for tightening the screws Fig.24 Position 3.2.3 connecting baremodule and flex jig

Fig.45 E.g. Torque screwdriver 0.3Nm with corresponding bit SW2.5mm

- Stencil for glue position incl. pen for marking the glue line or its area in which the applied amount of glue must be located (dimensions of the template can be found in the drawing in the appendix)

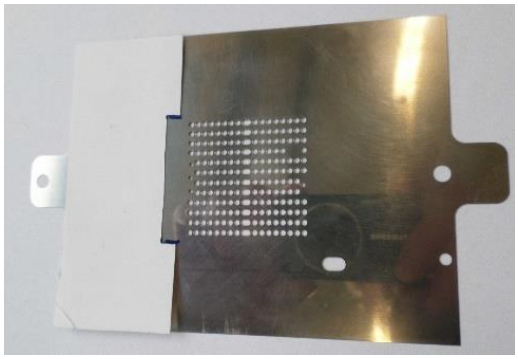


Fig.46 Marking template (white it sheet)

- Glue gun with glue cartridge and glue nozzle for applying the glue inside the stencil to the flex

Fig.47 Glue gun with glue nozzle

7 Detailed Operation

7.1 Preparation of the workplace

- Ensure vacuum connections (according to point 5.2)
- Ensure ESD protection (according to point 5.3)
- The bearing surfaces of the tool (in accordance with point 5.4) must be free of impurities and particles
- Provide the necessary tools (according to point 6)
- Provide module components (according to point 1)
- Module components must be cleaned and free of greases/oils, as well as contamination by foreign particles

7.2 Positioning and fixing module components

- Place baremodules at baremodules chuck on surface

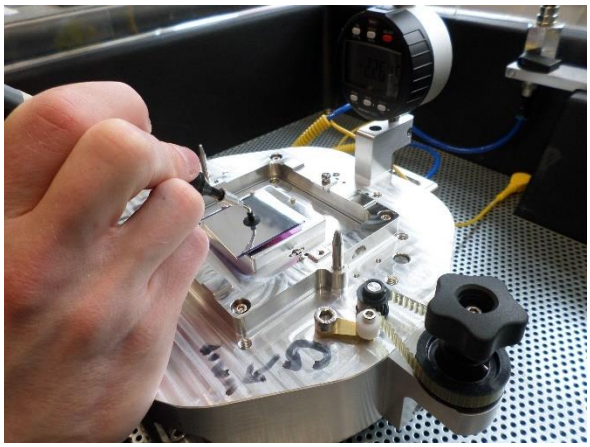


Fig.48 Positioning of baremodules at pins

- Push the baremodule slightly against the three alignment pins and activate the vacuum on the baremodule jig (make sure that the baremodule edges touch the PEEK pins during evacuation)

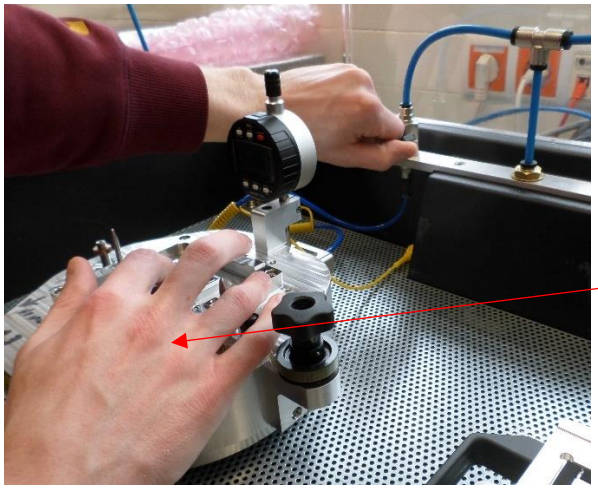


Fig.49 Positioning baremodule & jig evacuation

- Turn the knob counterclockwise to the end (the knob may be overturned in the respective direction to determine the end point, there is a slipping clutch inside)

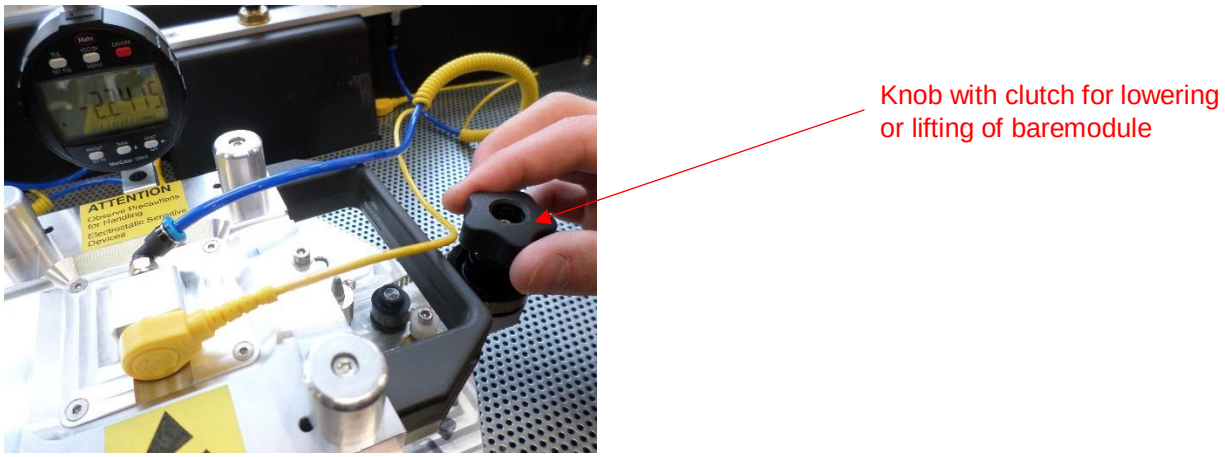


Abb.50 Move down baremodule chuck

- Place the FPCB with SMD side down on the flex jig, insert the upper right hole of the FPCB frame into the flex jig with the upper right alignment Pin and do the same with the slotted hole at the bottom left of the FPCB frame and the alignment Pin the lower left of the flex jig

