

3D HISTECH

**Pannoramic DESK II
2.0
User's Guide**

June 4, 2018

Rev. 1

PDII20-UG-Rev2

For research and education uses only, not for use in diagnostic procedures.

Contents

| | |
|---|-----------|
| Disclaimer..... | 4 |
| Declaration Of Conformity..... | 6 |
| Character Formats and Symbols..... | 7 |
| Notes Regarding Operational Safety..... | 8 |
| Notes on Warranty..... | 10 |
| Terms and Abbreviations..... | 11 |
| 1 Product Description..... | 12 |
| 1.1 Product Overview..... | 12 |
| 1.1.1 Intended Use..... | 12 |
| 1.1.2 Features and Benefits..... | 12 |
| 1.1.3 Warning and Information Labels..... | 13 |
| 1.1.4 Base Unit..... | 14 |
| 1.2 System Overview..... | 15 |
| 1.2.1 Pannoramic DESK II system..... | 15 |
| 1.2.2 Hardware Options..... | 16 |
| 1.2.3 Control Software..... | 17 |
| 2 Installation..... | 18 |
| 2.1 Control computer ports..... | 18 |
| 2.2 Connectors and cables..... | 19 |
| 3 Preparing Slides..... | 20 |
| 3.1 Affixing Barcode Stickers to Slides..... | 21 |
| 3.2 Inserting and Removing Slides..... | 22 |
| 4 Software Description..... | 29 |
| 4.1 Starting / Exiting Pannoramic DESK II Software Application..... | 29 |
| 4.1.1 Starting the software..... | 29 |
| 4.1.2 Exiting the software..... | 30 |
| 4.2 Main window functions..... | 30 |
| 5 Scanning modes and settings..... | 41 |
| 5.1 Brightfield Scanning Mode..... | 41 |
| 5.1.1 Profile Settings Panel..... | 42 |
| 5.1.2 Microscope Control Panel..... | 49 |
| 5.1.3 Quick preview functions..... | 59 |
| 5.1.4 Quick microscope functions..... | 59 |
| 5.1.5 Bottom menu bar of the main window..... | 61 |

| | | |
|---|--|-----------|
| 5.2 | Planner mode..... | 63 |
| 5.2.1 | General functions at the main menu..... | 63 |
| 5.2.2 | General functions at the tray menu..... | 64 |
| 5.2.3 | General functions at the slide menu..... | 64 |
| 5.2.4 | Slide view with card..... | 64 |
| 5.2.5 | Table view mode..... | 68 |
| 5.2.6 | Card collection view mode..... | 69 |
| 5.3 | Profile and Preview overview on the Planner..... | 70 |
| 5.4 | Progress features..... | 71 |
| 5.5 | Services and Settings..... | 71 |
| 5.5.1 | Services..... | 71 |
| 5.5.2 | Settings..... | 76 |
| 5.6 | Hosting..... | 79 |
| 6 | Using Profiles..... | 81 |
| 7 | Troubleshooting and Maintenance..... | 82 |
| 7.1 | Safety Information..... | 82 |
| 7.1.1 | Cleaning the device..... | 82 |
| 7.1.2 | Preventive maintenance..... | 82 |
| 7.2 | Troubleshooting..... | 83 |
| 7.3 | Maintenance..... | 85 |
| 7.3.1 | Removing the protective cover..... | 85 |
| 7.3.2 | Removing a slide..... | 86 |
| 7.3.3 | Transporting Pannoramic DESK II..... | 88 |
| 8 | Technical Data..... | 89 |
| Appendix – Packaging instructions..... | | 92 |
| Preparations..... | | 92 |
| Main parts and their accessories..... | | 92 |
| Packaging..... | | 93 |
| Packing the DESK II scanner..... | | 95 |
| Packing the accessories..... | | 95 |
| Closing the package..... | | 95 |
| Handling of the package..... | | 96 |
| Index..... | | 97 |

Disclaimer

Copyright © 2001-2018 3DHISTECH Ltd.
All rights reserved.

Intellectual property related to the 3DHISTECH products are as follows:

EP 1,789,831; US 7,663,078; EP 2,024,772; JP 2009-512685; US 12/301,781; EP 1,644,767; JP 2007-516451; US7,327,515; EP 1,994,398; JP 2008-557835; US 12/281,566; U0700210; US 6,246,785; HU0900142; HU0700404; PCT/HU2007/000065; EP 08762668.5; US 12/663,537; PCT/AT2006/000492; JP 2008-542552; EP 06817469; US 12/095,545; PCT/AT2006/000493; EP 06817470.5; US 12/095,596; HU0900741; US 61/264,732; US 11/826,752; P0401870; PCT/IB2005/050344; US 11/662,976; HU0700409; US 12/042,050; US 77/636,144 and 007502032.

The above mentioned granted patents, granted utility model, registered trademarks, pending international and national patent applications and the other corresponding IP are the sole properties of the 3DHISTECH Ltd.

CAUTION

For research and education uses only, not for use in diagnostic procedures. This product has not been approved or cleared as a medical device by the U.S. Food and Drug Administration or the

Do not use this device in close proximity to sources of strong electromagnetic radiation (e.g. unshielded intentional RF sources), as these may interfere with the proper operation.

Further Information

For the latest information on 3DHISTECH products and services, please visit our website at the following URL: <http://www.3dhitech.com>.

Further Information

For the latest information on 3DHISTECH products and services, please visit our website at the following URL: <http://www.3dhitech.com>.

Or contact the distributor:

Richard Allan Scientific Co.
Subsidiary of Thermo Fisher Scientific
4481 Campus Drive
Kalamazoo Mi 49008, USA
US Toll Free 1(800) 522-7270

Tudor Road, Manor Park
Runcorn, WA7 1TA
United Kingdom
+44 (0) 800 018 9396
+44 (0) 1928 534 000

Declaration Of Conformity

3DHISTECH Ltd. declares that the product Pannoramic DESK II slide scanner is designed and produced with consideration of specified requirements according to standards listed below:

IEC 61010-1:2010, "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements"

IEC 61010-2-101:2015, " Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

IEC 61010-2-081:2015, "Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes"

IEC 62471:2006, "Photobiological safety of lamps and lamp systems"




There is no further operator (user) action required in case of residual risks.

Further information may be obtained from the distributor:

Richard Allan Scientific Co.
Subsidiary of Thermo Fisher Scientific
4481 Campus Drive
Kalamazoo MI 49008, USA
US Toll Free 1(800) 522-7270

Tudor Road, Manor Park
Runcorn, WA7 1TA
United Kingdom
+44 (0) 800 018 9396
+44 (0) 1928 534 000



Character Formats and Symbols

| | |
|--|---|
| <p>Example</p> | <p>Words or characters that appear on the screen. These include field names, screen and window titles, push-button and menu names, paths or options.</p> <p>Keys on the keyboard. For example, function keys (such as F11) or the Ctrl+M key combination.</p> |
| <p><i>Example</i></p> | <p>Cross-references within this document or to other documents.</p> |
| <p> Warning!</p> | <p>It might cause irreversible damage or harm to the user of the product or the product itself if this instruction is not followed.</p> |
| <p> Caution!</p> | <p>It might cause the product to not work properly if this instruction is not followed and alerts to a potential danger situation.</p> |
| <p> Note:</p> | <p>Calls attention to some important features.</p> |

Notes Regarding Operational Safety







The below section of this User's Guide contains information and warnings of a kind that must be followed by owner/operator personnel.













Warning and advisory symbols which are used on the base unit of the Pannoramic DESK II and in the section **1.1.3 Warning and Information Labels** have the following meanings:

| | |
|---|---|
|  | <p>CAUTION Disconnect mains plug before any kind of intervention into the device!</p> |
|  | <p>CAUTION Crush hazard!</p> |

The Pannoramic DESK II, including any of its original accessory components, should not be operated in any other way than described in section **1.1.1 Intended Use**.

Any of the following notes should be strictly observed:

| | |
|--|--|
|  <p>Warning!</p> | <p>If operating the device other than specified by the manufacturer, the level of safety will decrease.</p> |
|  <p>Caution!</p> | <p>In the event of any non-conforming type of use, including non-conforming use of assemblies or single parts, no liability will be assumed by the Manufacturer. This shall also apply to service or repair work of any kind, which is performed by other than authorized service personnel. All claims for warranty and warranty services will be null and void in any such case.</p> |
|  <p>Note:</p> | <p>The safety level of the equipment after servicing will be identical with level of the original equipment.</p> |
|  <p>Warning!</p> | <p>Insert the power cord plugs only into a grounding outlet. The protective action must not be rendered ineffective by extension cables without protective conductor. The Pannoramic DESK II has a built-in protection which must not be rendered ineffective by extension cables without protective (earth-ground) conductor.</p> |
|  <p>Warning!</p> | <p>The operation of the instrument in explosion-risk environments is not allowed.</p> |
|  <p>Warning!</p> | <p>If protective devices are found to be ineffective, the Pannoramic DESK II must be shut down and precautions must be taken to prevent unintended usage. For necessary repair work or work to restore proper operating condition, you should contact the Thermo Fisher Scientific Customer Service.</p> |

| | |
|---|---|
|  Note: | <p>Electric power to the Pannoramic DESK II is supplied via an external mains power supply unit. It allows for operation at line voltages in the range of 100 V to 240 V \pm10%, 50/60 Hz, without any extra facilities required for voltage transformation.</p> |
|  Warning! | <p>Check that your local line voltage is compatible with Pannoramic DESK II specifications before you turn power on.</p> |
|  Disconnect plug! | <p>Remember to unplug the power cord before you open the Pannoramic DESK II main unit for maintenance.</p> |
|  Warning! | <p>Only connect external devices to the instrument which are approved to avoid the risk of electrical shock.</p> |
|  Warning! | <p>The Pannoramic DESK II does not include any special facilities to protect from samples with an etching, potentially infectious, toxic, radioactive or other health-damaging effect. You are under obligation to comply with all currently binding legislation, notably, national accident prevention rules when handling samples of this kind.</p> |
|  Caution! | <p>Dirt or dust may adversely impact the operating capability of the Pannoramic DESK II. For this reason, measures must be taken to eliminate such influences to a maximum possible degree. During periods of non-use, the Pannoramic DESK II must be protected with a dust cover. Check that power is turned off before you put the cover on.</p> |
|  Caution! | <p>Avoid touching the lamp bulb. Disconnect power plug and let the lamp cool down for about 15 minutes before replacing the lamp.</p> |
|  Caution! | <p>Do not position the equipment so that it is difficult to operate and to disconnect the device if necessary.</p> |
|  Crush hazard! | <p>Never open the front door unless prompted accordingly by software. When you open the door at any other time, make sure not to reach with your hands into the instrument to avoid the risk of crushing your fingers.</p> |
|  Warning! | <p>The front door is equipped with an interlock switch. If the door is opened while a digitization process is running, the process will be stopped instantly.</p> |
|  Warning! | <p>A defective Pannoramic DESK II is not classified as domestic waste. It must be properly disposed in accordance with currently valid legal requirements.</p> |
|  Warning! | <p>The Pannoramic DESK II may not be operated by other than properly instructed persons. Operating personnel must be fully aware of the potential dangers which a particular field of application involves. The Pannoramic DESK II is a precision instrument which may suffer a significant reduction in operational functions or even physical destruction following intervention performed in any nonconforming manner.</p> |

Notes on Warranty

We at Thermo Fisher Scientific are proud of our quality, reliability and of our after-sales service. We continuously strive to improve our service to our customers.

Please ask a Thermo Fisher Scientific representative about Service Contracts which can keep your purchase in peak condition for many years to come.

Warranty provisions necessarily vary to comply with differences in national and regional legislation. Specific details can be found in the delivery documentation or from your dealer or representative.

Please note that your warranty may be invalidated if:

- This instrument is modified in any way.
- Accessories and reagents which have not been approved by Thermo Fisher Scientific are used.
- The instrument is not operated or maintained in accordance with the instructions in the Operator Guide.

Terms and Abbreviations

| | |
|------------------------------|--|
| CSV | Comma Separated Value |
| FOV | Field of View |
| NA | Numerical Aperture |
| Virtual Slide / Slide | <p>A digital image of a thin glass plate on which specimens are mounted for microscopic study:</p> <p>a dynamic, interactive image that you can manage, save, magnify, zoom, name, evaluate, annotate, mark and comment, send to a colleague electronically for co-operation or advice, and so on.</p> |

1 Product Description

1.1 Product Overview

1.1.1 Intended Use

Pannoramic DESK II is designed to use transmitted light to digitize biological samples and specimens (histological sections, typically). The target users of the product can work for example, in education, research, industrial, or medical sectors.

**Warning!**

After each scanning make sure to inspect the digital slide for over-exposed areas. If the slide has been scanned based on improperly set parameters, it can highly affect the results because of information loss.

**Warning!**

Any modification to a hardware or software component of the PC will highly affect the functionality of the scanner program.

1.1.2 Features and Benefits

The Pannoramic DESK II offers world class brightfield whole slide scanning. An outstanding 0.12 µm/pixel resolution is achieved with the 40×/0.95 NA (equivalent to 80× magnification) Plan-Apochromat objective.

Key features of the Pannoramic DESK II Scanner are:

- Capable of scanning large slides
- 3MP camera for barcode reading and preview image
- Improved permanent auto-focus
- Compact and robust device
- Good quality and stable manufacturing

The Pannoramic DESK II is an entry-level half-automatic scanner with small footprint and dimensions, low maintenance, simple and easy use. Optimal for those customers, who want to begin with digitizing of their tissue samples and intend to use the scanner not for batch processing (recommended daily scan quantity up to 10 slides).

1.1.3 Warning and Information Labels

The following figure contains the labels used on the Pannoramic DESK II main unit and the external mains power supply unit.

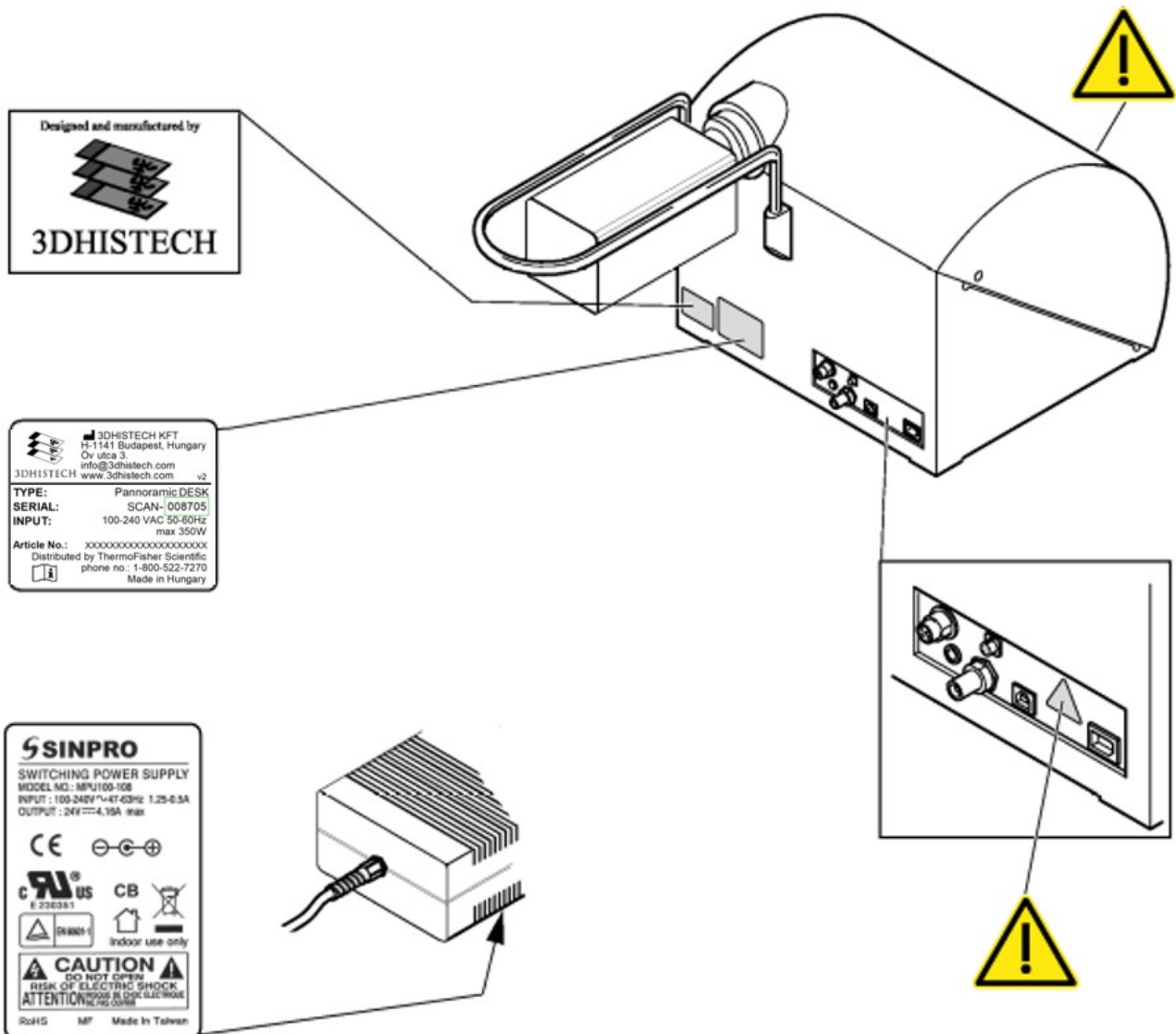


Figure 1 – Warning and information labels

NOTE: The symbol at the feeder slot calls attention to biohazardous materials in use.

