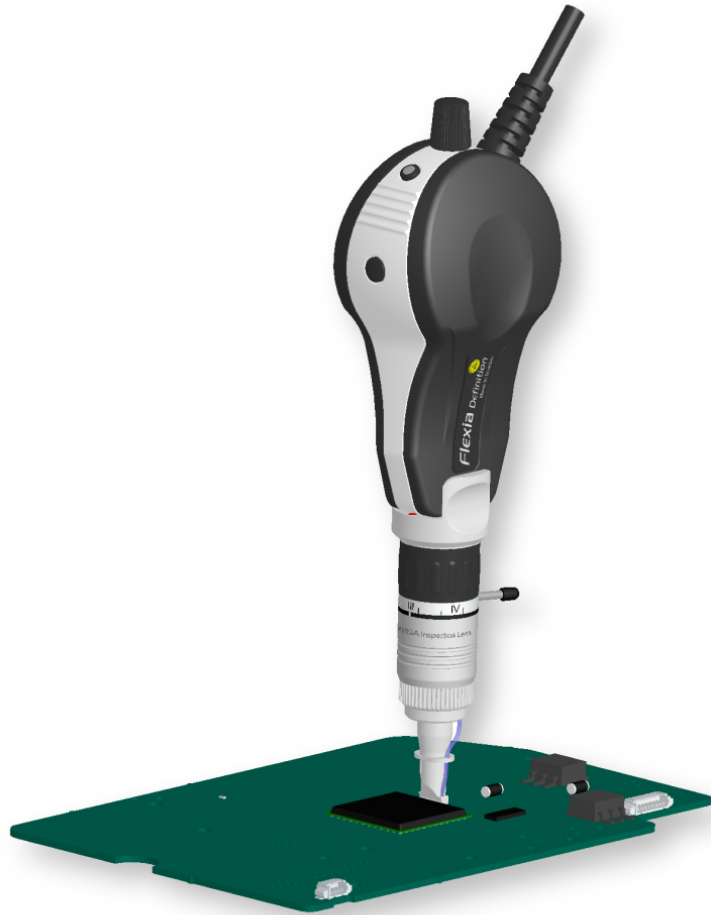


# Flexia BGA Inspection Systems



This manual describes how to use Flexia BGA Inspection System

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## 1. Safety and maintenance Instructions

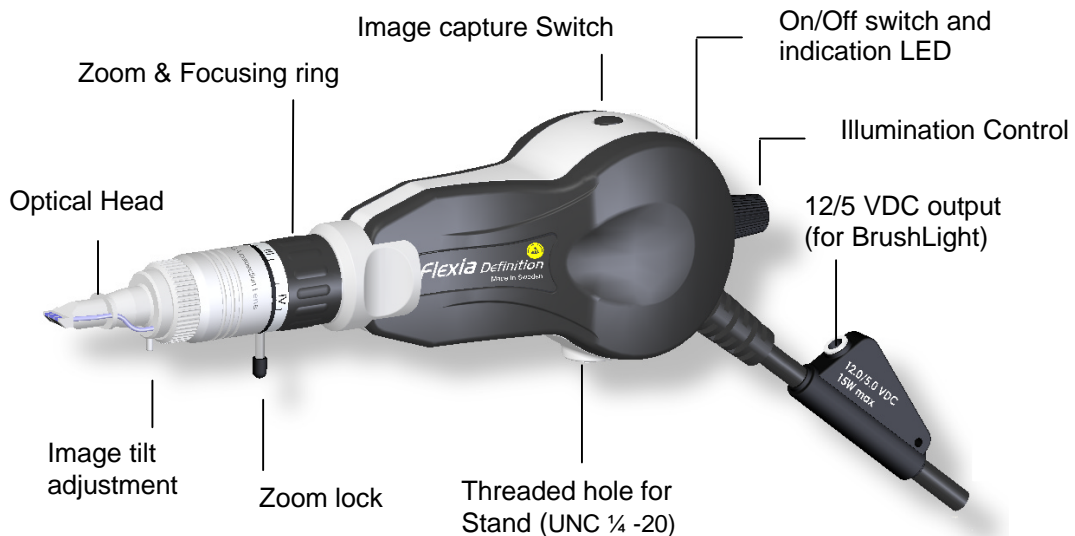
- Do not scratch or hit front edge of the side viewing prisms onto hard objects! This precaution is important especially when you operate Flexia BGA mobile ion free hand.
- Only use DC Power Sources provided or approved by Optilia.
- Only use accessories provided or approved by Optilia.
- Keep the equipment clean. Use Lens Cleaning Tissue and Pure Ethanol or Isopropyl alcohol for cleaning optical surfaces of the device.
- Never use Acetone or other similar solvents for cleaning.
- Never knock or drop the video microscope.
- Keep video microscope away from direct sun-light, heat and extreme humidity.
- Store the equipment inside case when not used.
- Protect the BGA lens, Objective lens and Zoom lens by the supplied protection Rubber Caps or store them inside their boxes when the equipment is not used.