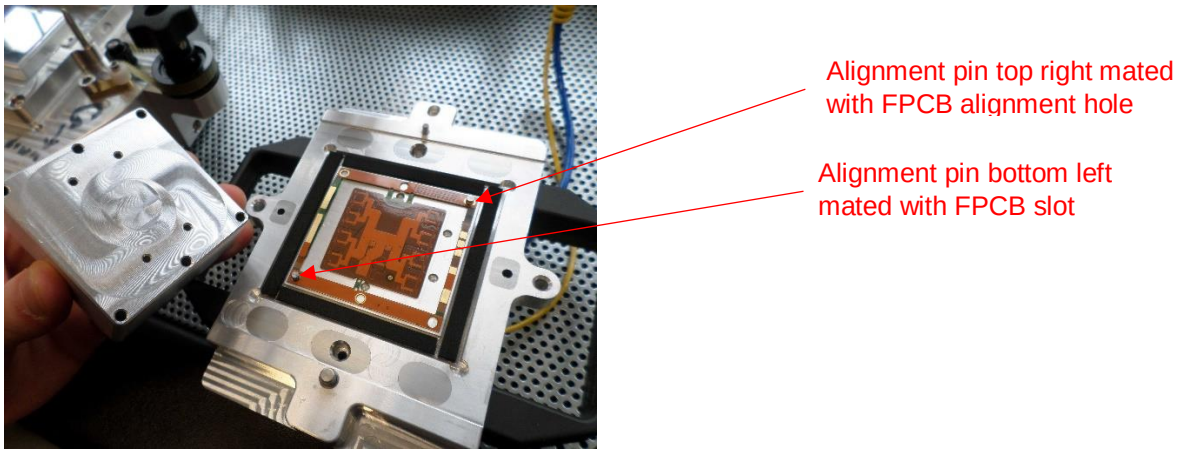


Fig.51 Positioning FPCB on Flex Jig

- Place Loading on the FPCB and weigh it down, using the two alignment pins of the flex jig as a positioning aid and evacuating the flex jig while doing so
- Then remove the load again

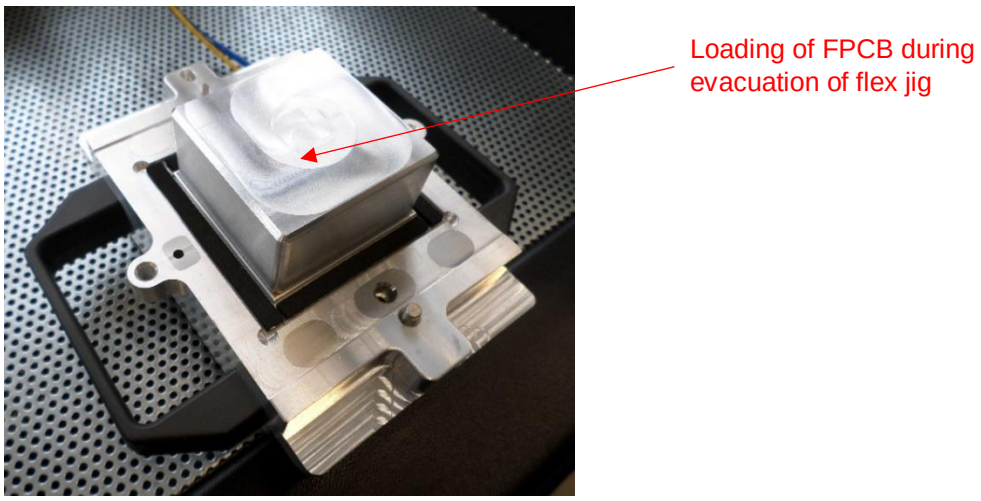


Fig.52 FPCB weigh down and evacuate flex jig

7.3 Adjusting Adhesive Gap

- Turn the fine screw with Allen SW 1/16 counterclockwise to the end

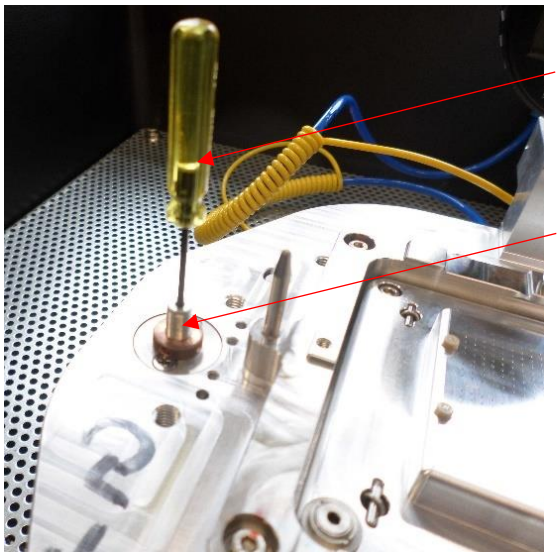


Fig.53 Preparation for fine screws

- Set dial gauge to zero

Fig.54 Dial gauge zero position

- Turn the knob counterclockwise to the end *(the knob should be overturned in the respective direction to determine the end point; inside there is a slipping clutch, which triggers as soon as the belt drive stops moving)*

