



Instructions Manual

INSPECTIS[®] ProX for **BGA** v7.2

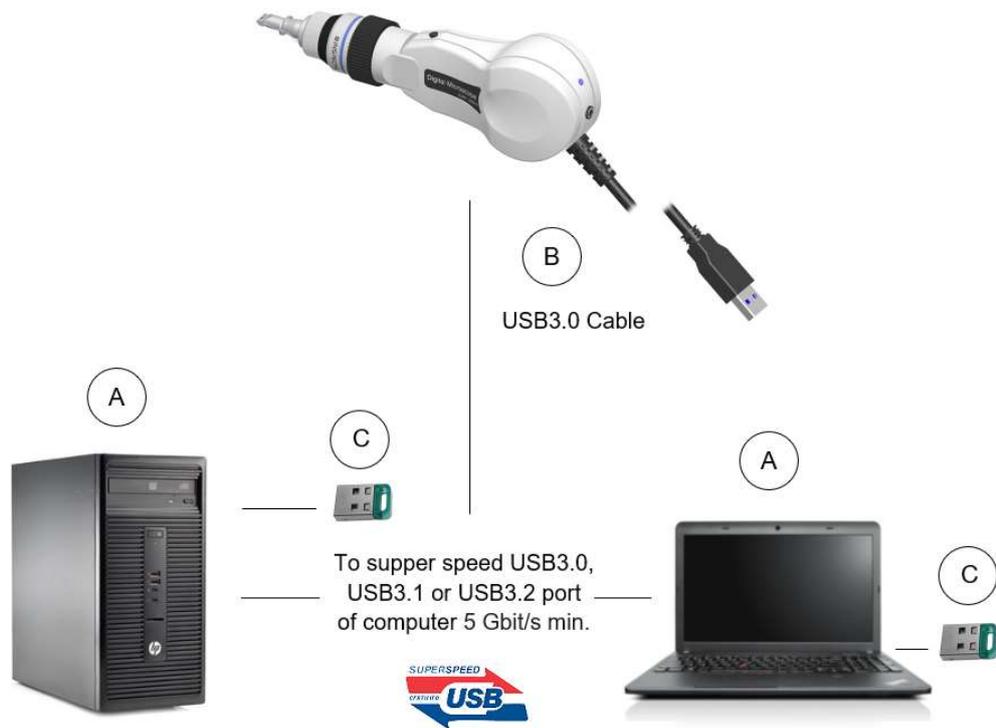
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Installation and Setup

Installing the USB Digital Microscopes

- A. Plug the Digital Camera to a free USB3.0, USB3.1 or USB3.2 port of the computer. Minimum bandwidth requirement for the USB port is 5Gbit/s.
- B. Plug the provided software protection Dongle to a free USB port of the computer. The protection dongle will be found inside the product box. Dongle is not needed if you intend to install the 15 days trial version of INSPECTIS software.
- C. Install INSPECTIS software. Refer to page 6 for detailed instructions.

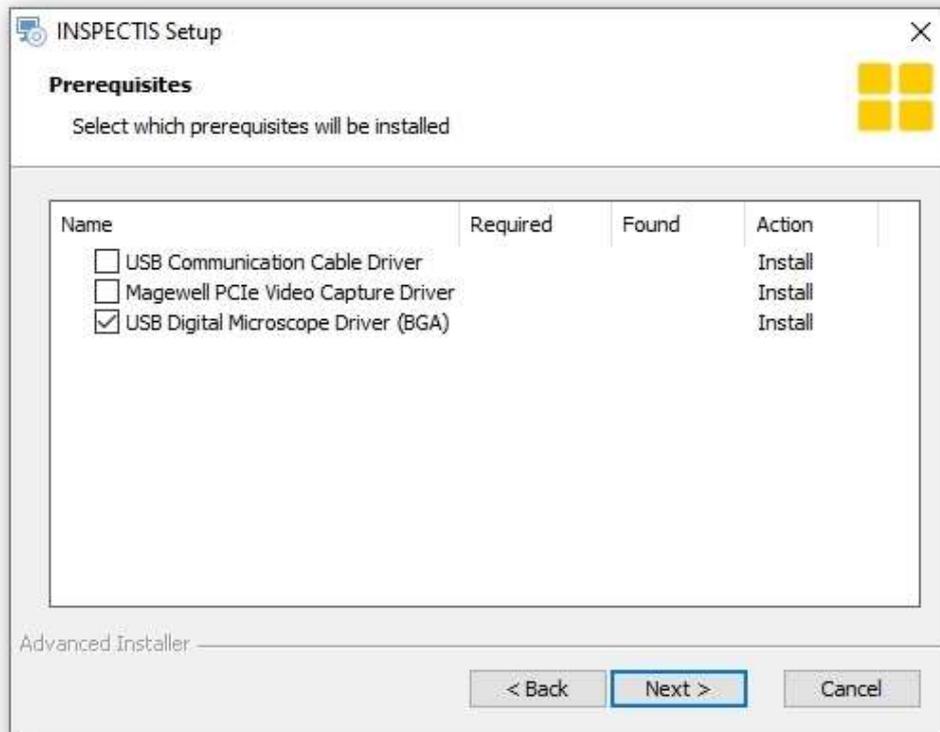


Installing INSPECTIS Software

- Installation shall be done with full administration privileges.
- You might need to disable antivirus system of your computer temporary during the installation.

To install INSPECTIS software:

1. Plug the provided software protection Dongle to a free USB port of your computer. The protection dongle will be found inside the product box.
2. Run the setup file. The installation wizard will start and guide you through the installation.
3. Device drivers will be installed automatically by the installation wizard. If drivers are already installed in your computer, uncheck all boxes. Also, uncheck USB communication Cable and Magewell PCIe boxes as the items are not used in BGA inspection syseem.



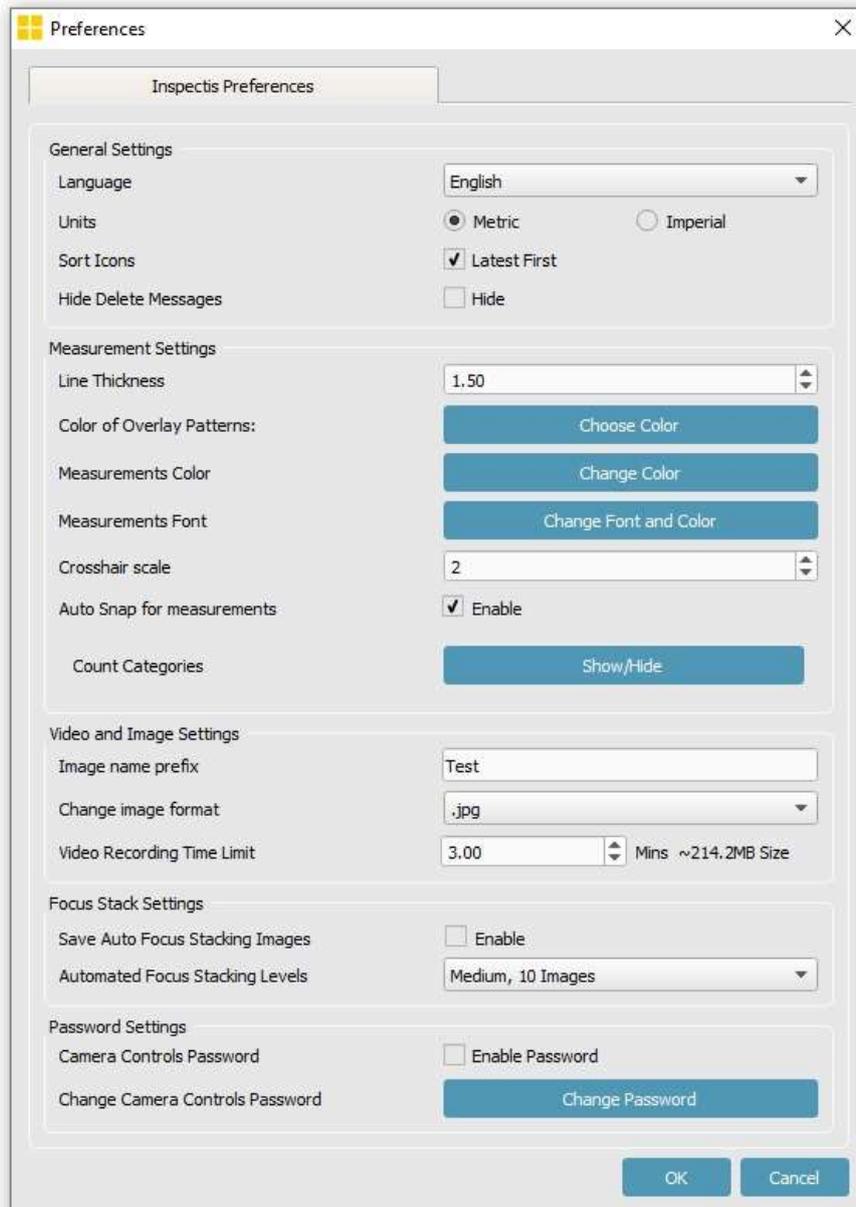
4. Follow on-screen instructions to complete the installation.
5. When the installation is complete click "Close" to exit the window.

Running INSPECTIS Basics for the First Time

1. Before launching INSPECTIS software please make sure your Inspectis digital microscope is connected to the computer. Refer to previous chapter on how to connect your device.
2. Make sure the software protection dongle is plugged into a free USB port on computer.
3. Right-click on INSPECTIS  icon on your computer desktop and select **Run as Administrator** first time. Running as Administrator will enable you to register and activate the software automatically over internet.
4. Select language from the list.
5. From the "Software Version" selection window, select:
 - **"INSPECTIS ProX"** if a full license has been ordered.
 - 15 days trial version for trying the software for 15 days. All software functions will be enabled for 15 days. Skip part 5 (license number).
6. Fill in license number (found in the package) and other requested information.
7. If automatic on-line registrations is not possible, complete the Off-line Registration form and email it to info@inspect-is-com to get an software activation key.
7. PLEASE READ THE LICENSE AGREEMENT CAREFULLY before using INSPECTIS software.

Software Preferences

In Preferences, overall settings of the INSPECTIS software is defined. Click  icon to display the preferences window.



Setup your preferred Language, Units and Number of Decimals to be displayed for measurements. Type the Prefix you prefer to be added to the name of saved imaged and videos. Review other software preferences and change the default if crucial for your application.

Entering a password blocks unauthorized access to the Preferences and Camera Control dialog box.

Device Settings

Selecting Device

Click  to show the device settings menu and select  to see list of the available devices. Select **Inspectis 5MP Camera** to connect it to INSPECTIS.

Your Device	Device Name
USB3.0 Digital Microscope (BGA)	Inspectis 5MP Camera

Once the device is selected, software automatically sets the optimum device settings. Your device will be automatically set by INSPECTIS next time you launch the program.

INSPECTIS software displays connected device names on the status bar.



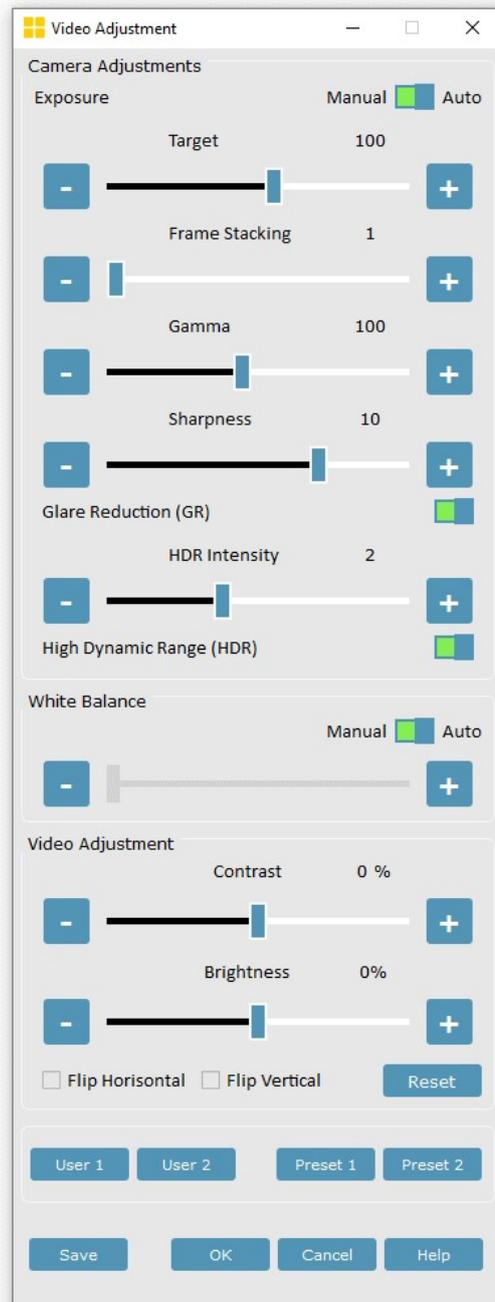
To automatically select your device, click  under Device Settings group. Software will search for Inspectis devices and select **Inspectis 5MP Camera**.