**This equipment is a precision optical device and shall be handled with great care!**

**Be careful not to scratch or hit front edge of the side viewing micro prisms onto hard objects!**

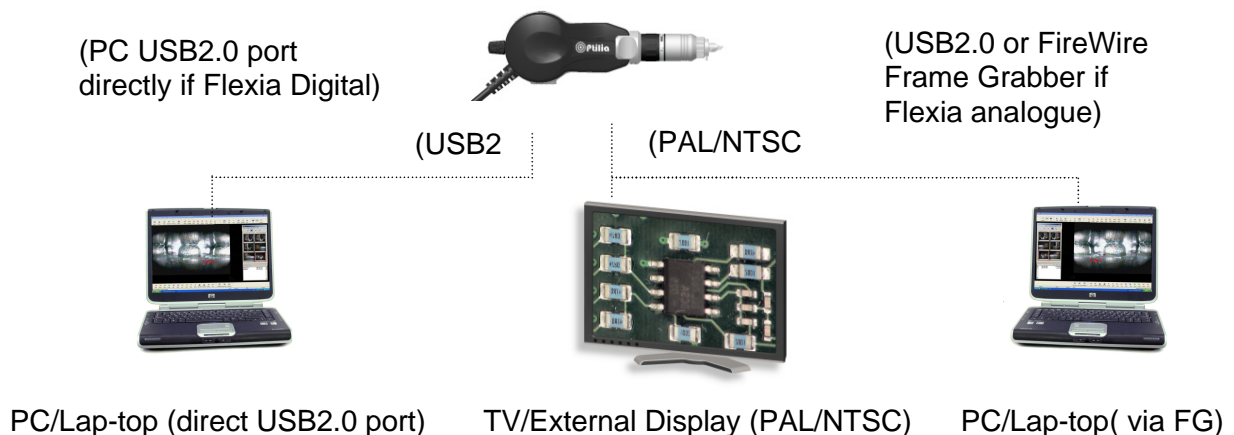
## 2. About “Flexia BGA”

Flexia BGA is a mobile Video Microscope designed for visual inspection, digital image recording and software measurements of solder joints of BGA, mBGA, CSP, Flip-Chip packages. Flexia BGA can also be used for visual control of pads, solders, components etc on PCBs in the production plants as well as in the laboratories and for R&D.



Flexia BGA analogue is directly plugged to a video monitor or TV. Flexia BGA digital is plugged to PC or laptop via USB2.0. In addition, Flexia analogue can also be connected to a Laptop or PC via Optilia’s High speed USB2.0 or FireWire Frame Grabbers.

