



Instructions Manual

WELDinspect

DIM-U, DIM-F, DIM-UX, DIM-FX

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General Instructions

Safety concept

- Do not scratch or hit optical surfaces of the device by hard objects.
- Never knock or drop the device.
- Keep the equipment clean. Put the dust cover over the equipment when not in use.
- Keep the equipment away from direct sunlight, heat, and high humidity.
- Protect the device from fumes, acids and from alkaline, caustic, or corrosive materials. Keep chemicals away from the instruments.
- Only use accessories provided or approved by Inspectis.

Cleaning

- Use lens cleaning tissue damped with pure Ethanol or Isopropyl alcohol for cleaning optical surfaces of the device.
- Use soft micro fibre tissue damped in warm water and light liquid detergent for cleaning metallic parts of the equipment.
- Never use Acetone or any other chemicals than specified for cleaning the equipment.



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

Servicing

- Repairs may only be carried out by Inspectis or Inspectis-trained service technicians.
- Only original Inspectis spare parts may be used.

Responsibilities of person in charge of the instrument

- Make sure the equipment is operated and maintained by authorized and trained personnel only.

Symbols Used

Warning, Safety hazard!



This symbol indicates especially important information that is mandatory to read and observe.

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

Warning of hazardous electrical voltage



Never open power the device or its components as you could otherwise risk physical injury or damage.

Failure to comply can cause the following:

- Hazards to personnel
- Functional disturbances or damaged instruments

Dangerous optical radiation.



This symbol warns against directly looking into the LED beam of the illumination equipment – either with or without optical instruments.

Failure to observe this notice poses a risk of eye damage.

Important information



This symbol indicates additional information or explanations that are intended to provide clarity.

Safety Instructions

Intended use

WELDinspect Digital Inverted Microscope is an optical instrument which uses optics, illumination, and digital image sensor for visualization of objects and specimens.

This equipment is intended for optical visual inspection of welds, metal part or other similar physical objects together with a computer within industrial applications.

Non-intended use

- The WELDinspect and its components shall never be used for medical and/or in vitro diagnostics (IVD) applications.
- Inspectis or its authorised reseller must be consulted whenever the instrument is altered, modified, or used together with non-Inspectis components that are outside of the scope of this manual!
- Unauthorised alteration of the instrument or non-compliant use voids all rights to any warranty claims.

Transport

- If your WELDinspect equipment needs to be sent to different locations often, order and use the Inspectis Flight Case for WELDinspect item HD-248.



To prevent damage during transportation, pack the equipment and its accessories in their designated places inside the Flight Case. The upper side of the instrument (optical window) must face upwards!

Integration in third-party products

Consult Inspectis or an authorized Inspectis reseller if you intend to integrate the equipment into third-party products.

Health risks

Illumination system of the equipment is in risk group 1 according to EN 62471:2008 when used according to its intended use.

Don't look directly into the LED beam of the illumination equipment – either with or without optical instruments for a long time. Failure to observe this notice poses a risk of eye damage.

Declaration of Conformity and applied standards

EU directives:

2001/95/EC General product safety
2014/30/EU Electromagnetic compatibility (EMC)
2011/65/EU Restriction of hazardous substances (RoHS)

Applied standards:

Emission:	EN 55032:2015 class A
Immunity:	EN 61000-6-2:2005, EN 61000-4-2:2008, EN 61000-4-3:2006, EN 61000-4-4:2012, EN 61000-4-5:2014, EN 61000-4-8:2009, EN 61000-4-11:2020
Environmental:	EN IEC 63000:2016

This equipment complies with the protection requirements of the above directives.

Introduction

Congratulations!

Congratulations on purchasing the Inspectis Digital Inverted Microscope, WELDinspect. The special design of this equipment makes it a powerful and easy-to-operate tool for fast and flexible inspection, measurement, and documentation of weld beads.

High-resolution display on the computer screen

The WELDinspect digital inspection system is connected to a computer via a super speed USB3.0 converter. The microscope image is viewed in INSPECTIS© or Nikon NIS Elements software on the computer monitor.

High resolution optics coupled with the built-in large-aperture incident lighting system and fast USB3.0 camera interface, produce clear, crisp, and high frame-rate real-time video of the inspection objects.