(Image)

Fig.55 Baremodule chuck preparation

- Position the flex jig on the baremodule jig, insert the conical pins of the baremodule jig into the tabs of the flex jig and place them slowly, parallel to the frame of the baremodule jig, so that the two balls of the baremodule jig frame are inserted into the bore and the slotted hole of the flex jig can be positioned
- Insert both mounting screws with washers into flex jig and tighten by means of 0.3Nm

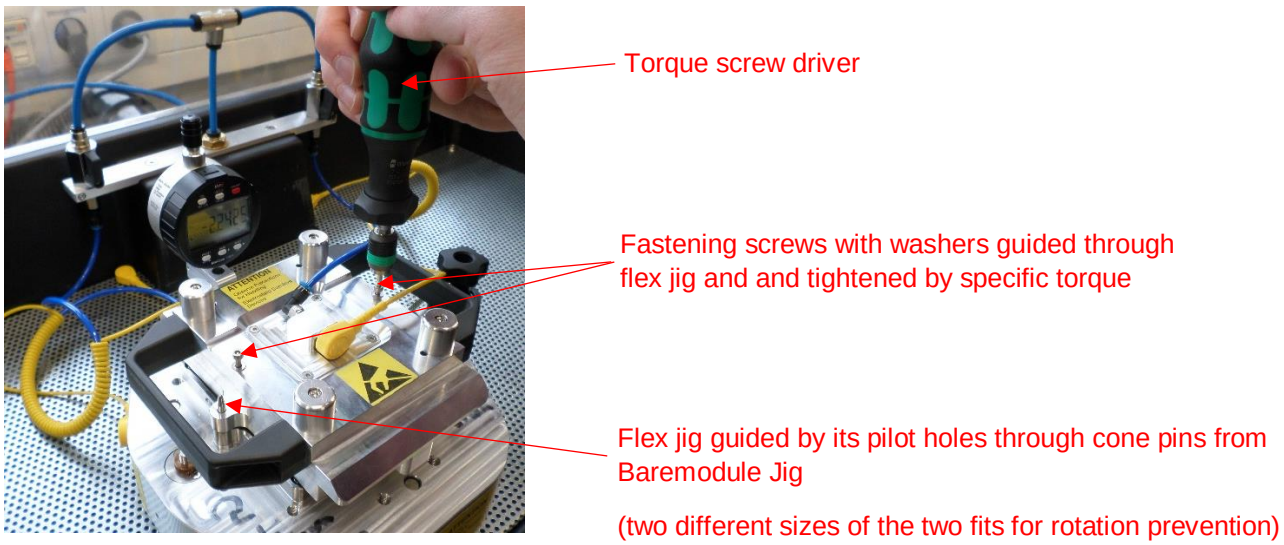


Fig.56 Flex jig positioning on baremodule jig

- Turn the knob counterclockwise to the end to lift the baremodules or move against the FPCB (the knob should be overturned in the respective direction to determine the end point; inside there is a slipping clutch, which triggers as soon as the belt drive stops moving)

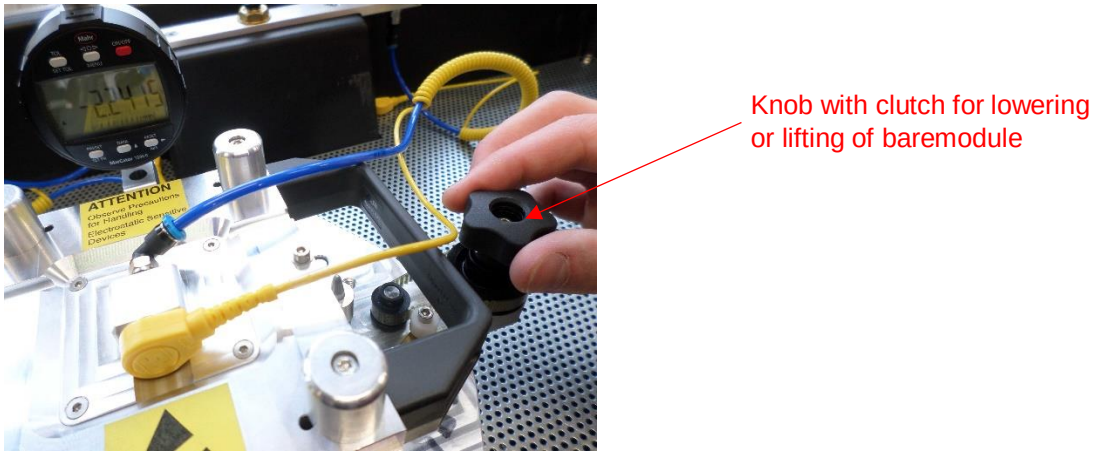


Fig.57 Lift up baremodule chuck

- The dial gauge must show display value with a negative sign to indicate that the baremodule is directly attached to the FPCB and that there is no gap between the components
- Then set the dial gauge to zero as a reference

Fig.58 Minus value dial gauge

Fig.59 Zero position gap

- Turn the fine screw with Allen SW 1/16 clockwise to the end until the dial gauge shows the desired value for the adhesive gap, this must be a value with a negative sign.
- Care must be taken to ensure that no axial pressure is exerted on the screwdriver, as this falsifies the measured value during adjustment (play in the thread). This means that the measured value must be checked again for correctness after removing the screwdriver.