*For installation of Flexia digital or Frame Grabber drivers to your computer please refer to instructions manual of the specific device.*

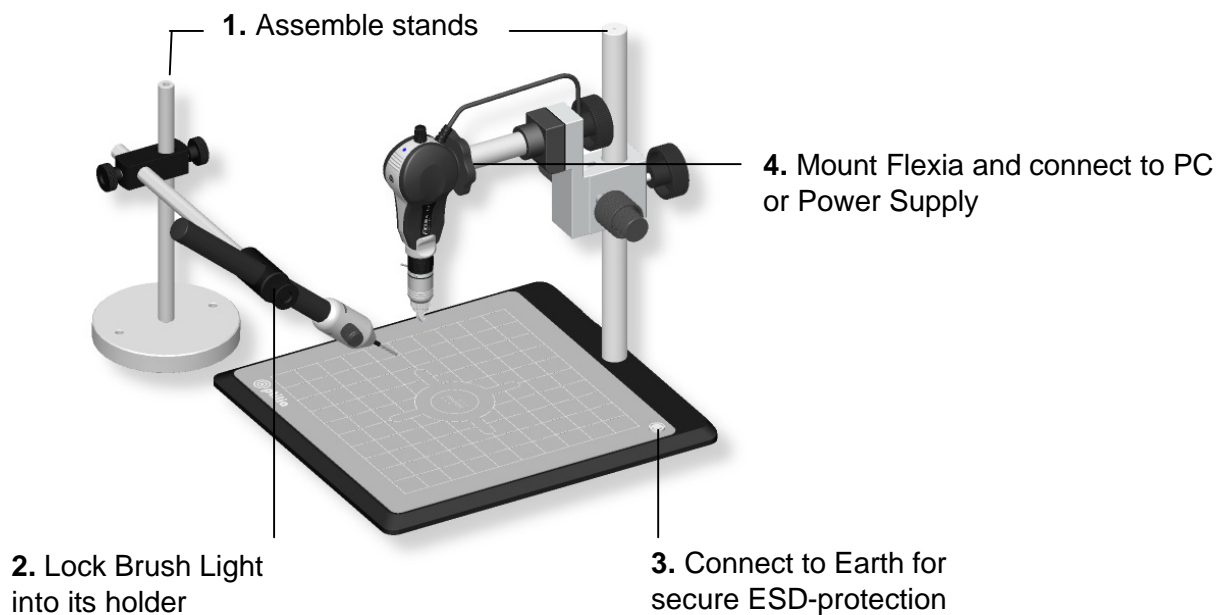


### 3. Mounting Flexia BGA

Remove the lens-protecting caps and attach the BGA lens onto the Flexia as illustrated.



Assemble Brush Light- and Focusing Stands as illustrated. Mount Flexia BGA to the stand as illustrated below. BGA lens must be aligned to the stand base at right angles precisely. Connect the dissipative mat to GND for ESD-protection. Connect Flexia to Power and monitor (if analogue sensor) or to USB2.0 port of your PC (if digital sensor). Install Flexia Digital drivers first, before connecting the device to PC.