INSPECTIS© software

Inspectis digital inspection systems are supplied with **INSPECTIS©** a specially designed powerful yet easy-to-use, image view, capture and metrology software. With a logical layout, graphical icons for each function and factory calibrated optics, you can quickly become familiar with the software, saving time during inspection and measurement routines, and reducing the need for training sessions.

In addition to **INSPECTIS©** WELDinspect can be connected to and directly controlled by powerful **Nikon Metrology NIS Elements** with Weld bead Analysis and Measurement software.

Items included when you order WELDinspect

Your standard Weldinspect HD-250 or HD-240 are delivered with following items:

HD-250 WELDinspect DIM-U, 8.0MP Ultra HD system



- 1 DIM-U, Inspectis Digital Inverted Microscope 8.0MP
- 2 4K UHD USB3.0 Capture Pro Device
- 3 INSPECTIS© Basics software license and installation files on USB flash memory
- 4 Inspectis USB communication Cable
- 5 HDMI Cable, 1m
- 6 Hardened glass windows (5 pcs kit)
- 7 Dust cover for the instrument
- 8 Power Supply and Mains cord
- 10 Instructions Manual and other documents

HD-240 WELDinspect DIM-F, 2.0MP Full HD system

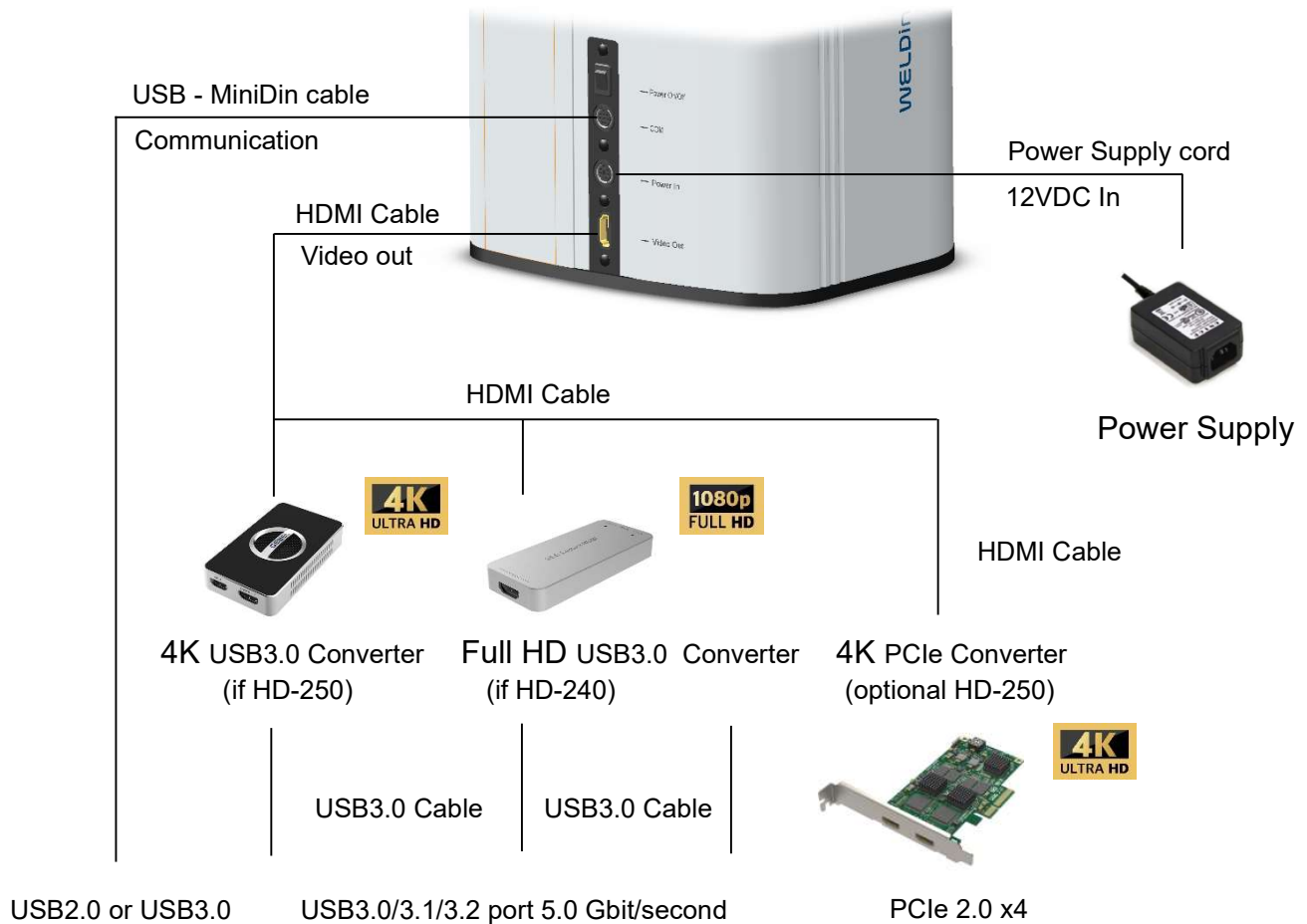


- 1 DIM-F, Inspectis Digital Inverted Microscope 2.0MP FHD
- 2 Full HD HDMI USB3.0 Capture Device
- 3 INSPECTIS© Basics software license and installation files on USB flash memory
- 4 Inspectis USB communication Cable
