INSPECTIS

Instructions Manual

INSPECTIS© Basics for BGA V7.2

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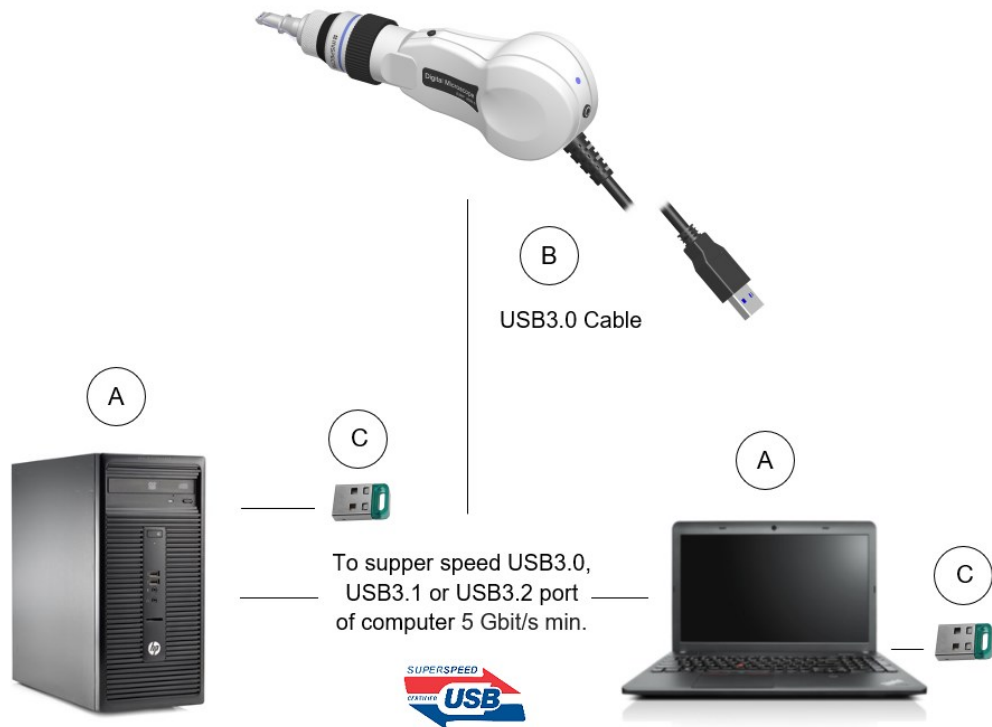# Installation and Setup

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.

B
USB3.0 Cable

A

C

A

C

To supper speed USB3.0, USB3.1 or USB3.2 port of computer 5 Gbit/s min.
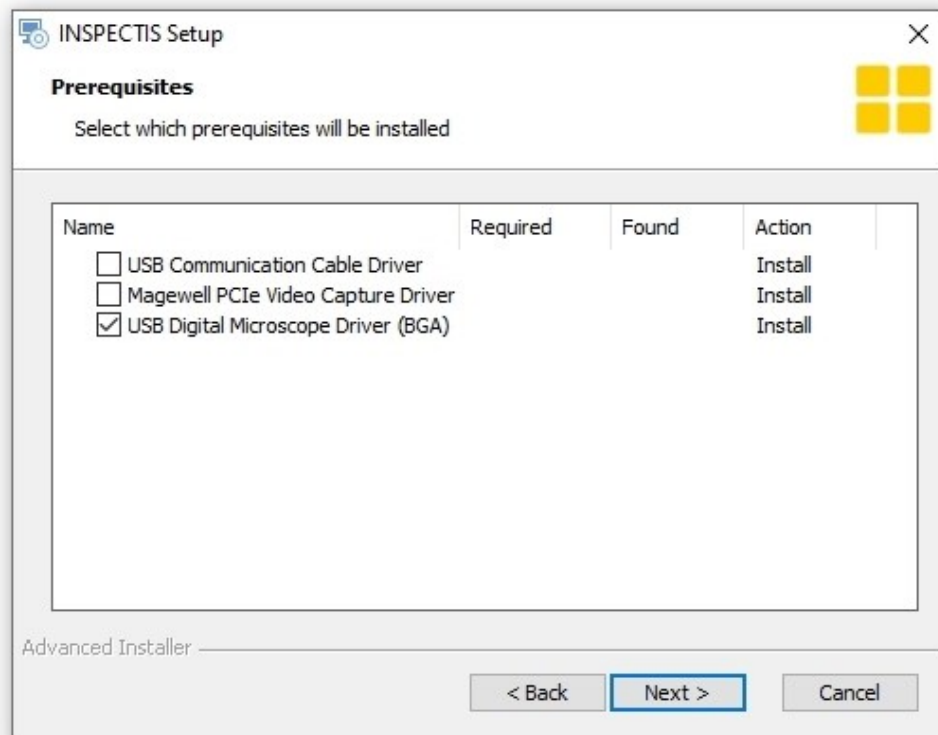
SUPERSPEED
CERTIFIED
USB