1.1.4 Base Unit

The following figure shows the main parts of the base unit.

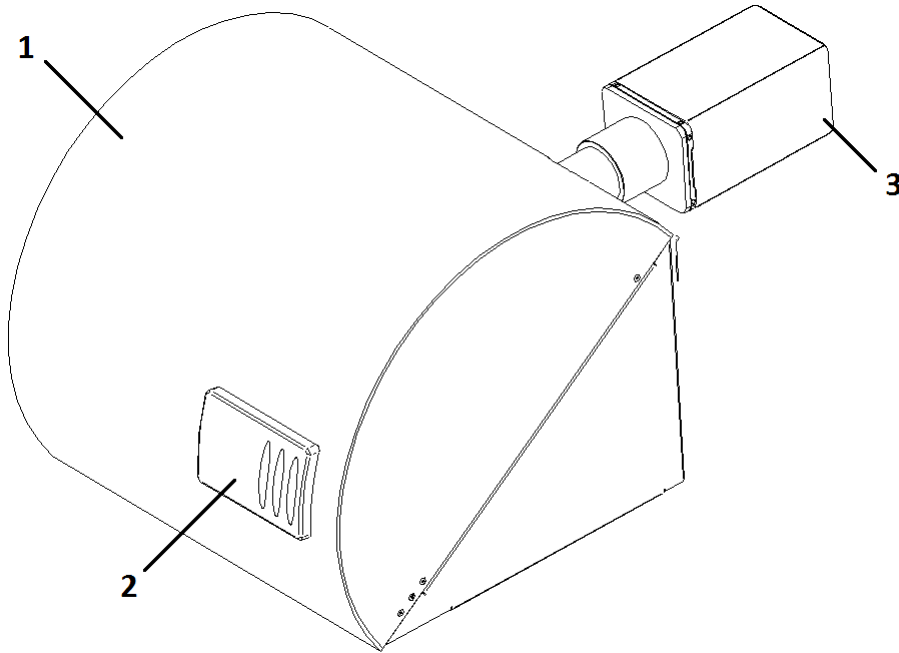


Figure 2 – Main parts of the base unit

1. Protective cover
2. Sliding door
3. Scan camera

1.2 System Overview

The standard scope of delivery of the product includes the following hardware and software items.

1.2.1 Pannoramic DESK II system

The following figure shows the main components of the Pannoramic DESK II system.

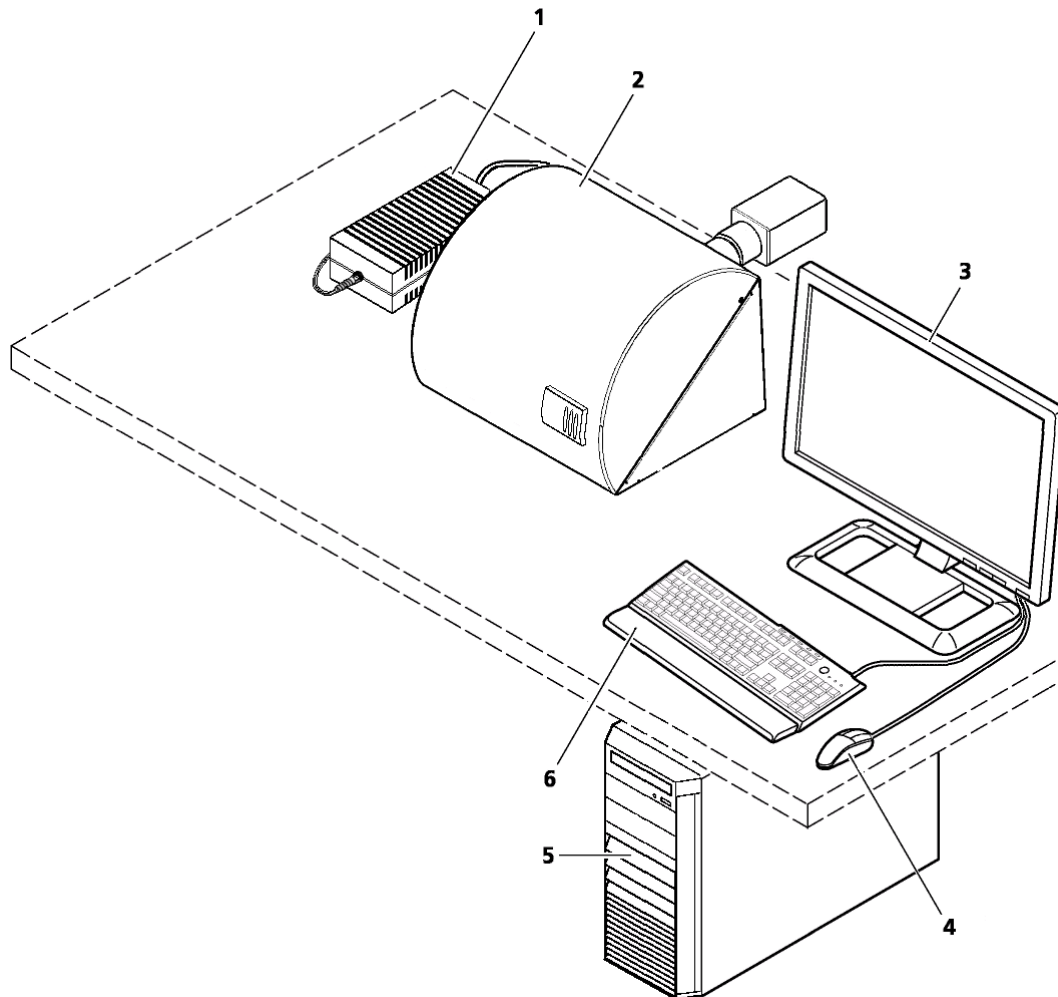


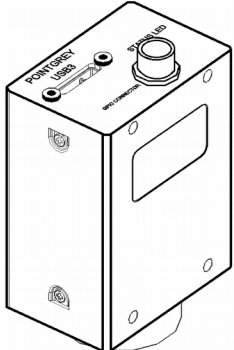
Figure 3 – Pannoramic DESK II system overview

1. 24 V external power supply unit
2. Pannoramic DESK II base unit
3. Monitor
4. Mouse
5. Control computer
6. Keyboard

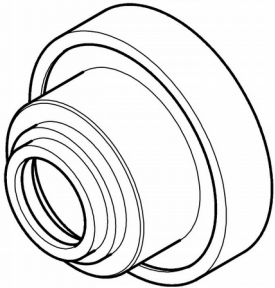
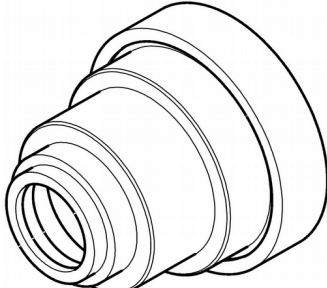
1.2.2 Hardware Options

The configuration of the control computer and monitor can vary depending on the product order.

Camera

| | |
|---|--|
|  | <p>Point Grey Grasshopper 3 Monochrome</p> <p>1 CCD monochrome camera for normal brightfield scanning</p> |
|---|--|

Camera adapters

| | |
|--|---|
|  |  |
| <p>0.63x adapter</p> | <p>1x adapter</p> |



Warning!

The installation of the cameras in Pannoramic DESK II must be carried out by trained professionals!

In any other case the warranty will be automatically voided.

The supplier or distributor is not liable for any damages caused by an installation carried out by an unauthorized person.

Base Unit options

- Pannoramic DESK II Brightfield Option – base unit equipped with Point Grey Grasshopper 3 monochrome camera for Brightfield scanning

Objectives

- Plan-Apochromat 20×/NA 0.8
- Plan-Apochromat 40× Corr/NA 0.95



Warning!

Do not change correction collar settings on 40×/NA objective, if you need it to be set, contact customer service.

1.2.3 Control Software

Pannoramic Scanner control software

Optional (licensed features):

- Extended focus
- Z-stack
- Barcode reader

CaseViewer software (fully functional)

Optional:

- CaseCenter
- Pannoramic Viewer TMA module
- 3D Reconstruction module
- QuantCenter including applications such as HistoQuant, NuclearQuant, MembraneQuant, and DensitoQuant modules
- TumorBoard module
- E-School Encoder

2 Installation



Warning!

The installation of Pannoramic DESK II must be carried out by a trained professional! In any other case the warranty will be automatically voided. The supplier or distributor is not liable for any damages caused by an installation carried out by an unauthorized person.

Only qualified service assistants are allowed to install the hardware and software. The product is ready for use after installation.



Caution!

Make sure that the device is placed so that there is enough space for ventilation and for safe and efficient operator maintenance.

2.1 Control computer ports

The following figure shows the location of the connectors in order to enable easier transportation of the product for a short distance, by disconnecting cables and detaching hardware components from each other.

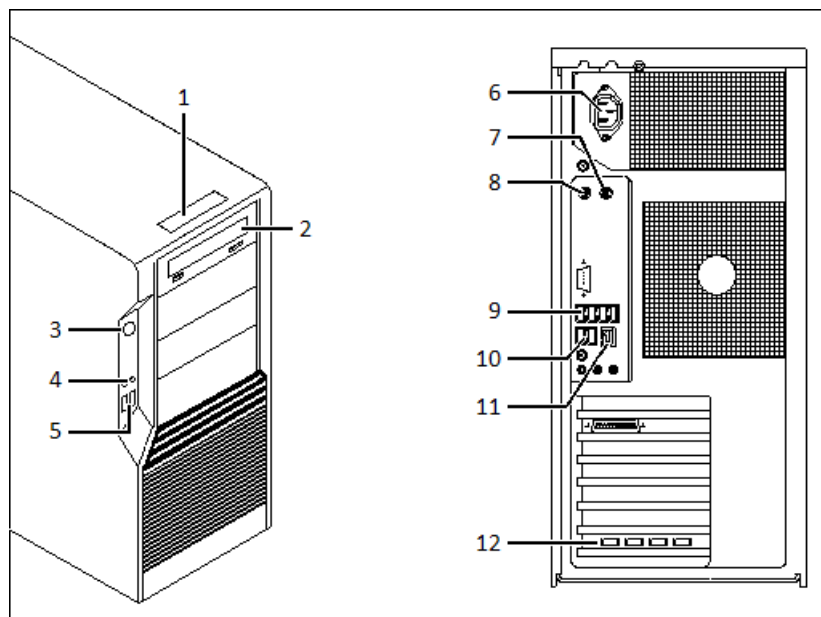


Figure 4 – Ports on control computer

1. Status display
2. DVD drive (RW)
3. Power on/off button
4. Earphone and microphone 3.5mm Jack ports
5. 2x USB port
6. Power supply connector
7. PS/2 mouse port
8. PS/2 keyboard port
9. 4x USB port
10. 2x USB port
11. Network port
12. 4x USB 3.0 ports for Point Grey Grasshopper 3 camera

2.2 Connectors and cables

- Control – USB cable (between scanner and control computer)
- Preview camera – USB cable (between scanner and control computer)
- Point Grey Grasshopper 3 Monochrome – USB 3.0 cable (between Point Goint Grey Grasshopper 3 camera and control computer)
- Video cable (between monitor and control computer)
- Power supply cable (between 230V/110V and monitor)
- Power supply cable (between 230V/110V and control computer)
- Power supply cable (between 230V/110V and power supply unit)



Warning!

Only connect external devices that are safety extra low voltage rated to the instrument to avoid the risk of electrical shock.

3 Preparing Slides

You can use all large slides and cover slips that meet the following specifications:

| | Slides | Cover slips |
|------------------|-------------------------------------|---|
| Length | 75.0 to 76.0 mm | max. 50 mm |
| Width | 25.0 to 26.0 and 51.0 to 52.0 mm | max. 24 mm (recommended: 22 mm) max. 50 mm |
| Thickness | 0.90 to 1.2 mm | No. 1 and No. 1.5 (0.13 to 0.16 mm and 0.16 to 0.19 mm) |
| Corners | 45° beveled corners | |
| Edges | Ground or cut | |



Warning!

Always wear personal protective equipment (safety goggles, gloves and coat) when working with biohazardous material or slides.



Warning!

Do not use a slide when it is broken or its edges are not properly cut or grounded. Using such slides can lead to injury.



Warning!

Ensure that no part of the mounted coverslip protrudes from the edges of the slide. Use slides with completely dried embedding medium only. Otherwise, the coverslip can be shifted that makes slide insertion less reliable. Not completely dried embedding might also influence the operation of objectives and other device parts.



Caution!

Do **NOT** scratch any circular marker onto the glass surface of a slide, use a soft tip pen instead for marking area of interest.

3.1 Affixing Barcode Stickers to Slides

This section describes how to affix barcode stickers to large slides. Barcodes enable virtual slide identification.

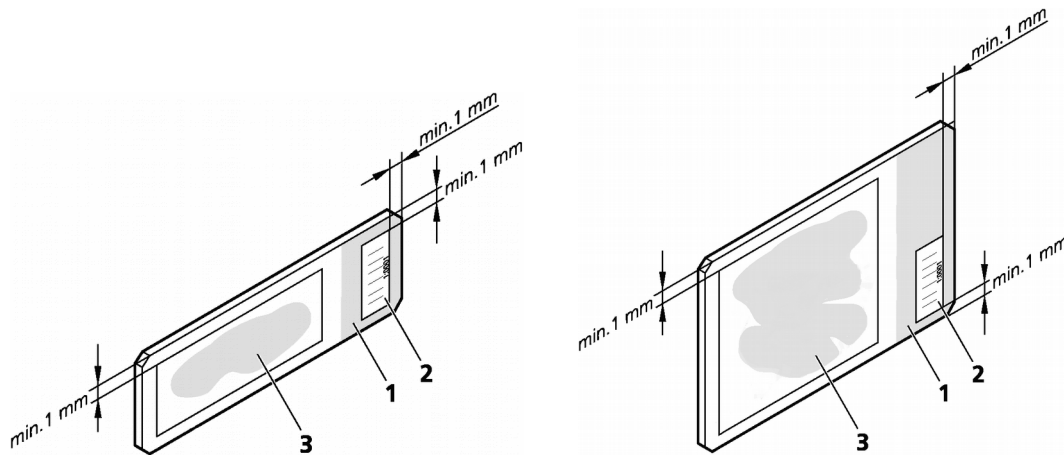


Figure 5 – Normal and large slides with barcode stickers

The label area (1) is recorded by the preview camera, and can be displayed by the control and viewer software.

To affix barcode stickers to slides, do the following:

1. Peel off the barcode sticker (2) from the roll.
2. Stick it on the colored label area (1) of the slide, on the specimen side. For large slides, the label sticker must be applied on the left side of label area.



Caution!

Ensure that a marginal space of 1-2 mm remains on all sides between the sticker and the label area outer limits. It is vital for barcode identification. Do not let barcode sticker protrude from slide edges, or stick on the coverslip surface (3).

The thickness of the barcode sticker on the slide must not exceed 0.4 mm! Do not stick more than four barcode stickers over each other and the overall thickness must be kept below 1.65 mm (including the barcodes and the slide).

3.2 Inserting and Removing Slides

Pannoramic DESK II features a manual feed for one single slide (normal or large).



Caution!

An adapter must be placed onto the specimen holder if normal slide is fed into the device. Depending on the slide type (normal or large) you are feeding into the device, always make sure to ascertain that the adapter is applied or not.