To restart your device while software is running, press F12 on your computer keyboard.

Connecting USB Digital Microscopes to INSPECTIS Software

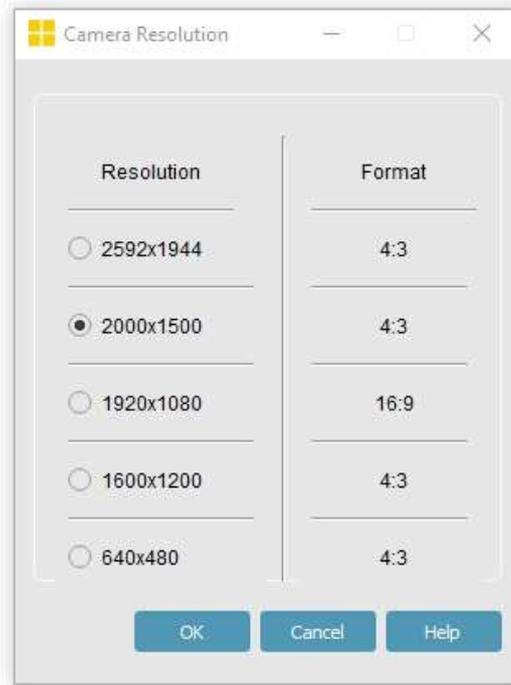
Inspectis 5MP Camera (BGA) communicates directly with the software via its USB interface. Camera adjustments dialogue for USB digital microscope (BGA Inspection) is as illustrated below.

User buttons  or Preset buttons  at INSPECTIS main window recalls previously configured and saved Camera setups.



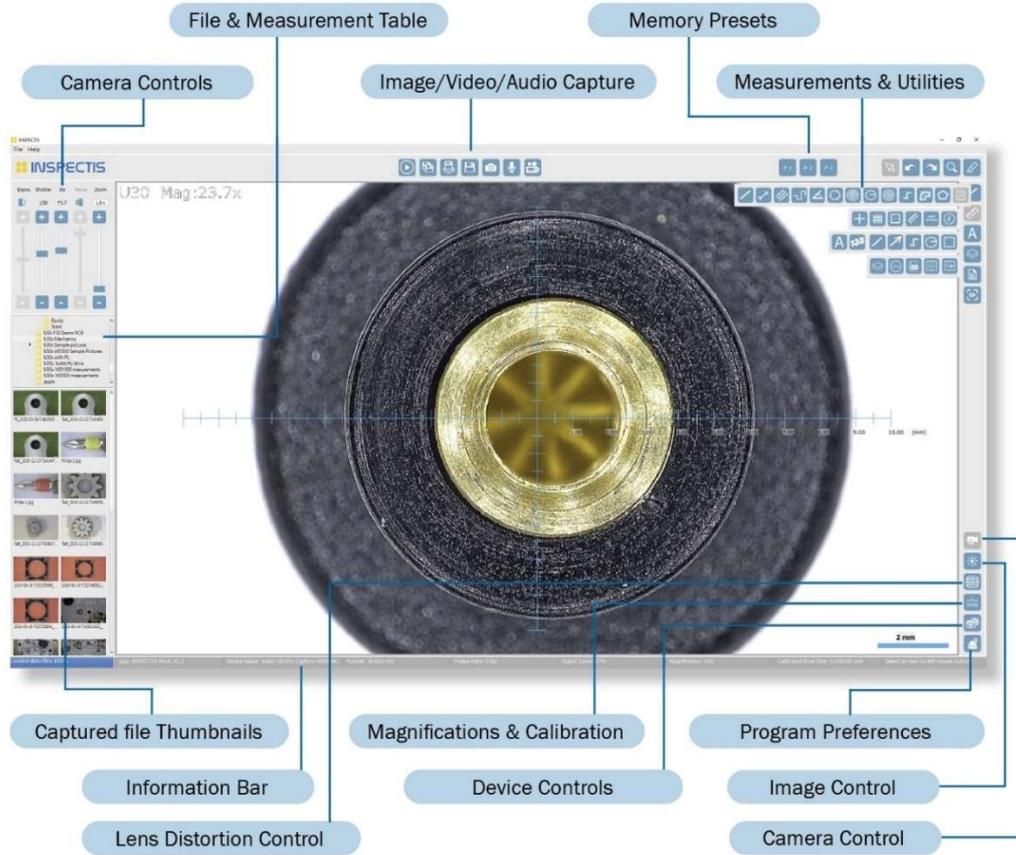
Device Resolution

When attached to USB3.0 digital camera, Resolution and Format (aspect ratio) of the live image can be set according to below tab. Default resolution for USB3.0 digital camera head is 2000x1500 pixels.

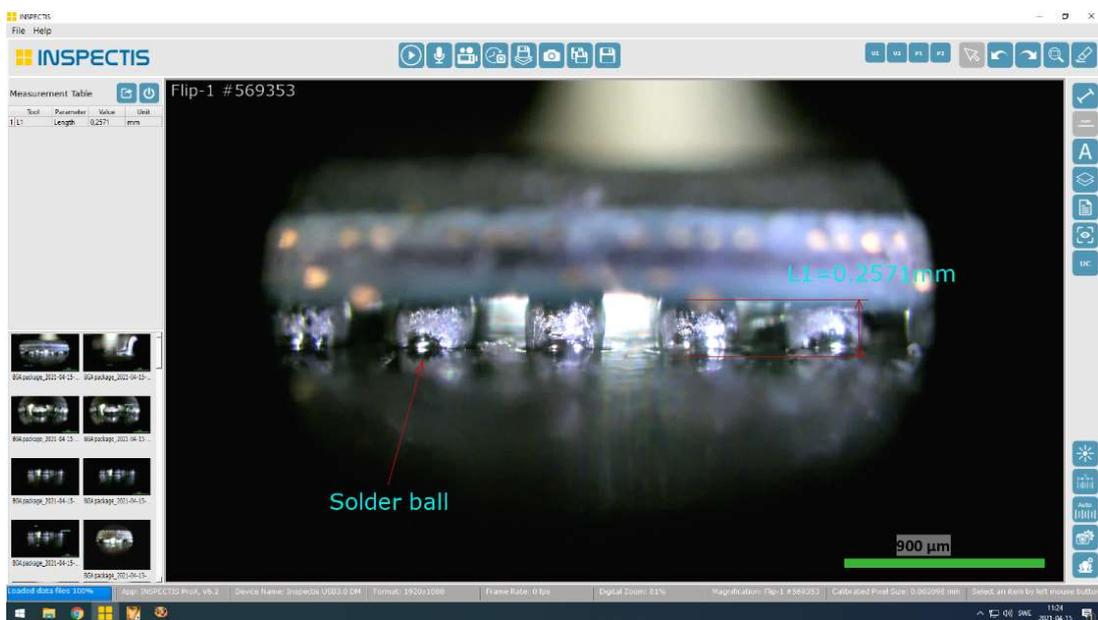


Working with INSPECTIS ProX Software

INSPECTIS software is designed with an icon-based user interface to help users navigate quickly. Most of the functions are available with a shortcut key indicated as [key] for quick access.



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Live Video and Still Images

INSPECTIS software automatically shows the live image of your device on start. To pause the live image, click  or SPACE BAR.

To start the live image again click  icon or press SPACE BAR.

Zooming

Both live and still images can be zoomed-in and zoomed-out digitally. Zoom functions are accessed by

clicking Zoom group icon .



Zoom In [Shortcut Key: F4]



Zoom Out [Shortcut Key: F3]



Zoom to Fit Screen [Shortcut Key: F5]



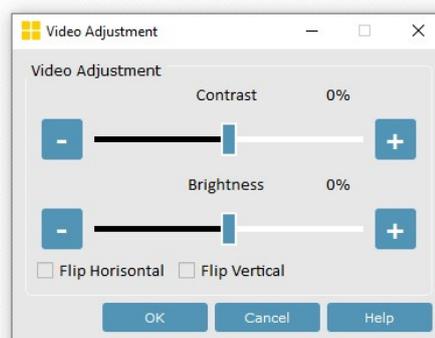
Full Screen [Shortcut Key: F6]. To close the full screen view, press ESC or press the  icon.

Digital zoom-in and zoom-out can also be done by the wheel of the computer mouse. Mouse cursor defines centre of the zoomed area. To pan the image when zoomed-in, press and hold the middle button of the mouse.

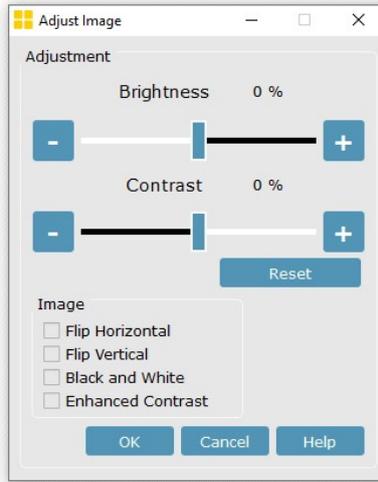
Image Adjustments

To adjust contrast and brightness of the image, click  icon. Depending on connected device and live or still image different adjustment windows will appear.

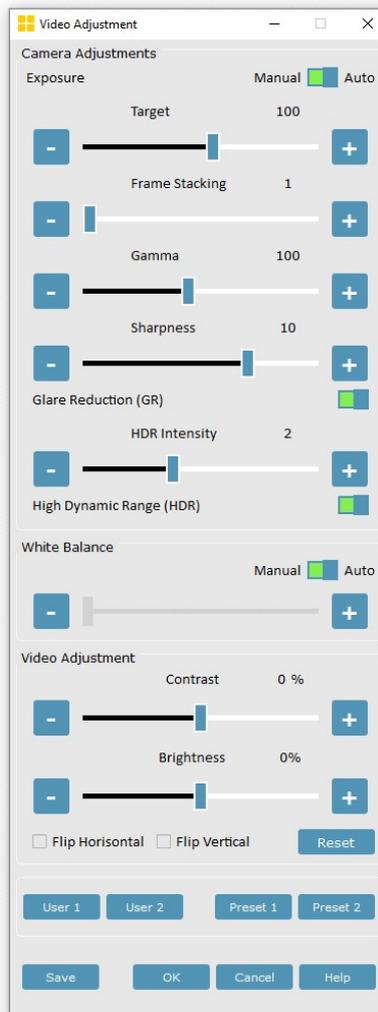
If image is live user can change orientation of the image, brightness and contrast value.



If the image is still, its brightness and contrast can be adjusted. In addition, Black and White and Enhanced Contrast can also be applied to still images.



Camera adjustment dialogue of the Inspectis 5MP Camera is according to below picture:

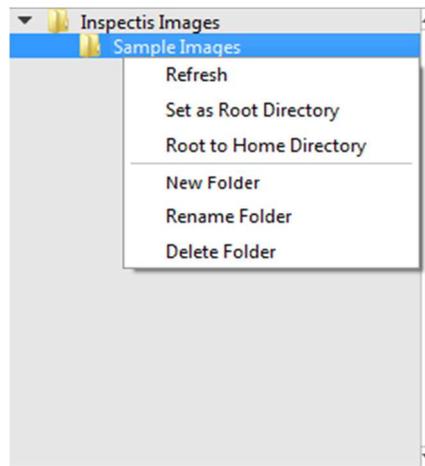


Choose between Preset1 and Preset2 or select your preferred adjustments and saved them under User1 or User2 for best image quality.