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.
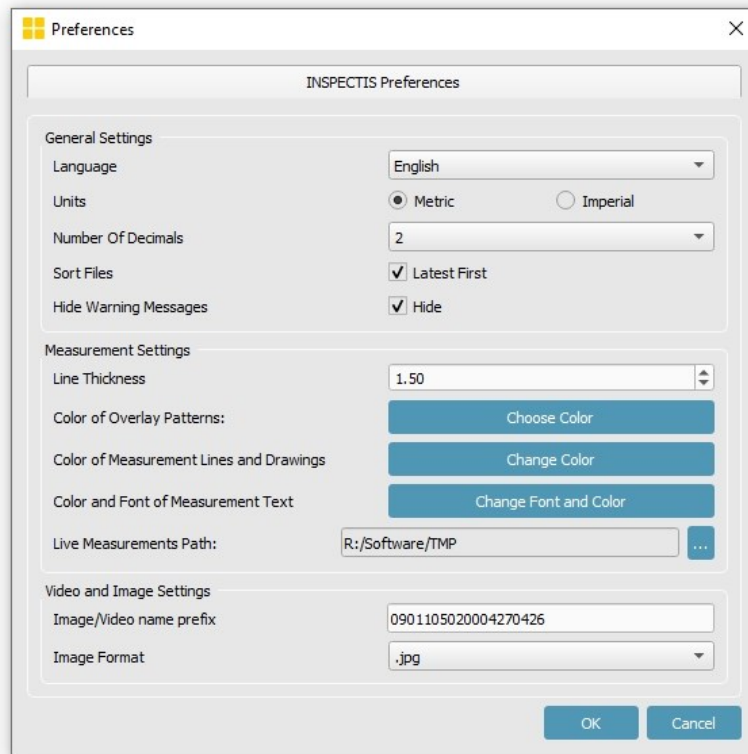

4. Follow on-screen instructions to complete the installation.

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:

    o "**INSPECTIS Basics**" if a full license has been ordered.

    o 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.

Running INSPECTIS Basics for the First Time

Software Preferences

In Preferences, overall settings of the INSPECTIS software is defined. Click [icon] 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
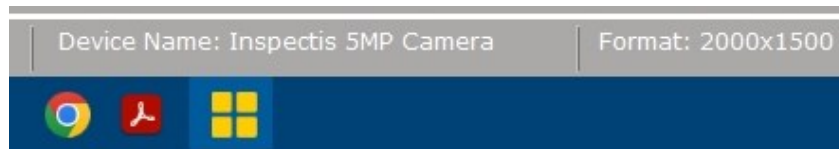
Selecting Device

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.

