



Instructions Manual

INSPECTIS[®] Basics v6.3

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Installation and Setup

Installing INSPECTIS Software

Important notes before installation:

- 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 the user must run the provided installation file. Double-click on it and a new window will be displayed.

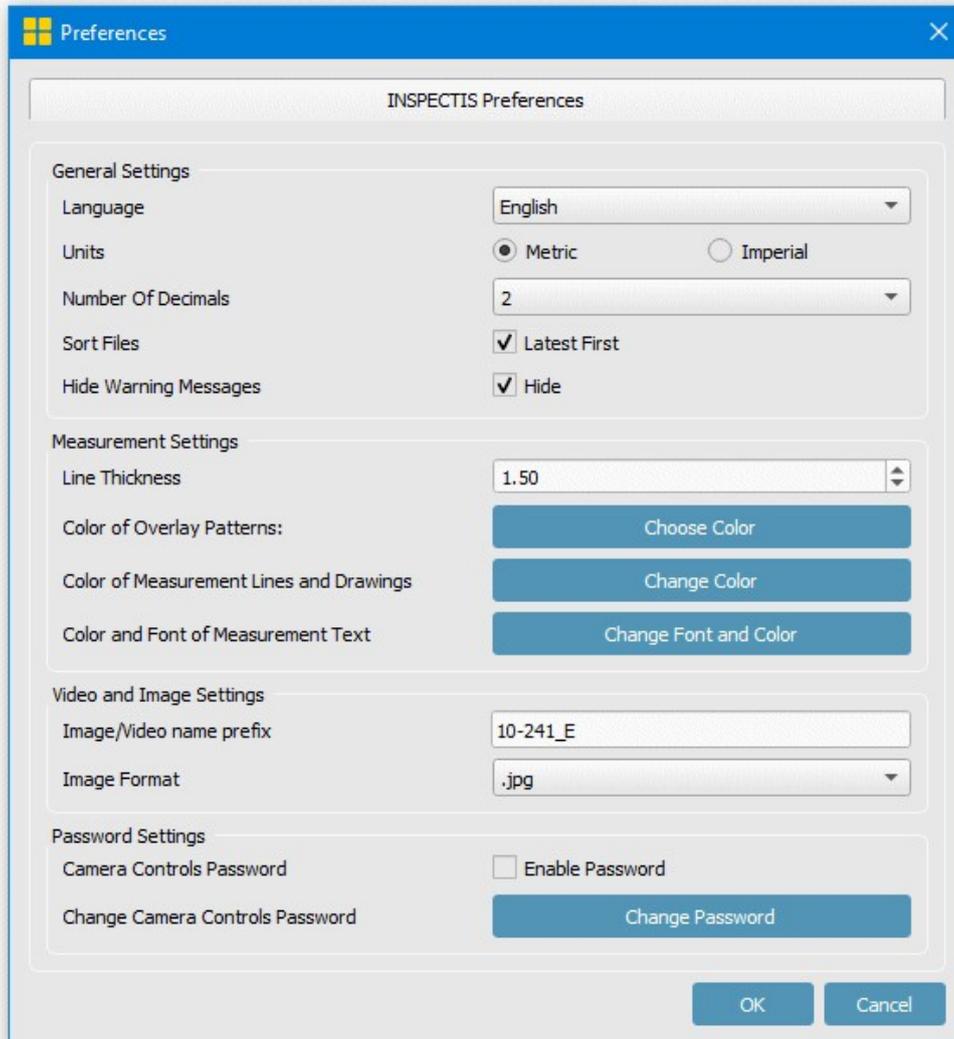
1. Click "Next" to continue.
2. Choose a folder in which to install INSPECTIS software. Click "Next" and "Next" again to start the installation.
3. Follow on-screen instructions to complete the installation.
4. When the installation is complete click "Close" to exit the window.
5. To install device drivers for the COM-USB communication cable, run CDM21228_Setup under Communication Cable Driver folder.

Running INSPECTIS for the First Time

1. Before launching INSPECTIS software please make sure your Inspectis device is connected.
2. Insert the software protection dongle into a free USB port on computer. The protection dongle will be found inside the product box.
3. 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 Basics" if a full license has been ordered with the software protection USB dongle. All software functions will be enabled.
 - 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 the 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.
8. The software will automatically detect and select the installed INSPECTIS device

Software Preferences

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



INSPECTIS Preferences

General Settings

Language: English

Units: Metric Imperial

Number Of Decimals: 2

Sort Files: Latest First

Hide Warning Messages: Hide

Measurement Settings

Line Thickness: 1.50

Color of Overlay Patterns: Choose Color

Color of Measurement Lines and Drawings: Change Color

Color and Font of Measurement Text: Change Font and Color

Video and Image Settings

Image/Video name prefix: 10-241_E

Image Format: .jpg

Password Settings

Camera Controls Password: Enable Password

Change Camera Controls Password: Change Password

OK Cancel

Device Settings

Selecting Device

Click  to show the device settings menu.

Software automatically finds the installed Inspectis device and sets the optimum device settings upon start of the program. INSPECTIS software shows the device names accordingly on the status bar:

FULL HD HDMI to USB3.0 Converter	-> X1100DUSB-HDMI Video
4K HDMI to USB3.0 Converter	-> USB Capture HDMI 4K+
4K HDMI to PCIe Converter	-> Video (00 Pro Capture HDMI 4K) or Video (Pro Capture)
USB3.0 Digital Camera	-> Inspectis USB3.0 DM or Inspectis 5MP Camera

If another device is preferred, right click on the device name on the status bar to show the device list and select the desired device.

To select a device from the list of available devices, click  under Device Settings group or right click Device Name on status bar of INSPECTIS.

To automatically select your device click  under Device Settings group. Software will search for Inspectis devices and select one according to following priority:

1. **Inspectis USB3.0 DM or Inspectis 5MP Camera**
2. **4K HDMI to PCIe Converter**
3. **4K HDMI to USB3.0 Converter**

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

Device Resolution

When attached to U, F and C series digital microscope, output resolution of converter devices can be

changed between 4K and FHD (1080p) and HD (720p) by clicking  under Device Settings group. For PCIe converter default resolution is set to 3840x2160. For USB3.0 converters default resolution is set to 1920x1080. If your USB3.0 converter supports 3840x2160 you can change Device Resolution to 4K.



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.



Camera Control and Setup

INSPECTIS software can be connected to Inspectis U, F and C series Digital Microscopes via Inspectis USB-COM communication cable to control camera and lens parameters. Inspectis 5MP Camera with USB interface is directly attached to the software.