How to place and remove the adapter

For the placement and removal of the adapter a special tool is needed. This applicator has a magnet at its head, thus allowing an easy and fast placement or removal of the adapter.

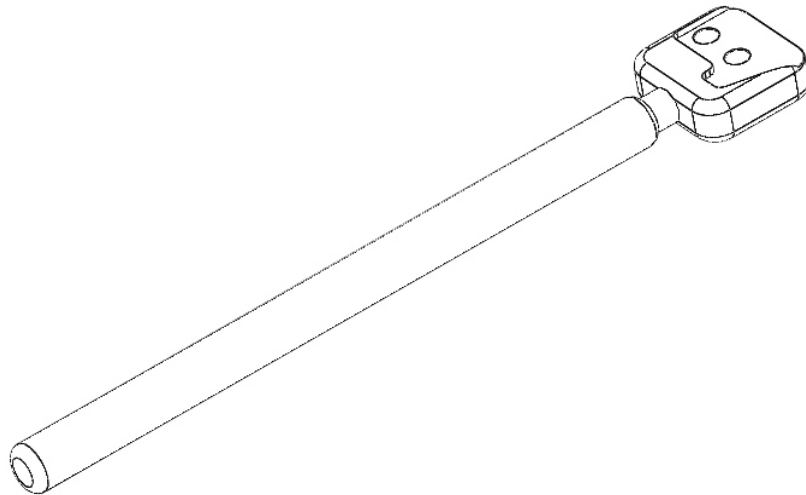


Figure 6 – Applicator for adapter

If a large slide is needed to be fed and the adapter is attached to the specimen holder, it must be removed first before feeding the slide.

1. Open slide feeder door, and locate the adapter (marked with red on **Figure 7**) at the front edge of the specimen holder

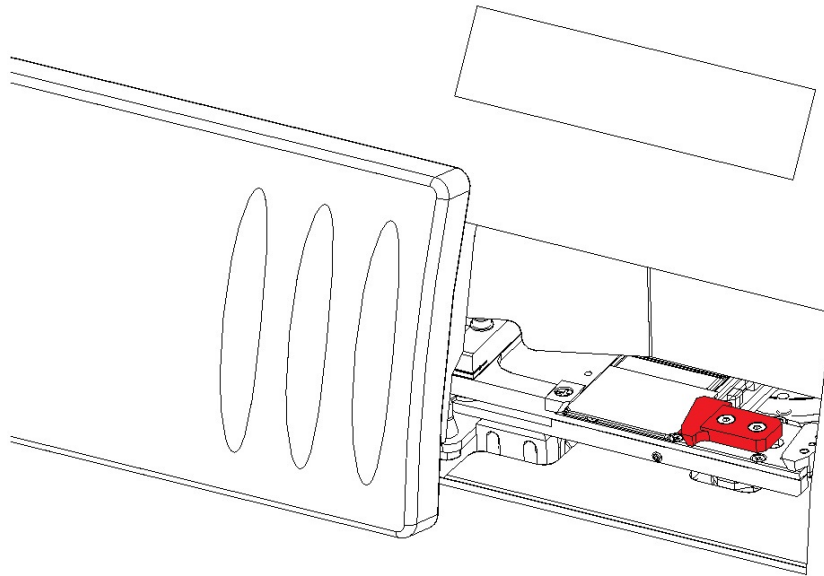


Figure 7 – Location of the slide adapter

2. With the applicator, gently remove the adapter from the specimen holder

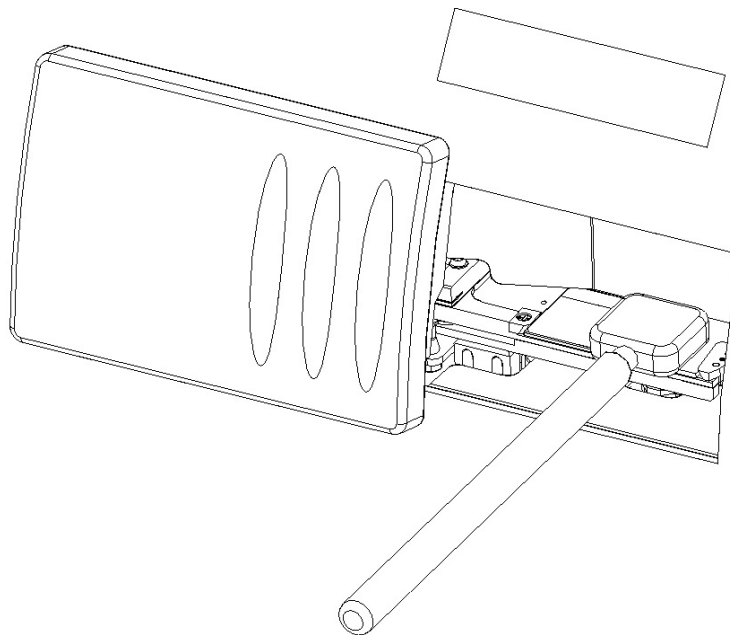


Figure 8 – Lifting off the applicator

3. Put both the applicator and the adapter in a safe place
4. The specimen holder is now capable to receive a large slide

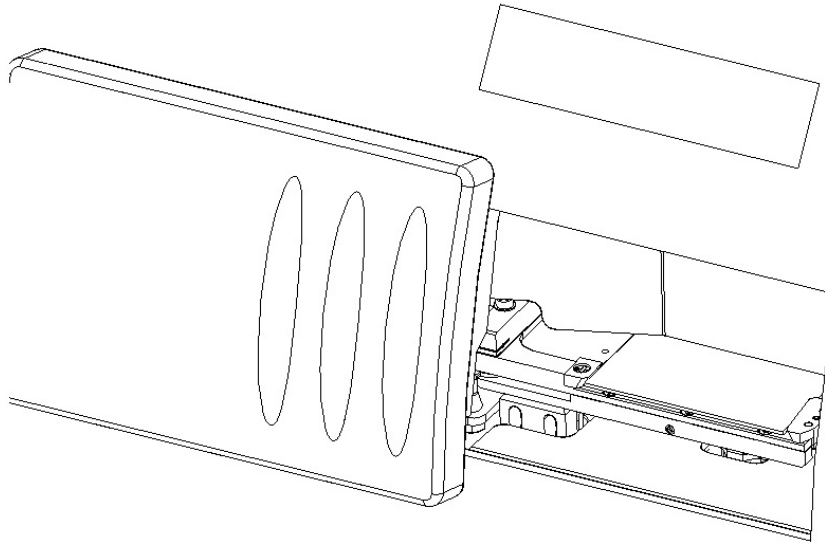


Figure 9 – Specimen holder with the adapter removed

If you want to load normal slide into the device, and the adapter is not placed on the specimen holder, follow the below steps:

1. Place the adapter to the head of the applicator
2. Open slide feeder door of the DESK II device
3. Place the adapter with the applicator onto the specimen holder

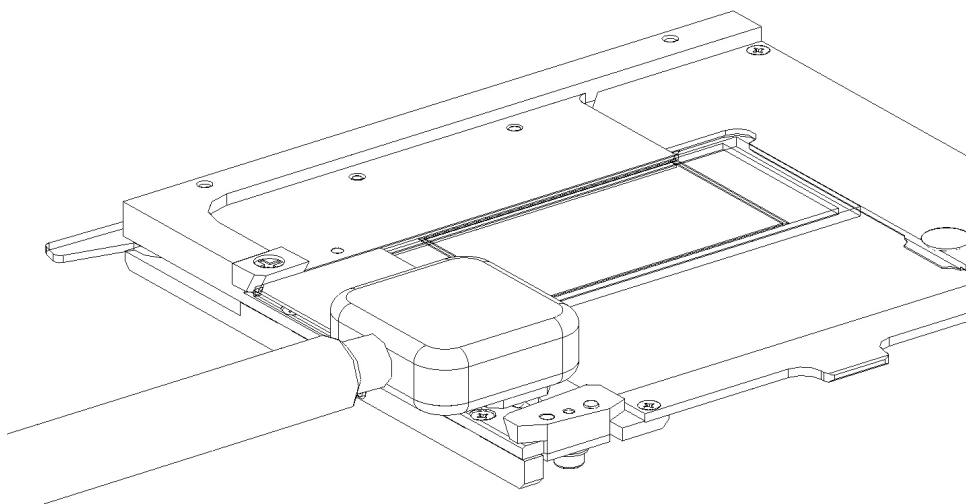


Figure 10 – Placing the adapter onto the specimen holder

4. After the adapter is placed on its location, lift the applicator and make sure the adapter stays at its place

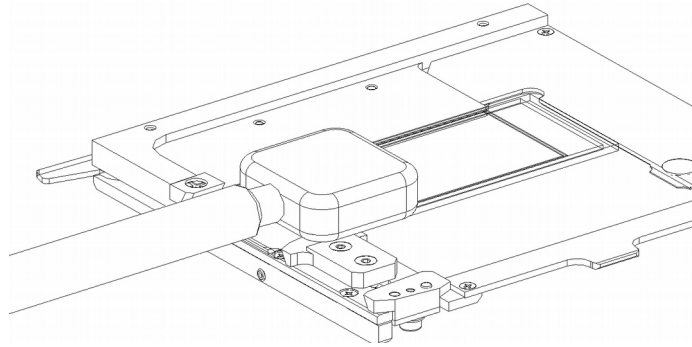


Figure 11 – Lifting off the applicator

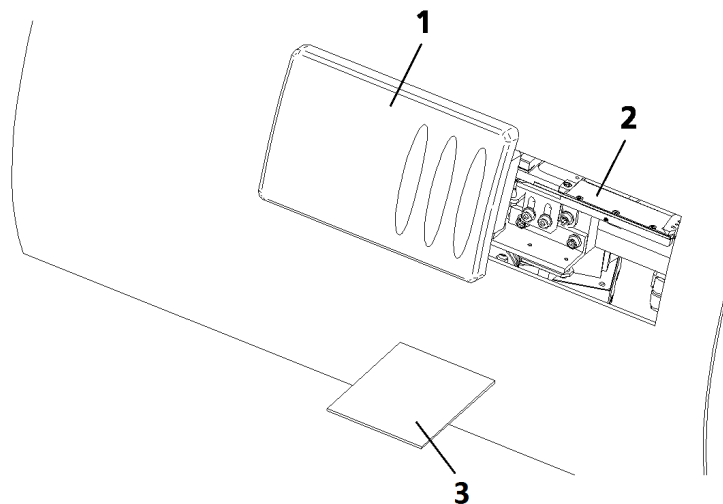


Note:

The device detects the presence of the adapter, and therefore preview image area is automatically modified accordingly.

To insert a slide**Caution!**

Incorrect slide insertion may break the glass. Always make sure that slides are correctly inserted in the tray. The edge of the broken area of the slide is sharp and its removal can lead to injury and contagion! Broken slide can be removed only by a well-trained person!

**Figure 12 – Inserting and removing a slide**

1. Click **Unload** in Pannoramic DESK II control software. The specimen holder moves to the load/unload position.
2. Open the slide insert door **(1)** by pushing it to the left.

**Caution!**

When opening the slide insert door, fingers may be pinched during operation.

3. Open the fixing lever by pulling it to the left.
4. Put the slide **(3)** you want to scan in the specimen holder **(2)**.

**Note:**

The cover slip and the label area should be on the top, with the label area pointing towards the slide insert door.

**Warning!**

To avoid jamming or breaking slides, ensure that the slide is not tilted and that it rests perfectly horizontally on the specimen holder.

Always make sure that the slide is correctly inserted on the specimen holder. Incorrect slide insertion may break the glass. The edge of the broken area of the slide is sharp and its removal can lead to injury and contagion! Broken slide can be removed only by a well-trained person!


5. Close the fixing lever by pushing it to the right so that it touches and therefore fixes the slide.
6. Close the slide insert door **(1)** by pushing it to the right.

**Caution!**

When closing the slide insert door, fingers may be pinched during operation.

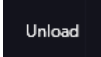
**Warning!**

Never open the front door unless prompted accordingly by software. When you open the door at any other time, make sure not to reach with your hands into the instrument to avoid the risk of crushing your fingers.

7. When you close the door, click  first, then barcode detection and preview image creation start automatically.

The preview image is displayed in the preview area of the control software.

To remove a slide:

1. Click  in Pannoramic DESK II control software. The specimen holder moves to the load/unload position
2. Open the slide insert door **(1)** by pushing it to the left.
3. Open the fixing lever by pulling it to the left.
4. Remove the slide **(3)**.
5. Insert another slide or close the fixing lever and the door **(1)**.

**Note:**

The slide insert door is equipped with an interlock switch. It automatically stops a running digitization process when the slide insert door is opened.

4 Software Description

4.1 Starting / Exiting Pannoramic DESK II Software Application

4.1.1 Starting the software

To start the program, double-click on the program icon on the desktop or start it from **Start \ Program Files \ 3DHISTECH \ Pannoramic Scanner**

After software initialization the user interface is opened and the mode selection icons are displayed.

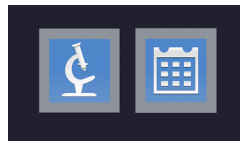


Figure 13 – Mode selection window

These two mode buttons represent **Microscope** and **Planner** scanner modes:

Microscope mode

- for digitization of individual slide
- set scanning profile of the slide
- run Live teleconsultation
- use Live microscope

Planner mode

- plan the entire scanning procedure
- assign one or more profiles to each slide
- define scanning profile to slides
- a list of profiles used for scanning is displayed

After selecting the required mode, the main window will open.

4.1.2 Exiting the software

To exit the software, Click **X** at the main window header to close the program. Note, that when exiting the software, it does not unload the slide automatically.

4.2 Main window functions

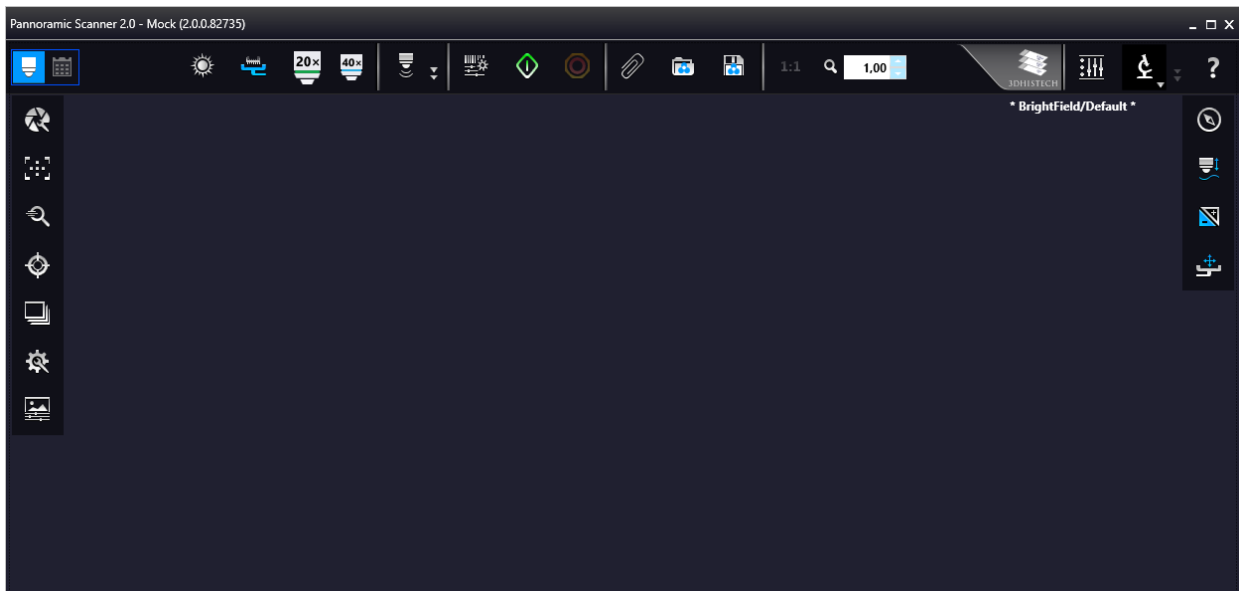
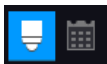
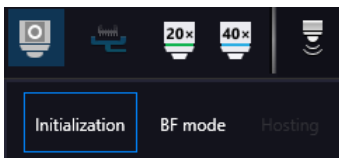


Figure 14 – Pannoramic Scanner 2.0 main window

The following functions are available for you to select from at the main menu bar:



– Switch between Microscope and Planner modes



– Microscope initialization



Initialization – All motors and the preview camera during start-up



BF mode – In BF mode: the camera for brightfield scanning is initialized



Hosting – Start and host a live Teleconsultation session



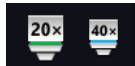
– Tray/ Slide loading

Load

– If there is no slide loaded into the scanner, this button is displayed. Click this button to prompt the software to move the stage into loading position. Open the door of the slide insert, load the slide, then close the door.