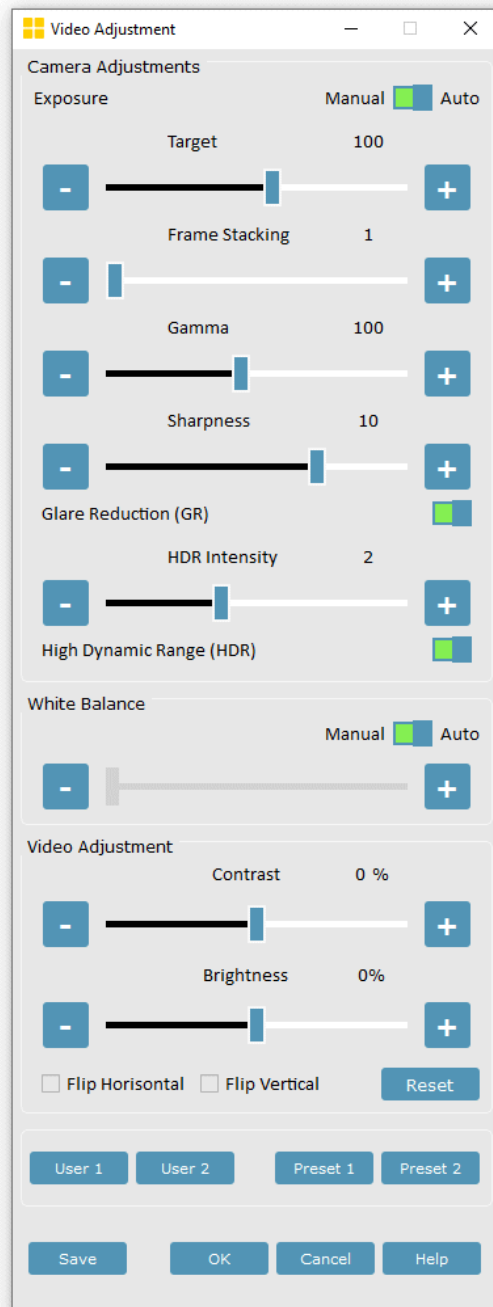INSPECTIS software displays connected device names on the status bar.

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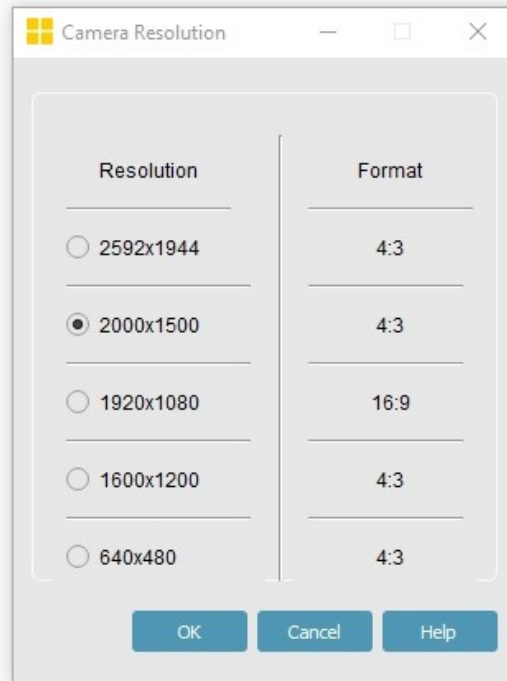
User buttons [U1] [U2] or Preset buttons [P1] [P2] at INSPECTIS main window recalls previously configured and saved Camera setups.
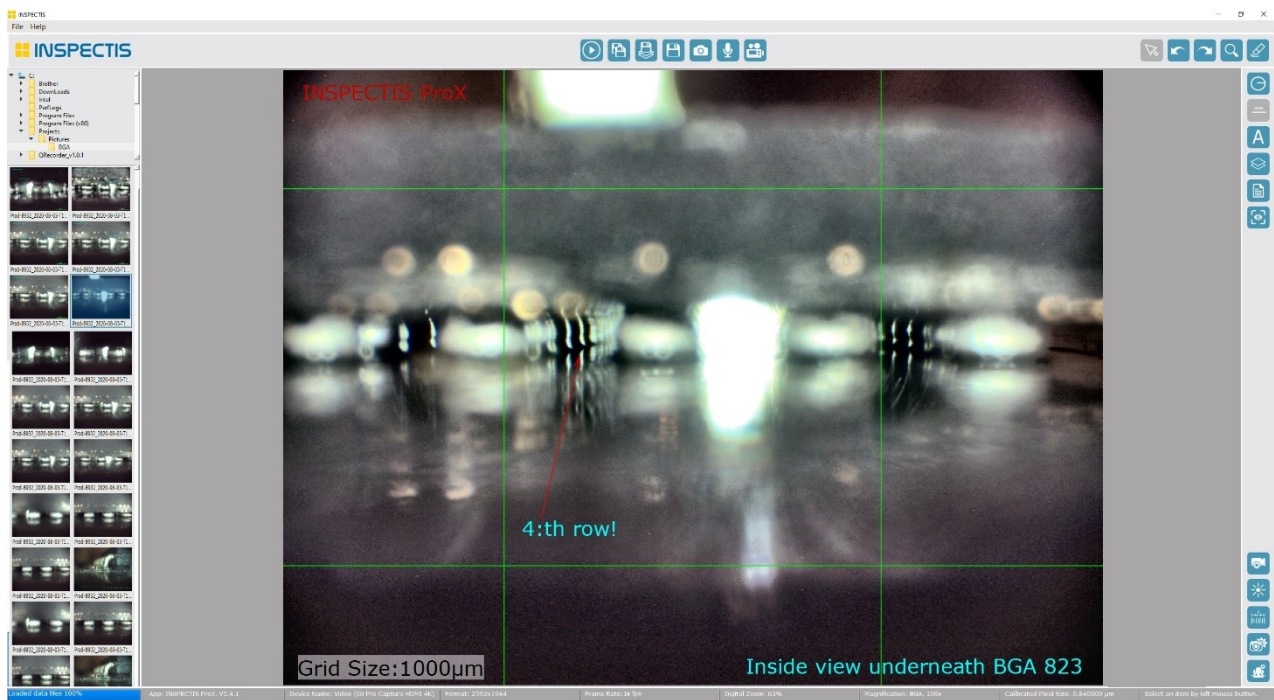
Device Resolution