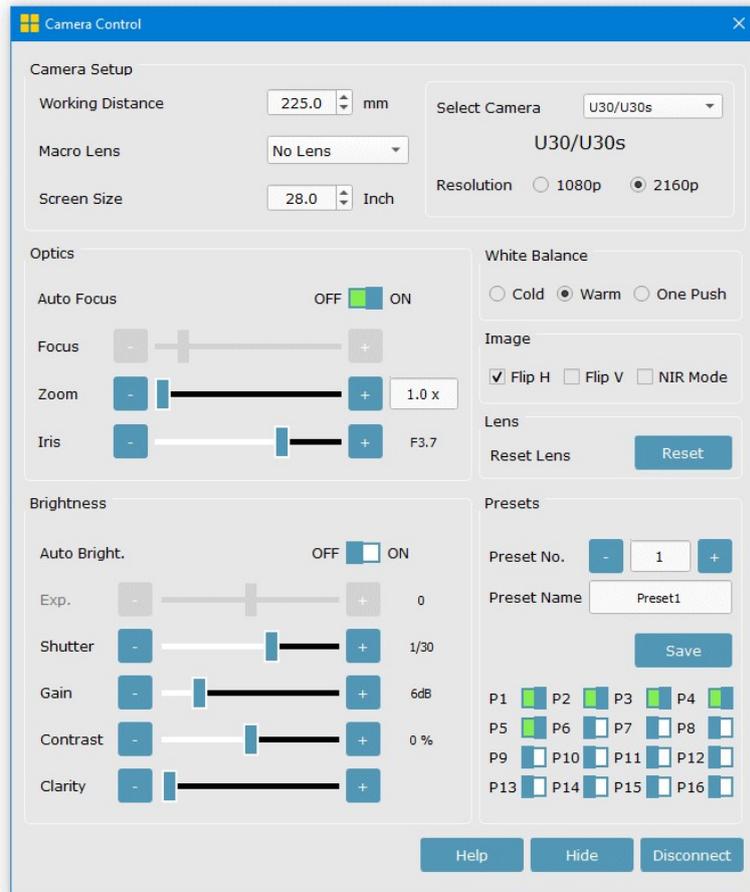
In addition to real-time control of Focus, Zoom, Iris, Exposure, Shutter Speed and Gain via the Camera Control dialogue, additional functions such as Lens Distortion Correction, Calibration Tracking and memory Presets are provided in INSPECTIS software.

Connecting to Inspectis C, F and U-type Cameras

To establish connection between U, F, C and DIM type Digital Microscope and software:

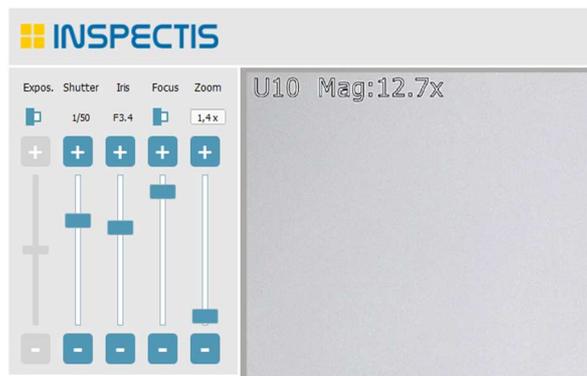
Attach MiniDin side of the Communication Cable to Inspectis digital microscope and USB side of the cable to an available USB port on your host computer before starting INSPECTIS software. Notice it might be necessary to install device drivers of the communication cable to your computer first.

Click on  icon to initiate the camera connection. INSPECTIS will automatically detect the COM port, connect digital microscope to the computer and display Camera Control dialogue.



To disconnect the camera right click on  icon or Disconnect  button at bottom-right of the Camera Control dialogue.

To hide Camera Control dialogue press Hide  button. Camera and lens control bars will be enabled on INSPECTIS main window when Camera Control dialogue is hidden and not password protected.



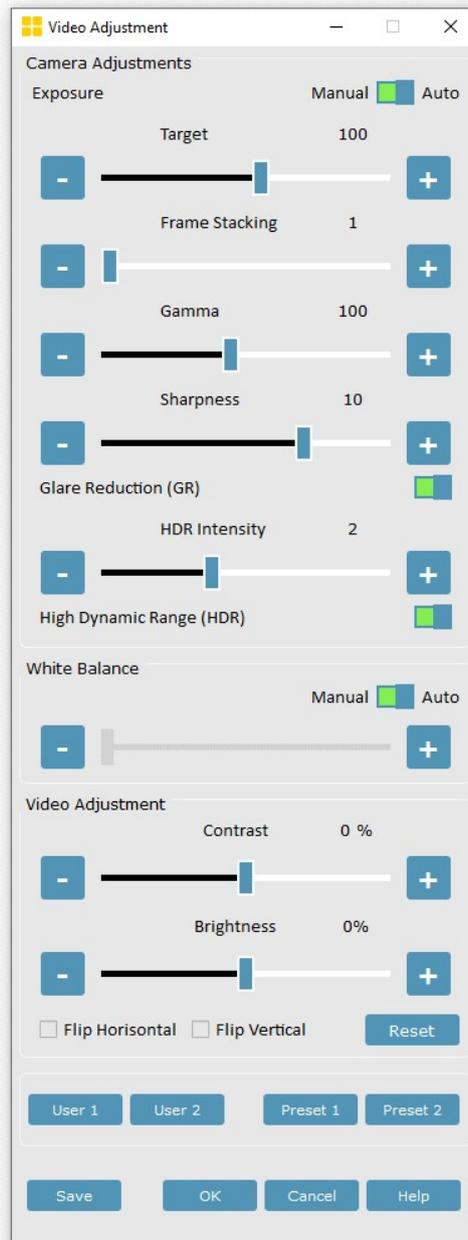
It is possible to password protect the Camera Control dialogue under [Preferences](#).

Connecting to Inspectis 5MP Camera (BGA Inspection System)

Connection between Digital Microscope and software is established automatically as soon as Inspectis 5MP Camera is selected as input Device.