Unload

– Unload the inserted slide by clicking **Unload**, open the door, then remove the slide.



– Objective changer



– Live view is on

A normal live mode is activated, where images are taken with user-specified exposure time.



– Live view is on with the shutter closed

– Toolbar for live images

- The toolbar is only available for the displayed live image, but not available for camera images during digitization.
- One pixel on the monitor corresponds to one pixel on the camera
- The live image completely fills the display area
- Displays or hides the vertical and horizontal scale bars
- Displays the magnifier window
- Activates red marking on overexposed pixels
- Saves the current image as BMP or JPEG file

- **Fast Mode**



In **Fast live mode**, images are displayed with a frequency of at least 10 images per second. If an exposure time is set to more than 100 ms, the pixel values are multiplied accordingly (for example, if an exposure time of 200 ms is set, the pixel values are multiplied by 2, and the exposure time is reset to 100 ms). Therefore the resulting images will have a higher noise level.

This function is useful for fluorescent live view where in spite of the higher noise level, the resulting image will be refreshed as in normal mode.

- **Screenshot**










- **Magnifier Window**



- **Ruler**



- **Calculate white balance** 
- **Image Processor Plugins** 
 -  Convolute gray-scale image by custom kernel
 -  Multi-channel histogram with normalization
 -  Invert image (for testing purposes)
 -  Mark overexposed pixels

Scan Properties  (included as well on the profile cards added to the slide in Planner mode) unique settings can be defined even for each separate scanning.

- **Scan to Local**
 - Select the Slide save Path
 - Folder from Barcode
 - Free space: Free space capacity of selected local drive
 - Use Barcode
 - Slide name: Can be defined by manual or generate automatically with **Generate name** setting.
 - Scan separately: The FOV areas of the preview image will be scanned and saved separately as discrete digital slides.

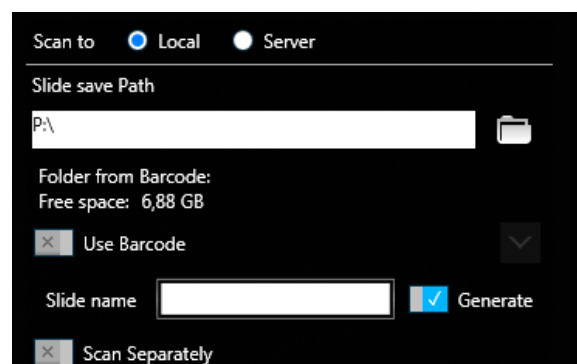


Figure 15 – Scan Properties window

- **Scan to Server**

- **Server:** the drop-down list includes all the saved servers. Click **Add new item ...** to create another server connection.

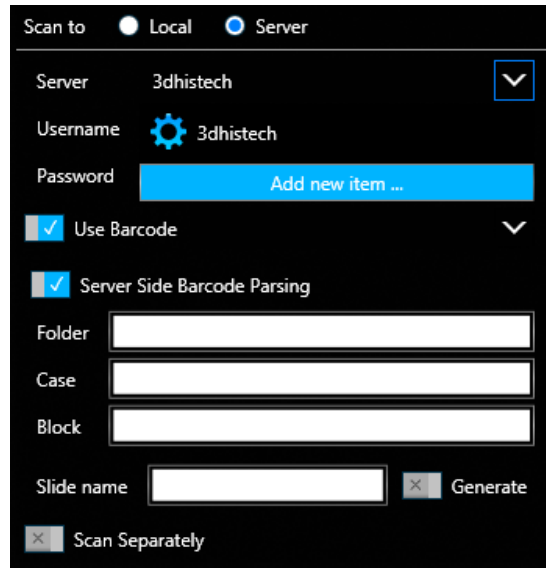


Figure 16 – Scan to server settings

- **Server Editor:** The user define here the following details of the Server:
 - **Display Name**
 - **Host Name**
 - **Protocol**

Server Editor stores each of the created server in a list. List entries can be removed or a new entry can be added if required. With the **Filters** function you can narrow down the results by searching for a specific server data. By double-clicking a list item, server data will be loaded in the **Scan to Server** panel.

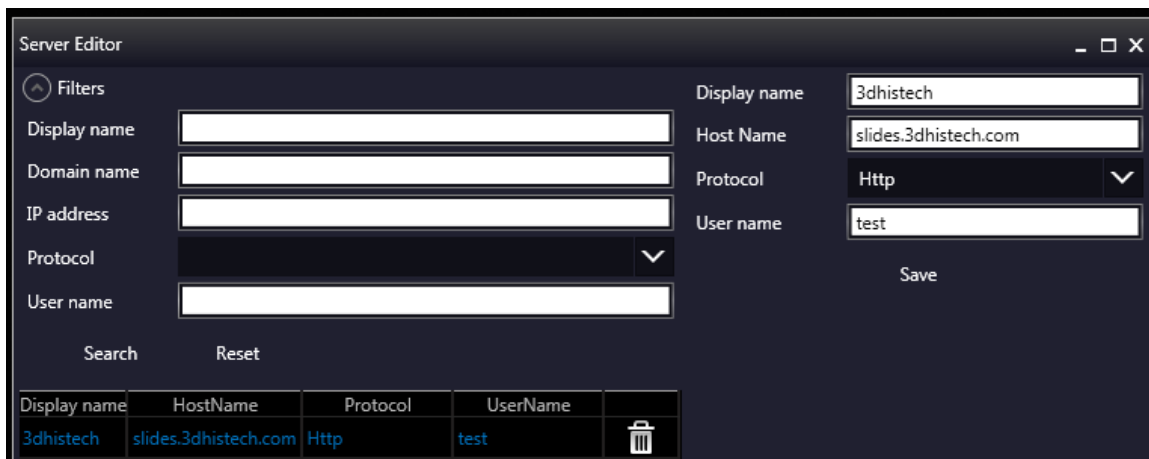
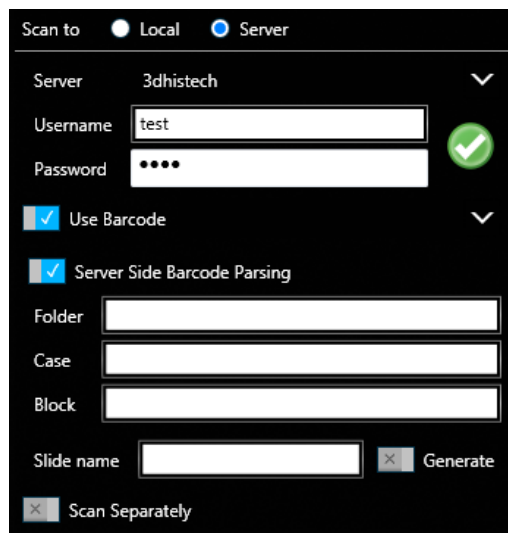


Figure 17 – Window of server editor

After loading server data, user name and password is required to be added for authentication and accessing the server. If connection is successful, a green checkmark is displayed in the window.



- **Use Barcode:** Barcode settings can be modified in the Barcode Editor window. By predefining barcode type and other settings.



Figure 18 – Window of Barcode Editor

You can select the following barcode types:

1D barcode types

- *Code 39
- Code 128
- Code 16K
- *Interleaved 2 of 5

- Standard 2 of 5
- IATA 2 of 5
- Matrix 2 of 5
- Telepen
- Code 93
- Code 11
- MSI
- Codabar
- Patch Code
- Pharmacode
- EAN-13
- EAN-8
- UPC-A
- UPC-E

2D barcode types

- Aztec
- Data Matrix
- PDF417/Compact
- Micro PDF417
- QR
- Micro QR
- MaxiCode



– **Start Scan:** Scanning of the actual slide or performing the whole previously planned scanning procedure can be initiated.



– **Stop actual progress**



– **Stop actual progress**



– **Auto attach:** Actual profile is assigned to the loaded slide automatically.



Open profile: The Profile Browser window containing a list of previously saved profiles is opened. Based on the Illumination type, profiles are grouped into two clusters: Brightfield and Fluorescence. Additional profiles can be created here as well, and you can also search for a specific profile by filtering based on the following data:

- Objective type
- Multilayer mode
- Illumination
- Filters
- Modify date
- Last use date

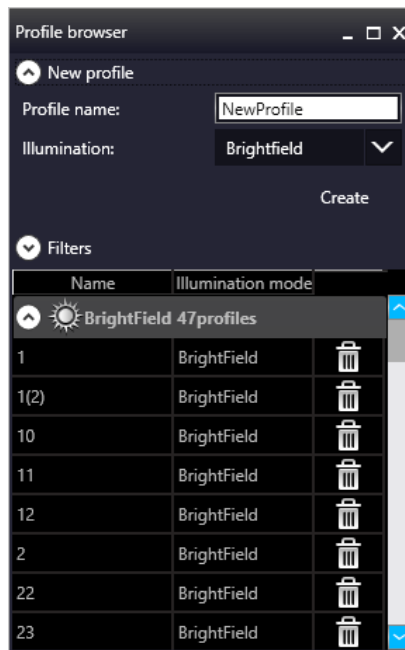


Figure 19 – Profile browser window



Save Profile

The selected profile can be saved in this window after typing the profile name into the text field and clicking **Save as**.



Reset Zoom

This function is active only in Live view at 1:1 magnification.



– Live image magnification



– Preferences








This panel contains user settings that have global effect on the GUI and some of its functions.





Appearance settings

- **View Mode Selector**

- Text mode
- Icon mode
- Float Text mode
- Float Icon mode

- **Style selector**
 - Black Jelly 
 - Flat style 
 - Black Jelly P1000 
 - Flat style P1000 
- **Planner style editor**
 - Slides with card 
 - Table 
 - Card Collection 

Live mode

- **Rendered**  – live image is displayed in an embedded window
- **External legacy**  – live image is displayed in an external window

Profile settings

- Use profile history save – With this function each profile modification is saved in Profile History from which the different stages can be reloaded.
- Save interval – Profile content is automatically saved at the specified time-frames.
- Enable setting of focus time – Parameters (**Short / Normal / Long**) related to focus time will be enabled on the profile settings panel. **Normal** is set as default.

Slide settings

- Take preview automatically – This function is designed to take preview images of slides automatically, once they are loaded.
- Unload slide after FL grabbing
- Slide label anonymity – Slide label area is displayed as a clear white image during scanning, patient data will not be visible in CaseViewer.
- Do not save label to slide – The original label area is not saved to the slide, and will not be visible in CaseViewer.
- Calculate exposure time for barcode grabbing – Three images are recorded for barcode image creation. Exposure times will be recalculated each time, thus creating perfect light conditions for barcode reading, so to make sure that barcode identification is successful.

Scanning History

- **Hardware log** 

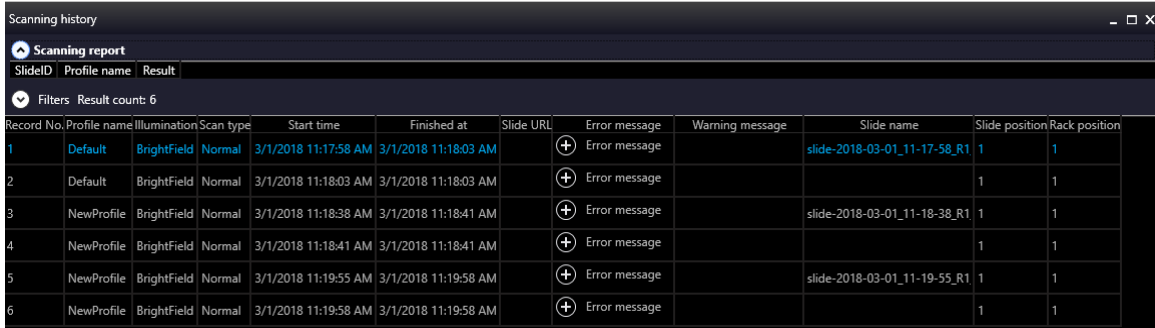
Scanner hardware operations are contained in this log. To enable this function, first the database from the following folder must be loaded: C:\ProgramData\3DHISTECH\SlideScanner\HWLogDataBase

The following motor movements are recorded in the log list:

- DFP Light
- General
- Halogen Light
- Microscope Part
- ND
- Objective Changer
- Preview Light
- RGB Light
- Relay
- Scan Loader
- Service
- Slide Scanner
- Stage

○ **Software log** 

All of the circumstances and states of the slide scanning procedure is saved. LogID is the sequence number of scanning performed on the scanner in use. (Profile Name, Illumination mode, Scan type, Scan Start, Scan Finished, URL, Error)



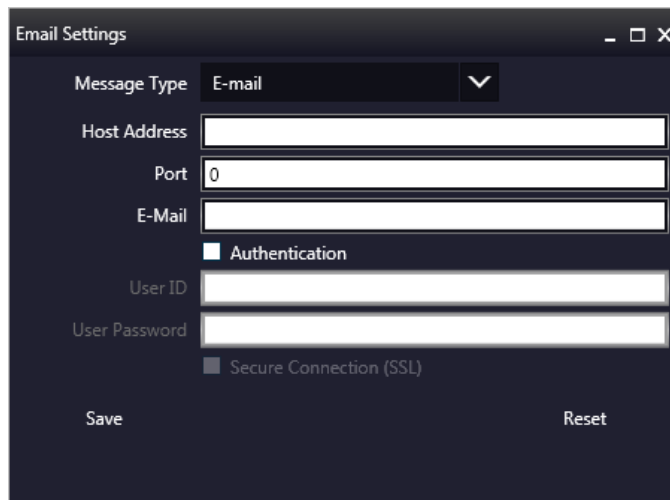
| Record No. | Profile name | Illumination | Scan type | Start time | Finished at | Slide URL | Error message | Warning message | Slide name | Slide position | Rack position |
|------------|--------------|--------------|-----------|----------------------|----------------------|-----------|---------------|-----------------|------------------------------|----------------|---------------|
| 1 | Default | BrightField | Normal | 3/1/2018 11:17:58 AM | 3/1/2018 11:18:03 AM | | + | Error message | slide-2018-03-01_11-17-58_R1 | 1 | 1 |
| 2 | Default | BrightField | Normal | 3/1/2018 11:18:03 AM | 3/1/2018 11:18:03 AM | | + | Error message | | 1 | 1 |
| 3 | NewProfile | BrightField | Normal | 3/1/2018 11:18:38 AM | 3/1/2018 11:18:41 AM | | + | Error message | slide-2018-03-01_11-18-38_R1 | 1 | 1 |
| 4 | NewProfile | BrightField | Normal | 3/1/2018 11:18:41 AM | 3/1/2018 11:18:41 AM | | + | Error message | | 1 | 1 |
| 5 | NewProfile | BrightField | Normal | 3/1/2018 11:19:55 AM | 3/1/2018 11:19:58 AM | | + | Error message | slide-2018-03-01_11-19-55_R1 | 1 | 1 |
| 6 | NewProfile | BrightField | Normal | 3/1/2018 11:19:58 AM | 3/1/2018 11:19:58 AM | | + | Error message | | 1 | 1 |

Filtering for the following parameters is available:

- Scanning date
- Profile name
- URL
- Slide name

Email Settings

An e-mail can be sent automatically about every failure and error that is occurred during scanning to the specified address. The log files are compressed into a ZIP file, that is attached to the mail.






Message Type: E-mail
Host Address:
Port:
E-Mail:
 Authentication
User ID:
User Password:
 Secure Connection (SSL)
Save Reset

 – Help

5 Scanning modes and settings

After microscope initialization, if FL HW option is provided, you can select from the following two modes:

- **Brightfield scanning mode** (see section *5.1 Brightfield Scanning Mode* for more information)
- **Option modes**
 -  **Off**
 -  **Service** (see section *5.6 Services and Settings* for more information)
 -  **Settings** (see section *5.6 Services and Settings* for more information)

In accordance with the selected mode, the **Profile Settings Panel** and the **Microscope Control Panel** views are modified.