Folder Structure and Thumbnail View

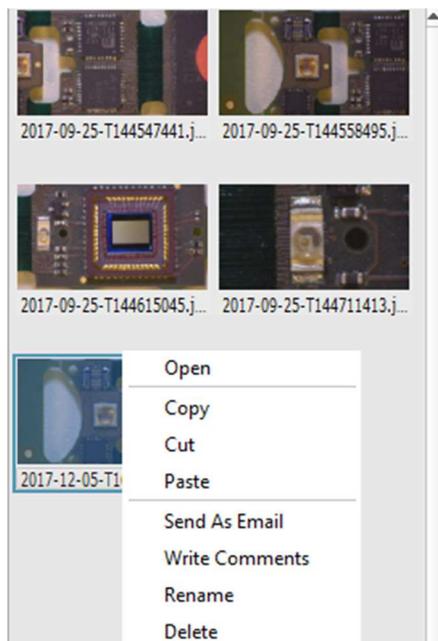
Right click on the folder structure and choose the working folder to be used for saving or recalling images and files. Working folder can be also selected via "File Menu -> Select Folder". Images and other files in the working folder are displayed as thumbnails in the Thumbnail View beneath the folder structure.

By right clicking on the file structure below folder functions can be accessed:



By clicking "Set as Root Directory", other folders except for the selected working folder will be hidden. Clicking "Root to Home Directory" will display all folders.

By right clicking on a saved image icon, extra image functions can be accessed:



You can select one or multiple images at a time to Copy, Cut, Paste, E-mail or Delete.

Comments will be saved to the selected image file and automatically printed on Reports when you attach the image to the report.

Saving Images

There are four options for saving an image:



Capture Live Image [Shortcut Key: F11]. Captures a still image from live video of the connected device and saves it under current working folder as .png (default) or .jpg. Image will be automatically labelled with date and serial number.

If the live image is paused and there are measurements and overlays on it,  will only save the image without overlays and measurements.



Save Image [Shortcut Key: F10]. Saves the image, measurements and overlays under the current working folder as .png (default) or jpg. Image will be automatically labelled with date and serial number with "_measured" suffix.



Save Averaged Frames [Shortcut Key: F9]. Averages a sequence of frames and saves the image with user specified name and folder. This is particularly used to denoise the final saved image.



Save Image As [Shortcut Key: F8]. Saves the image with user specified name and folder.

Recording Video

Click on  icon to start recording a video at .AVI format. [Shortcut Key: F2].

To stop the video recording press . [Shortcut Key: F2].

Recorded video file will be saved under the current working folder and automatically named with date and serial number.

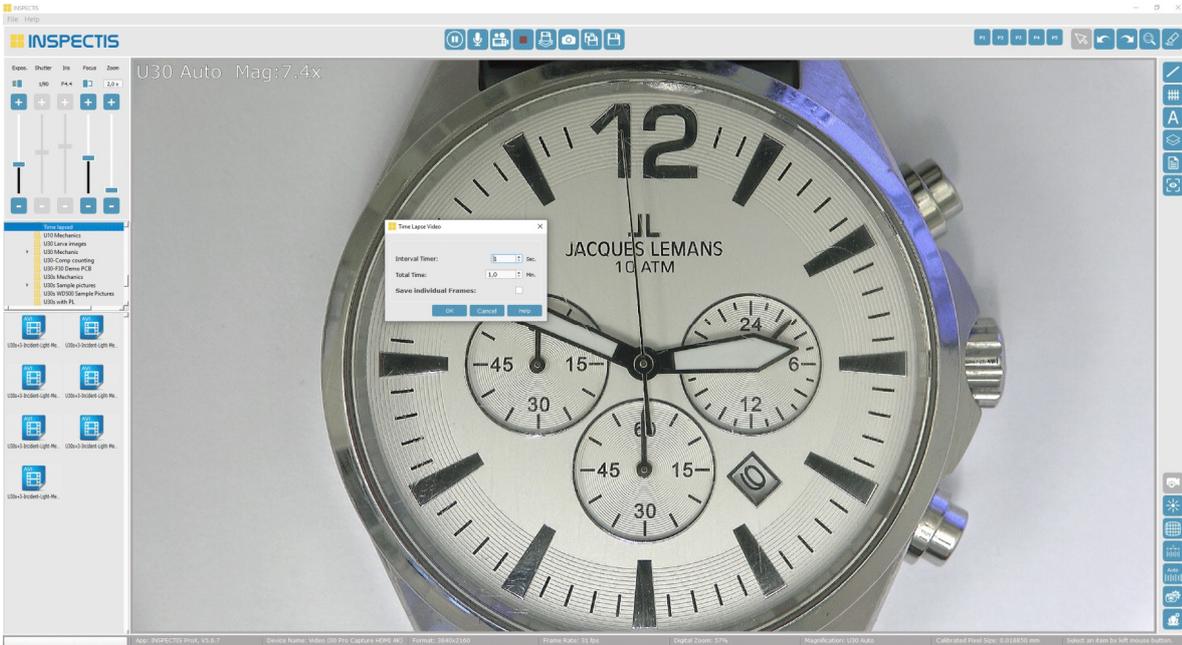
The video recording is time-limited to 3 minutes by default. Video recording time limit can be changed under [Preferences](#).

Video recording compression levels can be adjusted in the [Preferences](#).

Time Lapse Video



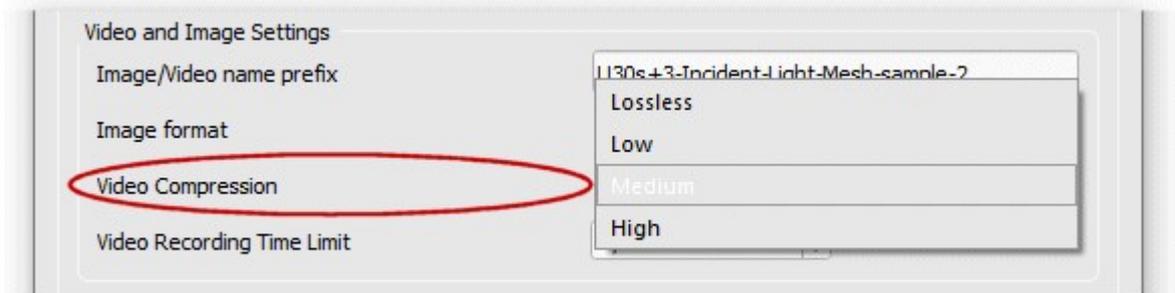
Click on icon to start capturing time-lapsed images and creating a video sequence of images at .AVI format.



To stop the Time Lapse video recording press .

Time lapsed video file will be saved under current working folder and be automatically named with date and serial number. If selected, individual frames will be saved in a sub-folder automatically created under working folder.

"Video compression" level (record quality) and "Video name prefix" can be chosen in the [Preferences](#).

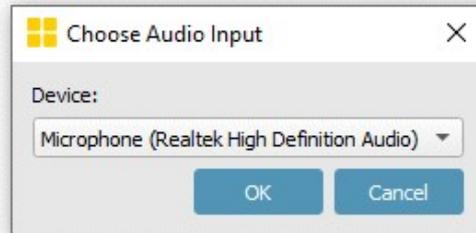


Recording Audio



Click on  icon to start recording audio, speech or dictation at .WAV format. A microphone must be connected to your computer to record Audio. [Shortcut Key: F1].

Select your microphone and press OK to start recording audio.



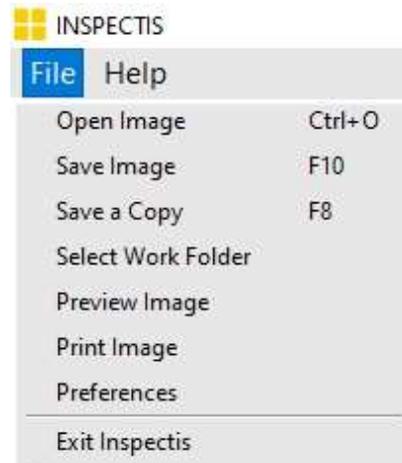
To stop the video recording press  [Shortcut Key: F1].

Recorded audio file will be saved under the current working folder and automatically named with date and serial number. The specific audio device can be selected after clicking on record audio icon.

Loading Images and Videos

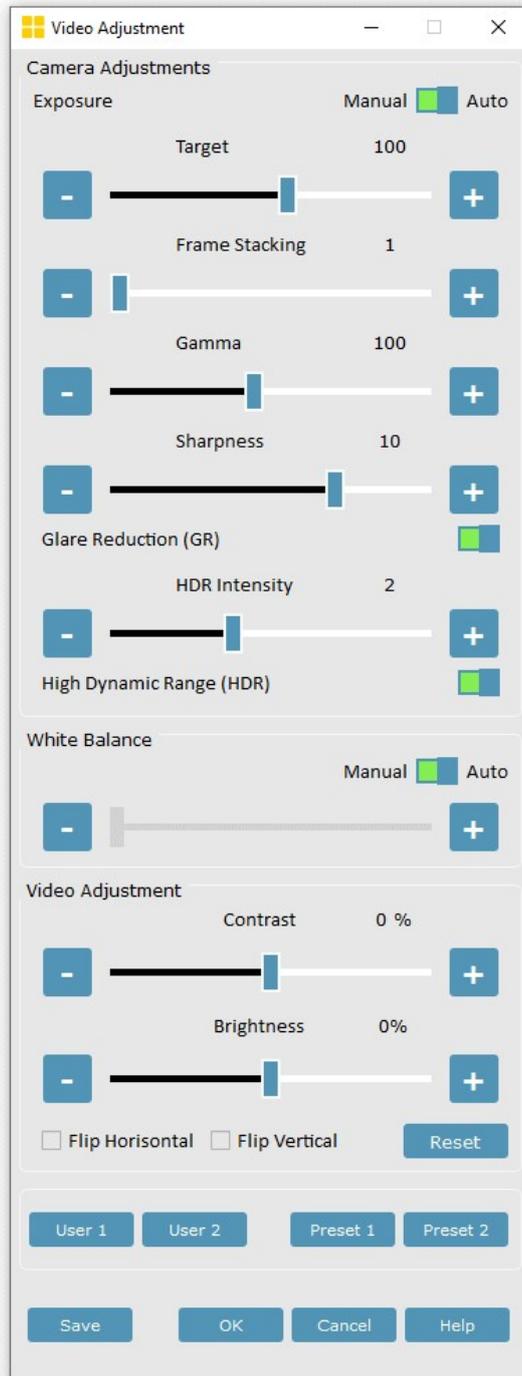
To load a thumbnail image, video or a document from the working folder, left click on it or right click and choose open. If the image contains measurement objects, the measurement results will also be loaded to the measurement table.

To load an image from another location, click “File/Open Image”, then select the image to be opened.



Camera Control and Setup

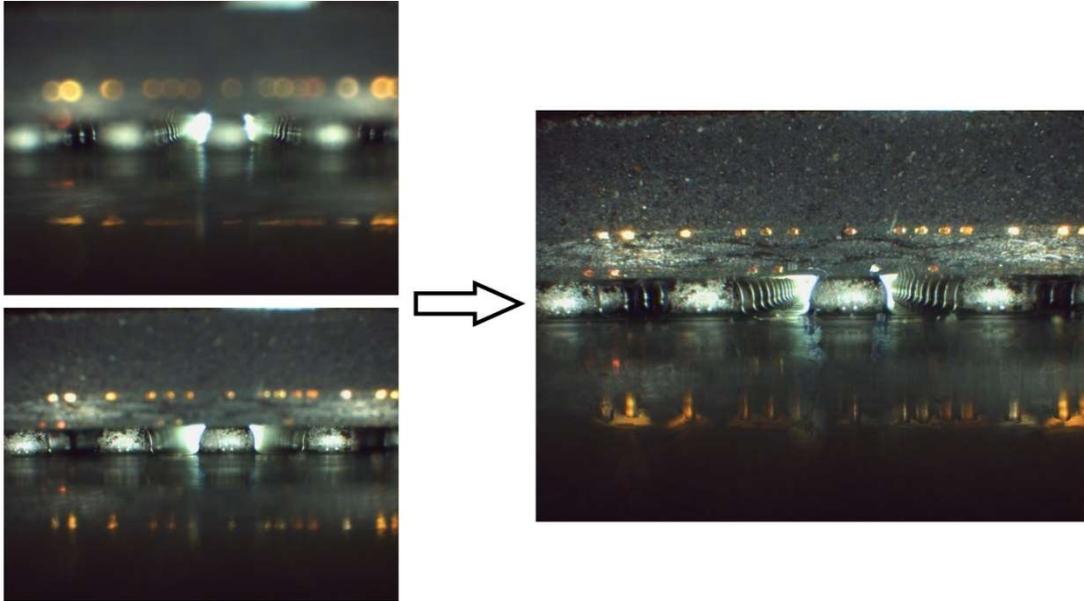
Inspectis 5MP Camera is directly controlled in INSPECTIS via its USB interface.