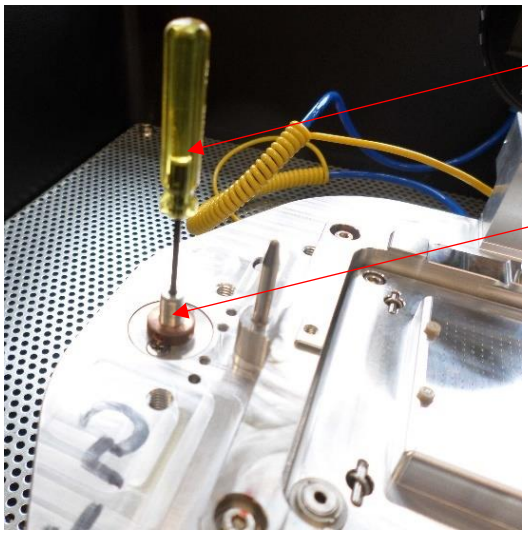


Fig.60 Adjustment of adhesive gap on fine screw

- Loosen the two mounting screws with washers on the flex jig, remove and remove the flex jig from the baremodule jig. Th e it is important to make sure that the flex jig is lifted upwards.

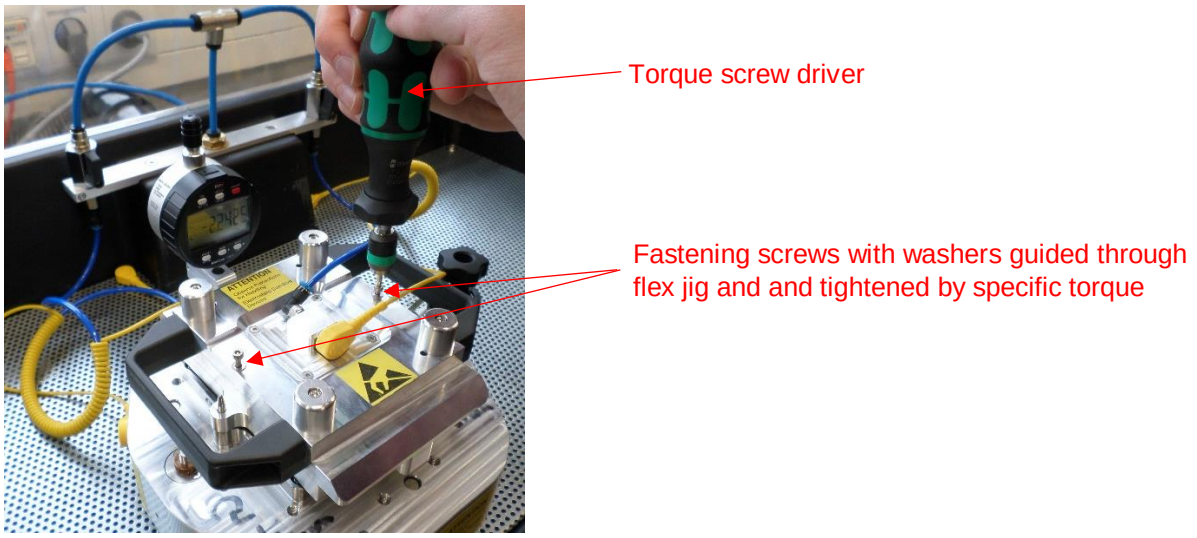


Fig.61 Removing the flex jig from the baremodule jig

- Turn the knob counterclockwise to the end (the knob should be overturned in the respective direction to determine the end point; inside there is a slipping clutch, which triggers as soon as the belt drive stops moving)

(Image)

Fig.62 Baremodule chuck preparation

7.4 Apply Adhesive to FPCB

- Cleaning the stencil or by degreasing with isopropanol and a foot-free cloth, the stencil must then be free of any residues such as fats, oils or microparticles in order to produce an optimal bonding result
- Then blow off a little with compressed air to remove any lint

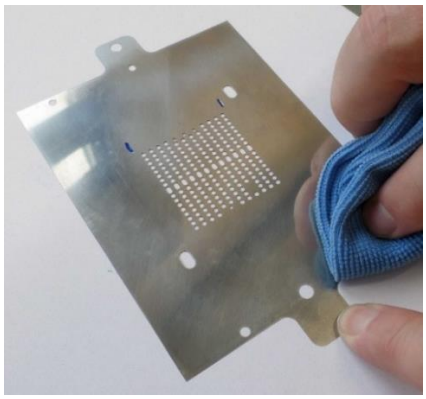


Fig.63 Degreasing stencil

- Use a stencil to mark the area where the glue needs to be applied

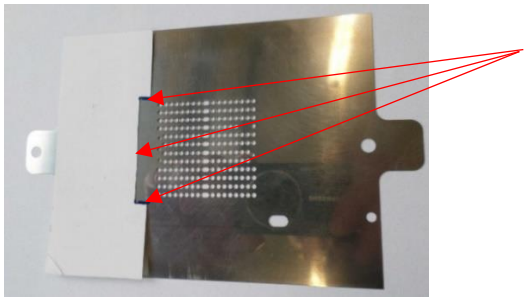


Fig.64 Marking the adhesive area

- Apply the glue as a defined line in front of the glue pattern, making sure that the glue is applied evenly between the markings with a thickness of about 3-4mm. Care must be taken to ensure that the applied glue does not contain any air bubbles.
- The stencil with the adhesive applied should then be weighed as a check to ensure that sufficient glue has been applied. (approx. Xmg Glue)

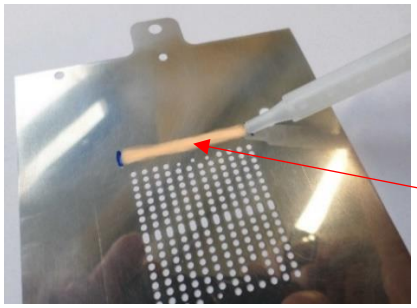


Fig.65 Apply adhesive between markings

Fig.66 Weigh stencil + glue

- Position the stencil on the flex jig, where the stencil is positioned by means of its bore and groove by the guide pins of the flex jig. These have different diameters to prevent axial twisting.
- In addition, it is important to make sure that the free grooves of the stencil coincide with the alignment pins of the FPCB. This also serves to prevent axial twisting.