5.1 Brightfield Scanning Mode

Microscope View consist of three different sections:

- **Main functions:** Located at below the window header, these functions are identical both in microscope and planner modes.
- **Profile Settings panel:** Profile settings containing parameters used for scanning.
- **Microscope Control Panel:** Live microscope movement functions

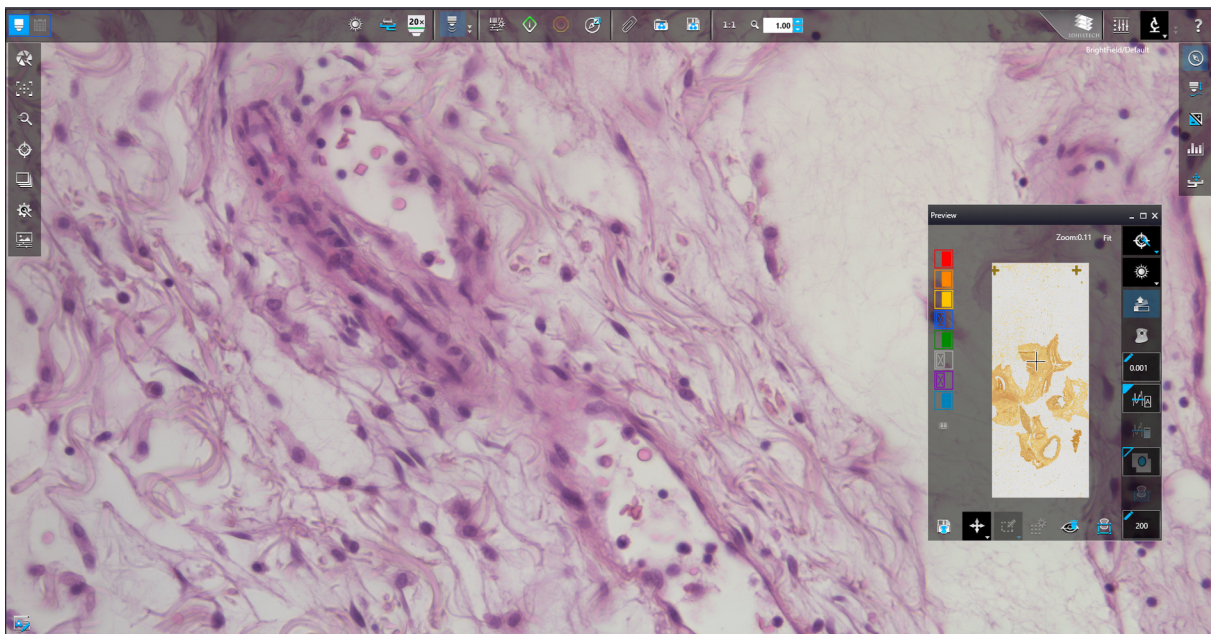


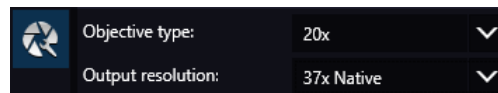
Figure 20 – Main window of Brightfield Microscope mode

5.1.1 Profile Settings Panel



Objective settings

This field displays the objective used for scanning.



NOTE: There is no objective changer in DESK II, therefore only one objective type is displayed.

- **Objective type**
 - **20x (40x** if a 40x objective is used for scanning with DESK II)
- **Output resolution**
 - Fixed values are: **37x Native** for 20x objective, and **73x Native** for 40x objective.



Focus settings for the scan profile

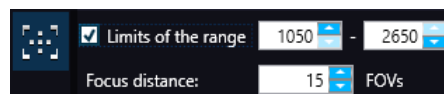


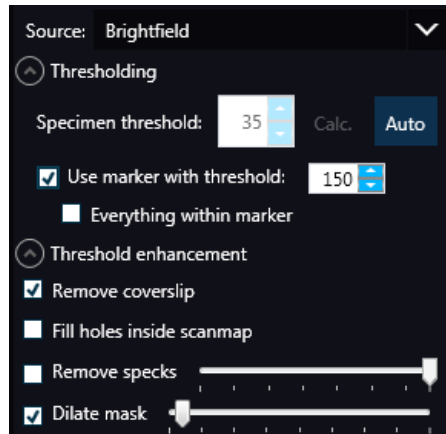
Figure 21 – Focus settings for scan profile

- **Limits of the range:** You can define focus limits by defining the upper and lower limits by selecting the desired value in the selection boxes. This is useful if focusing was not targeted on the specimen, but on a spot on the coverslip.
- **Focus distance:** the distance of focal points can be set to create a focus map, based on which the software calculates interpolated focus values (one step in distance means one FOV).



Sample detection

This panel offers options for threshold setting and selection of the area to be scanned.



- **Source**

- **Brightfield preview** – a normal type of illumination in the microscope for scanning the slide. This option is recommended when scanning in Brightfield mode.


- **Thresholding**


The manually specified value is used for thresholding during scanning. Preview image of the loaded slide is displayed in the Preview window, and when modifying any of the parameter values, it will have effect on the preview image. If the threshold value presented on the Microscope Controller preview window is modified, this value is automatically applied by the profile in the Profile Settings panel.

- **Specimen threshold**

Sets the sensitivity of the specimen detection. To set the desired threshold value manually, click the **Auto** button first (as it is activated by default), then change the setting in the **Specimen threshold** selection box in the range of 0-255. The default value is 212. Click **Calc.** to calculate threshold for the preview image. Smaller values result in a more sensitive scanning, meaning that more areas will be digitized, however, this may also include specks or other imperfections of the slide. Greater values result in a less sensitive scanning, but it is possible that some of the smaller specimen areas will not be digitized.

- **Auto Threshold**

By clicking  the specimen will automatically be detected in the preview image.



Caution!

Make sure that the detection result is acceptable for you. Otherwise, set the threshold value manually or append missing areas with the help of appropriate functions in the **Preview** window.

- **Use marker with threshold**

If the specimen cannot be identified as required for digitization, (for example, weak contrast), it can help to encircle completely the specimen with a black marker pen. You have to draw a full circle with the pen to enable the detection. Marker pen detection will make specimen detection easier by limiting the scanned area. If this option is selected, only the area encircled with a marker pen will be scanned. You can define the threshold level by changing the threshold value in the **Use marker with threshold** selection box in the range of 0-255. This sets the sensitivity of the specimen detection inside the marker area. To set the desired threshold value manually, change the setting in the **Specimen threshold** selection box in the range of 0-255. The default value is 105.

- **Everything within marker**

To scan everything within the marked area, check the **Everything within marker** selection box.

Alternatively, click  in the preview window to activate this function.

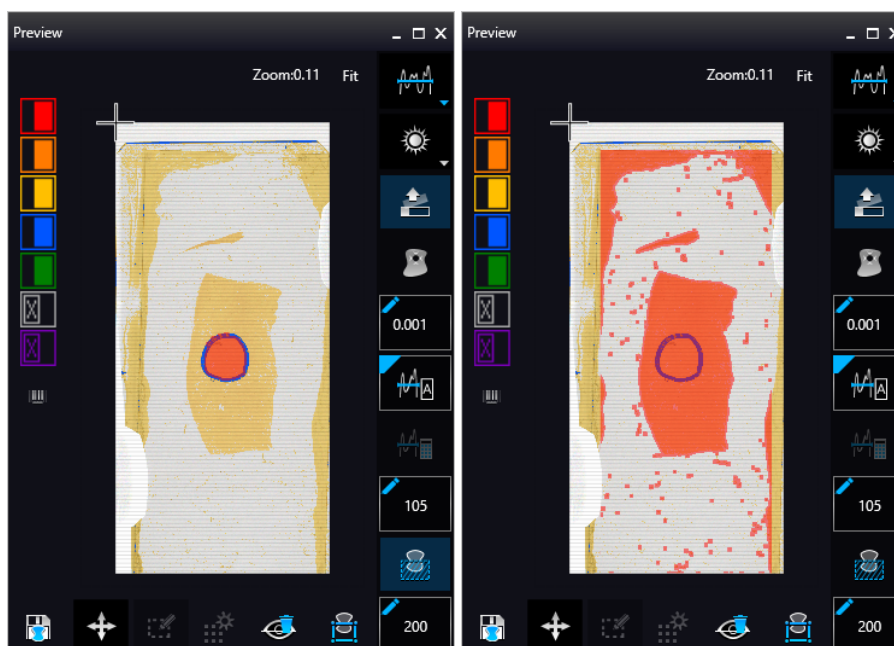


Figure 22 – Scan everything within the marked area (selected / not selected)

- **Threshold enhancement**

- **Remove coverslip** – If selected, the edges of the coverslip are not detected as specimen to be scanned. Depending on the threshold level, it is possible that the edges of the coverslip are detected as areas to be digitized.

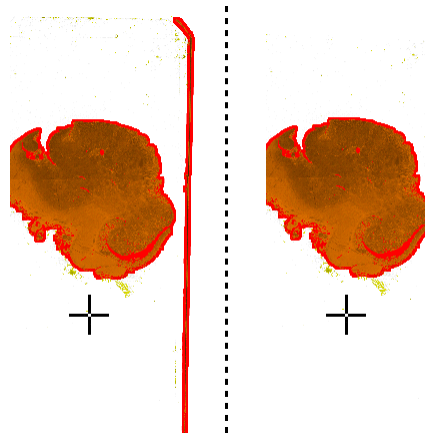


Figure 23 – Preview image with and without coverslip edge



Caution!

It requires lots of time (since it cannot find focus neither on the edges, nor on specks) to digitize coverslip edges. Select **Remove coverslip** function to eliminate those areas.



Warning!

Do **NOT** use **Remove coverslip** function on TMA slides! The layout of TMA slides may mislead the detecting algorithm.


- **Fill holes inside the scanmap** – If selected, the holes inside the specimen will also be scanned. Often these holes contain small sample objects that otherwise would not be scanned.
- **Remove specks** – If selected, the scanner does not digitize objects smaller than the predetermined size. This helps filtering specks and other uninteresting objects out. Set the maximum size of specks not to be digitized by adjusting the slider.
- **Dilate mask** – Adjust the slider to enlarge or decrease the scanned area. The edge is extended discretely by 100 μm each time.



Scanmap

A previously saved scanmap can be loaded and applied.

- **Use Threshold:** The defined preview settings are applied as the basis of scanmap.
- **Loaded scanmap:** This function is useful if the slides contain areas of interest that cannot be detected by the preview camera. This function along with saving profiles helps to scan all slides with the most adequate settings.

To load a mask, click  first, then browse for the scanmap to be loaded.

- **Custom scanmap:** The scanmap drawn manually on the preview image is used for scanning.



- **Use selection box restriction**

If selected, only the area inside the box is scanned. It is useful if you only want to scan the area that is equivalent with the size of the coverslip, so external specks will not be scanned.



Multilayer mode

- Select **Single layer** option if you want to scan a single layer of the slide.
- **Extended focus:** By choosing the **Extended focus** option, the software selects the sharpest image from each focus level for each image field, and combines them into one single image. Therefore those parts that were blurry in auto/manual focus will also be sharp. This method guarantees the maximum depth of sharpness, however, it reduces digitization speed.

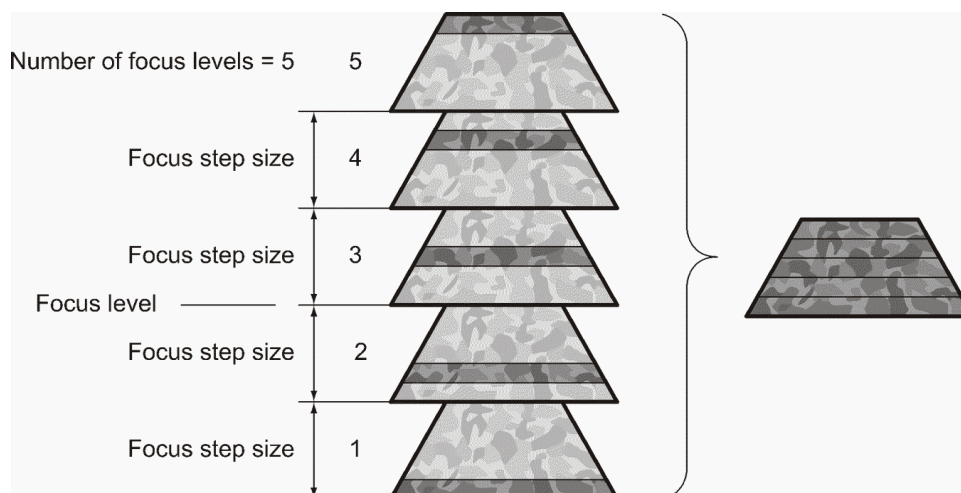
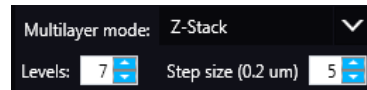


Figure 24 – Focus level and step size

- **Z-stack scan mode:** Both for Extended focus and **Z-Stack** scanning methods, you can determine the desired number of focus levels with the **Levels** selection box. The current focus value is the starting point. If you set 5 for example, one current, two focus levels above and below FOVs are captured. Therefore, it is advised to choose an odd number for the focus levels. Separate layers are created and stored this way, and can be opened with Pannoramic Viewer. The Z-stack slide contains the extended focus layer.



Step size determines the spacing between focus levels. One step is around 0.2 μm .

Default settings are: **Levels: 7; Step size: 5.**



Scanning Settings

Includes the **Stop and Go** scanning mode.

Use Color matrix: Select an applicable preset color profile to be used for Brightfield scanning from the drop-down menu. Settings according to the profile has effect on the color set, color temperature, and gamma value of the scanned image.

Separate color matrix can be defined and used for each profile and scanning.

Preset profiles are the following:

- **Calibrated Linear:** Color scheme is defined by calibration (Gamma value is not included)
- **sRGB standard:** Color scheme is defined by calibration (standard Gamma value -2.2- is applied)
- **sRGB standard Microscope Like:** Color scheme is defined by calibration (standard Gamma value / White Point: D50)
- **Legacy:** a Color scheme calibrated for the previous software version is applied
- **Custom:** Color profile set in Service is applicable if needed.



Image settings

You can choose the following predefined image formats (and a subsequent custom option) from the **Image Quality** drop-down list in the **Image Encoding** section of the window:

- Excellent (JPEG: 90)

- Good (JPEG: 80)
- Medium (JPEG: 60)
- Low (JPEG: 30)
- Custom...

If choosing this option, the Image compression setting is displayed on which you can select from different image formats. Accordingly, further adjustments can be made, except if PNG or BMP image format is selected.

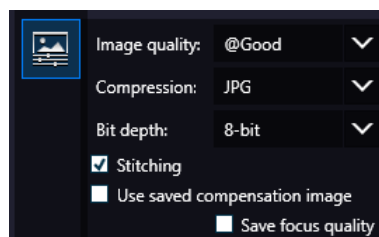


Figure 25 – Image encoding window

- **JPEG** – The quality can be adjusted with the **JPEG quality factor** slider. Greater values result in better quality, but larger files. The default setting is 80%.
- **PNG** – Lossless compressed image format.
- **BMP** – Lossless uncompressed image format, but larger files due to less effective compression. It is a raw data file.
- **Stitching:** Use Stitching function enables the seamless stitching of digital tiles.
- **Use save compensation image:** The **Use saved compensation image** function enables the use of previously recorded reference images for all slides. Use this function when the slide is completely covered by the specimen (for example, blood smear) thereby making compensation image capture impossible. For such slides, use an empty slide with coverslip to grab a compensation image. If you select this, the software will not create new compensation images for each slide. Compensation images are reference images used for white balancing and shading.
- **Save focus quality:** The measurement of focus quality (correctness of average focus on layers) is saved. This option is inactive when **Extended focus** option is activated.
- **Save image in original Bayer size** function is only available if pco.edge 4.2 camera is installed on the scanner. It is not accessible for configurations installed with Point Grey Grasshopper 3 camera. Image fields will be saved with native pixel resolution. If this function is disabled, you will work with reduced pixel resolution. These resolution differences are not really visible with the human eye, what is important in this feature is the resulting smaller file size.

5.1.2 Microscope Control Panel

The Microscope Control panel includes the main control features of the microscope.

5.1.2.1 Preview Window

The Preview panel offers options for threshold setting and selection of the area to be scanned.