User buttons **U1** **U2** or Preset buttons **P1** **P2** at INSPECTIS main window recalls previously configured and saved Camera setups.

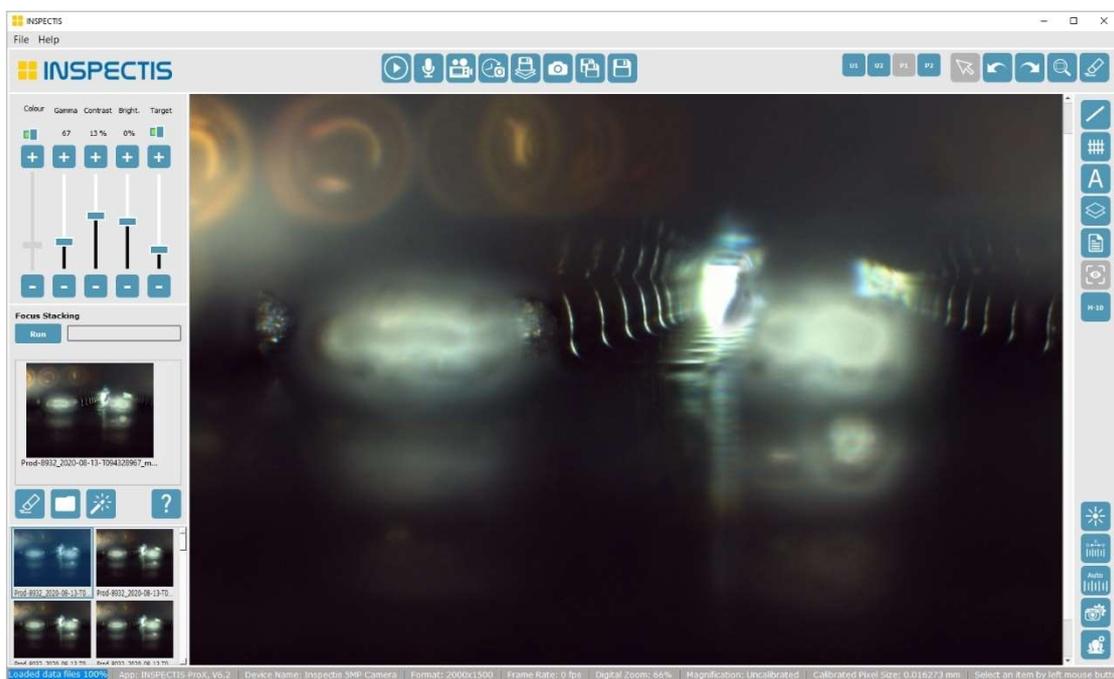
Focus Stacking

Inspectis ProX can create focus stacked images by taking 6-22 images at different focus planes to create one single sharp image.



To start the Focus Stacking press the  icon.

Image adjustment controls will be accessible at the INSPECTIS tool bar when Focus Stacking is enabled. Control bars can be adjusted using mouse wheel (when pointer is hovered over controls) or Up/Down arrow keys on your computer keyboard.



Capture images at different focus levels one by one and stack to one single image by clicking  button. The resulting image is saved automatically to destination folder.

You may also click on any saved image thumbnail on your working folder to add it to focus stacking field.

Images can be selected from any folder in your computer by clicking on  icon .

To remove all images from focus stacking field, click on the  icon.

To enable the Enhanced Focus Stacking, select  before starting the focus stacking. Enhanced Focus Stacking uses advanced image processing to create stacked pictures with less image quality defects.

Measurement and Analysis Tools

INSPECTIS software has intuitive powerful geometrical measurement tools. For performing accurate measurements, current magnification shall be calibrated in the software.

If an uncalibrated image is selected, measurement results will be presented in pixels.

INSPECTIS for BGA has 4 factory-defined calibrated magnifications for 8-80 lens named by the Working Distances (WD7 to WD225). For doing measurements with BGA lens, new magnifications need to be defined and calibrated. Each new user-defined magnification will be accessible via a memory button on INSPECTIS named M1 to M10.



To achieve high measurement accuracy, we highly accurate manual or automatic calibrations of your preferred magnifications and working distances shall be done.



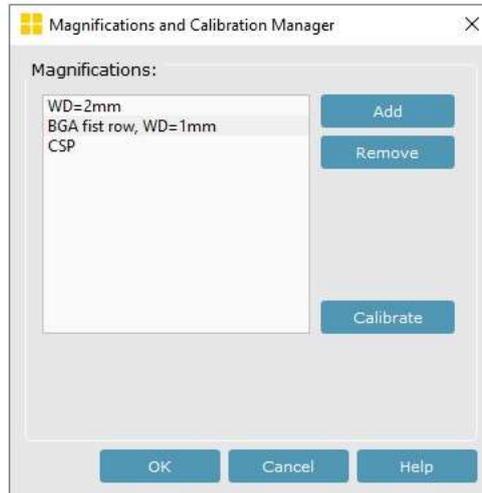
Magnification and Calibrations

Magnification Manager

Magnifications can be added, calibrated or removed via Magnification and Calibration Manager. Click on



icon to display the dialogue.



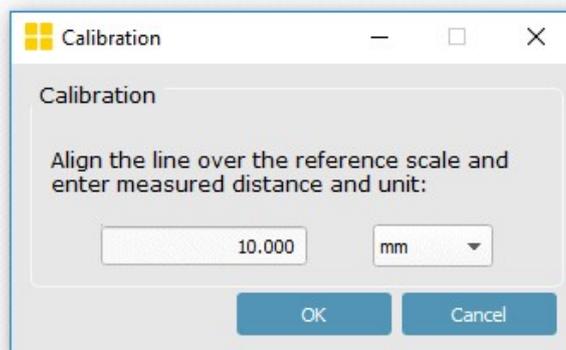
Put the Calibration Block on the BGA component you wish to inspect and set up your camera to image micrometre scales of the Calibration Block at your preferred magnification or working distance. Select

Add

and add it as a new Magnification.

Calibrate

Calibrate this magnification by selecting **Calibrate**. The live image will be frozen and calibration windows with calibration line will appear.



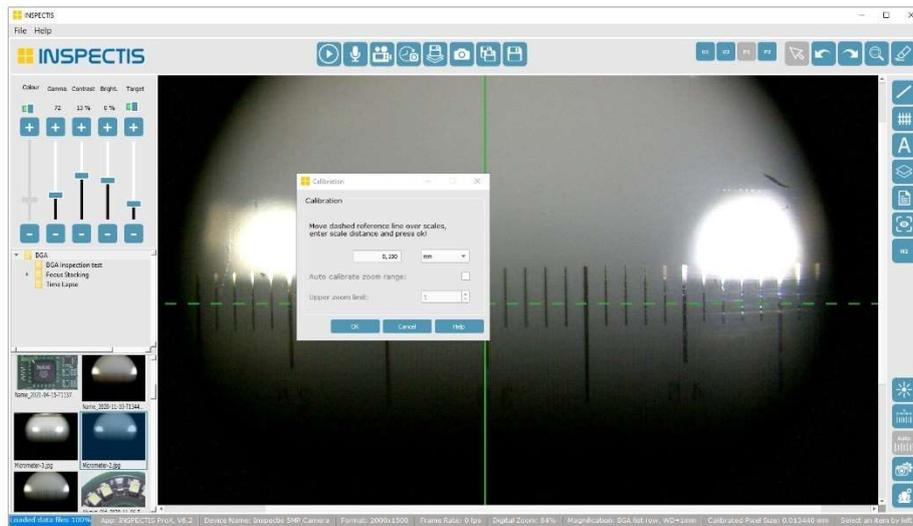
Select, drag and align both ends of the calibration line to the matching lines on the reference image. Type in the distance and select the unit (**mm** or **um**) in the calibration window. If imperial units are selected in Preferences, imperial units will be shown in calibration window. Click **OK** to end the calibration process.

Auto Calibrating Magnifications

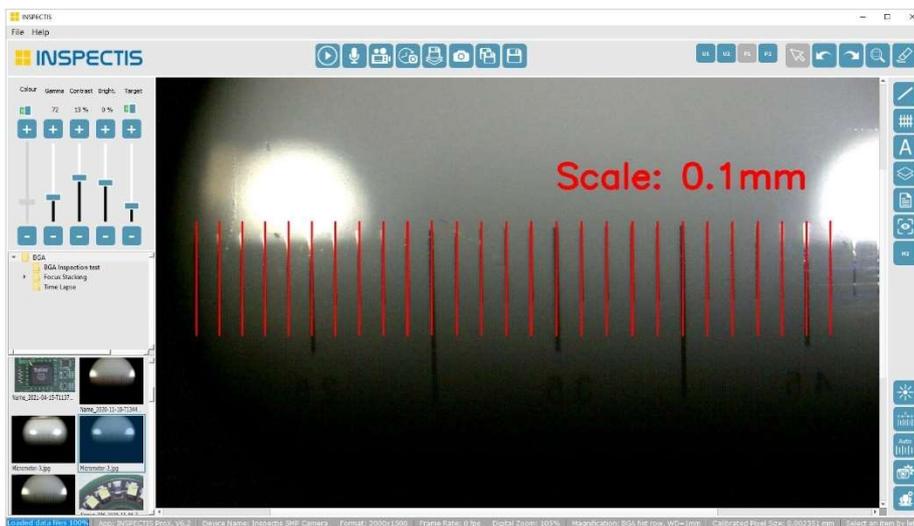
Auto Calibration  can be used to automatically calibrate current magnification.

Put the Calibration Block on the BGA component and set up your camera to image micrometre scales of the Calibration Block at your preferred magnification or working distance first.

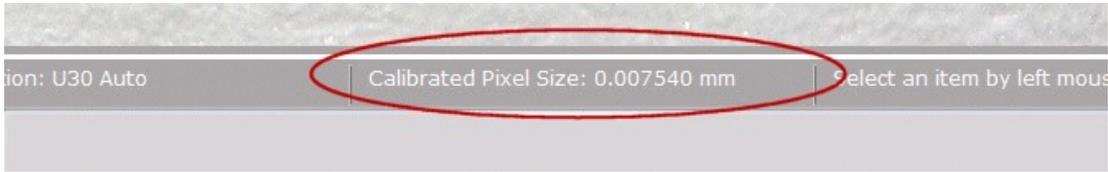
Click . Calibration dialogue will pop-up and a solid vertical as well as a dashed horizontal line around which the calibration is processed will be displayed on the live image. If necessary, drag the horizontal dashed line over the scales to intersect properly. Enter scales size in mm/ μ m and click OK.



Software will automatically find the scales, mark them by reference red lines and ask you to accept and save the calibration. If reference lines are correctly drawn on scales, press OK to save calibration value for current magnification and exit. If reference lines are not correctly displayed on scales, cancel .



Calibration pixel size which is result of your calibration and used by software for 2D-measurements is displayed on status bar of INSPECTIS software.

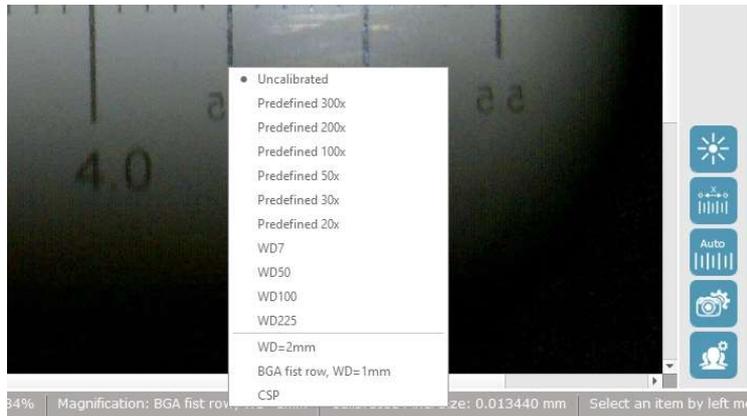


Selecting Magnifications

To select a magnification, open the Magnification and Calibration Manager dialogue, select the desired magnification and click OK button.



For quick selection of magnifications, right click on the Magnification on the INSPECTIS status bar and choose desired magnification.