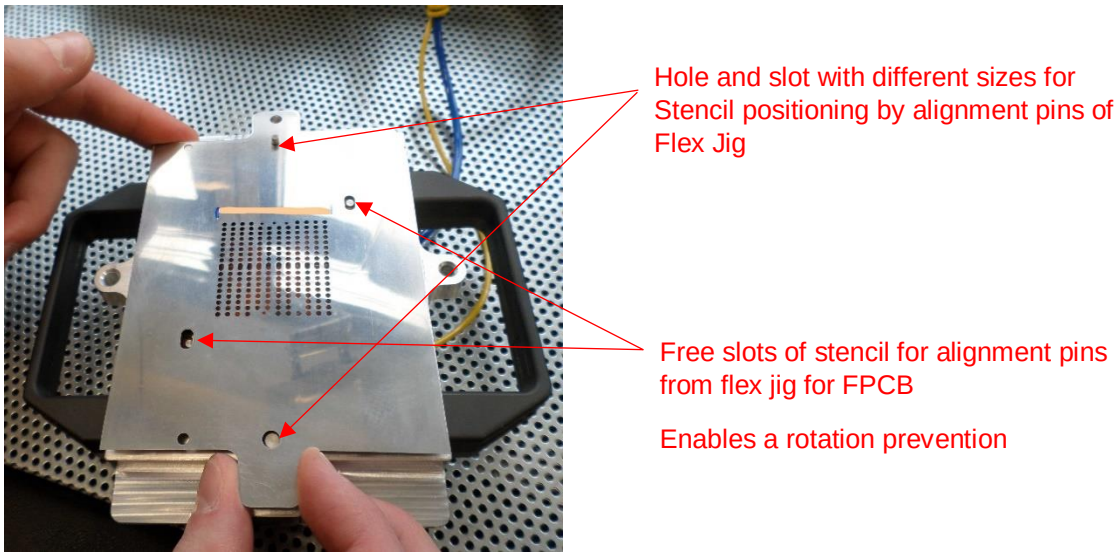


Fig.67 Position stencil with glue on flex jig

- Open the clamping lever on the stencil tool, tilting them outwards.
- The stencil tool is placed on top of the flex jig, making sure that the guide bushes of the stencil tool match the guide pins for the stencil with their different diameters.
- Clamping levers on the stencil tool are closed, and they are tilted inwards. Care must be taken to ensure that they are tilted completely inwards.

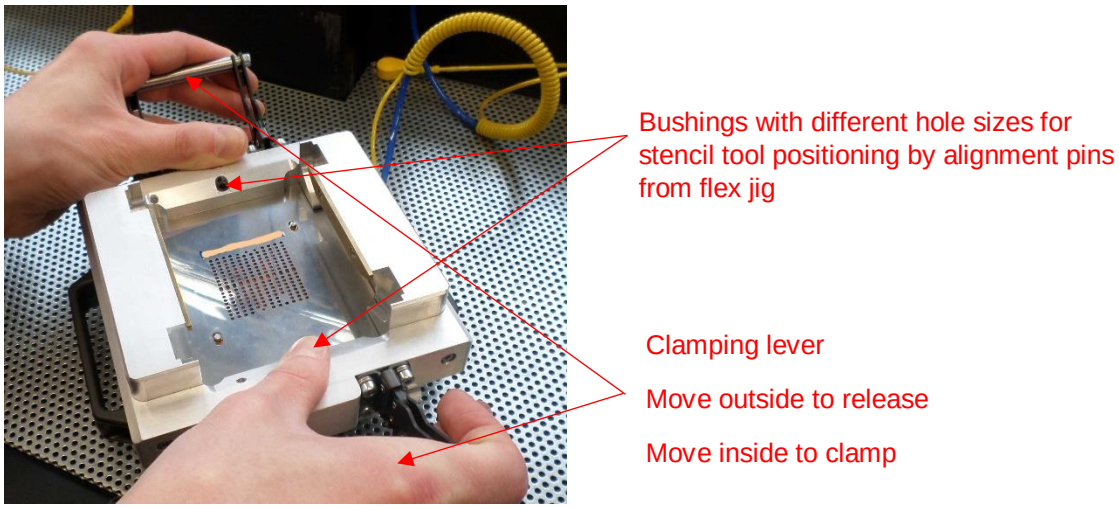


Fig.68 Positioning the stencil tool on the flex jig

- The spatula is inserted into the stencil tool and passed over the adhesive pattern of the stencil at a steady speed over a period of 15-20 seconds
- It is important that the filler always rests on the entire surface of the stencil and does not tip over, so that it is ensured that the positioned adhesive on the stencil is completely pulled along