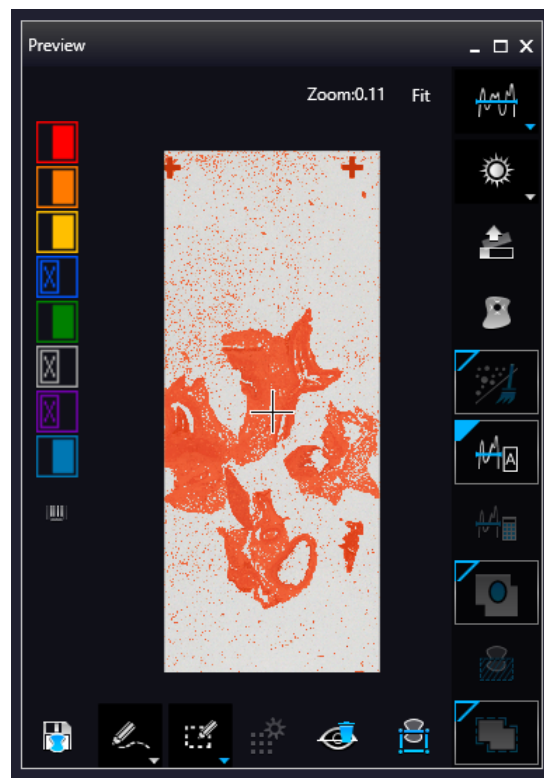




Figure 26 – Preview panel

Threshold options

This section is located at right side of the preview window. **Scanmap Source** is designed to set which type of scanmap is used on the preview image. This scanmap is displayed automatically in the **Profile Scanmap Source** setting. Selectable scanmap types are the following:

- Use threshold 
- Load previously saved scanmap from file 
- Custom scan map 

Preview Type setting determines the type of illumination. In Brightfield mode the following preview types are available:

- **Brightfield preview**  – a normal type of illumination in the microscope for scanning the slide. This option is recommended when scanning in Brightfield mode.


Remove Coverslip  – If selected, the edges of the coverslip are not detected as specimen to be scanned. Depending on the threshold level, it is possible that the edges of the coverslip are detected as areas to be digitized.



Figure 27 – Preview image with and without coverslip edge




Caution!


It requires lots of time (since it cannot find focus neither on the edges, nor on specks) to digitize coverslip edges. Select **Remove coverslip** function to eliminate those areas.




Warning!


Do **NOT** use **Remove coverslip** function on TMA slides! The layout of TMA slides may mislead the detecting algorithm.

Fill holes inside scanmap : If selected, the holes inside the specimen will also be scanned. Often these holes contain small sample objects that otherwise would not be scanned.

Remove specks : If selected, the scanner does not digitize objects smaller than the predetermined size. This helps filtering specks and other uninteresting objects out.

Set the maximum volume of specks manually in the setting window . The maximum value that can be set is 1.

Threshold settings have two different statuses:



- **Auto threshold** : It automatically detects the specimen in the preview image.





Caution!


Make sure that the detection result is acceptable for you. Otherwise set the threshold value manually.

Make sure that the detection result is acceptable for you. Otherwise set the threshold value manually.

- **Manual threshold** : Set threshold value manually, or calculate value on the actual preview with **Calculate Threshold**  function which is active only if setting the value manually. This sets the sensitivity of the specimen detection. To set the desired threshold value manually, change the setting in the **Specimen threshold level** selection box in the range of 0-255. The default value is 212. Smaller values result in a more sensitive scanning, meaning that more areas will be digitized, however, this may also include specks or other imperfections of the slide. Greater values result in a less sensitive scanning, but it is possible that some of the smaller specimen areas will not be digitized.

Use marker with threshold : If the specimen cannot be identified as required for digitization, (for example, weak contrast), it can help to encircle completely the specimen with a black marker pen. You have to draw a full circle with the pen to enable the detection. Marker pen detection will make specimen detection easier by limiting the scanned area.

Manual setting of Use marker with threshold : If this option is selected, only the area encircled with a marker pen will be scanned. You can define the threshold level by changing the threshold value in the **Marker threshold level** selection box in the range of 0-255. This sets the sensitivity of the specimen detection inside the marker area. To set the desired threshold value manually, change the setting in the **Threshold** selection box in the range of 0-255. The default value is 212.

Everything within marker : This function is available only to select if the **Use marker with threshold** function is activated. To scan everything within the marked area, check the **Scan everything within marker** selection box.

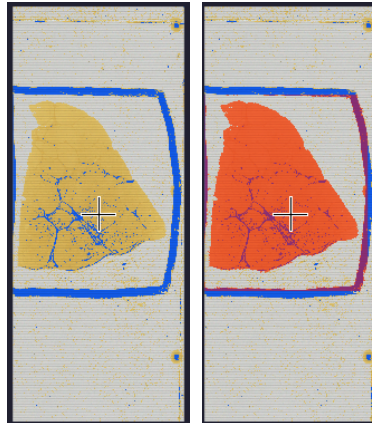





Figure 28 – Scan everything within the marker selected / not selected





Dilate mask : Adjust the slider to enlarge or decrease the scanned area. The edge is extended discretely by entering a new value each time. To switch to manual mode click the top left corner of the button and the required value can be entered in the box .


Use selection box restriction : If selected, only the area inside the box is scanned. It is useful if you only want to scan the area that is equivalent with the size of the coverslip, so external specks will not be scanned.

Preview Toolbar



This section is located at the bottom of the preview image.

- **Save scanmap**  – Click this icon to save the currently selected areas to scanmap.
- **Position** : To position the specimen holder that holds the current slide, click **Position sample** and then click on the area of interest on the preview image. This will define the Live image that you can access from the **Live view** .
- **Union** : Add the selected areas to the preview. Mark area for scanning based on the shape selected in the Preview Toolbar. This area will not be scanned.

- **Erase** : Delete selected areas from the preview image. Deselection is made based on the selected shape from the Preview Toolbar. This area will not be scanned.

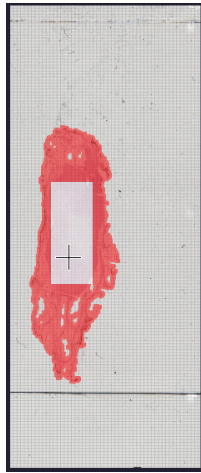



Figure 29 – Not scanned selection

- **Edit** : The size of selected area (positive or negative) can be modified at the borderlines or corners.

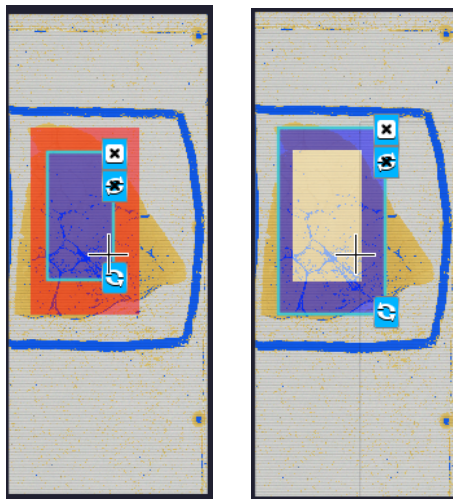






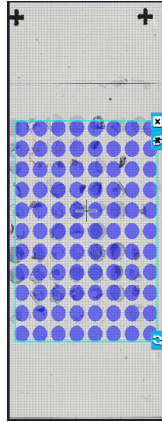



Figure 30 – Edited negative and positive selection masks.

- **Crop** : Crop the area of the selected area.
- **Place Circle** : You can select the area to be scanned with the different tools on the Preview toolbar.
- **Rectangle tool** : Draw rectangle shaped area.
- **Ellipse tool** : Draw ellipse selection.

- **Polygon tool** : Area selection by defining a polygon shape. Finish area selection by double-clicking with the mouse at or near the starting point.
- **TMA tool** : TMA tool is used for selecting TMA spots on TMA slides. You can set the selection settings on the following four tabs:



- **TMA Grid Setting** : This function is enabled only if a TMA grid has already been placed on the preview image. Set grid parameters (row and column numbers) and spot shape (round or rectangle).

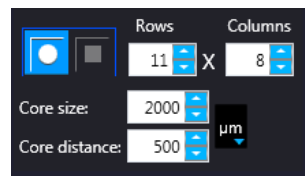


Figure 31 – TMA tool: Grid selector

Delete TMA grid by clicking the **X** at the top right corner, and rotate grid by clicking the icon at the bottom right corner. Enter the number of rows and columns in the **Rows** and **Columns** fields or select the appropriate values with the arrows.

Enter the distance between two spots on the X and the Y axis in μm in the **Core distance** fields or select the appropriate values with the arrows. Enter the average diameter of the spots in the **Core size** field or select the appropriate value with the arrows.

- **Clear scanmap** : The entire scanmap area will be cleared and reset to default.

- **Use selection box restriction** 

The preview image shows the area that will be digitized with a red and/or an orange mask. If the **Use selection box** is enabled, and the crop function is selected, a black frame displayed in the image, and only the area inside the box is scanned. It is useful if you only want to scan the area that is equivalent with the size of the coverslip, so external specks will not be scanned.

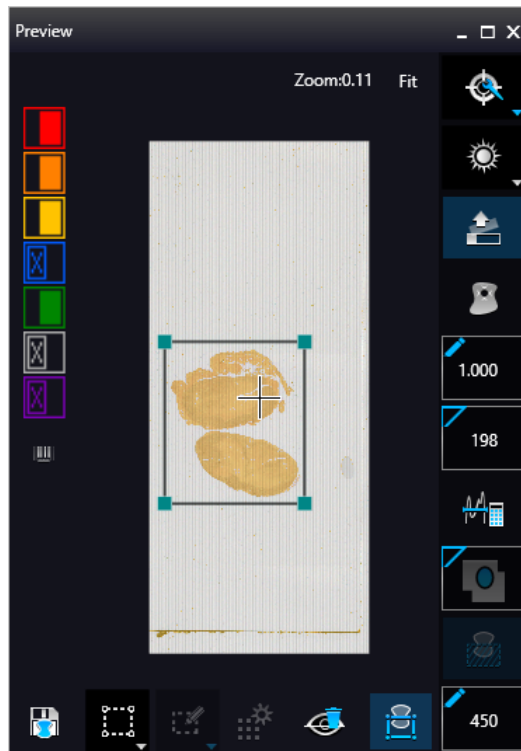
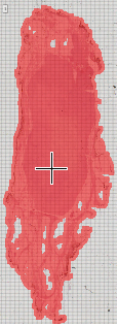



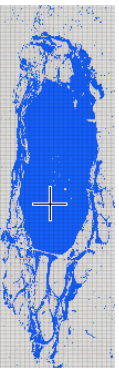

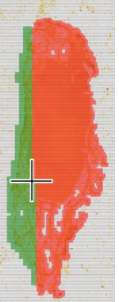






Figure 32 – Use selection box

The following colors are used in the preview image to demonstrate digitization and selection settings:



Figure 33 – Colors in preview image and Label area switching button

| | |
|---|---|
|  |  <i>Areas that will be scanned</i> |
|  |  <i>Detected sample areas that will be scanned</i> |
|  |  <i>Detected sample areas that will not be scanned</i> |
|  |  <i>Marker</i> |
| | <p>If Scan area inside the marker is selected in the Preview panel, the preview camera detects the marker pen. The inside areas appear in red color and will be digitized.</p> |
| |  <i>Areas scanned in</i> |
| | <p>This color is only displayed during scanning.</p> |
| |  <i>Hide all layers</i> |
| | <p>All the layers will be hidden / existing but not visible.</p> |
| |  <i>Separate scanning</i> |
| | <p>Discrete sample areas will be scanned separately as individual slides. If there are two samples on a slide, two separate virtual slides will be created.</p> |





Click the  button to display barcode label area. To rotate the label area by 180°, click .



Figure 34 – Barcode label area window

5.1.2.2 Focus Indicator

Click  to activate the **Focus indicator** function. Search for the sharpest focus on the current field of view automatically by clicking  - **Auto focus** button.

To define focus limits, select **Limit the range**. Set the upper and lower limits by selecting the desired value in the selection boxes. By using **Set +-Range**, the **Lower limit** value is set to -32 of the current focus value and the **Upper limit** value is set to +32 of the current focus value. This is useful if **Auto Focus** does not find the focus on the specimen, but on the coverslip. Also, this makes the focusing sequence faster.

For manual focusing define the manual focus step size by adjusting the **Step size** slider and use the two arrow buttons to focus manually. This is useful when you are interested in an area that remained blurry with **Auto Focus** (for example, the specimen is thicker in that area). This does not influence the way slides are digitized in Auto focus mode.

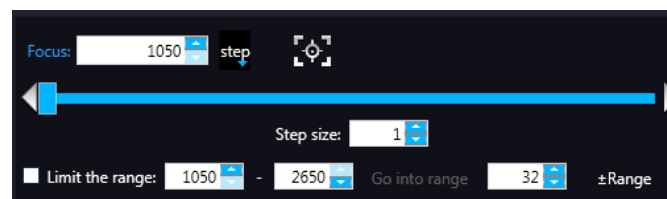




Figure 35 – Focus indicator panel

5.1.2.3 Exposure Indicator

Activate Exposure indicator function by clicking . Click  to calculate exposure time for the actual Live image. In Brightfield mode there is no option for manually setting the values. Exposure time can be displayed in microsecond, millisecond, and also in second.

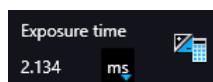



Figure 36 – Window of Exposure Indicator in Brightfield scan mode

Image Intensity

Click  to open Image intensity settings window. An **image** is defined as a two-dimensional function $f(x, y)$ the amplitude of at any pair of coordinates (x, y) is called the **intensity** or gray level of the **image** at that point. The pixel intensity at the coordinate pointing at with the cursor is displayed in the Image Intensity window.

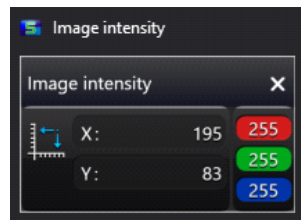



Figure 37 – Window of Image Intensity

5.1.2.4 Stage positioning

Click  to activate **Stage Positioning Tool** to navigate on the slide, so to perform microscope movements on the Live image with this control function. The number at the center of the controller defines the step size by which the stage is moved. Value can be entered by hand or with the slider.

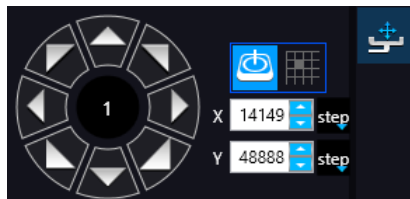


Figure 38 – Stage positioning tool

This tool offers easy and punctual slide navigation in distinctive steps. Set step size (FoV) – 1, ½, or ¼ to determine the size of movement in proportion of one FOV. Click an arrow to move to the required direction with the set step size.

5.1.3 Quick preview functions

Use **Ctrl+mouse wheel** to zoom in or out to the preview area or the Live image.

A quick preview function tool pops up by right-clicking to the preview area. It allows a quick access to main preview-related functions:

- Drag
- Draw
- Erase
- Retake preview
- Settings
 - Toggle deletion always on top
 - Reset zoom
 - Window auto-size
 - Clear scanmap

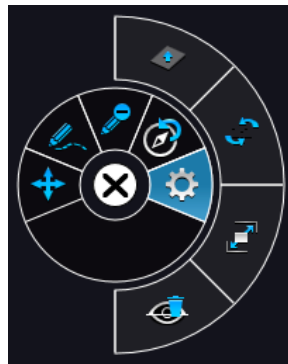


Figure 39 – Quick toolset for preview

5.1.4 Quick microscope functions

A quick microscope functions tool can be displayed upon right-clicking on the background of the main window (outside the preview window). It includes quick-access-buttons to main functions for DESK II:



Figure 40 – Quick toolset for microscope

- **Focus**



Figure 41 – Focus

- Autofocus
- Set coarse focus point
- Set interpolated focus point 1
- Set interpolated focus point 2
- Set interpolated focus point 3

- **Live tools**



- Fast mode
- Screenshot
- Magnifier
- Ruler
- Image processor plugins
- Add scanmap

- **Auto exposure**



5.1.5 Bottom menu bar of the main window

Profile History

This function can be activated by clicking  in **Preferences**. During setting scanning profile all of the previously used parameter will be saved automatically.

Each modification in the profile creates a so-called Milestone unit. These stage units are linked in a row displayed at the bottom left corner of the main window.

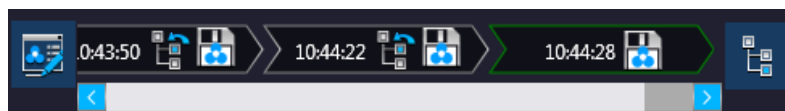


Figure 42 – Progress of the profile modification history

Once you are moving the mouse cursor over a unit all of the parameters will become visible in a pop-up window.