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 Basics 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.

Most of the functions are available with a shortcut key indicated as [key] for quick access.

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]

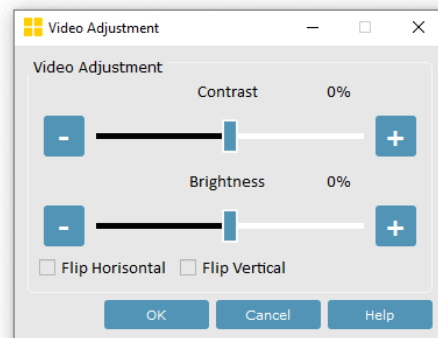🔍 **Zoom to Fit Screen** [Shortcut Key: F5]

⛶ **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.
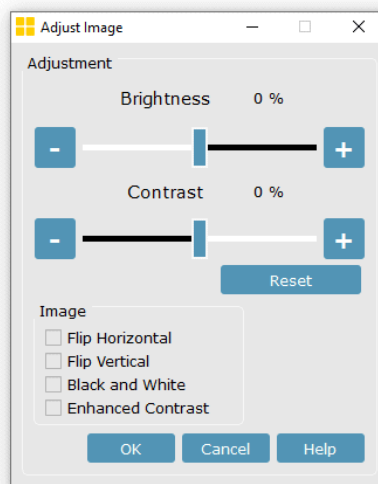
Image Adjustments

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

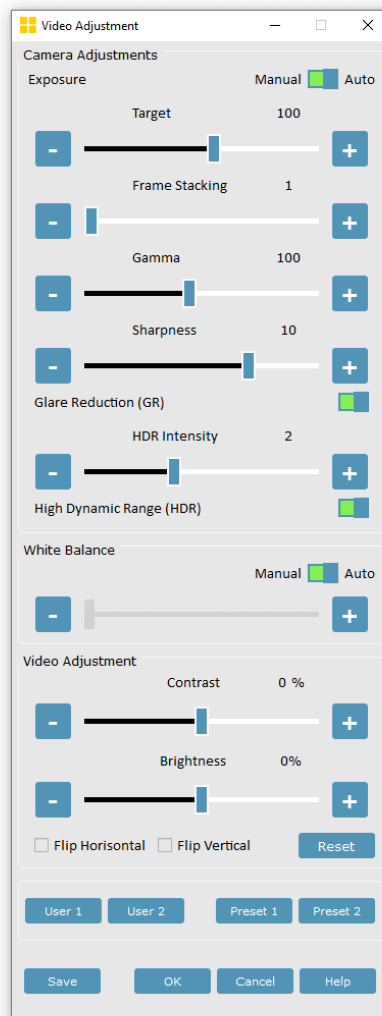If image is live user can change orientation of the image, brightness and contrast value.