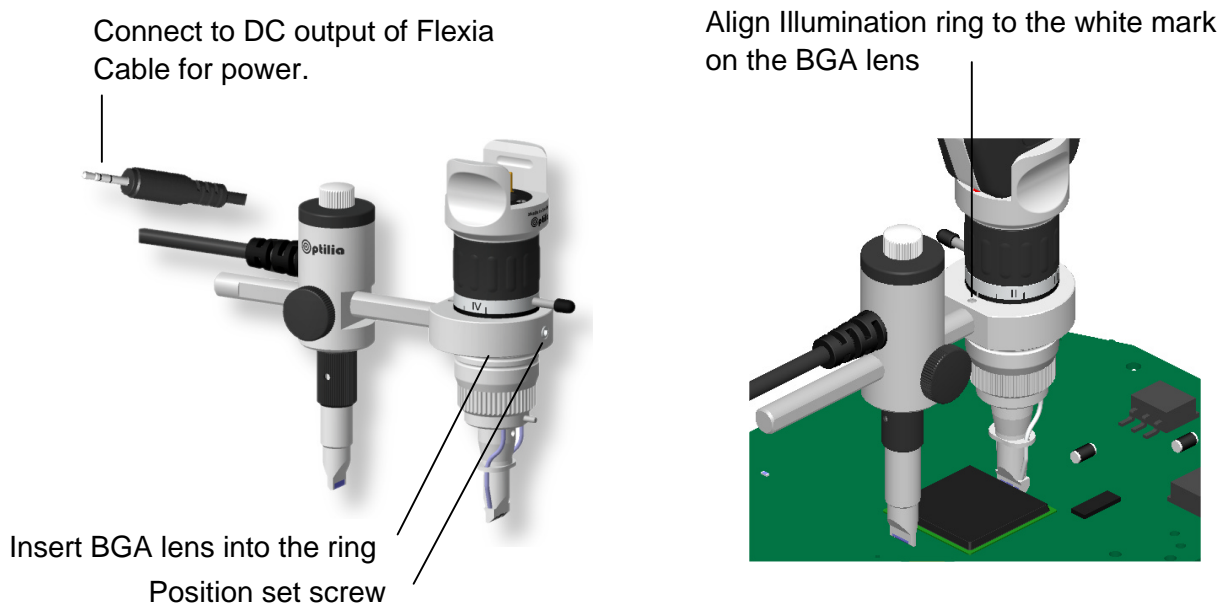


#### 4. How to attach Background Illumination

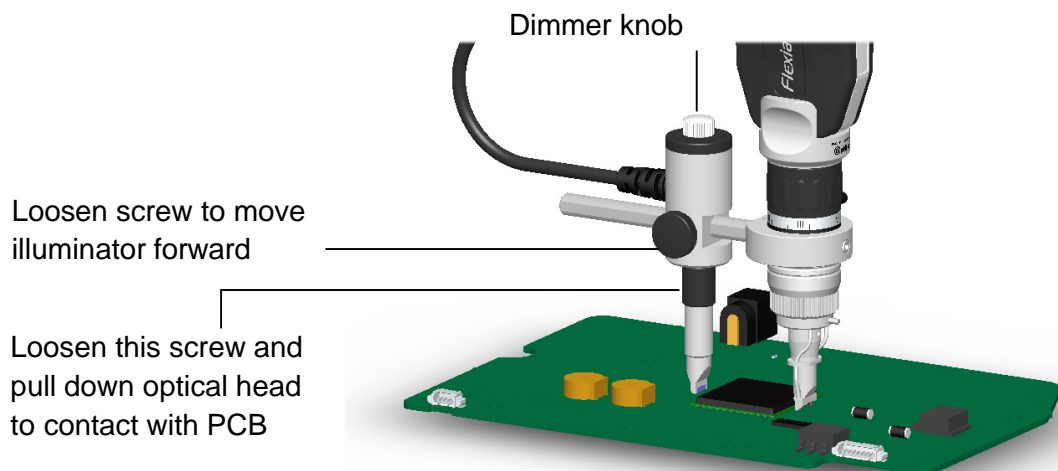
(Optional, only if you have purchased the Background illumination)

Insert BGA lens carefully into the ring of the Illumination device. Align front side of the illumination to the white mark on front side of the BGA lens and fix it by tightening the screw.

Plug the DC connector into AUX output of Flexia Cable for power.

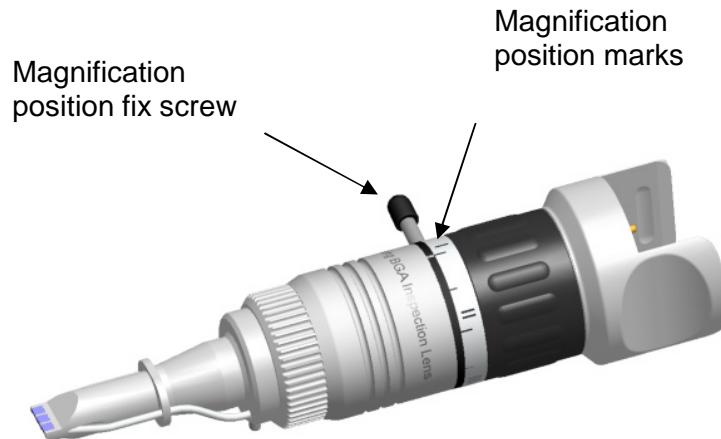


Loosen the illumination position screw to move illuminator forward/backward. Pull down optical head gently until contact with the PCB surface. Light intensity is controlled by dimmer knob.