Measurement Tools

INSPECTIS provides several tools for performing non-contact geometrical measurements on the picture. You can measure distances, radius, angles, curve lengths and areas for different shapes.

To select a measurement tool right click on the measurement group icon  on the right menu bar. Measurement tools group will pop-up.



Left click on the desired tool to activate/deactivate. Last selected tool icon will replace the menu icon for quick access.

To activate the current tool for performing measurements left click on the current measurement tool icon. Measurement values are shown with sufficient significant numbers and are dynamically displayed depending on the Calibrated Pixel Size. For example:

- If the Calibrated Pixel Size is larger than 0.05 mm measurement values will be displayed as “x.xxx mm” or “xx.xx mm” or “xxx.xx mm”
or
- If the Calibrated Pixel Size is less than 0.01 mm measurement values will be displayed as “x.xxx μm” or “xx.xx μm” or “x.xxxx mm” or “xx.xxxmm”

To modify, move or delete a measurement activate the **Select Tool**  and click on the specific measurement. **Select Tool**  is automatically enabled after each measurement.

All measurements can be undone or redone using **Undo**  and **Redo**  respectively.

To clear all items, click on .

Measurement Table on top-left of INSPECTIS window is automatically displayed as soon as a

measurement tool is selected. To return to File Structure window de-select Hide Table  icon. Click

"Export" button  on the top-right corner of the table to export measurement as an Excel file.

File Help		INSPECTIS	
Measurement Table			
Tool	Parameter	Value	Unit
1 R1	Length	5.99	mm
2 D1	Length	11	mm
3 FL 1	Perimeter	7.45	mm
4 R2	Length	6.1	mm
5 A1	Angle	90.1	°

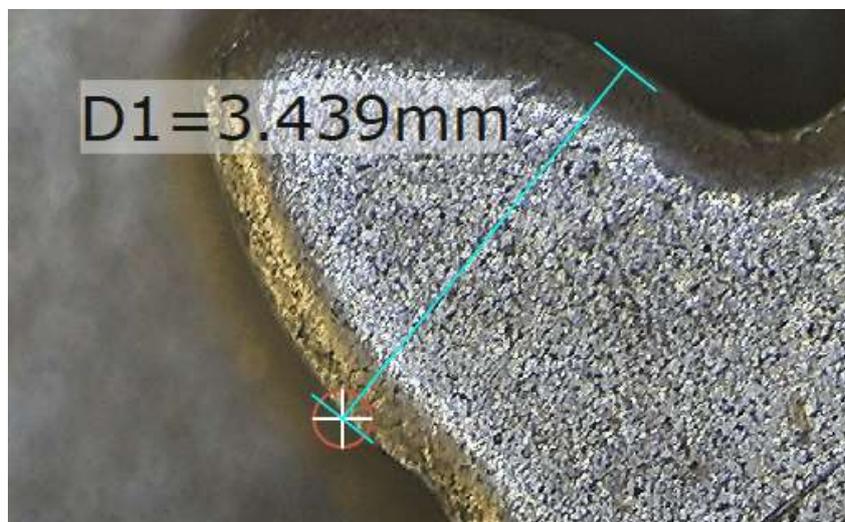
Saving Measurements

Measurement results as well as calibration information is always saved together with the picture. All the saved measurements are part of the image and cannot be changed as they are burned into the image.

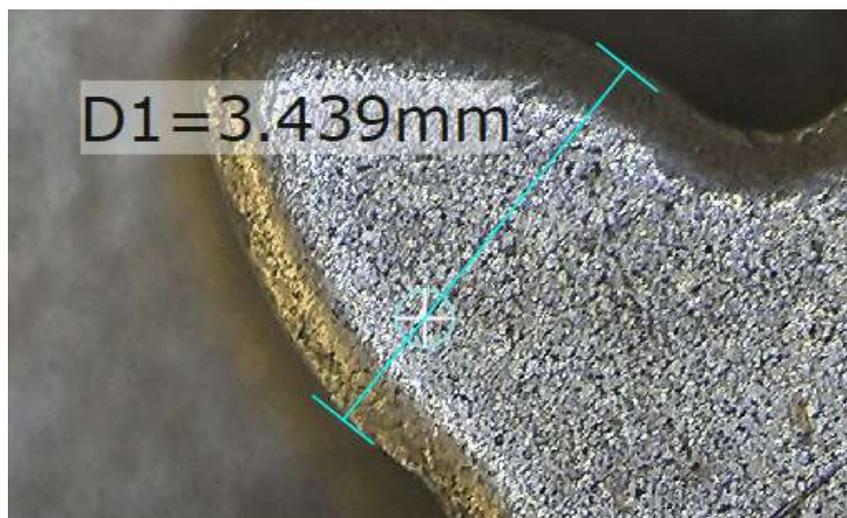
Snap Mode

To increase precision of the measurement, Snap Mode can be enabled in [Preferences](#). In this mode, starting and ending points of current measurement is automatically snapped to the nearest point of an previously drawn circle centre, edge or measurement line.

Snap Edge or Centre:



Snap Line:



Distance Measurements

INSPECTIS provides 3 types of Distance measurements:

Measure Distance: : Measure a linear distance. Press and hold the left mouse button, drag to draw a line from A to B on the image and release the button to finish. Select  is enabled after each measurement.

Press and hold Ctrl key on computer keyboard to make Horizontal or Vertical Distance measurements.

To adjust position of measurement lines and text:

Click and drag end of measurement lines to change the distance.

Click and drag measurement lines to move all.

Click and drag the text box to move.

Measure Distance (CAD type):  Measure a linear distance similar to CAD programs. Press and hold the left mouse button and drag to draw a line from A to B on the image, release the button and extend measurement leaders to desired position and click to finish. Select  is enabled after each measurement.

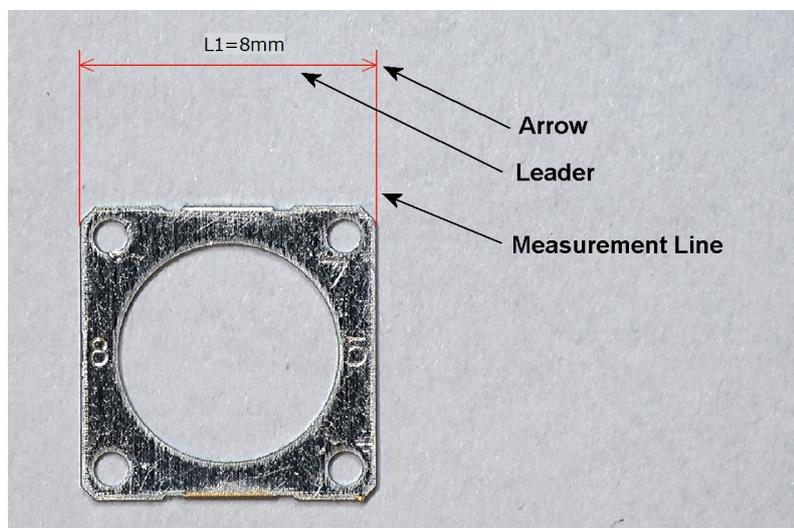
Press and hold Ctrl key on computer keyboard to make Horizontal or Vertical Distance measurements.

Click and drag end of measurement lines to change position and angle.

Click and drag leader or arrows to adjust height of measurement lines.

Click and drag measurement lines to move all.

Click and drag the text box to move.



Multiple Distance Measurement: : Measure linear distances multiple times in order to get statistics (Max, Min, Average and Standard Deviation of the population). Press and hold the left mouse button, drag to draw a line from A to B on the image and release the button to finish. To finish Multiple Distance Measurement select  any other button.

	Tool	Parameter	Value	Unit
1	MD2-1	Length	1.539	mm
2	MD2-2	Length	0.8894	mm
3	MD2-3	Length	1.035	mm
4	MD2-4	Length	0.857	mm
5	MD2_Min	Min	0.857	mm
6	MD2_Max	Max	1.539	mm
7	MD2_Mean	Mean	1.0801	mm
8	MD2_SD	Stddev	0.273296	mm

Press and hold Ctrl key on computer keyboard to make Horizontal or Vertical Distance measurements.



Free Form Distance: Measure a free form distance. Click the left mouse button and drag to draw multiple lines from A to B on the image. Double click to finish the measurement.

Select down line corners or line end to adjust their position.

Select lines to move all.



Curve: Measure length of a free form curve. Click and hold the left mouse button and drag to draw on the image. Release the button to finish the measurement.

Select curve to move it.

Thickness and colour of measurement lines as well as font size of the text can be changed in [Preferences](#).

Angle Measurements



Angle by 2 Lines: Measure an angle by drawing 2 lines. Select the vertex first by left mouse button, draw first arm, click to draw second arm and click to finish.



Angle by 3 Points: Measure and angle by selecting 3 points. Select the vertex first by left mouse button, release to draw fist arm, click to draw second arm and click again to finish.



To modify or fine-tune an angle measurement, activate Select  and Click and drag the vertex to change its position.
Click and drag any arm end to change the angle.
Click and drag the arms to move all to a new position.
Click and drag the text box to change its position.

Thickness and colour of angles as well as font size of the text can be changed in [Preferences](#).

Circle Measurements



Circle by 3 Points: Measure radius of a circle by selecting 3 points.



Concentric Circle by 3 Points: Draw and measure radius of concentric circles by selecting 3 points. If Snap function is activated, this measurement tool automatically snaps centre of previous concentric circle to increased accuracy.



Circle by Radius: Measure size of a circle by drawing a radius from edge to origin of the circle. Click and hold the left mouse button and drag to draw on the image. Release the button to finish the measurement.



Concentric Circle by Centre Point: Measure size of a circle by drawing a radius from edge to origin of the circle. If Snap function is activated, this measurement tool can automatically snap to origin of previous concentric circle to increased accuracy. Click and hold the left mouse button and drag to draw on the image. Release the button to finish the measurement.



To fine adjust a drawn circle, activate Select tool  and:

Select circumference of the circle and drag to change radius of the circle.

Select inside the circle to drag to a new position.

Area of the circle and measured radius are saved and displayed in the measurements table.

Thickness and colour of circles as well as font size of the text can be changed under [Preferences](#).

Area Measurements



Area: Measure an area by drawing on perimeter of the area. The area will close when releasing the mouse button.



Polygon: Measure a polygon by selecting polygon's corners.

To fine adjust a drawn polygon, activate Select tool  and:

Click and drag corners of the polygon to move to a new position.

Select inside the polygon to drag to a new position.

When a new polygon is drawn inside another one, their size ratio is calculated and displayed in the measurements table.

Thickness and colour of polygons as well as font size of the text can be changed under [Preferences](#).

Reference Tools

To select a reference tool right click on the current icon  on the right menu bar. Reference tool group will pop-up.



Left click on the desired tool activate/deactivate. Last selected tool icon will replace the menu icon for quick access.



Cross-hair: Left click to activate/deactivate Cross-hair on the screen. Thickness and colour of cross-hair can be changed in [Preferences](#).



Grid: Left click to activate/deactivate Grid on the screen. When Grid is selected first time, a new window will appear to define size of the grid. Right click on the Grid icon to change the grid size next time. Thickness and colour of cross-hair can be changed in [Preferences](#).



Rectangle: Left click to activate/deactivate Rectangle on the screen. When Rectangle is selected first time, new window will appear to define width and height of the rectangle. Right click on the Rectangle icon to change the rectangle size next time. To move the rectangle, click on it and drag to the desired location. Thickness and colour of rectangle can be changed in [Preferences](#).



Ruler: Left click to activate/deactivate the Ruler. Size and scale of the ruler depends on the current magnification. To move the ruler, click on it and drag to desired location. Ruler scaling as well as its thickness and colour can be adjusted in [Preferences](#).



Reference Scale: Left click to activate/deactivate a calibrated Reference Bar on the screen. Colour of Reference Scale bar can be changed in [Preferences](#).



Information: Left click to activate/deactivate the image information box. Image attributes such as image name, image size, calibration and device name are shown when Information is activated.