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:
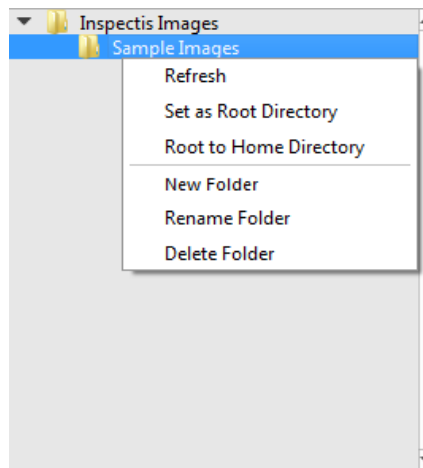

Choose between Preset1 and Preset2 or select your preferred adjustments and saved them under User1 or User2 for best image quality.
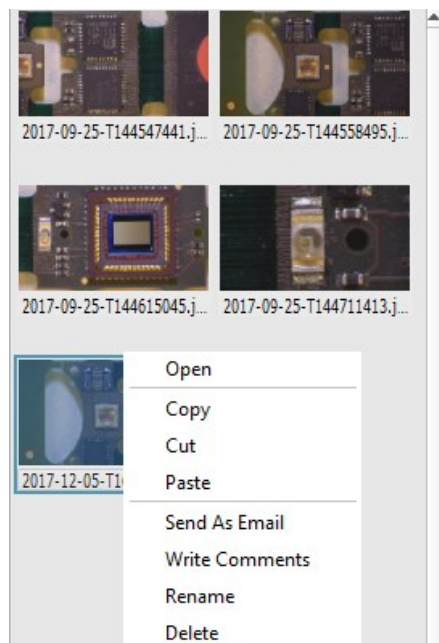
Folder Structure and Thumbnail View

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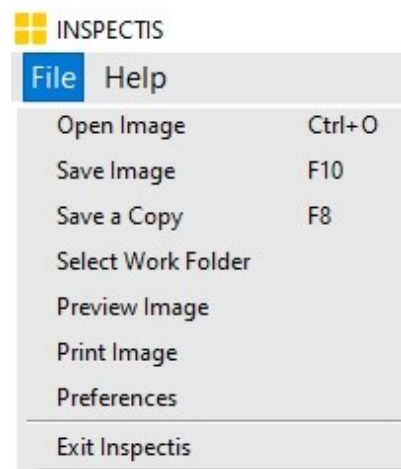
 Save Image As [Shortcut Key: F8]. Saves the image with user specified name and folder.
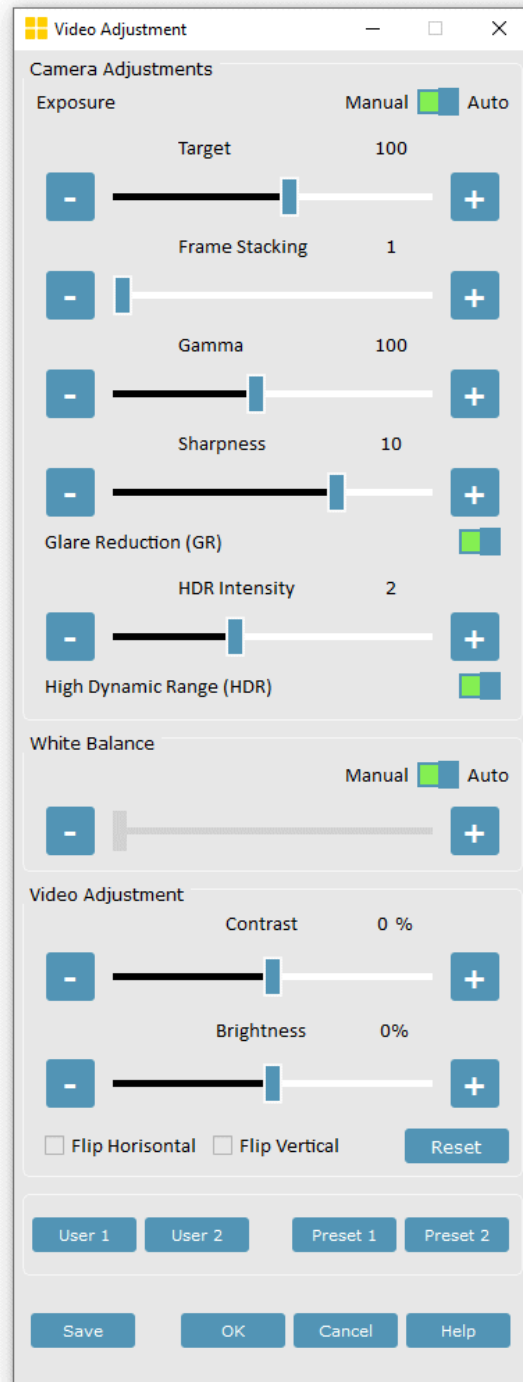
Loading Images and Videos