Click on  icon to display Video Adjustment dialogue of the camera as illustrated below:



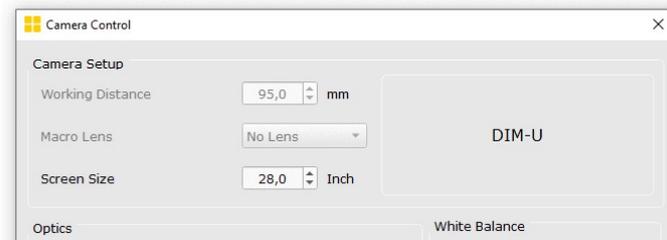
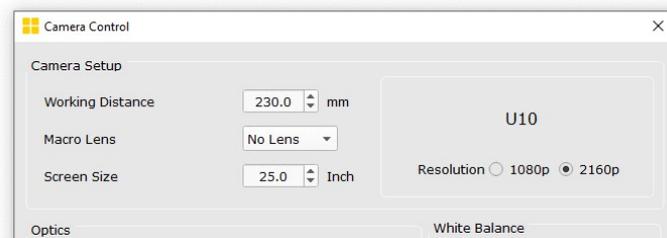
New camera settings can be configured and saved under User 1-2 buttons for future use. Quick access

buttons   and   at INSPECTIS main window recalls user-defined or factory configured Camera setups.

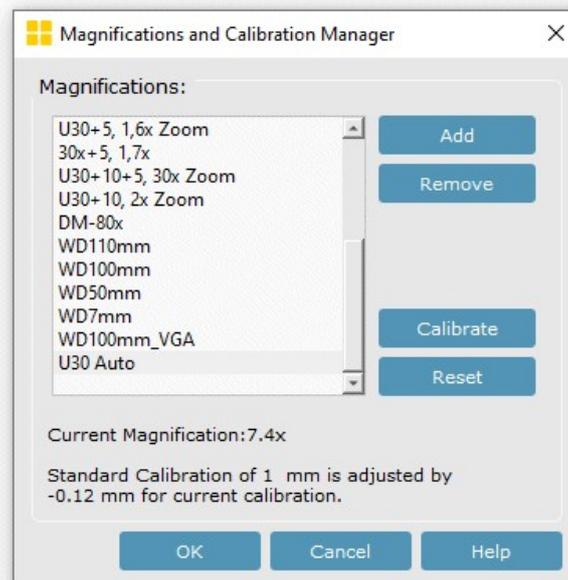
Setup and Calibration Tracking

Thanks to real-time communication with the Digital Microscope, INSPECTIS can auto-track zoom position of the lens and display (factory) calibrated magnification of the image for current zoom position.

You need to enter current Working Distance (Object Distance), Screen Size and Macro Lens (close-up lens) if any is attached to your device. The calculated on-screen magnification will be displayed on the upper left corner of the live image field. If you are running a DIM (Digital Inverted Microscope) only Screen Size can be adjusted.



However, in order to achieve high measurement accuracy, you may need to perform an accurate manual calibration for your preferred magnifications and working distances. Every new custom made calibration will override the factory set calibration. You may reset a custom made calibration to factory set any time by using Reset  button on Magnification and Calibration Manager dialogue.



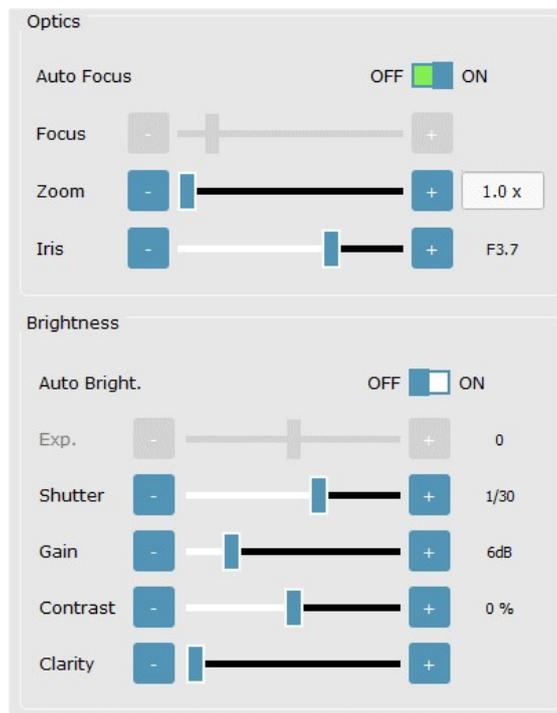
Working Distance: Working distance is defined as the distance measured from the front surface of your Digital Microscope lens housing to the object at maximum zoom factor.

Macro Lens: If any macro lens (close-up) is attached to the Digital Microscope, select the corresponding macro lens. Enter the correct working distance value to the Working Distance field when a Close-up lens is attached to your device.

Screen Size: Diagonal size of the screen in inches.

Camera Controls and Presets

Camera and lens parameters of U, F and C type digital microscopes such as, Focus, Zoom, Iris, Brightness and White Balance can be controlled through the Camera Control dialogue. You may use controls bar or computer mouse wheel or arrow keys on computer keyboard to adjust lens and camera parameters in Camera Control dialogue.



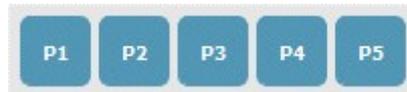
Optics: To control Zoom, Focus and Iris values of the camera lens. To enable Auto Focus, set slider switch to ON. Iris controls aperture or F-number of the camera lens. Higher Iris F-value (e. g. lower aperture size) will increase the Depth of Field. Lens and camera controls can be adjusted using mouse wheel while mouse pointer is hovered over controls. Left and right arrow keys on your computer keyboard can also be used to adjust lens and camera parameters. CapsLock (on computer keyboard) will turn mouse wheel from Zoom to Focus control.

Brightness: To control shutter speed and gain (electronic amplification) of the camera. When Auto Brightness is turned ON, manual control bars for Iris, Shutter and Gain are disabled. When Auto Brightness is turned ON, Exposure level can be adjusted for making image darker or brighter by using the Exposure slider.

White Balance: Warm, Cold or One Push white balance can be selected. Before One Push is selected, place a white object or paper under the camera and adjust image brightness in order to get the best colour balance.

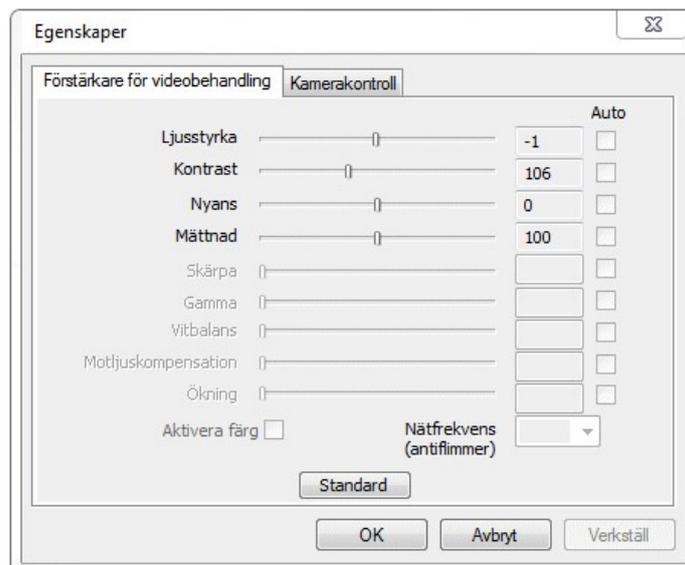
Presets: 5 memory Presets can be saved and recalled later. To save a Preset select the Preset, adjust Optics and Brightness values you wish to use and click the Save button.