- 5 HDMI Cable, 1m
- 6 Hardened glass windows (5 pcs kit)
- 7 Dust cover for the instrument
- 8 Power Supply and Mains cord
- 10 Instructions Manual and other documents

One-year “Service and Support for INSPECTIS© software” is already included in your system. For software support and future updates after first year, please sign and return the “Annual Service and Support Agreement” to info@inspect-is.com or to the authorised Inspectis reseller.

Hardware Installation

Attach power supply, USB communication cable, Converter, HDMI cable and USB3.0 cable as illustrated below.



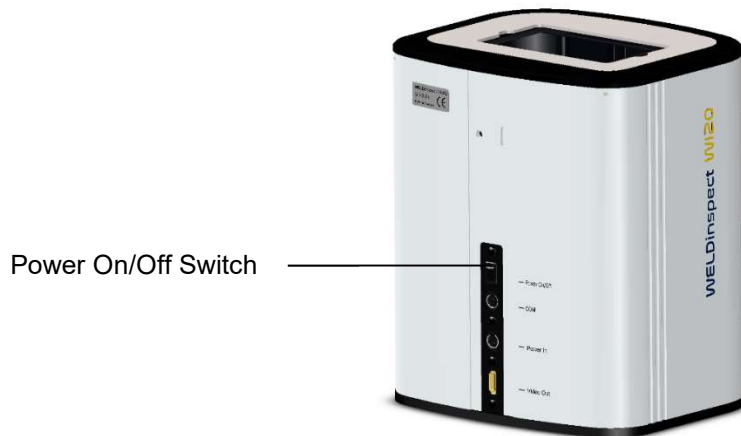
USB3.0 converters are plug&play devices but PCIe card requires driver installation on computer.



Use only the Power Supply provide by Inspectis.

Power On

- A. Place WELDinspect on a flat and stable surface.
- B. Remove the plastic film from glass window surface of the device.
- C. Turn on WELDinspect by using the power On/Off switch on rear panel of the device.
Ring light of the device will illuminate white when instrument is on.





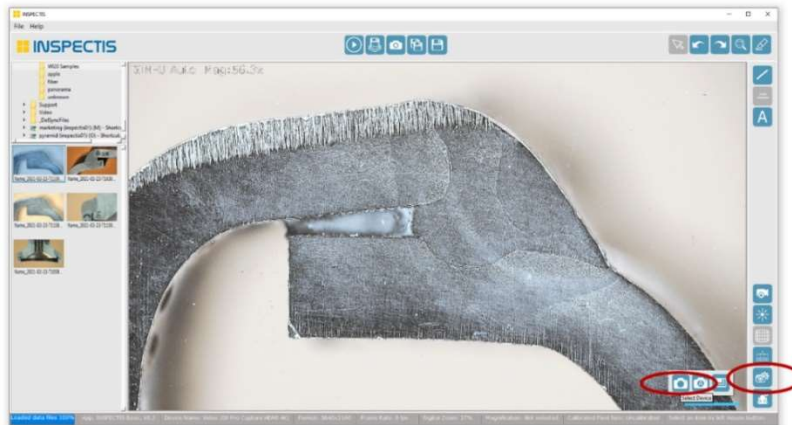
Software installation and setup


Included **INSPECTIS© Basics** software enables you to display live image of WELDinspect in your computer, to control the device, to Capture still Images and to perform calibrated distance measurements on captured images. To install and setup INSPECTIS© Basics please proceed as instructed below.