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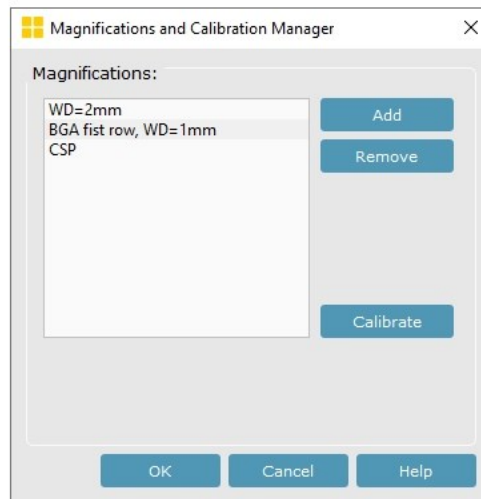
Magnification and Calibrations

Magnification Manager

Magnifications can be added, calibrated or removed via Magnification and Calibration Manager. Click on
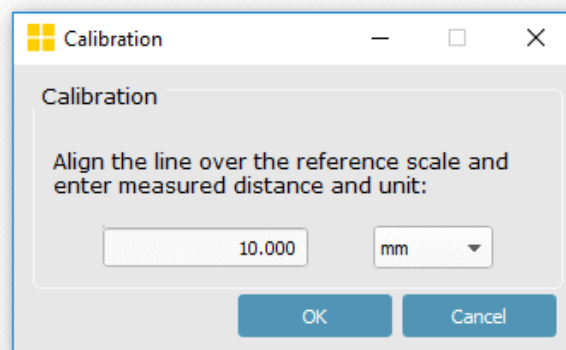
 icon to display the dialogue.

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

 and add it as a new Magnification.

Calibrate this magnification by selecting . 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.
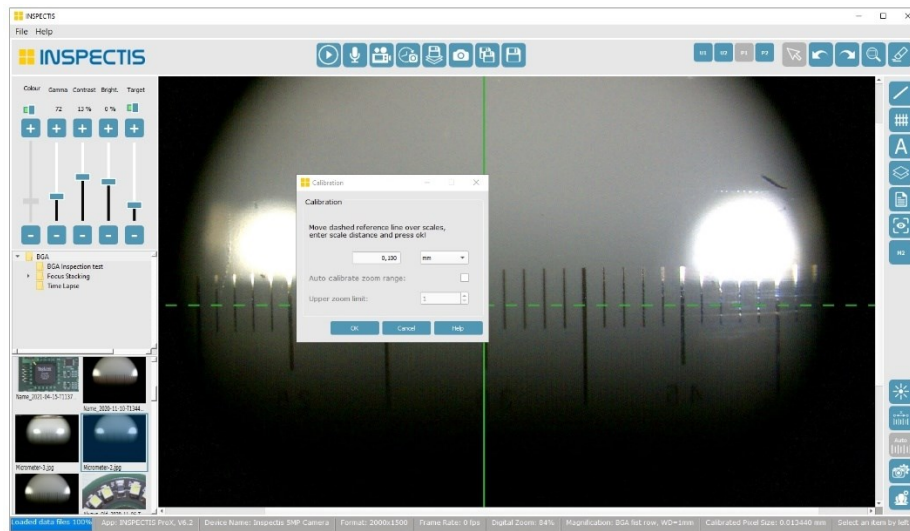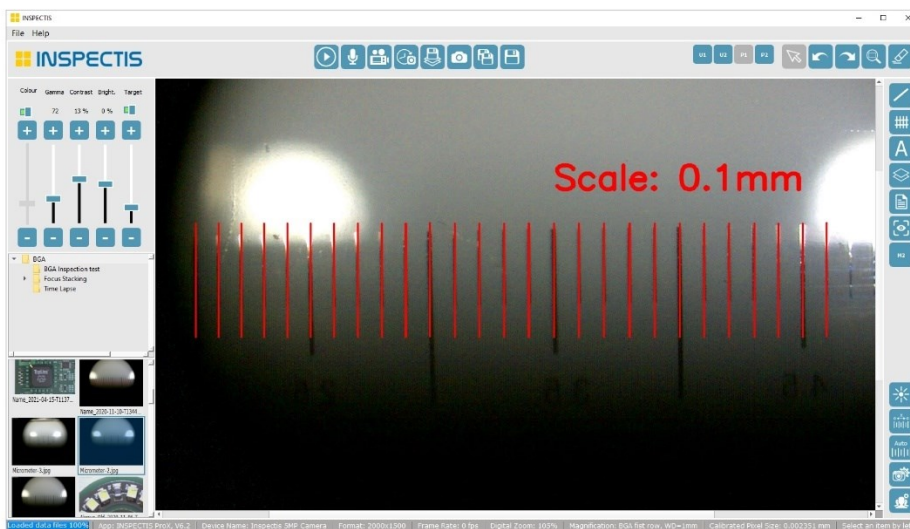
Auto Calibrating Magnifications