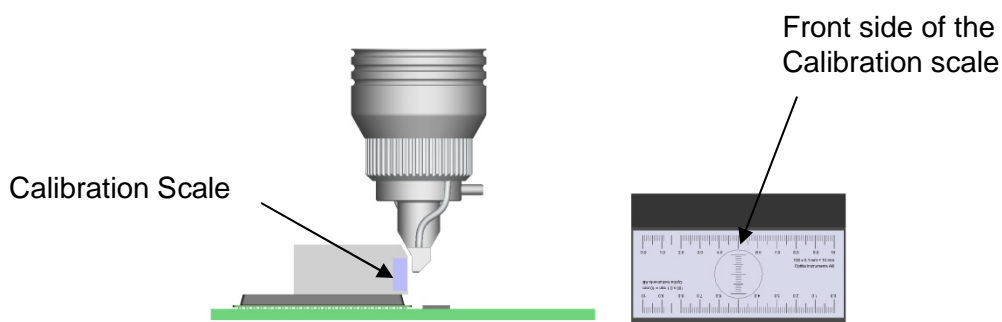


## 5. How to calibrate magnifications of BGA lens in OptiPix (Optional, only if you have purchased “OptiPix Full” software)

Zoom ring of BGA lens is marked by Greek numbers I, II, III and IV. These positions indicate different optical magnification of the lens and can be calibrated in OptiPix software to perform dimensional measurements.



- Define 4 magnifications in OptiPix. (refer to instructions manual of OptiPix for how to define magnifications).
- Put the provided Calibration Micrometer Scale on top of the BGA component (top of the die). Fix position of the Zoom ring to the first magnification and move the calibration scale forward/backward and/or sideways until you achieve a sharp picture of the printed scales on the glass substrate. If available, use of XY-table is preferred.
- Calibrate this magnification and do same procedure for other magnifications.

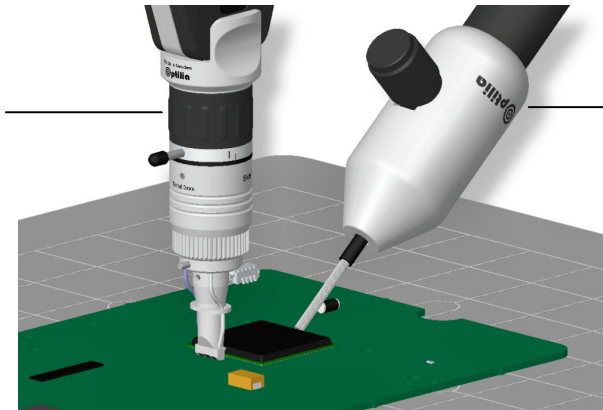


**Note:** Accuracy of the calibration (and dimensional measurements) is higher at high optical magnifications. Performing dimensional measurements is not recommended at low optical magnifications due to large depth of focus and image distortion of BGA lenses at low magnification.

## 6. How to inspect BGA solders

Turn on Flexia. Put the PCB on the stand base. Adjust height of the Rack & Pinion roughly. Use the Rack & Pinion unit to slide down Flexia to a few millimeters above the BGA package. “Fine adjust” position of BGA package against optical head of Flexia BGA and move down Flexia BGA slightly and carefully to contact with the PCB surface. Do not press BGA lens to the PCB.

1. Move down Flexia BGA gently to get in touch with the PCB surface next to the BGA package.



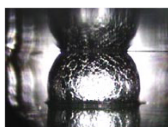
2. Tilt the Brush Light appr. 45 deg. and position tip of the optical fibers to edge of the BGA component.

Tilt the Brush-Light approximately 45° and position tip of the optical fibers to edge of the BGA component by adjusting the Brush Light Stand. Turn on the Brush Light to insert background illumination underneath BGA component. Adjust intensity of the background Illumination by turning the Brush-Light knob.