For performing complete weld bead measurements and reporting according to ISO standards, **Nikon metrology NIS-Elements & Weld analysis module** shall be used. Please refer to NIS-Elements user's manual for how to install and use the software.

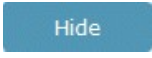
- A. Plug the software protection Dongle to a free USB port of the computer. Dongle is not needed if you intend to install the 15 days trial version of INSPECTIS software.
- B. Install the software by running "INSPECTIS X.x Setup" installation file. Follow on-screen instructions.
- C. Once installation is finished, right click on INSPECTIS icon on your computer desktop and select **Run as Administrator** first time.
- D. Start Inspectis. On "Select Inspectis Version" dialog box, select "**INSPECTIS© Basics**". Enter license number and other requested information. Follow up on-screen instructions to complete installation.
- E. Software will be registered and activated automatically over internet once you provide license number and other requested information. If on-line registration is prohibited or not possible due to your network restrictions, complete the Off-line Registration form and email it to info@inspect-is-com to get an activation key.

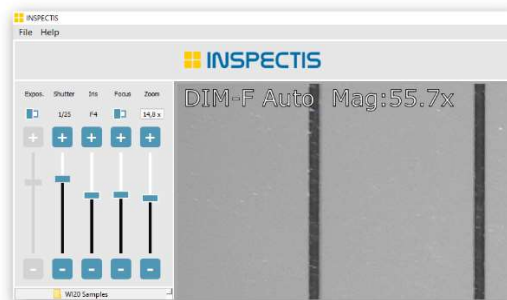
- F. On INSPECTIS, click Device Settings  and Select your Converter Device . Software will start monitoring live image of the WELDinspect.



- G. Select Camera Control icon  to establish real-time communication between WELDinspect and software. WELDinspect and its zoom lens will be initialized and calibrated once the communication is established.



- H. Hide Camera Control dialogue by press Hide  button. Camera and lens control bars will be enabled on INSPECTIS main window to allow you adjust magnification, dept-of focus (Iris size) and brightness of the image in real time.



Distortion Correction and Reference Scale are also activated automatically by software.

To manually turn Off/On distortion correction or Reference Scale, click  and .

Calibration of Optics


Thanks to real-time communication of the software with WELDinspect, INSPECTIS can auto-track position of the zoom lens and display (factory) calibrated magnification of the image at each zoom position on top-left of the image filed.


Though entire zoom range of WELDinspect is pre-calibrated and captured images are ready for measurements. However, to ensure high measurement accuracy, we highly recommend performing new accurate manual or automatic calibrations of your preferred magnifications and working distances.