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 horisontal line around which the calibration is processed will be displayed on the live image. If necessary, drag the horisontal dashed line over the scales to intersect properly. Enter scales size in mm/µm 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.
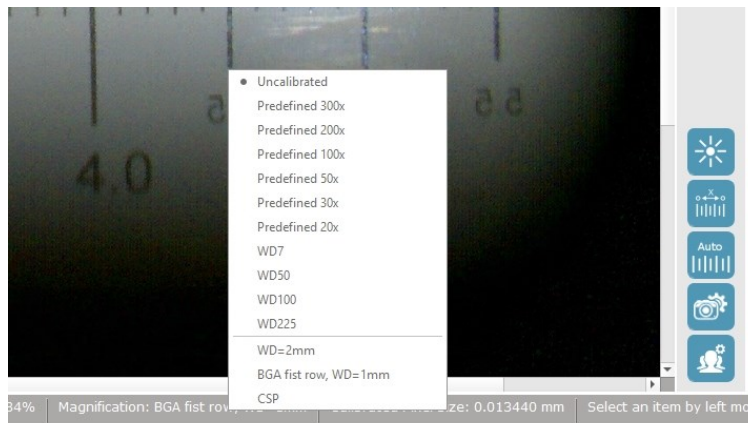

Selecting Magnifications

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

 Measure Distance. To 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 automatically activates after each measurement to fine-tune the measurement line if necessary.

To fine-tune the start and end position of the measurement line:

- Click and drag the ends of the measurement line to change the distance.
- Click and drag the measurement line to move the line.
- Click and drag the text box to move it to another position.

Press and hold Ctrl key on computer keyboard before drawing the measurement line to make Horisontal or Vertical Distance measurements.

Number of decimals for measurement results can be set in Preferences (1 to 5 decimals).

Thickness and Colour of measurement lines as well as Font Size and Colour of the text can be changed in Preferences.

To modify, move or delete a measurement activate the Select Tool and right-click on the specific measurement line.

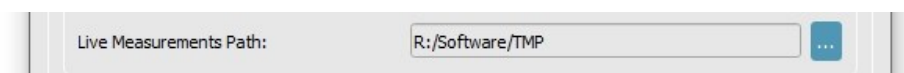All measurements can be undone or redone using Undo and Redo respectively.

To delete and clear all items, click on .

If you select an uncalibrated image, measurement results will be presented in pixels.

Measurement Table on top-left of INSPECTIS window is automatically displayed as soon as a measurement tool is selected.

	Tool	Parameter	Value	Unit
1	D1	Length	4,04	mm
2	D2	Length	4,4	mm
3	D3	Length	2,98	mm
4	Ø1	Diameter	3,64	mm
5	Ø1A	Area	10,41	mm²
6	α1	Angle	39,86	°

A measurement result file in CSV format is automatically created and updated in real time. The location of the measurement file is defined by the user under Software Preferences.

Live Measurements Path: R:/Software/TMP

Saving and Exporting Measurements

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

Measurement results are also displayed under Measurement Table field on INSPECTIS and can be exported to Excel or other CSV file compatible software.