To enable recall of a Preset memory, set the slider switch of the respective Preset to ON. Enabled Preset buttons P1 to P5 will be displayed and accessible on INSPECTIS main window.

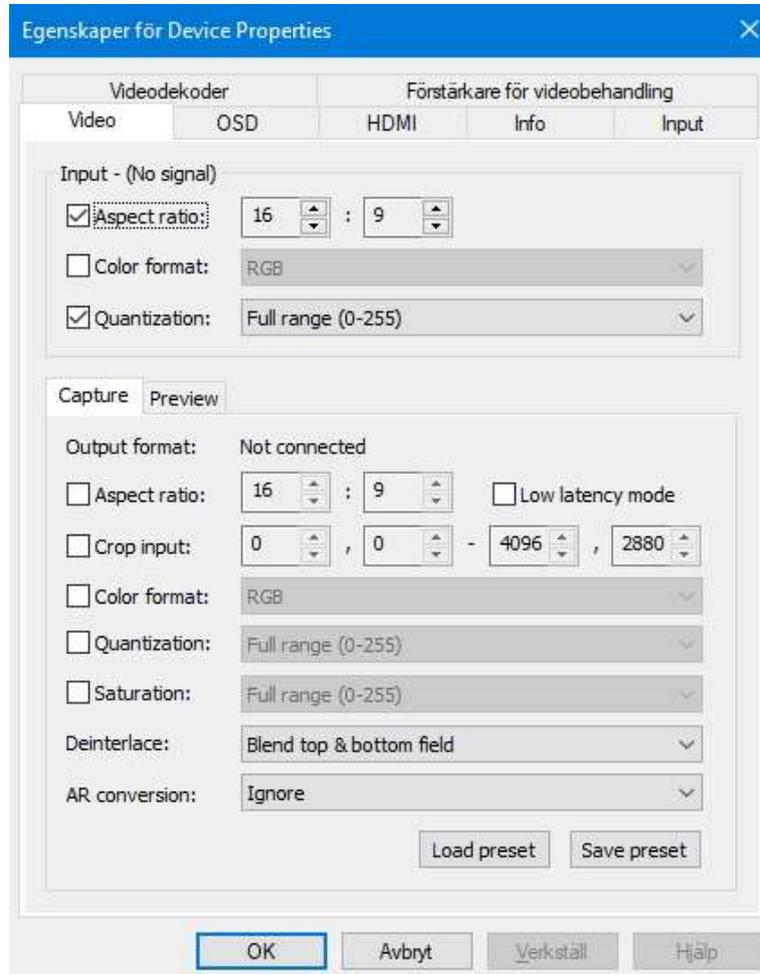


Camera Control dialogue can be password protected. Operators can use Preset button at INSPECTIS main window but are denied access to Camera Control dialogue. Password protection can be enabled under Preferences.

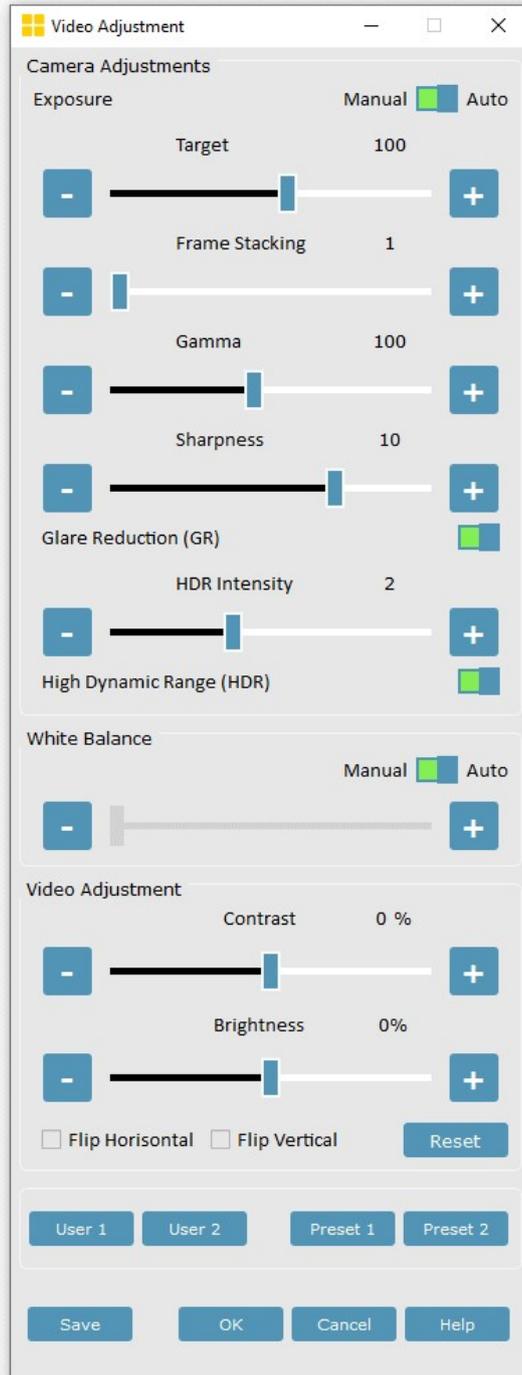
External device settings window similar to below may be displayed if the Inspectis COM cable is not attached or if real-time communication between Inspectis digital cameras and software is not established by any reason.



Notice "Colour format" for PCIe device shall be unchecked to allow automatic detection of RGB signal of U and F cameras. If other formats than RGB is selected colour of the live image will be distorted.



Camera adjustments dialogue for USB digital microscope (Inspectis 5MP Camera) is as illustrated below.