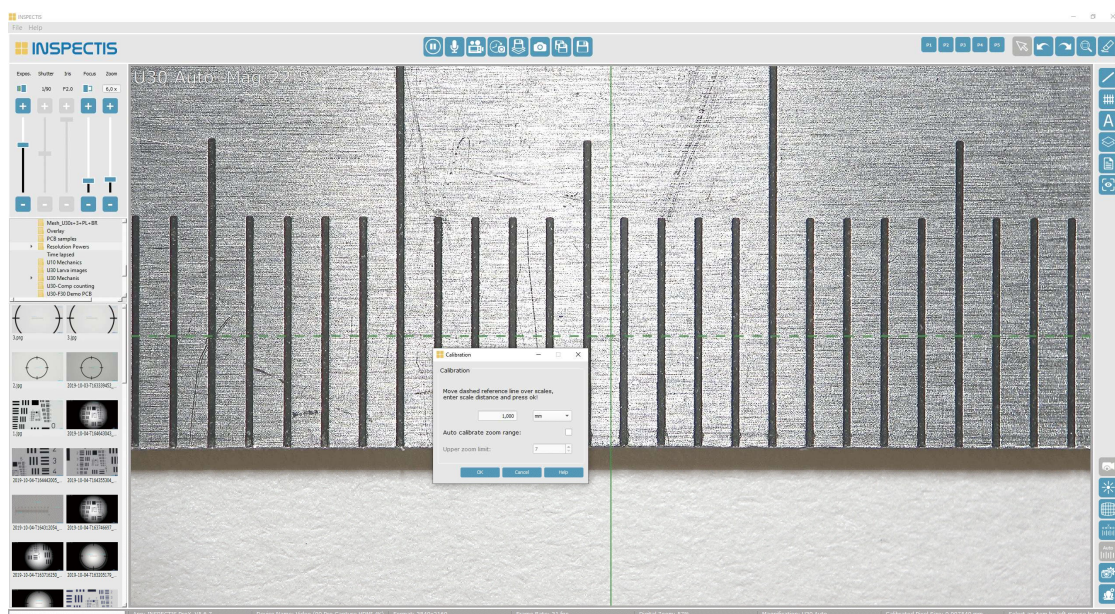
Auto Calibration

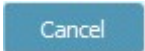
Before starting to Auto Calibrate a magnification, place an accurate ruler or micrometre scale under the microscope, adjust image brightness and white balance and make sure the live image is on focus at your preferred working distance. We recommend using Inspectis Calibration Micrometre Scale, 50mm (optional item HD-243 or HD-244) for calibration.

If you are planning to calibrate low-zoom magnifications 1x to 4x (large field of views), make sure

Distortion Correction is activated .

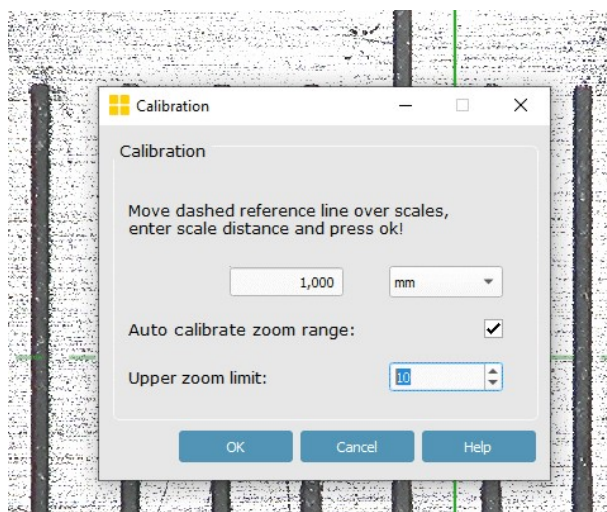
Click . Calibration dialogue will pop-up and a solid vertical as well as a dashed horizontal line around which the calibration is processed will be displayed on the live image. If necessary, turn the ruler to align scale lines in parallel to the vertical line on image. If necessary, drag the horizontal 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 .




If you wish to Auto calibrate several magnifications within a specific zoom range, select "Auto calibrate zoom range" checkbox and enter the "Upper zoom limit". Software will scan and calibrate all magnification within specified zoom range. Notice Auto calibration of zoom range is not available for Inspectis 5MP Cameras (BGA Inspection).




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




You may reset any custom-made calibration and return to factory set Standard Calibration any time by using Reset  button on Magnification and Calibration Manger.

Manual Calibration

If you are planning to calibrate low-zoom magnifications 1x to 4x (large field of views), make sure

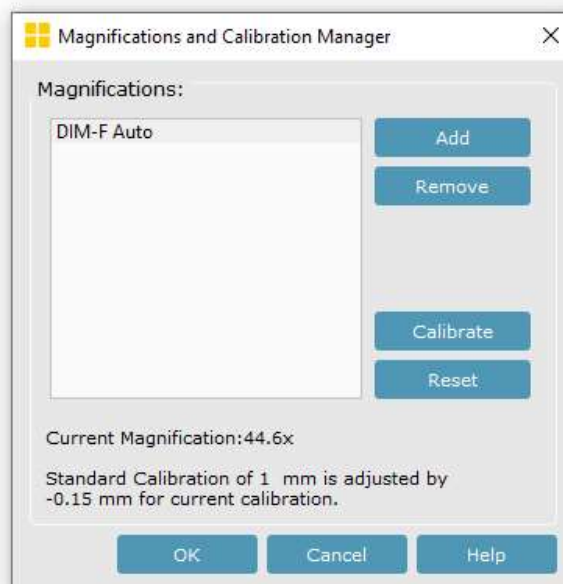
Distortion Correction is activated .