Measurements can be burned to the image and saved together with the image using Save Image or Save as Copy button.

Annotation Tools

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

Annotation with Line: Draw a line and a text window will appear. Write in the text field or leave it blank to just draw an arrowhead line. To insert a text without line, just click on the image field instead of drawing a line. Select is automatically activated when annotation is completed to let you adjust position of the line and text box! Select the annotation line or text box by left click and right-click your mouse button to delete all or to rename annotation text.

Counting Objects: Check the desired category A-F from the counting window and count the 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.
The results are also displayed under Measurement Table field on INSPECTIS and can be exported to Excel or other programs in CSV file format.
Name of the categories as well as their font size and colour can be changed in Preferences.

Reference Overlay Tools

To select a reference tool for display on live image, 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. Grid can be moved across the image field. Right mouse click to move it back to default centre position. 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. Rectangle can be moved across the image field. Right mouse click to move it back to default centre position. Thickness and colour of rectangle can be changed in Preferences.
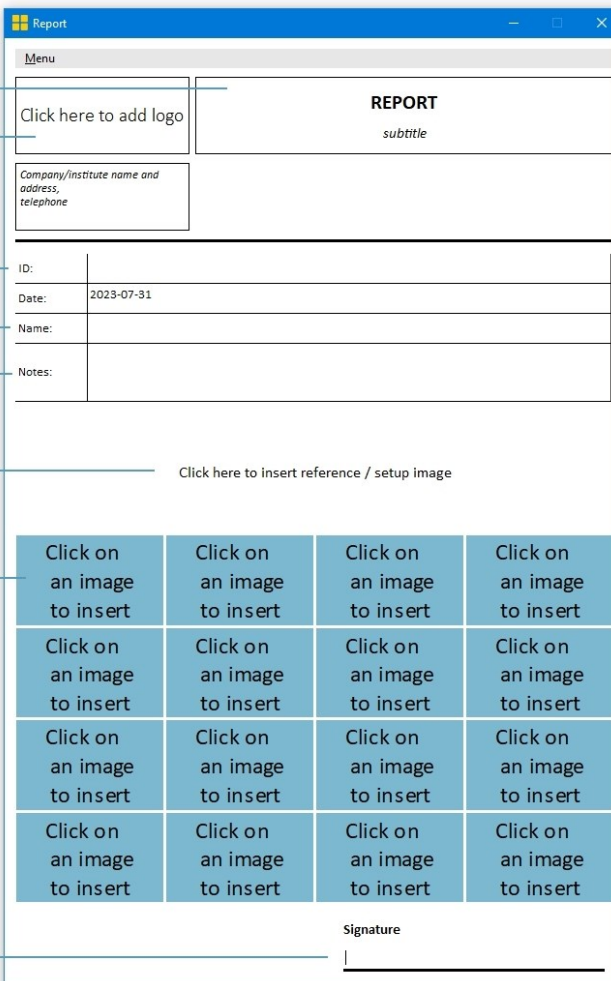
Reference Scale: Left click to activate/deactivate a calibrated Reference Bar on the screen. Colour of Reference Scale bar can be changed in Preferences.

Report Tools

To start creating a report click [icon].

Under Menu you can create a New Template including 16 or 32 pictures or open an existing report template. Click on saved picture thumbnails to insert them into the report template. When the report is completed Save it as PDF in your computer or directly Send it as email.

Logo area: Left-click to add a logo in JPG or PNG format.

Report name and Subtitle area: Add title/subtitle to the report by clicking on the respective area.

Company/Institute details: Editable field to update organisation details. "Menu -> Save Template" also saves company details.

ID/name and Notes: Editable field to insert patient details.

Signature: Editable field to text operator name or signature.

Select **Menu** -> **Save** Template to save a template for future use. Company details, logotype and other common information will be saved into the new template.

Hot-Keys

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

Save Image [Shortcut Key: F10].

Save Image As [Shortcut Key: F8].

Capture Live Image [Shortcut Key: F11].

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**].

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

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

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

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

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

Preset recalls:

User 1, 2 [Shortcut Key: **1, 2**].

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

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

INSPECTIS© is developed by Inspectis AB

![INSPECTIS logo]

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