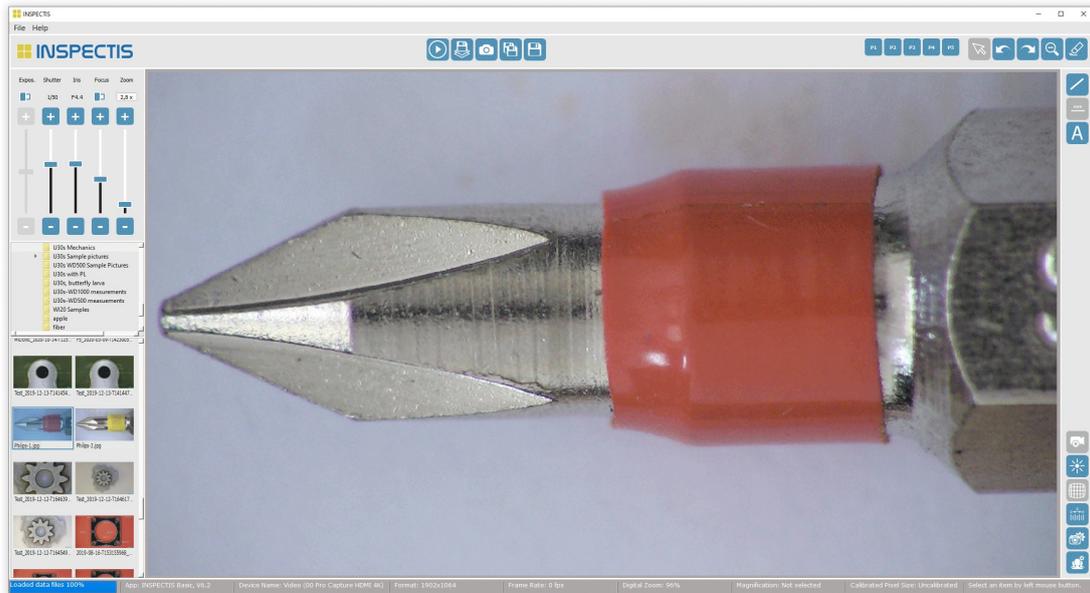


New camera settings can be configured and saved under User 1-2 buttons for future use. Quick access

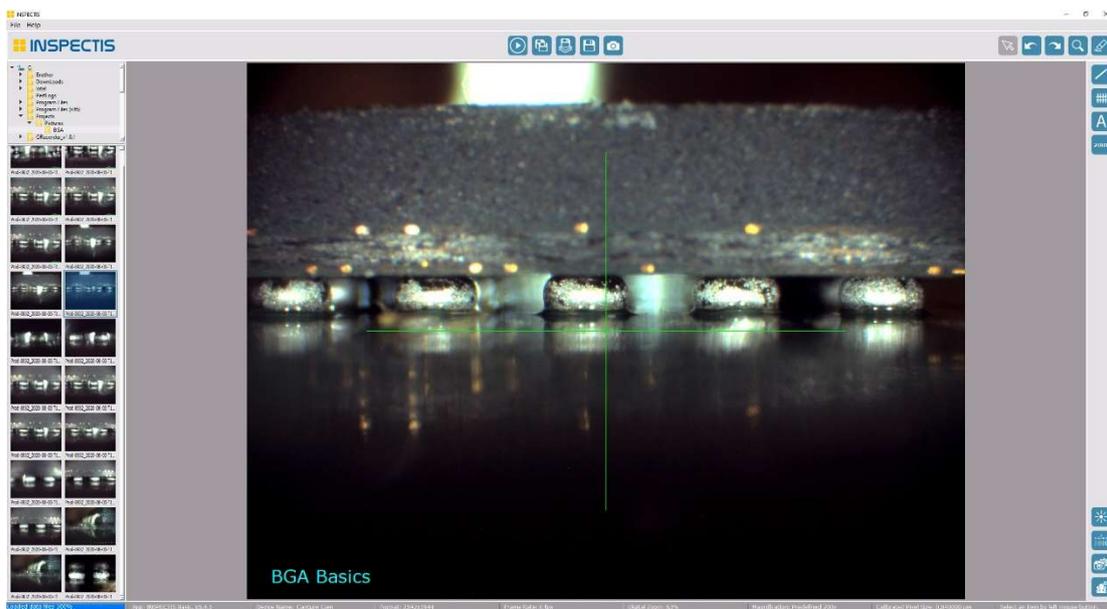
buttons **U1** **U2** and **P1** **P2** at INSPECTIS main window recalls user-defined or factory configured Camera setups.

Working with INSPECTIS Software

INSPECTIS software can be connected to Inspectis U, F and C series Digital Microscopes via Inspectis USB-COM communication cable to control camera and lens parameters. In addition to real-time control of Focus, Zoom, Iris, Exposure, Shutter Speed and Gain via the Camera Control dialogue, additional functions such as Lens Distortion Correction, Calibration Tracking and memory Presets are provided.



Inspectis 5MP Camera (BGA Inspection System) is directly attached to the USB3.0 port of your computer and connected to the INSPECTIS when selected as input device in the software.



Camera attributes like Exposure, Gamma, Image Sharpness, Dynamic Range, Contrast and Brightness can be adjusted by software.

Live Video and Still Images

INSPECTIS software automatically shows the live image 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 out digitally. Zoom functions are accessed by clicking



Zoom In [Shortcut Key: F4]



Zoom Out [Shortcut Key: F3]



Zoom to Fit Screen [Shortcut Key: F5]

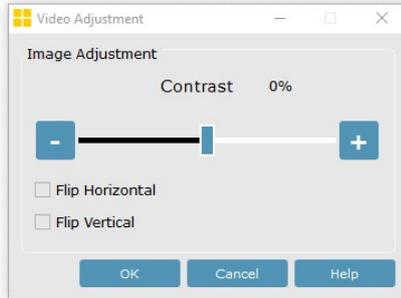


Full Screen [Shortcut Key: F6]. To close the full screen view, press ESC or press the  icon.

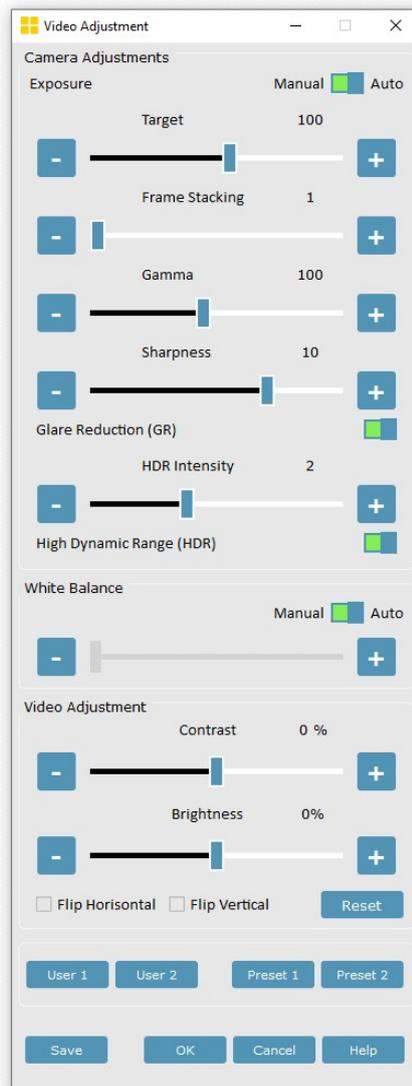
Digital zoom-in and zoom-out can also be done by the wheel of the computer mouse. Mouse cursor defines centre of the zoomed area. To pan the image when zoomed-in, press and hold the middle button of the mouse.