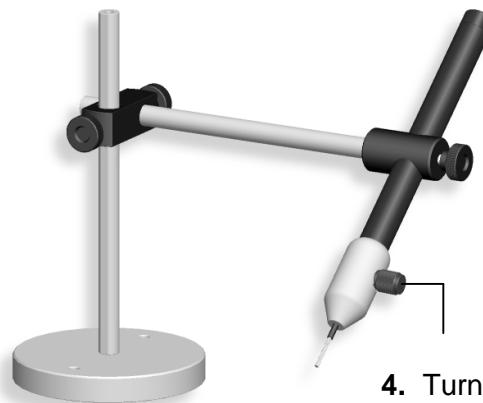
3. Loosen locking screws and move the brush light toward the BGA package.



Solder ball without background light



Solder ball with background light



DC-adaptor

4. Turn on the light and adjust illumination intensity.

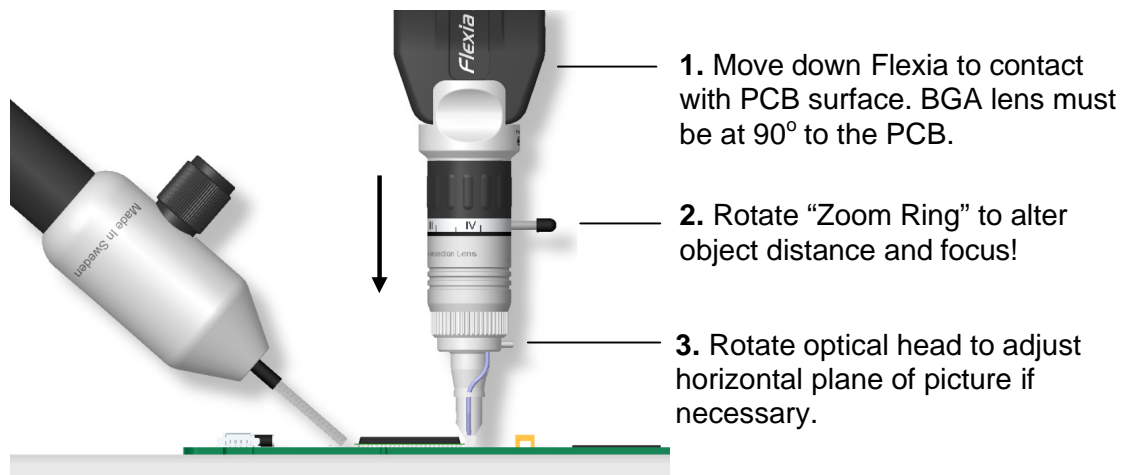
**Note:** Brush-Light is powered by battery or by Flexia. Switch battery tube with DC-adaptor (optional) and connect it to AUX output of Flexia cable to power the illumination via Flexia Cable. Power supply must be connected to Flexia Cable!



## 7. Zoom, Focus and image tilt adjustment

Image magnification as well as object distance of the BGA lens can be adjusted by turning “focus ring” of the lens. Horizontal plane of the image (Image tilt) can also be adjusted by rotating optical head of the BGA lens about its axis a few degrees.

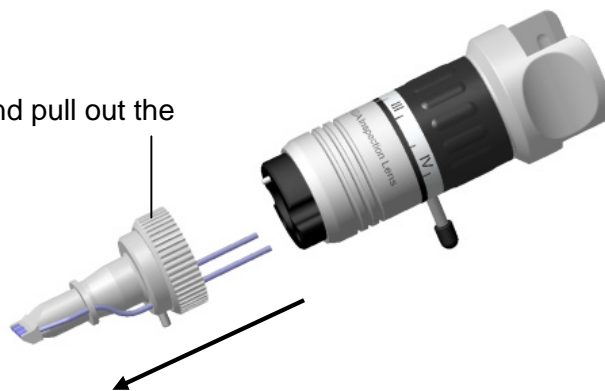
Turn the “zoom ring” in order to focus deeper underneath the BGA component.



## 8. Changing Optical Head of the BGA lens

Optical Head of BGA lens can be replaced in case of damage or aging.

1. Unscrew the ring and pull out the Optical Head



**Note:** *Micro prisms on the tip of the Optical head are protected by mechanical housing. These can still be damaged if pressed against hard edges.*





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