Overlay and Digital Graticule

Overlay Display

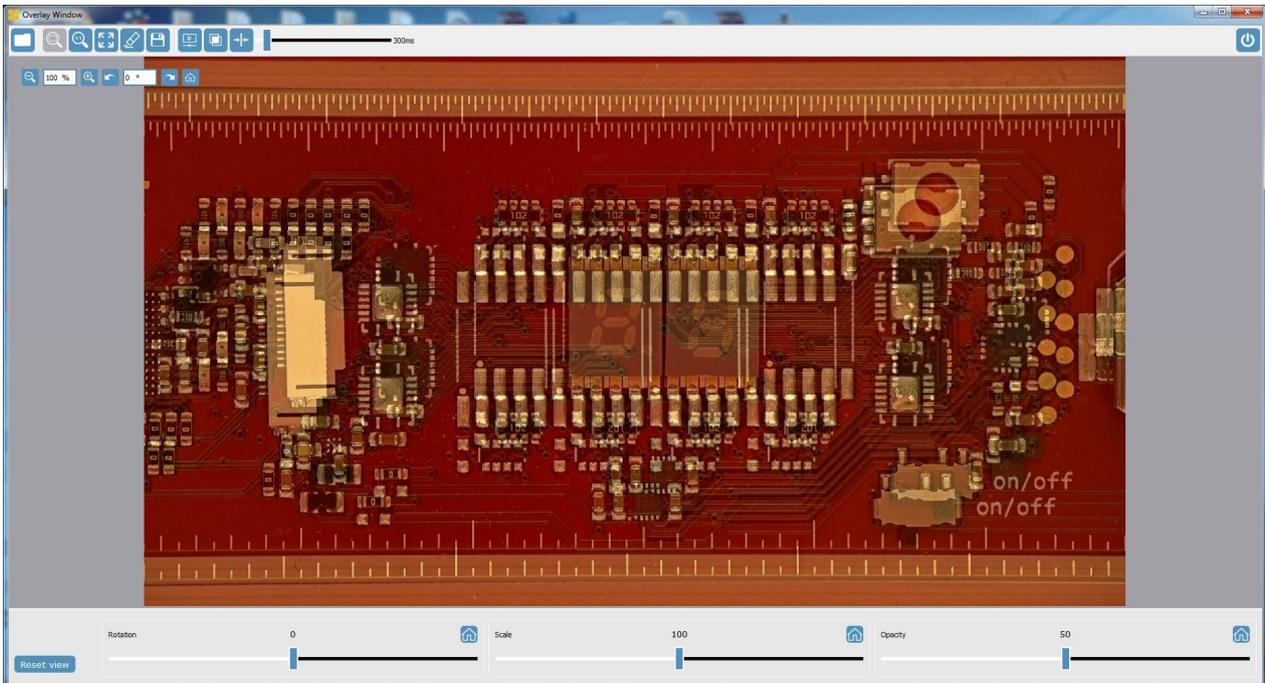
To select an overlay/compare tool right click on the current  icon on the right menu bar. Overlay/Compare tool group will pop-up.



Left click on the desired tool to activate. Last selected tool icon will replace the menu icon for quick access.



Overlay Display: A still image is overlaid on top of another still image or live image with selective transparency.



In still image mode (default) click on the desired image thumbnail in working folder to add your images to overlay window. The first added image is static but second image's (*Overlay*) transparency, scaling, rotation and pan can be adjusted manually.

To zoom in and rotate both reference and overlay image together, top left controls can be used.

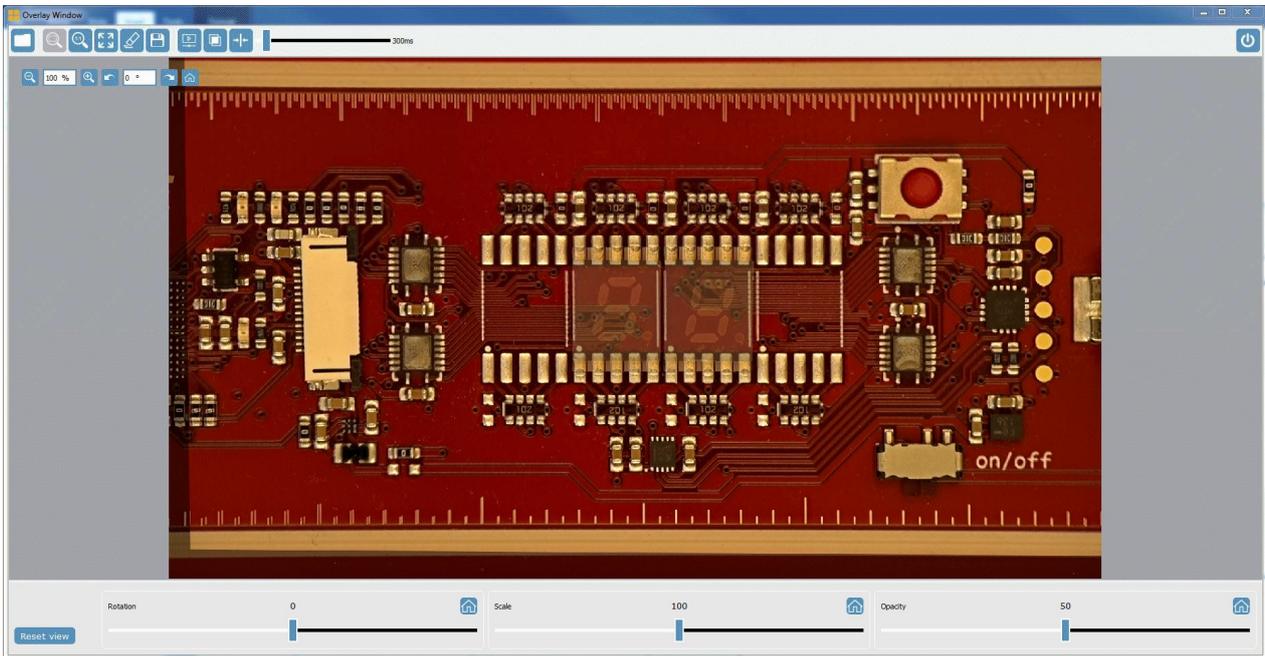
Overlay image's Opacity, Rotation and Scale can be adjusted with the bottom sliders.

Overlay image can be moved laterally for fine alignment. Check the "Lateral Displacement" check box.

Press and hold the mouse and drag to move the overlay image.



To align second image with the first image based on the matched features, click on  icon. The overlay window shown above consists of 2 images and the result of picture alignment can be seen below.



To enable the overlay on live image click first on icon  to display the live image. To add the overlay image, click on the image thumbnail in destination folder. To freeze the live image, click on the same icon.

To enable Interval Display Mode, click  icon [A]. Interval Display Mode automatically switches off and on the overlay image at any defined frequency between 200ms to 2000m /switch. Interval Display frequency is adjusted with a slider.

To select overlay images, click on  icon.

To go to Full Screen View click .

To clear the view click,  and to save the overlaid pictures on your working folder click  [F10].

Digital Graticule

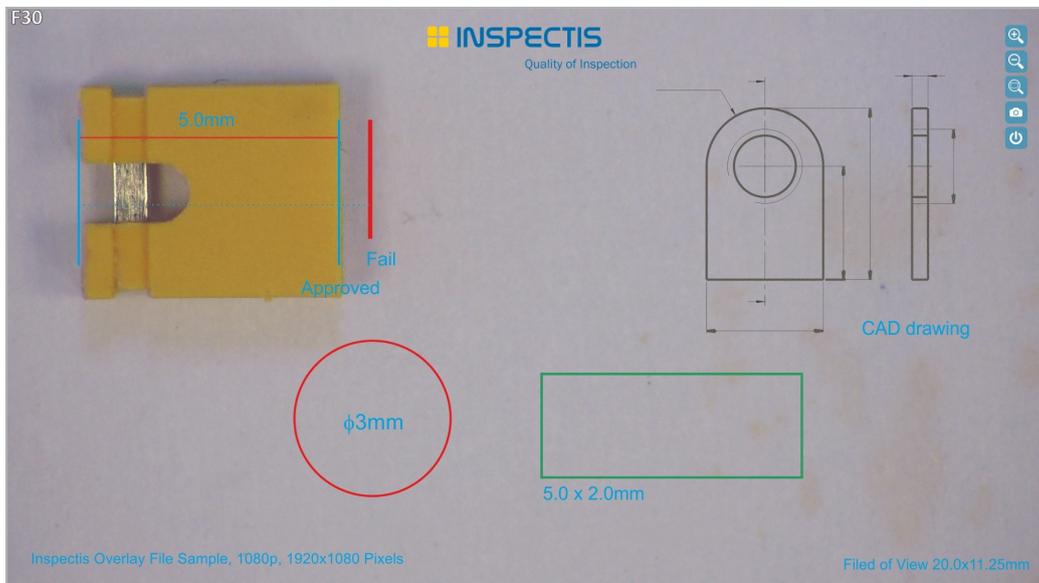


Digital Graticule: A custom designed picture file with transparent background (similar to a graticule)

can be overlaid on the live image. Left click  to activate. Select the graticule image (you have already produced in graphical design programs) with the same resolution as the live image. Refer to the document "How to generate Overlay pictures for INSPECTIS Software" for more information. The overlay file should be in .PNG format with fully transparent areas. Software will automatically switch to full screen and project the graticule over the live image.

To save the image with the overlay (and annotation, measurements etc.) press **F10**, to save the image without the overlay data press **F11** on the keyboard. Press **ESC** to remove the overlay and exit full screen.

To change the overlay image right-click on the icon .



Compare Tools

To select compare tools right click on the current icon on the right menu bar. Overlay/Compare tool group will pop-up.



Left click on the desired Compare tool to activate.

Compare Live Images



Compare Live Images: Left click to run compare live window. Left view will display live image of the digital microscope and right view will be used for reference still image. To add a reference image, click on the image thumbnail in working folder or drag and drop the image onto the compare window. It is possible to activate reference tools (Crosshair, Rectangle, Grid and Ruler) on the live image.

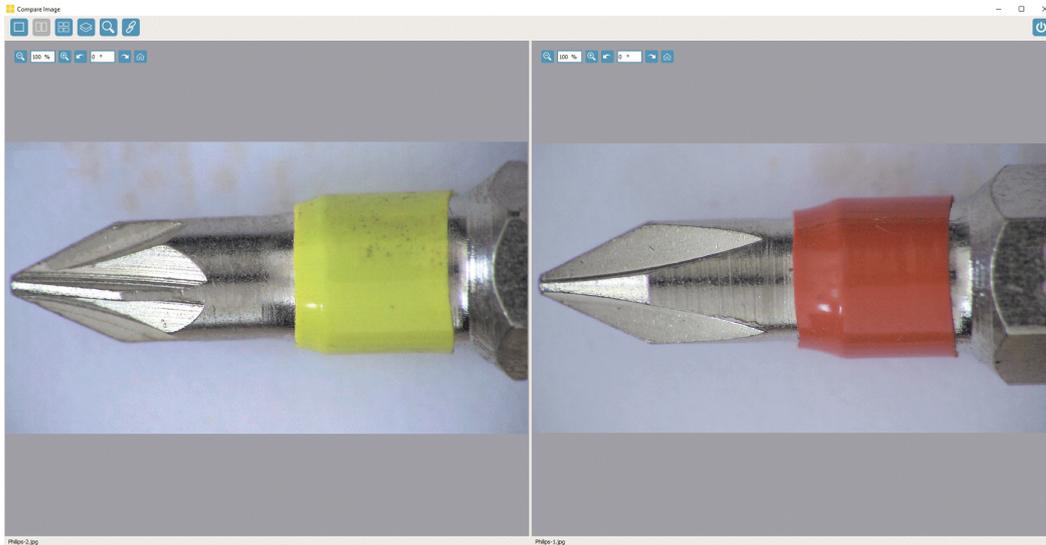


To zoom in/out images, top left controls on the Compare Live Image can be used. Press and hold the left mouse button and drag to pan the the images.

To enable synchronized zooming and panning click  icon.

Compare Still Images

 **Compare Images:** For comparing up to 4 captured images click to the  icon. To add an image to compare window click on the thumbnail at working folder or drag the thumbnail and drop it onto one of the views in the compare window. To remove an image right click on it with the mouse.