Image Adjustments

If image is live, adjust contrast of the C- F- and U-type cameras by clicking  icon. You can also change orientation of the image by Flip-H and Flip-V check-boxed.

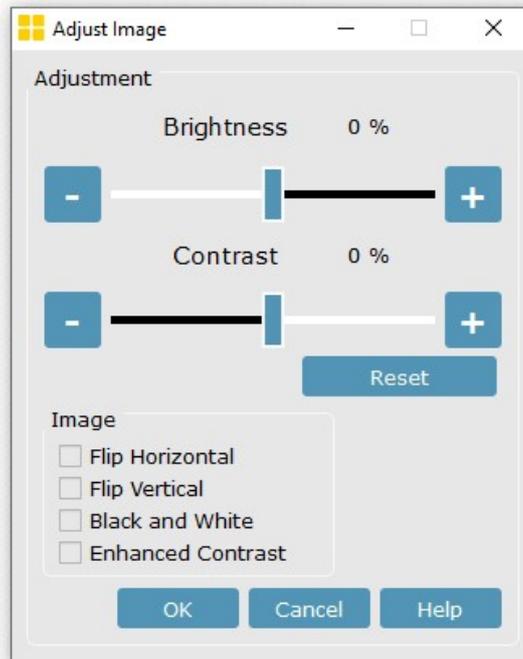


If your connected device is Inspectis 5MP camera (BGA Inspection system), Video Adjustment dialogue will be according to the below picture:



Select your preferred adjustments and saved them in computer memory under User1 or User2 for future use.

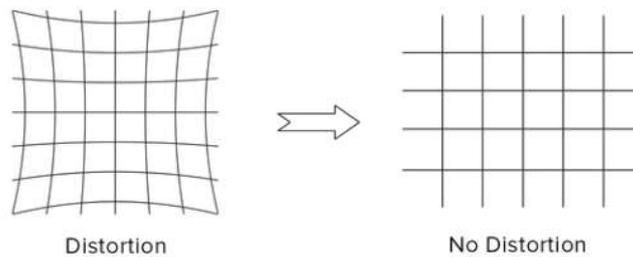
If INSPECTIS image is still, its Brightness and Contrast can be adjusted by clicking . In addition, Black and White and Enhanced Contrast can also be applied to still images.



Distortion Correction (for C, F and U type Digital Microscopes)

Lens Distortion Correction: Lens distortion is inherit to most wide-filed optical systems. By switching on

the Lens Distortion Correction icon , distortion of the current lens will be automatically calculated and corrected for low magnifications. For zoom factors higher than 4x residual lens distortion is low why Distortion Correction is disabled.

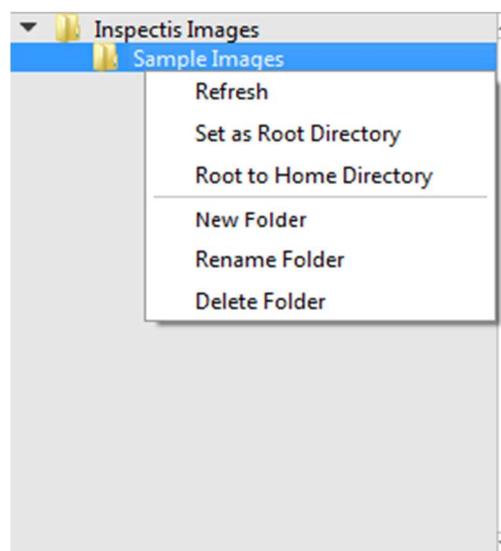


Distortion Correction is automatically enabled when as soon as C-, F- and U-type Digital Microscopes are connected to INSPECTIS software.

Folder Structure and Thumbnail View

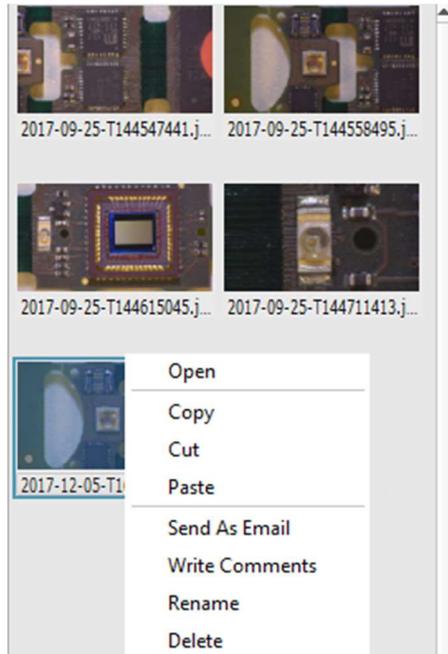
Right click on the folder structure and choose the working folder to be used for saving or recalling images and files. Working folder can be also selected via "File Menu -> Select Folder". Images and other files in the working folder are displayed as thumbnails in the Thumbnail View beneath the folder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



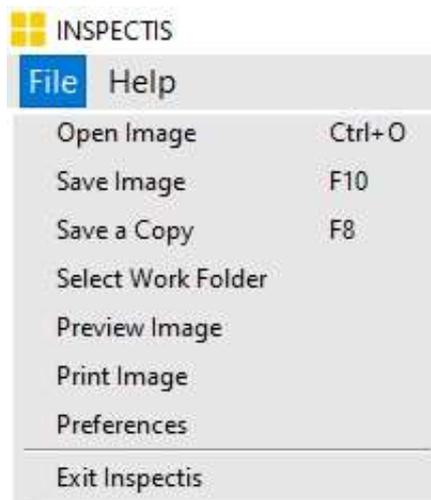
Save Image As [Shortcut Key: Ctrl+A]. Saves the image with user specified name and folder.

Loading Images

To load a thumbnail image or a document from the working folder, left click on it. 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.