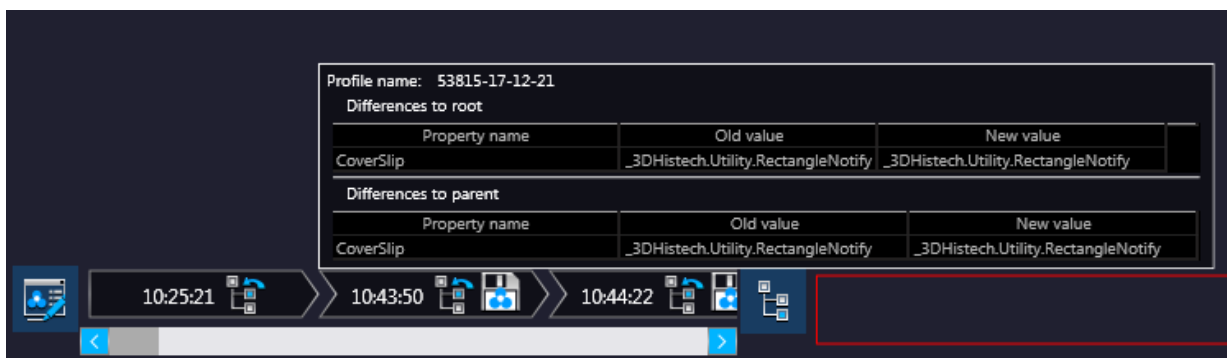





Figure 43 – Details of parameter modification

For the easier perspicuity, modifications can be observed in a pop-up window by clicking the  button in which both the original and the modified values are presented.

Click  to save parameters of the milestone unit into a new profile.

Click  to restore a modification stage (load parameters of a milestone unit) if needed.

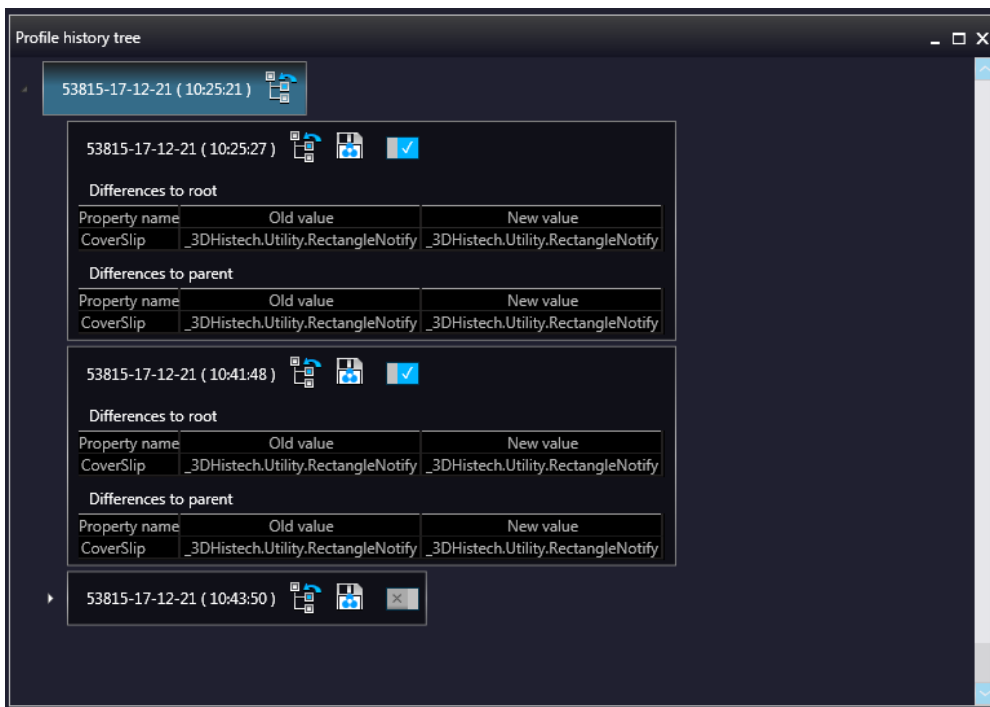
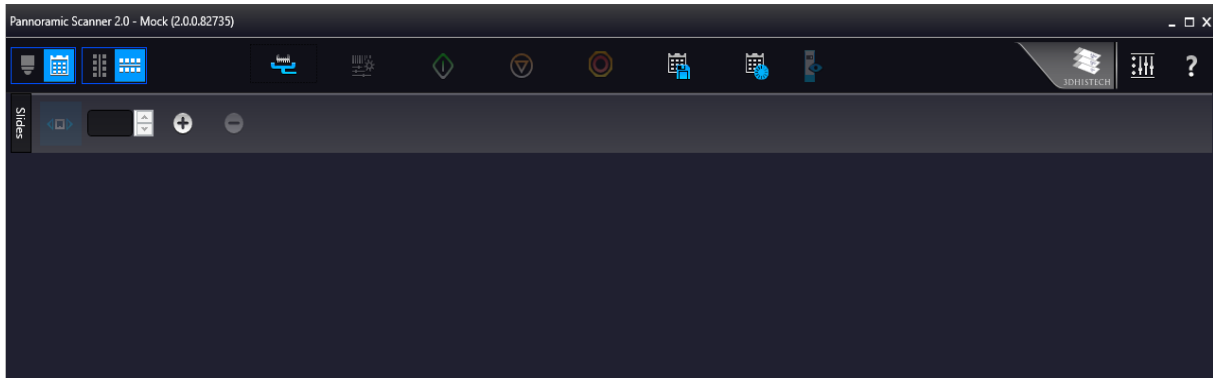


Figure 44 – Profile history tree

5.2 Planner mode

The whole scanning procedure can be planned in this mode. Assign profiles to slides, modify scan-maps without performing physical loading of slides. In Planner mode not only the scanning of the actually loaded tray can be planned, but also profile assignment to slides of prepared virtual trays is available to be performed. It is also possible to scan to different locations with each profile, and virtual slides can be created and stored in different folder or server.




Planner module includes three appearance types for planning scans, located under the **Preferences / Planner Layout Selector** menu:


-  – Slide view with card
-  – Table
-  – Card collection


5.2.1 General functions at the main menu

 **Microscope/Planner selector**

 **Horizontal/Vertical selector** (Available in **Slide view with card** mode)

 **Stage Control** – Available after initialization, upon clicking the slide icon or entering slide position number at the right side, the slide can be loaded.

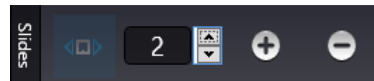
 **Scan to** – Available after loading procedure, unique settings can be defined even for each separate scanning.



 **Start scan** – Scanning of the actually loaded slide, or if the planner has been defined, the whole scanning process can be initiated.

**Stop scan****Stop actual process****Save planner:** A scanning plan containing all parameters and profile assignment will be saved.**Load planner:** The previously saved scanning plan can be loaded.**Jump to scanned:** Loads the planner view of the actual slide during scanning**Preferences****Help**

5.2.2 General functions at the tray menu

Slide view mode selector: Several other slides can be added to the planner



Click  to add a virtual slide to the planner, and  to remove a slide from the planner.

5.2.3 General functions at the slide menu

- Right-click the slide and select **Mark as empty** to cancel slide selection.
- Right-click the slide marked as empty and click **Reset** to cancel slide selection.

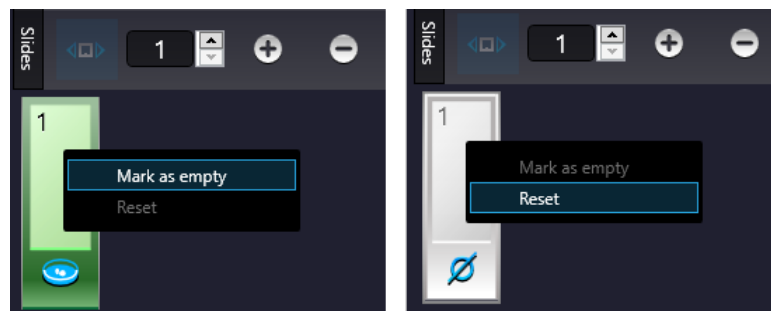





Figure 45 – General functions at the slide menu

5.2.4 Slide view with card

Click  in the **Preferences** window / **Planner layout selector** to activate this view in which the slide position and its card can have a horizontal or vertical layout. Slide preview and the list of the assigned profiles are displayed.

By clicking  or  profiles can be added or removed, respectively.

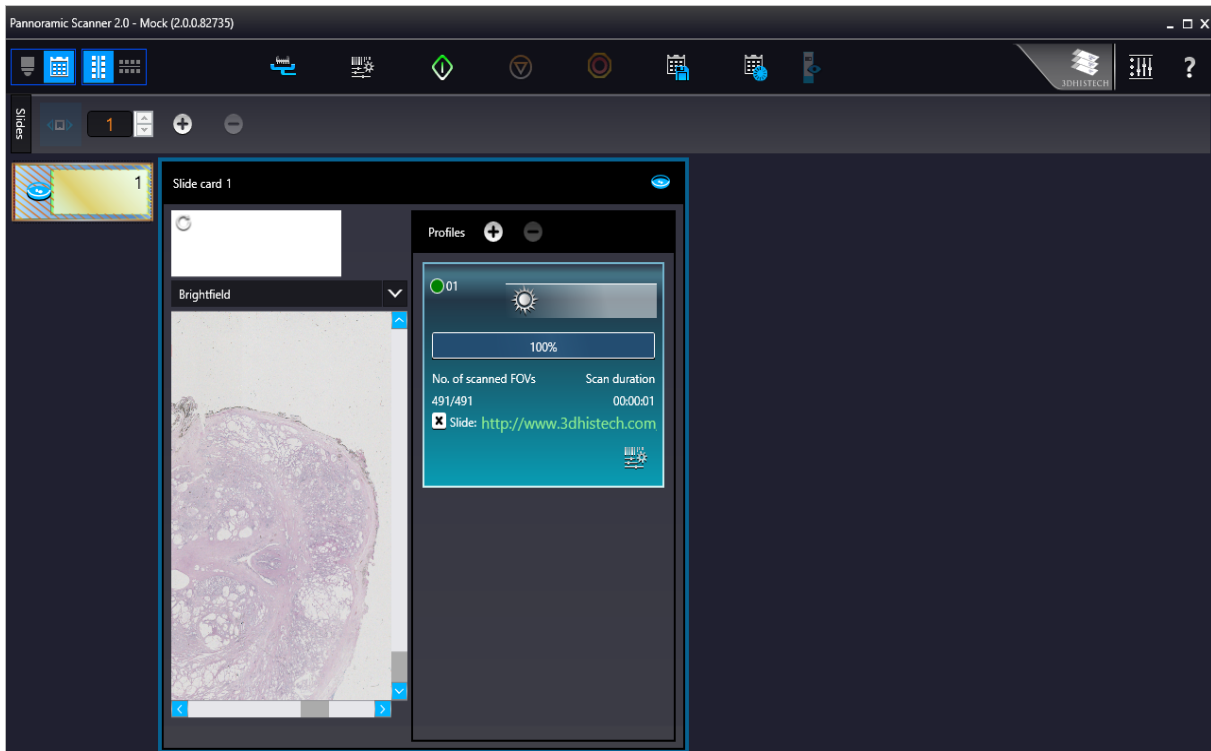


Figure 46 – Vertical Slide view with card

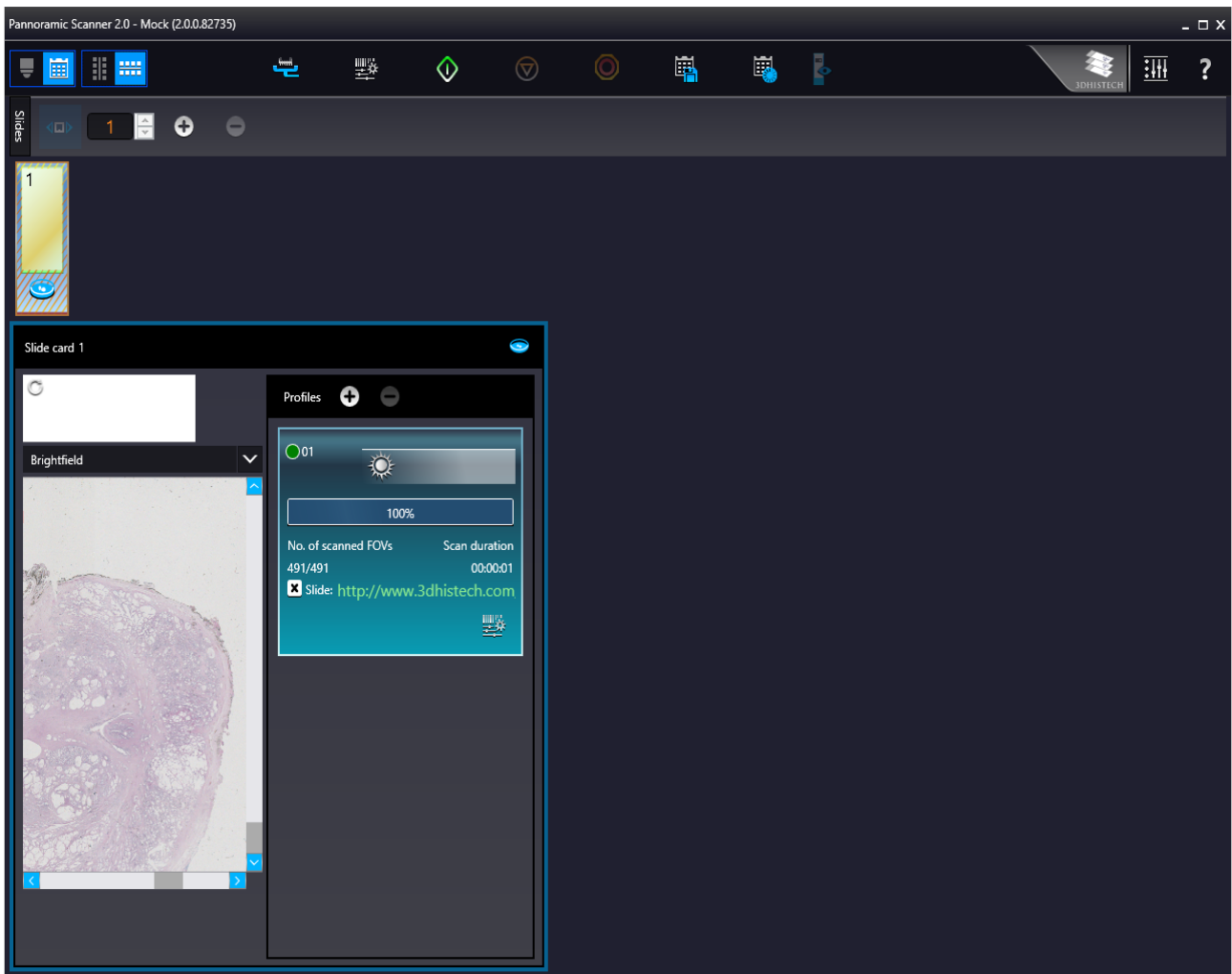


Figure 47 – Horizontal Slide view with card

The parameters of the assigned profile is displayed in a card. The colors of a Brightfield and a Fluorescence profile cards are different.

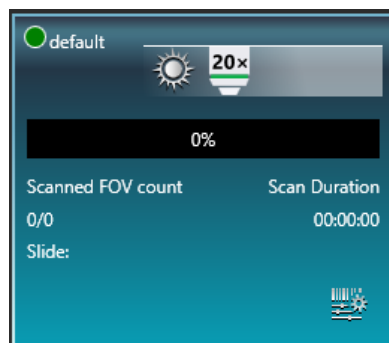







Figure 48 – Brightfield profile card

The following information are included in a profile card:

- Profile name in the top left corner.


- Profile status is marked with spots of different color:
 -  – Stored
 -  – Edited
 -  – Draft
- Scanning mode icon representing Brightfield mode
- Objective type
- Scan progress
- Scanned FOC count
- Scan duration
- Slide: actual status of the slide is presented here. If the slide is under scanning, the “Scanning”, if scanning has been interrupted by some error, the “Failed” text is visible.



NOTE: If slide status is marked as “Failed”, delete status before scanning by clicking .

If the virtual slide is created (the scanning is finished), the location path of the destination folder is displayed. To re-scan and thus recreate the slide, click  at the front of the displayed path to start the scanning process over.

- Scan properties 

5.2.5 Table view mode

By clicking  each slide will be displayed in a separate row.

Click  to assign profile to a slide, and  to detach a profile from a slide. A slide can have more than one profile assigned to it.