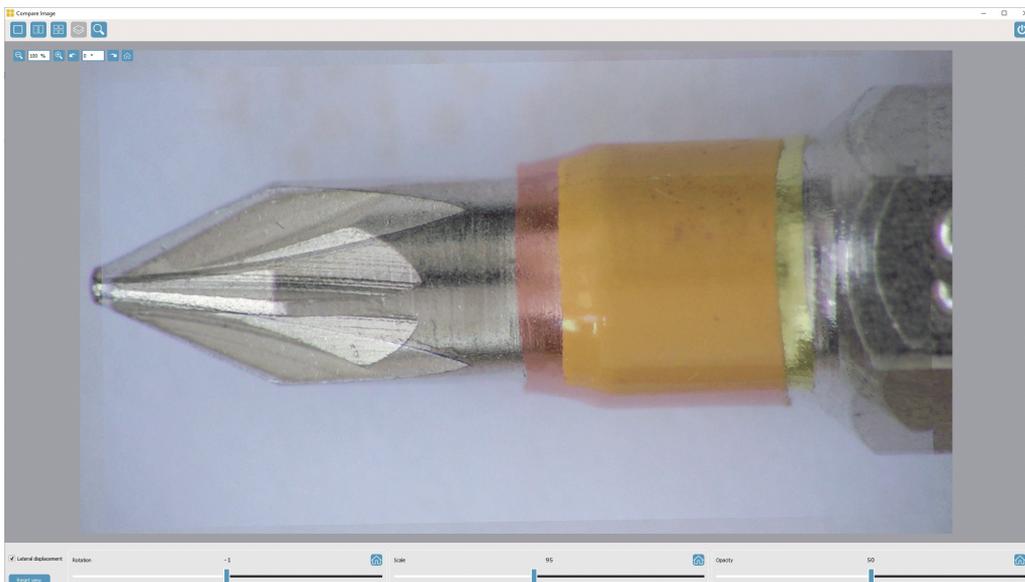


To zoom in/out and/or rotate images, top left controls on the individual views can be used. Press and hold the left mouse button and drag to pan the images.

To enable synchronized zooming, rotating and panning click  icon.

To switch between, one, two or four image view, press , ,  icons respectively. To

activate Overlay View, click  icon.



DXF Edit and Overlay

With DXF Edit and Overlay tool you may:

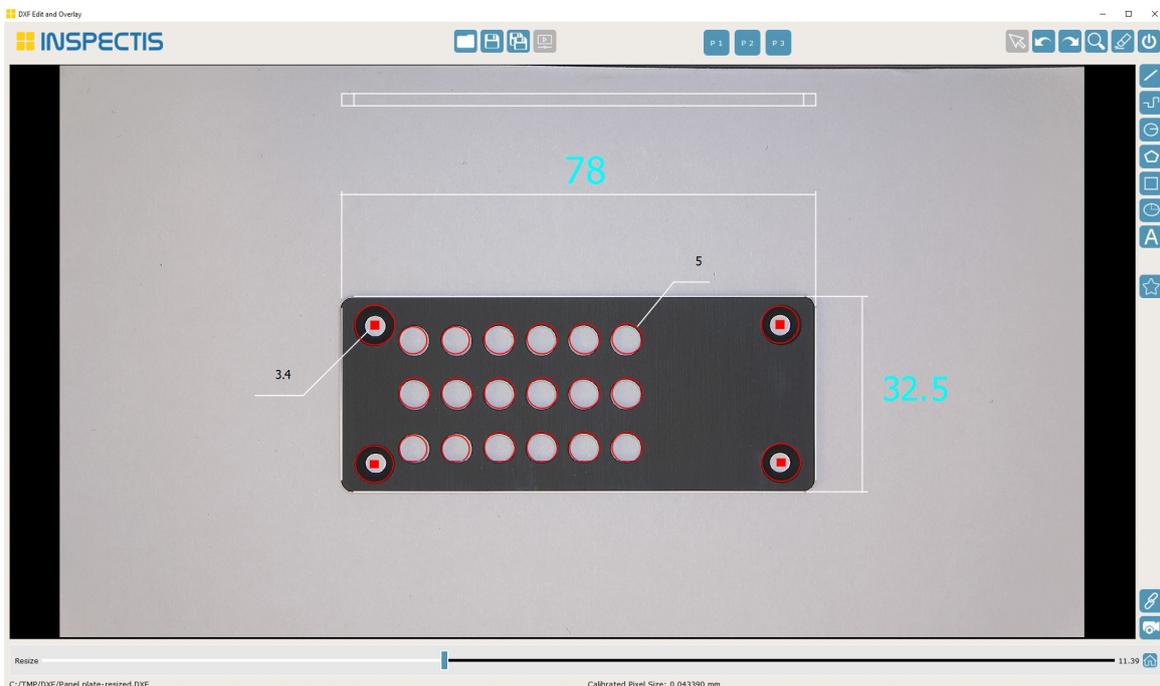
- Open an existing DXF file, edit and overlay on live image
- Create a DXF file using the built-in drawing tools.
- Produce a DXF from an object using Optical Edge Detection tool.

Before selecting DXF Edit and Overlay tool, set up your camera parameters and required magnification on INSPECTIS main window. Calibrate your magnification if necessary.

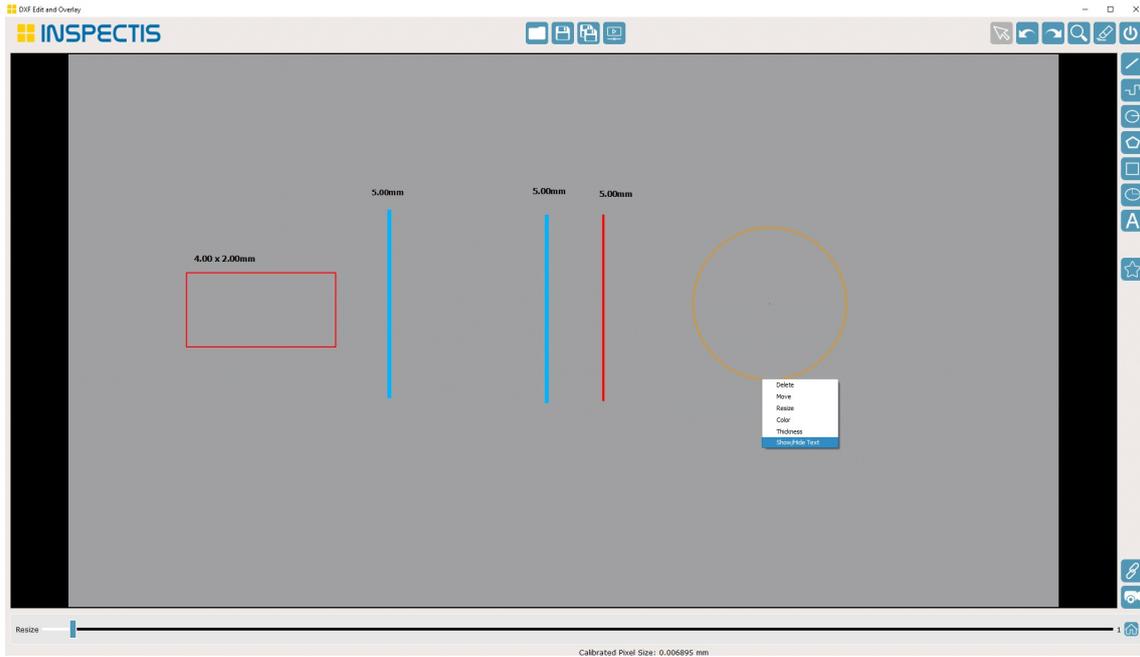
Under Overlay/Compare tool group  select DXF Edit and Overlay tool .

Open an existing DXF file: Select Open icon  to open an existing DXF file. Resize it to actual magnification using the Resize control bar on bottom of the window, edit and overlay on live image by

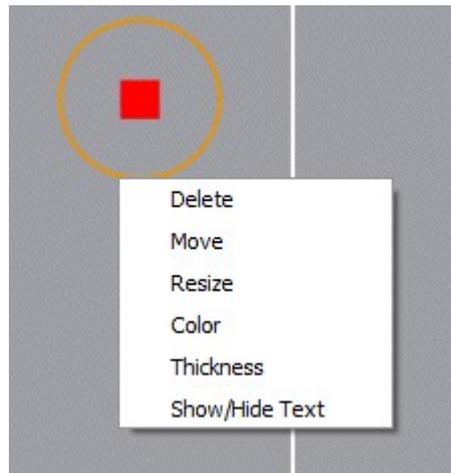
clicking . Save as editable DXF in vector format  or PNG image for overlay as Digital Graticule



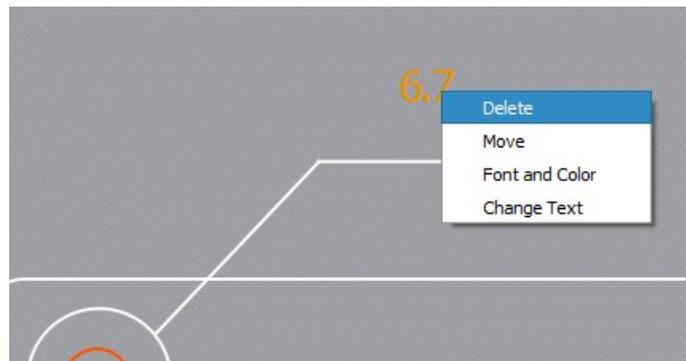
Create a DXF file using the drawing tools tools: Turn off live image by de-selecting  and use drawing tools to create your requested patterns in DXF vector format. Line, polyline, circle, polygon, rectangle, ellipse and text tools are available.



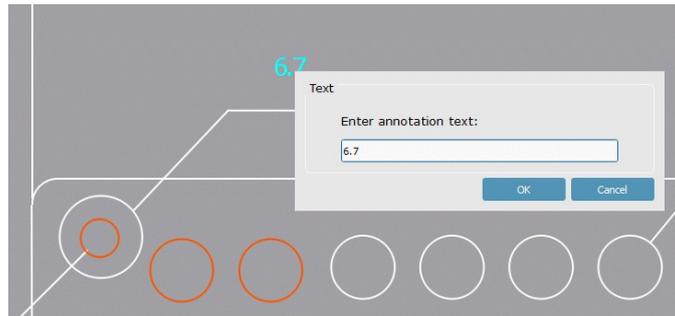
Right-click an object to Delete, Move, Resize, change Colour, change Thickness or Show/Hide geometrical value.



Right-click on annotation to Delete, Move, change Font and Colour and change Text.



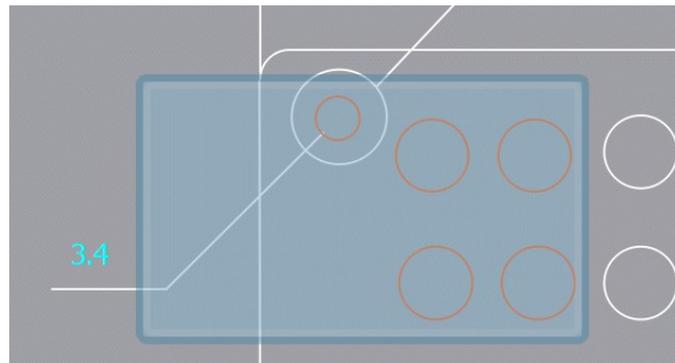
Double click on annotation to change the Text.



Double-click on an object to change size or scale of it.

Select more than one object at a time by enclosing the objects in a selection window specified by a rectangle with two corner points. Using the pointer, click the first corner, drag the pointer until all the objects are enclosed in the window preview, and click the second corner. Objects must be entirely within the window to be selected if you draw selection window from left to right.

Selected objects are highlighted by orange.



Link the DXF pattern to the live image with zoom tacking by selecting Magnification Tracking . Size of the DXF pattern will be adjusted proportionally when zoom/magnification is changed.

Optical Edge Detection



To start Optical Edge Detection select  under DXF Edit and Overlay window.

Select a still picture from main window or switch to live image .

Select Auto Thresholding or manually adjust controls to detect edges. Press **Done** when ready.