Shortcut key list (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**].



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



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**].

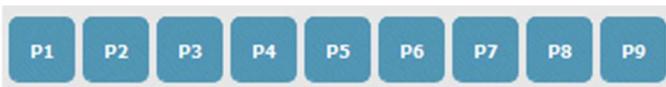


Undo [Shortcut Key: **Ctrl+Z**].

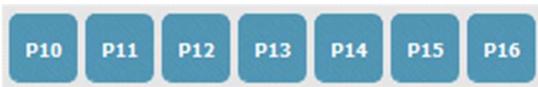


Redo [Shortcut Key: **Ctrl+Shift+Z**].

For U, F, C and DIM type Digital Microscopes:

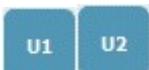


Preset 1 to 16 [Shortcut Key: **1 to 9**].



[Shortcut Key: **Shift+0 to Shift+6**].

Preset recalls for Inspectis 5MP Camera:



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



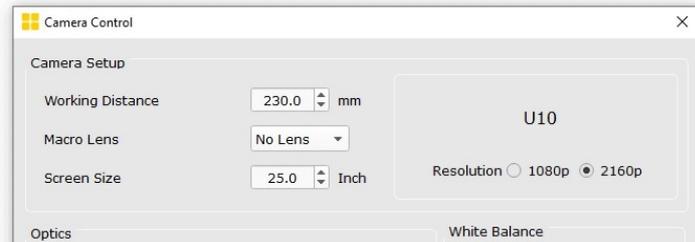
Preset 1, 2 [Shortcut Key: **3, 4**].

Camera Controls (U, F, C and DIM type Digital Microscopes):**Zoom in** [Shortcut Key: **up**].**Zoom out** [Shortcut Key: **down**].**Focus Near** [Shortcut Key: **F**].**Focus Far** [Shortcut Key: **Ctrl+F**].**Increase Iris** of the lens [Shortcut Key: **Right**].**Decrease Iris** of the lens [Shortcut Key: **Left**].**Increase Exposure time (Shutter speed)** [Shortcut Key: **S**].**Decrease Exposure time (Shutter speed)** [Shortcut Key: **Ctrl+S**].**Increase Auto Exposure** [Shortcut Key: **Right** arrow].**Decrease Auto Exposure** [Shortcut Key: **Left** arrow].**USB3.0 Digital Microscope Camera Controls (Inspectis 5MP Camera):****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**].

Measurement and Analysis Tools

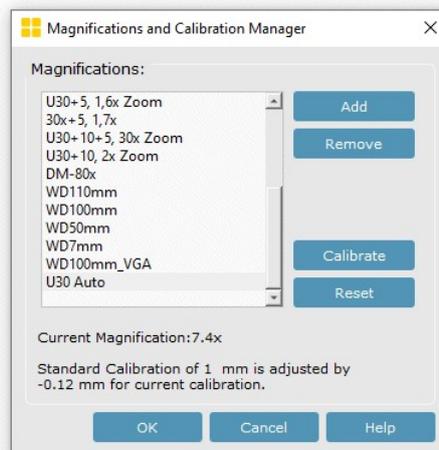
INSPECTIS Basics software features distance measurement tool. For performing accurate measurements, current magnification shall be calibrated in the software. If you select an uncalibrated image, measurement results will be presented in pixels.

If your connected device is any of C- F- or U-type digital microscopes, you need to define Working Distance, presence of Macro Lens (Close-up) and Screen Size of your computer on Camera Control dialogue.



If your C- F- or U-type Digital Microscope is connected to the host computer via Inspectis` COM-Cable, factory set Standard Calibrations for entire zoom range of your Digital Microscope will be enabled. Software tracks the zoom and displays calibrated on-screen magnification of each zoom factor automatically on top left of INSPECTIS live image field. Notice factory set Standard Calibrations are only valid and accurate when Working Distance of the digital microscope is set to maximum.

To achieve high measurement accuracy, we highly recommend performing new accurate calibrations of your preferred magnifications and working distances. Every new custom-made calibration will override the Standard factory-set Calibration in INSPECTIS. Information about how much Standard Calibration is adjusted is displayed for each magnification on Magnification and Calibration Manager dialogue.



You may reset a custom-made calibration to factory set Standard Calibration value any time by using Reset

Reset

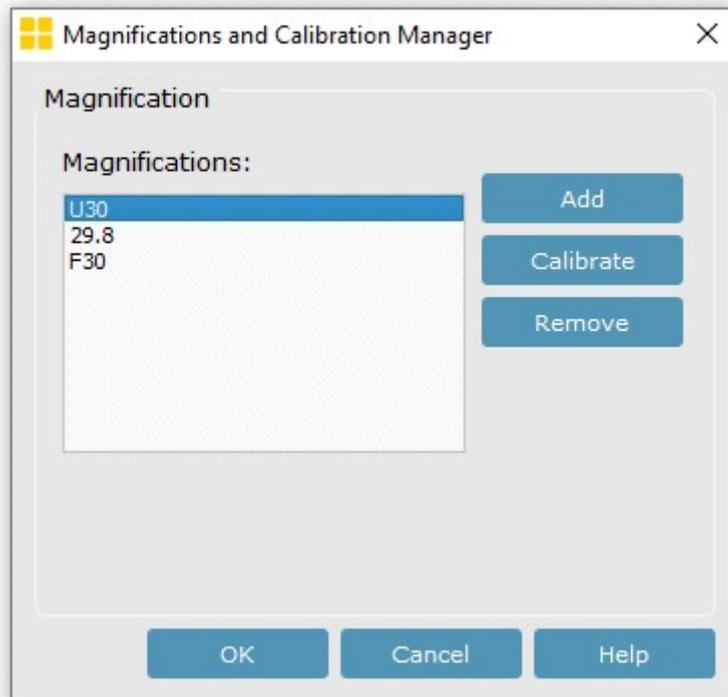
button on Magnification and Calibration Manager dialogue.