Place Inspectis Calibration Micrometre Scale, 50mm (optional item HD-243 or HD-244) on

WELDinspect and press  to calibrate current magnification. Follow on-screen instructions to complete the calibration. 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

Reset

button on Magnification and Calibration Manager dialogue.



You may reset any custom-made calibration and return to factory set Standard Calibration any time by using Reset  button on Magnification and Calibration Manager.



For more information on how to use the software refer to instruction's manual of **INSPECTIS®**.

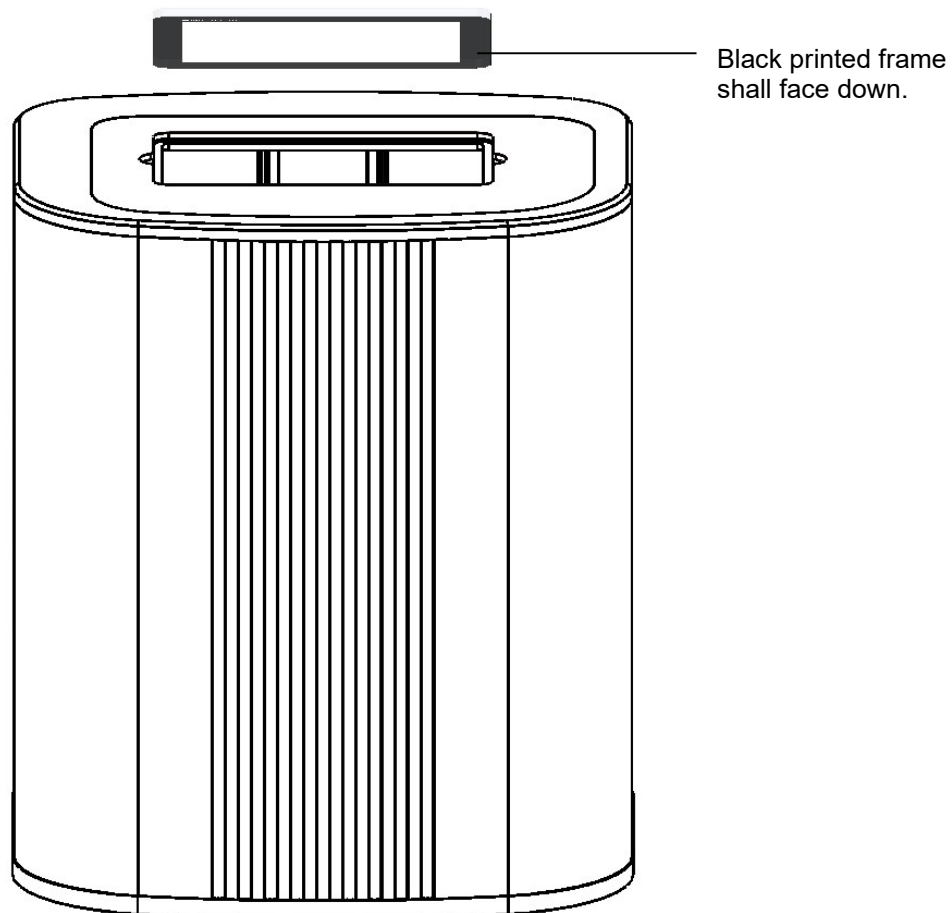


For installation of **NIS-Elements** and **Weld Measurement** module, please refer to instruction's manual of the software.

Exchange of the Glass Window

If the optical surface of the glass window is scratched, aged, or damaged in such degrees that image quality is affected, a new window must be installed.

- A. Move WELDinspect to a clean and dust-free environment.
- B. Lift up and remove the damaged glass window. If necessary, vacuum clean inside the WELDinspect with care.
- C. Pick up a new glass window and gently remove the protection plastic film from bottom surface of the glass window (black printed surface).
- D. Gently drop the glass window into place.