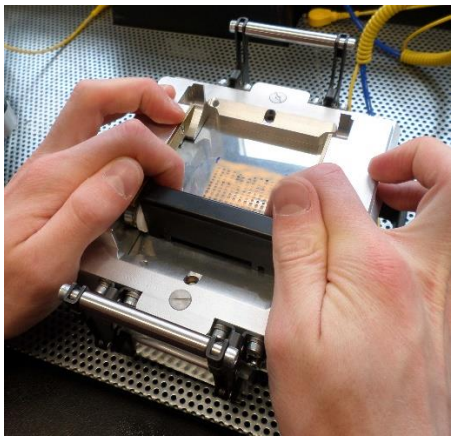


Fig.69 Applying adhesive to FPCB through stencil

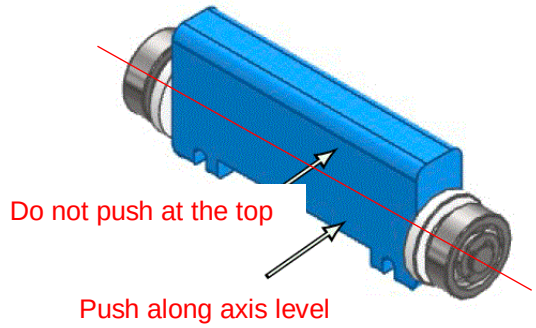


Fig.70 Avoid tilting the spatula

- The stencil tool is released by moving the clamping outwards and then removing it upwards
- The stencil is removed from the flex jig upwards, making sure that the stencil is not pressed into the applied adhesive pattern, but is now carefully lifted upwards

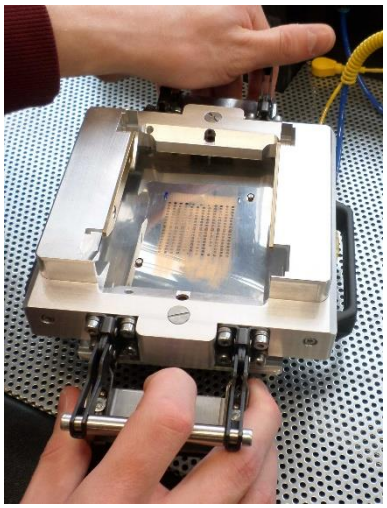


Fig.71 Removing the stencil tool

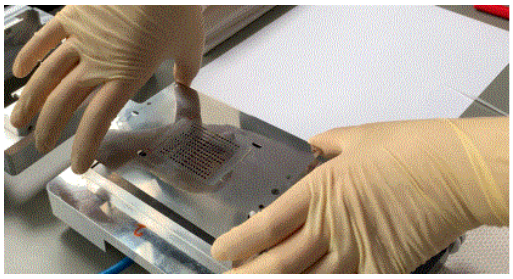


Fig.72 Removing the stencil from flex jig

- To check, the FPCB should then be weighed again to ensure that the necessary amount of glue is on the FPCB (approx. Xmg Glue +/-Xmg)

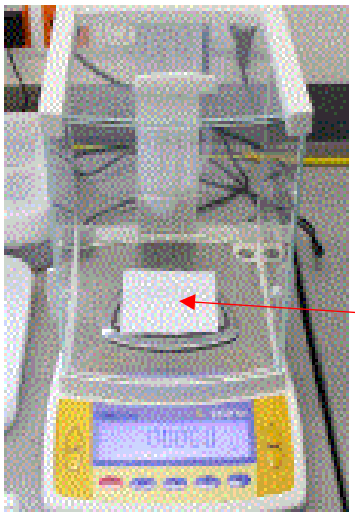


Fig.73 Weighing of the liver on the FPCB

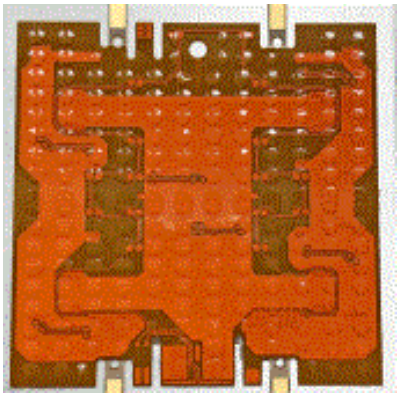


Fig.74Glue pattern on FPCB

- The putty knife must be thoroughly cleaned of all adhesive residues, this must be done immediately after gluing to prevent the glue from hardening on the spatula. Care must be taken to ensure that no adhesive gets into the area of the rotating components, e.g. ball bearings, spacers or axles of the putty.
- The stencil must also be thoroughly cleaned of all glue residues, this should also be done immediately after gluing in order to prevent the adhesive from hardening at the stencil. Care must be taken to ensure that no adhesive sticks to the holes and their walls.

Fig.75 Cleaning spatula

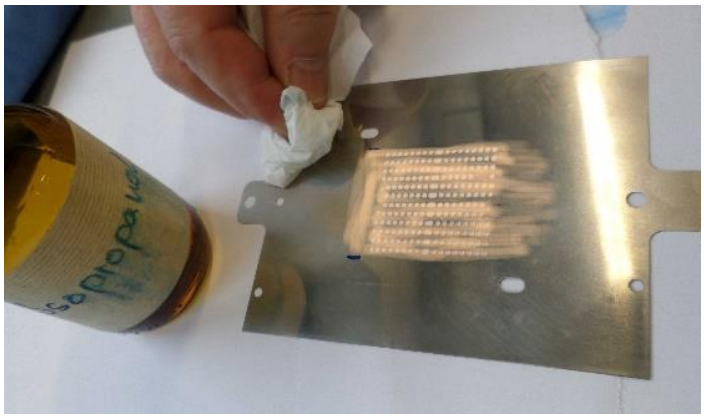


Fig.76 Stencil pre-cleaning

For a more detailed description under the following link is a video that was recorded during the prototype phase

https://cernbox.cern.ch/files/link/public/qKsGztsUqnd6Zrk?tiles-size=1&items-per-page=100&view-mode=resource-table

Thorough Cleaning Stencil

An adhesive residue settles in the holes of the stencil, even after the most thorough cleaning with wipes.