Magnification and Calibrations

Magnification Manager

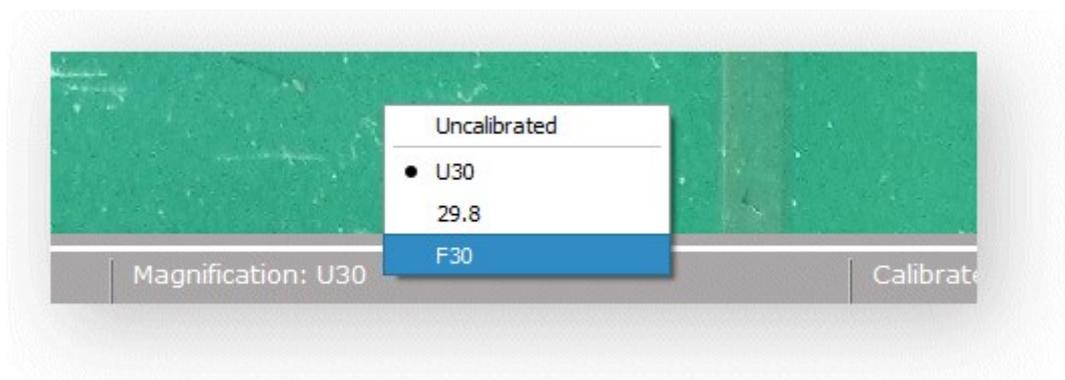
Magnifications can be added, calibrated or removed via Magnification and Calibration Manager. Click on

 icon to display the dialogue.



Selecting Magnifications

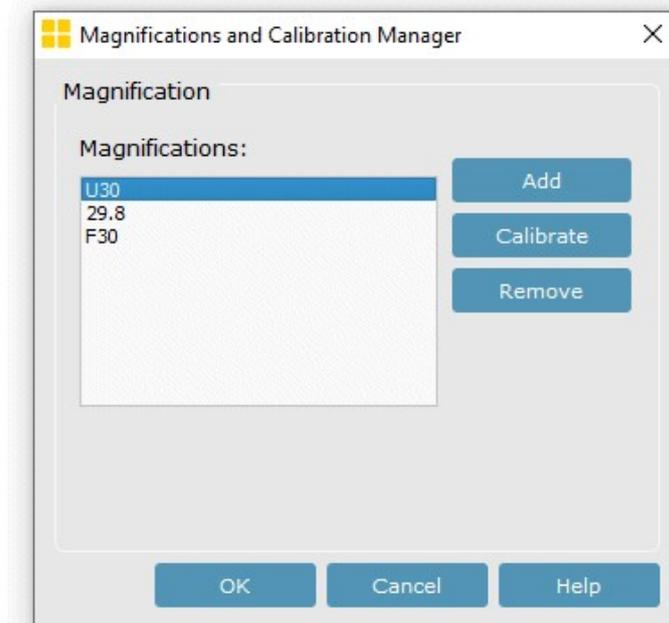
To select a magnification, open the Magnification and Calibration Manager dialogue, select the desired magnification and click OK button. For quick selection of magnifications, right click on the Magnification on the INSPECTIS status bar and choose desired magnification.



Adding New Magnifications

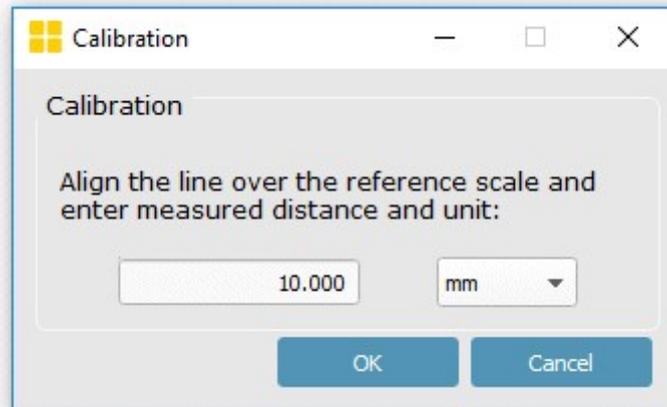
Before adding a new magnification, place an accurate ruler or micrometre scale under the microscope and make sure the live image is on focus.

Open Magnifications and Calibration Manager and click **Add** button. Type preferred name of the magnification and press **OK** button. Live image will be paused, and the calibration procedure will start automatically. See the next section for calibration procedure.

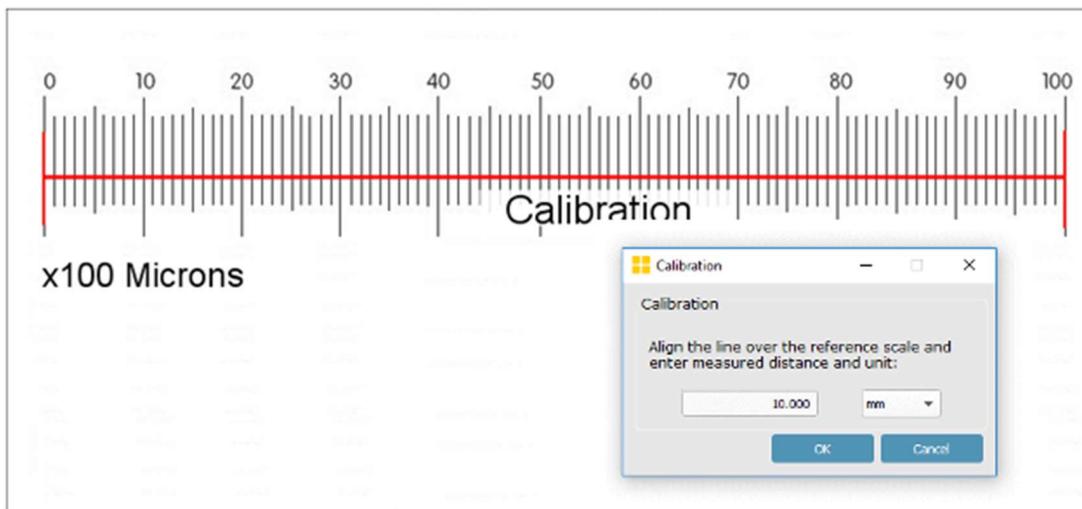


Calibrating Magnifications

Before starting to calibrate a magnification, place an accurate ruler or micrometre scale under the microscope and make sure the live image is on focus. Select the desired magnification and click **Calibrate** in the Magnifications and Calibration Manager dialogue. 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.



Measurement Tools

To activate the current tool for performing measurements left click on the  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 .

Saving 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.

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.

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



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

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](#).

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

System Requirements

Minimum System requirements:

Component	Minimum specification
CPU	Intel Core i5, CPU @ 2.5 GHz or faster Recommended: Core i7, CPU @ 3.3 GHz or faster
Operating System	Windows 7/8.1/10/11 (x64 version Professional, Enterprise)
Memory	16 GB or higher 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 port Two USB 2.0 port

Recommended computers by Inspectis:

- **Station:** HP Workstation Z2, Intel Core i7, 16 GB
- **Laptop:** HP ProBook, Intel Core i7, 15.6", 8 GB, Full HD

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