- E. Remove the protection film from top surface of the glass when it is on place.
- F. Put an Inspectis Low-friction Screen Protector on the new glass surface directly if you have ordered this extra item. (See next page).



Never touch bottom-side of the glass surface facing the camera and ring-light!

Applying Low-friction Screen Protector (optional)

WELDinspect is delivered with a durable tempered glass window. However, for extra protection of the optical glass surface, an Inspectis low-friction screen protector may be applied on the window. (Item no. HD-245 to be ordered separately).

- A. Move WELDinspect to a clean and dust-free environment. Wash your hands.



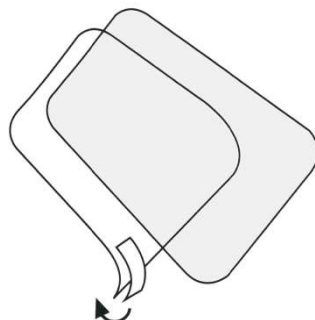
- B. If necessary, wipe the glass window surface by the supplied lens cleaning tissue. Remove remaining dust particles using the supplied dust removal stickers.



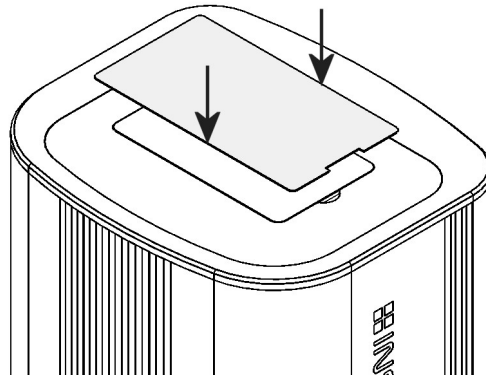
If you have just changed to a new glass window, do not touch nor wipe optical surfaces of the glass, and jump to C below.



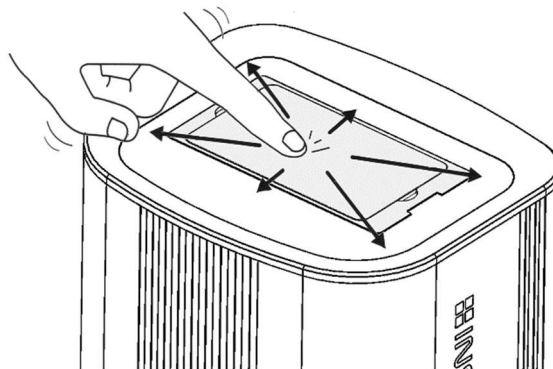
- C. Pick up a screen protector and gently remove the protection film from its bottom surface. Don't touch the surface after removing the film!



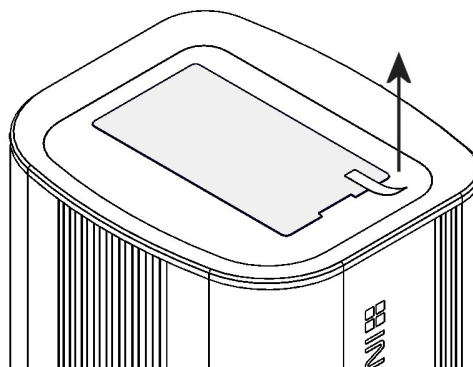
- D. Hold the screen protector with your fingers a short distance above the glass window, align and lay it down slowly and carefully.



- E. Put your index finger on the center of screen protector immediately and push it slightly. Remove your finger and allow it to lay down on its own.



- F. Once it is laid down, put the supplied sticker on the corner of the screen protector and tear the protection film off from the top side of the screen protector.



Notes

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System Requirements

Minimum System requirements:

Component	Minimum specification
CPU	Intel Core i5, CPU @ 4.8 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:** HP Workstation Z2, Intel Core i7, 16 GB RAM
- **Laptop:** DELL Latitude 3540, Intel Core i7, @ 5.0 GHz, 8 GB RAM 15.6", Full HD
HP EliteBook, Intel Core i7,1355U, 16 GB RAM 15.6", Full HD

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WELDinspect is designed and manufactured by Inspectis Optical Systems in Sweden.



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