This changes the clear diameter of the holes (they become smaller), thus leading to a lower amount of adhesive application and also changing the adhesive pattern.

(This can be easily checked by weighing the manually cleaned stencil after each use. It gets a few mg heavier each time).

Therefore, after every use, put the stencil in an acetone bath for at least about 5 minutes,
then clean for at least approx. 5 min in an ultrasonic bath with appropriate cleaning liquid (suitable for stainless steel material).

7.5 Joining Baremodule and FPCB

- Make sure that the baremodule chuck incl. baremodule is in the down position and that it is

(Image)

Fig.77

- Position the Flex Jig on the baremodule jig, insert the conical pins of the baremodule jig into the tabs of the Flex Jig and place them slowly and parallel on the frame of the baremodule jig, so that the two balls from the baremodule jig frame s into the bore and the slotted hole of the flex jig can be positioned
- Insert both mounting screws with washers into flex jig and tighten by means of 0.3Nm

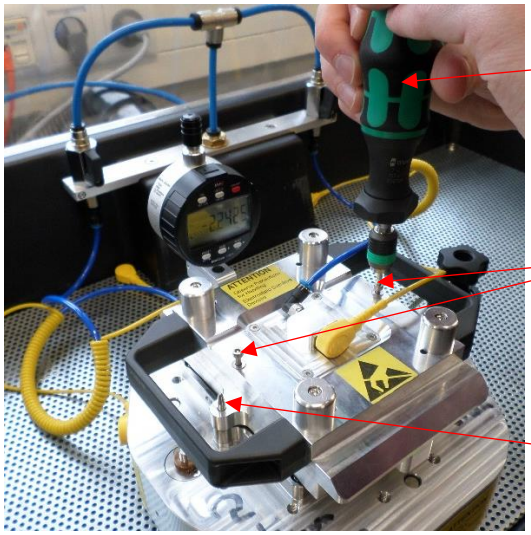


Fig.78 Flex jig positioning on baremodule jig

- Turn the knob counterclockwise to the end (the knob should be overturned in the respective direction to determine the end point; inside there is a slipping clutch, which triggers as soon as the belt drive stops moving)

(Image)

Fig.79 Baremodule chuck provision

7.6 Removal Glued Module

After the curing time specified by the manufacturer of the adhesive, the module can be removed from the tool

- Th e vacuum on the baremodule jig and ventilate the vacuum chambers of the baremodule jig by means of atmospheric pressure through a ventilation valve on the vacuum hose

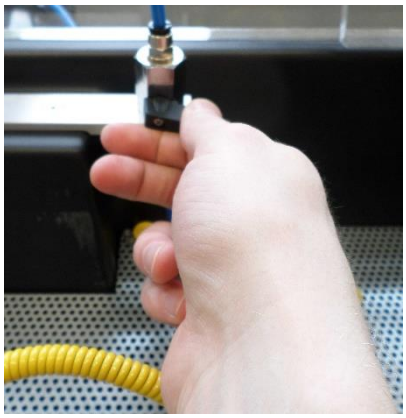


Fig.80 Ventilation flex jig

- Loosen and remove the two mounting screws with washers on the flex jig

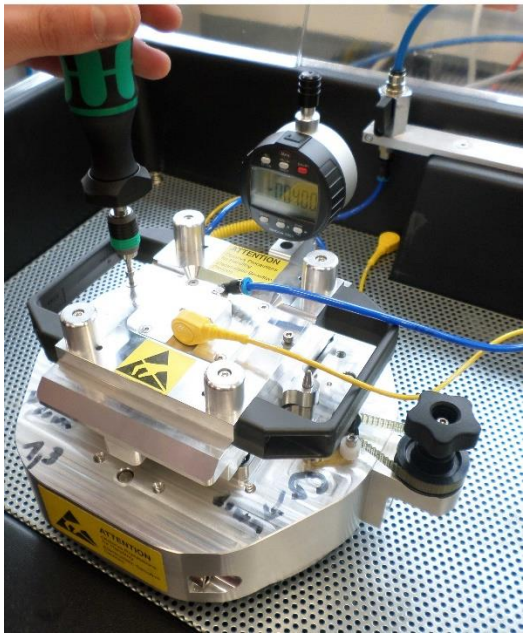


Fig.81 Loosening and removing the fastening screws

- Turn the knob counterclockwise to the end (the knob may be overturned in the respective direction to determine the end point, there is a slipping clutch inside)

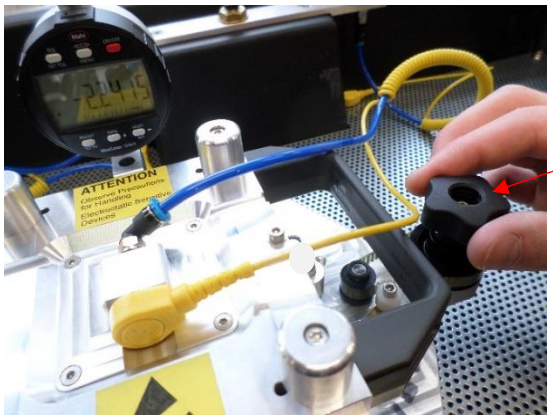


Abb.82 Move baremodule chuck downwards

- Th e vacuum on the flex jig and ventilate the vacuum chamber of the flex jig by means of atmospheric pressure through a ventilation valve on the vacuum hose