Detected patterns are highlighted in DXF vector format and displayed on a new layer over the background picture. All detected objects can be edited by the INSPECTIS DXF editor and be saved as DXF or PNG

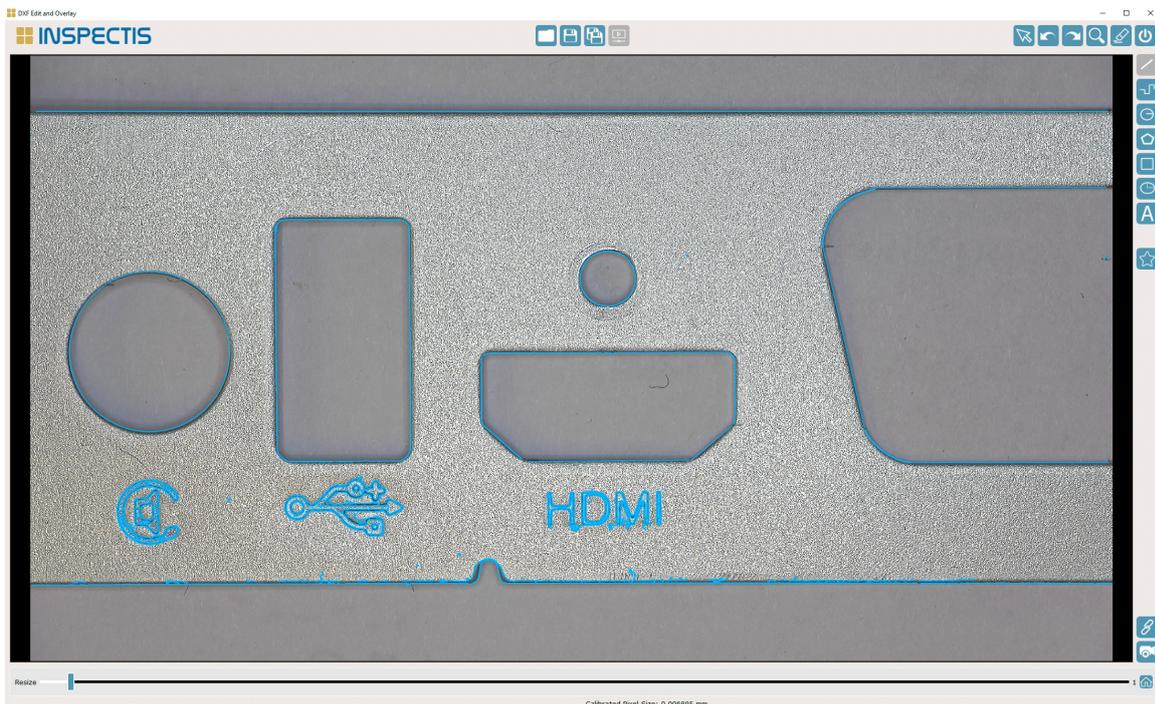
files using  button.

Auto Thresholding:

Auto thresholding finds the edge detection parameters automatically according to the pixel intensity values.

Manual Thresholding:

Filter Strength: Low pass filter to smooth out the image. Lower filter values preserve more details on picture. Thresholds: Lower and higher threshold pixel controls allow the user to reduce false edges. These values vary widely depending on sharpness, contrast and quality of the picture.



Save as PNG if you want to overlay the pattern on the live the image as Digital Graticule .

Save as DXF if you need to edit and file later.

Annotation Tools

To select an Annotation Tool right click on the current  icon on the right menu bar. Annotation tool menu will pop-up.



Left click on the desired tool to activate/deactivate. Last selected tool icon will replace the menu icon for quick access

 **Annotation with Line:** Draw the line and a text window will appear. Write a text or leave it blank to just draw a line. To annotate only a text, just click instead of drawing a line. Select is activated when annotation is completed to let you adjust position of the line and text box! Select annotation line or text box by left click and right-click your mouse button to delete all or to rename annotation text.

 **Counting Objects:** Choose the desired category from the counting window and count objects on the image by left clicking on each item. The counted object will be mark with the first letter of the selected category followed with the current count. After finishing counting objects, click **OK** to close category window.

Name of the categories as well as their font size and colour can be changed in [Preferences](#).

 **Draw a Line:** Press left mouse button to start and release to draw the line. Select  is activated when drawing is completed to let you adjust position and length of the line! Select line by left click and right-click your mouse button to delete.

 **Draw an Arrow:** Point to the object you want to mark, press left mouse button to start drawing arrow head and release to complete the line. Select  is activated when drawing is completed to let you adjust position and length of the arrow! Select arrow by left click and right-click your mouse button to delete.

 **Draw a Free Form Curve:** Press left mouse button to start drawing a free form curve and release to

finish. Select  is activated when drawing is completed to let you change position of the curve! Select curve by left click and right-click your mouse button to delete.



Draw an Ellipse: Point to top-left edge of the area you want to mark with an ellipse or circle, press left mouse button to start drawing and release to complete. Press and hold **Ctrl** key to force ellipse be

drawn as Circle. Select  is activated when drawing is completed to let you adjust position of the ellipse! Select ellipse by left click and right-click your mouse button to delete.



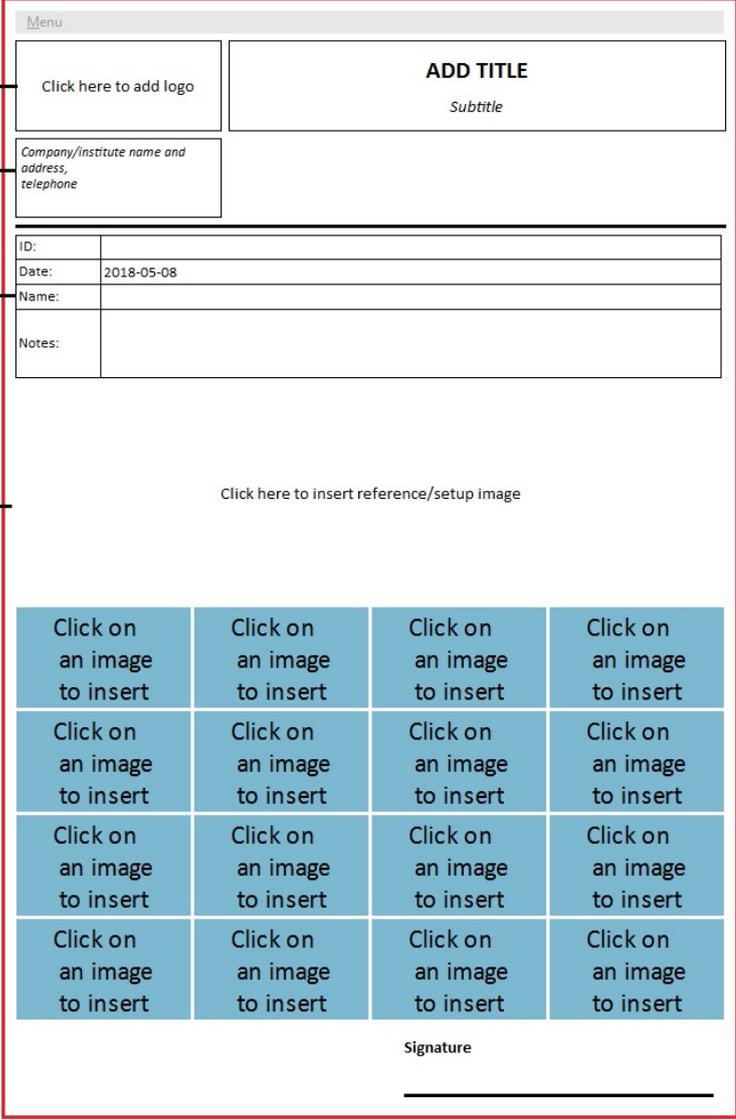
Draw a Rectangle: Point to top-left edge of the area you want to mark with a rectangle, press left mouse button to start drawing and release to complete. Press and hold **Ctrl** key to force rectangle be

drawn as square. Select  is is activated when drawing is completed to let you adjust position, size and shape of the rectangle! Select rectangle by left click and right-click your mouse button to delete.

Font size, line thickness and colour of annotation can be changed in [Preferences](#).

Reporting

To start creating a report click  icon.



The screenshot shows a report creation form with the following sections:

- Title:** A box with "Click here to add logo" and a larger box with "ADD TITLE" and "Subtitle".
- Company Details:** A box with the placeholder text "Company/institute name and address, telephone".
- Report Details:** A table with fields for ID, Date (2018-05-08), Name, and Notes.
- Image Area:** A large area with the text "Click here to insert reference/setup image" and a grid of 16 blue buttons, each labeled "Click on an image to insert".
- Signature:** A line with the label "Signature" below it.

Title Area: Add logo and editable title/subtitle to a report by clicking on the respective area. Title can be saved as a template for the future reports. Click "Menu/Save Template" to save the template

Company Details: Editable field to update company details. "Menu/Save Template" also saves company details.

Report Details: Editable fields to update the details. Date is auto-generated and can be edited.

Image Area: Click on an image in the thumbnail view to include it in the report. Right click to remove the image. A reference or set-up image can also be added.

Click Menu/ Save As PDF to save a PDF copy of the report and click on "Send As Email" to mail the report in a PDF format. Detailed information of each image as well as measurement results will be automatically printed on the report. A PDF reader must be installed on the PC to view the reports.

Shortcut Key List (Hot-keys)

Following quick-access shortcut keys (Hot-keys) are available in INSPECTIS ProX:



Save Image [Shortcut Key: **F10**].



Save Image As [Shortcut Key: **F8**].



Capture Live Image [Shortcut Key: **F11**].



Save Averaged Frames [Shortcut Key: **F9**].



Capture Video [Shortcut Key: **F2**].



Record Audio [Shortcut Key: **F1**].



Play/Pause Video [Shortcut Key: **Space**].



Zoom In [Shortcut Key: **F4**].



Zoom Out [Shortcut Key: **F3**].



Zoom to Fit Screen [Shortcut Key: **F5**].



Full Screen [Shortcut Key: **F6**].



Clear all Items [Shortcut Key: **Ctrl+Del**].



Undo [Shortcut Key: **Ctrl+Z**].



Redo [Shortcut Key: **Ctrl+Shift+Z**].



Picture Alignment [Shortcut Key: **A**].



User 1, 2 [Shortcut Key: **1, 2**] and **Preset 1, 2** [Shortcut Key: **3, 4**].



Increase Contrast [Shortcut Key: **up arrow**].



Decrease Contrast [Shortcut Key: **down arrow**].



Increase Exposure time [Shortcut Key: **Right**].



Decrease Exposure time [Shortcut Key: **Left**].

Reset and Restart Camera [Shortcut Key: **F12**].

Barcode, QR, and Data Matrix Scanner



Click  by left mouse button to automatically scan a Barcode, QR-Code and Data Matrix visible on the image field. The encoded information e. g. text or numeric data will be read by the software and transferred to an Excel file which is automatically created from a Template and saved under current Work Folder. The Excel file is named with the decoded Barcode ID.



Default Excel file Template has the following layout. You may define your specific Template and saved it under ../INSPECTIS/Templates on C:/Program Files (x86).



Right click on  icon to select the Template. Current Template will be used by software until a new Template is selected.

Task	Date & Time	Notes

Date and time are always displayed in cell A1 even in user defined Templates.
 Encoded information is always displayed in cell A2 even in user defined Templates.
 Other cells may be edited and saved as a new Template according to your specification.

Images in the Work Folder can be exported onto the Excel file by right clicking on the thumbnails and selecting "Send Image to Excel".

Double-click the Excel file thumbnail to open it after inserting the images.

Left-clicking an image thumbnail in the Work Folder will automatically copy it to the computer clipboard to be pasted onto the open Excel file or any other APP outside the INSPECTIS Software.

If there are multiple Barcodes on the image field, the software will highlight only the first decoded Barcode.

Notice size of the Barcode (e. g. live image magnification) and/or brightness of the live image shall be sufficient for being scanned by the software.

Supported Barcode Formats are: DATA MATRIX, EAN-13/UPC-A, UPC-E, EAN-8, Code 128, Code 93, and Code 39.

System Requirements

Minimum System requirements:

Component	Minimum specification
CPU	Intel Core i5, CPU @ 2.4 GHz or faster
Operating System	Windows 10/11 (x64 version Professional, Enterprise)
Memory	8 GB of RAM
Hard disk	200 GB of Free Space
Display	Laptop: 15.6" / 1920 x 1080 (Full HD) PC: 24"-27" / 3840 x 2160 (4K)
Ports	One USB 3.0 or USB3.1 or USB3.2 port (5Gbit/s) Two USB 2.0 port One PCIe Gen2 x4 (if PCIe converter is used)

Recommended computers by Inspectis:

- **Station:** DELL Precision Workstation, Intel Core i7, 16 GB RAM
- **Laptop:** DELL Latitude, Intel Core i7, @ 5.0 GHz, 8 GB RAM 15.6", Full HD
HP EliteBook, Intel Core i7, 16 GB RAM 15.6", Full HD

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Printed in Sweden. Sept-2024