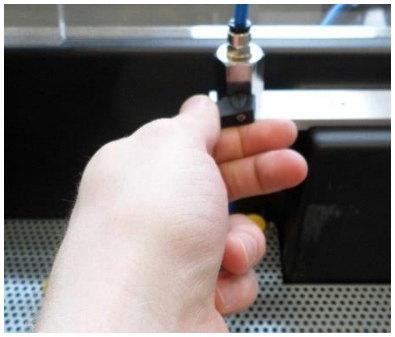


Fig.83 Aeration baremodule jig

- Removal of glued module by means of a vacuum gripper from flex jig

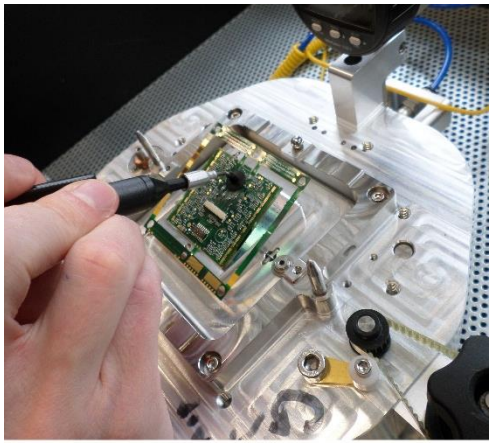


Fig.84 Removal of glued module

8 Maintenance and Servicing

8.1 Maintenance

The tool is designed in such a way that the components of the tool are not subject to regular maintenance. The entire tool is grease and oil free.

8.2 Maintenance

In order to maintain the tool, proper use is required.

In the event of functionally impairing problems, the development site of this tool (II. Institut of Physics Göttingen, Precision Mechanics Workshop) should always be contacted in order to rectify the problem and ensure that it works again. Please indicate the device number (point 4.2).

Georg-August-University

II.Institute of Physics Göttingen

Precision Mechanical Workshop Mr. Widera / Mr. Kanngießer

Friedrich-Hund-Platz 1

D-37077 Göttingen

8.2.1 PEEK Pins

The sensitive PEEK pins can be susceptible to wear when the baremodules is passed along the pins. This should be observed by a systematic and continuous trend deviation of the X/Y positioning of the bonded module components, as well as by visual view of abrasive wear. If this is the case, the PEEK pins should be replaced with new ones.

However, due to conducted wear studies, this is not to be expected with the number of modules to be glued per tool.

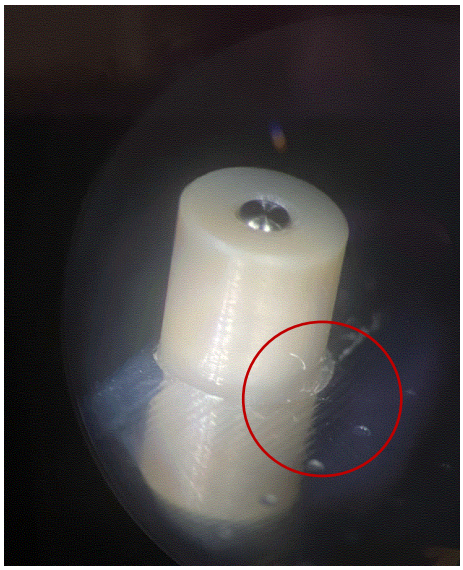


Fig.85 PEEK Pin attrition

8.2.2 Spatula

The filler must be checked regularly for signs of wear such as material removal from its floor surface. This always occurs if the stencil is not deburred at its adhesive pattern cut-outs.

Attached is a detailed description of how to deburr the stencil, if it is in the delivery condition.

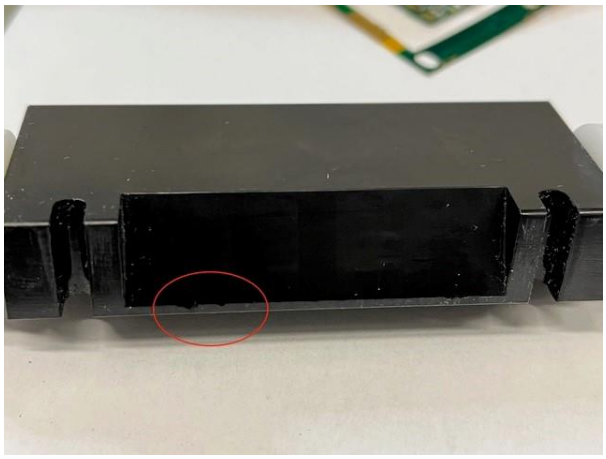


Fig.86 Residues of adhesive

9 Safety

During the handling of ITkPixToolV2.0, the generally applicable occupational health and safety measures of the respective country must be observed.

9.1 Use of glue

When using the adhesive, the safety measures or occupational health and safety measures applicable by the manufacturer in the safety data sheet must be observed.

9.2 Use of cleaning agents

When using cleaning agents, the safety measures or occupational health and safety measures specified by the manufacturer in the safety data sheet must be observed.

10 Closing Remarks

This instruction manual always corresponds to the data indicated in the footer. We always try to keep them up to date, despite the often-changing conditions within the corresponding project phases.

Accordingly, illustrations or texts are only as up-to-date as the document revision. In case of changes to the module or process requirements, it is therefore important to inform the ITkPixel coordinator of the 2nd Institute of Physics of the University of Göttingen or the associated precision mechanics workshop and the author of the document in order to keep the operating instructions up to date on the project status.

11 Appendix

11.1 Technical Documents of Modules

11.2 Unpacking- and Packing Instruction Transport box

11.3 PEEK Pin Positioning Instructions according to Baremodule Variant

11.4 Vacuum Map

11.5 Drawing Marking Template

11.6 Deburring Instruction Stencil

11.7 Cleaning Instruction Stencil