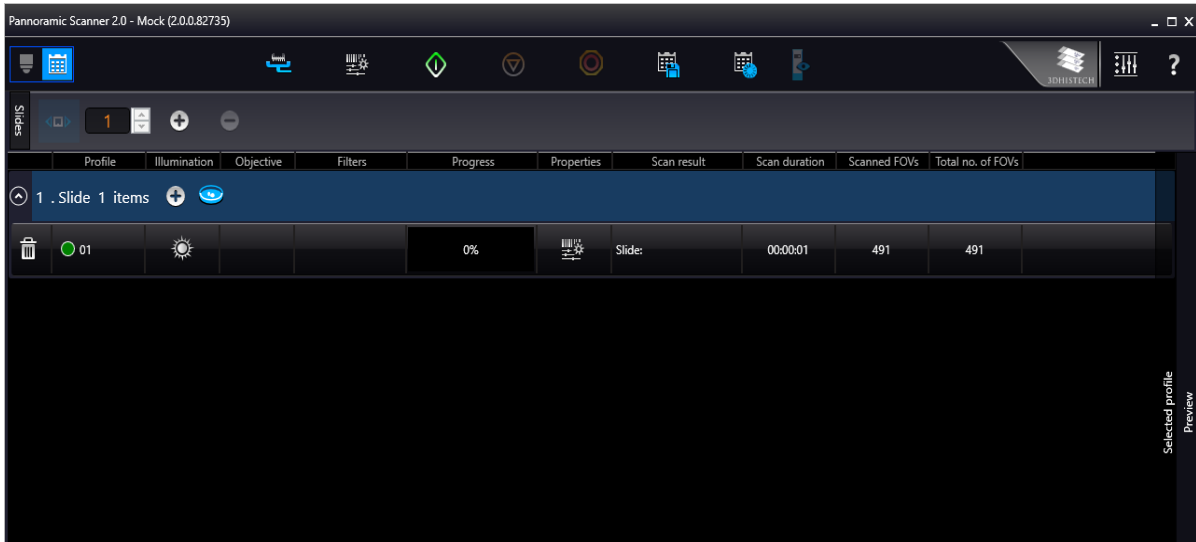





Figure 49 – Planner layout – table view

In Table view the following information are displayed in the profile strip based on the loaded profile:

- Profile name
- Illumination
- Objective type
- Filters (N/A)
- Progress
- Properties: The location of the virtual slide with the selected profile can be defined
- Scan result
- Scan duration
- Scanned FOVs
- Total FOVs

5.2.6 Card collection view mode

If you click the  button, each of the slide previews are displayed in the window.

Add profiles by clicking  and detach profiles by clicking . Functions are the same as with the other modes.

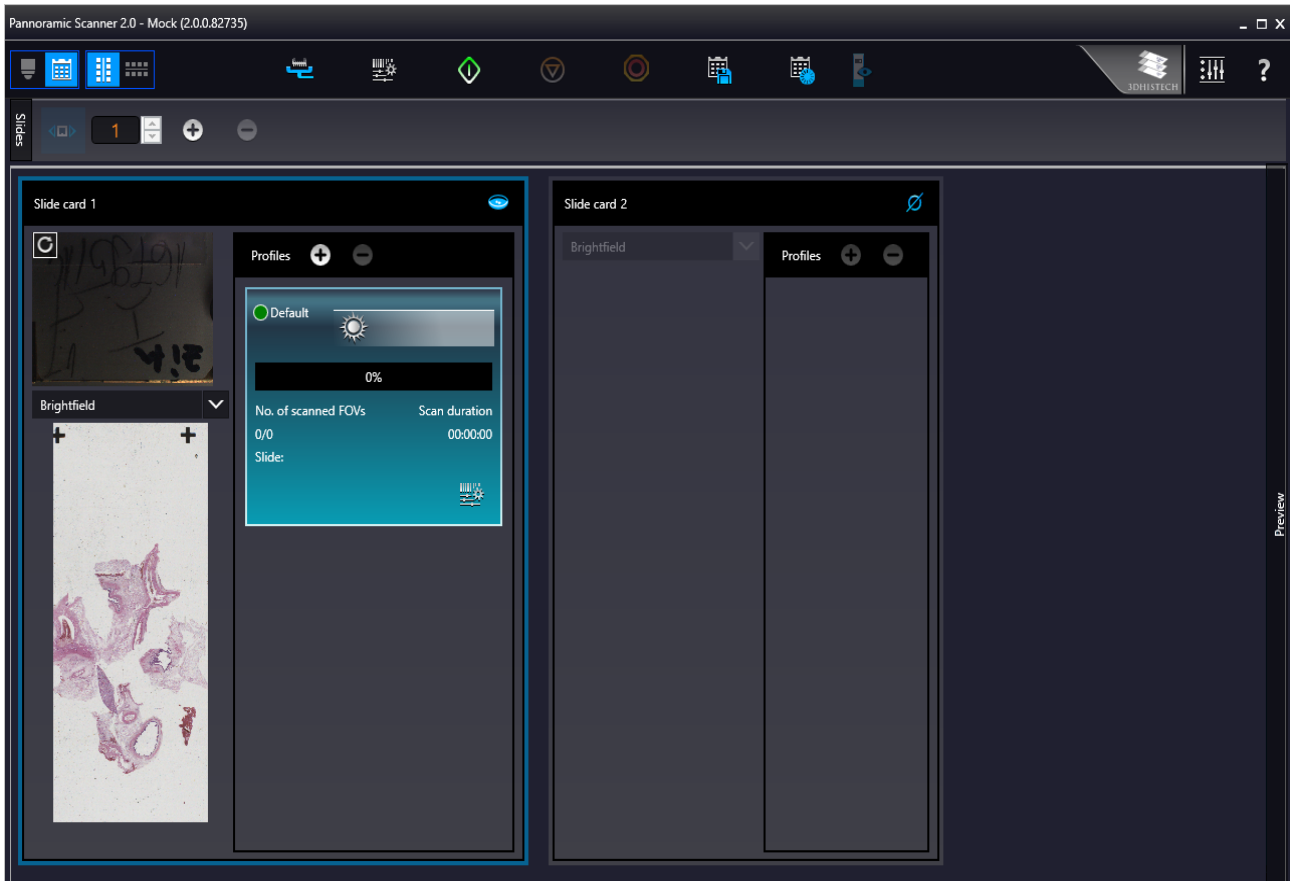


Figure 50 – Window of Table view mode

5.3 Profile and Preview overview on the Planner

Each of the assigned profiles are checkable and modifiable. The expanding panel at the right side includes all of the profile settings, in coherence with the view type of the Profile Setting panel. Slide preview is displayed in the Preview window in which the scanmap can be modified until beginning the scanning process. Every aforementioned Profile setting can be modified depending on the scan profile type, being Brightfield or Fluorescence.

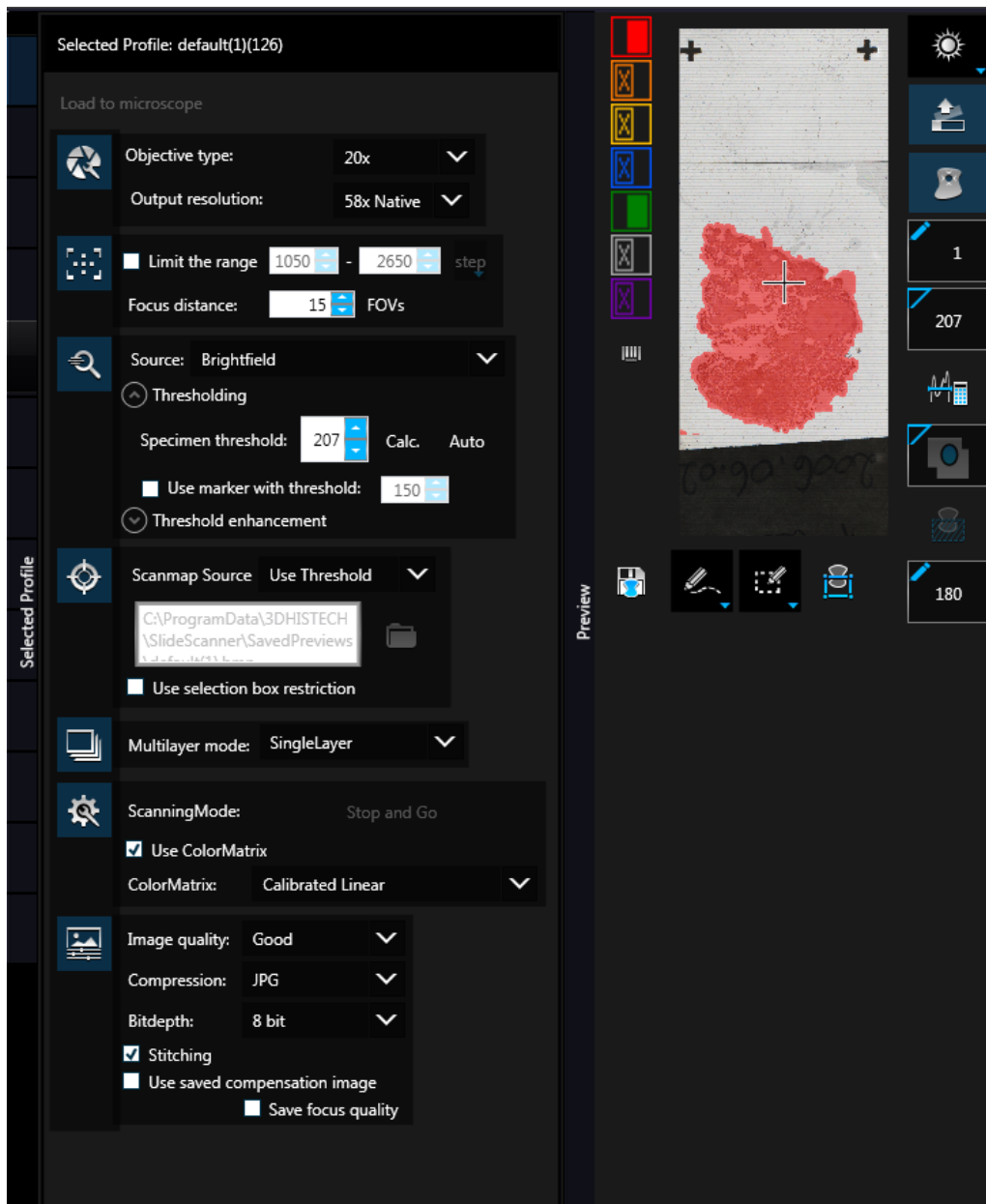
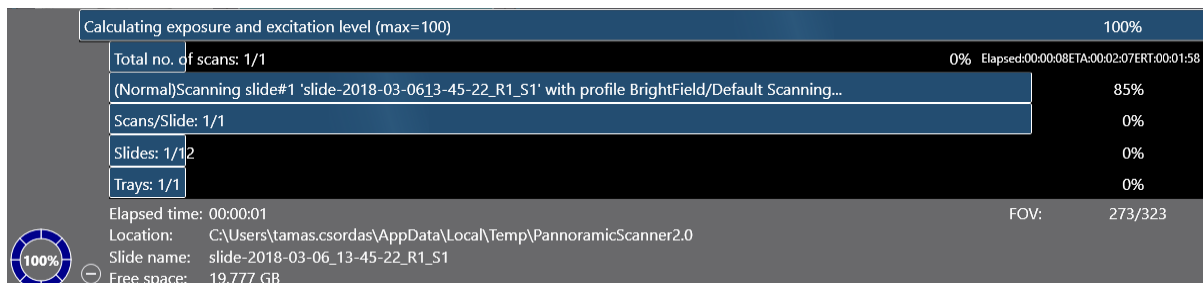


Figure 51 – Selected profile and expanded Preview window in Planner mode

5.4 Progress features

The progress is visible both in Microscope and Planner modes whenever there is a running hardware operation or scanning procedure. Progress content can be therefore different depending on the type of the running procedure.




The following information is included in the progress log list during scanning:


- Filter
- Elapsed time
- Location
- Slide name
- Free space
- FOV count

5.5 Services and Settings

Activate Services by clicking  and Settings by clicking  at the right side of the main menu bar.

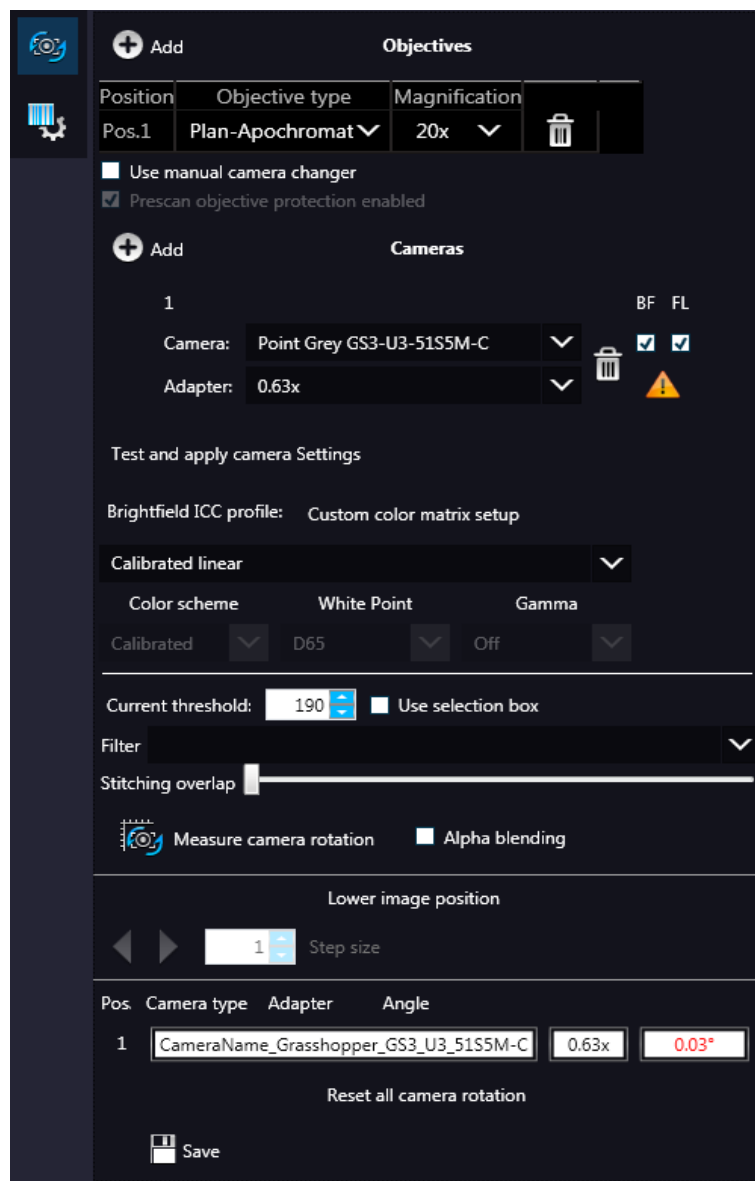
5.5.1 Services

Activate **Services** by clicking  at the right side of the main menu bar.

-  – **Camera settings**
 - **Position**
 - **Objective type** – Select the type and the magnification level of the objective.
 - **Magnification**

- **Use manual camera changer** – Changing the cameras is performed manually.
- **Prescan objective protection enabled** – If activated, slide area near the edges will not be scanned to record fast preview image. If inactive, Fast Preview processing becomes slower.
- **Cameras**

Select **Camera** and **Adapter** if the default camera has been replaced. Check **BF** for the camera. The software automatically loads the camera settings upon clicking the **Test and apply camera settings** button.



- **Brightfield ICC Profile**

Select an applicable preset color profile to be used for Brightfield scanning from the drop-down menu. Settings according to the profile has effect on the color set, color temperature, and gamma value of the scanned image.

Preset profiles are the following:

- **Calibrated Linear:** Color scheme is defined by calibration (Gamma value is not included)
- **sRGB standard:** Color scheme is defined by calibration (standard Gamma value -2.2- is applied)
- **sRGB standard Microscope Like:** Color scheme is defined by calibration (standard Gamma value / White Point: D50)
- **Legacy:** a Color scheme calibrated for the previous software version is applied
- **Custom:** parameters are freely customizable as follows:

- **Color Scheme**

- **Calibrated:** Scheme is defined by the color calibration slide
- **Legacy:** a Color scheme calibrated for the previous software version is applied
- **Raw:** the color information of the recorded raw image is applied

- **White Point**

- **D65:** color temperature according to a standard illuminant D65 white point value is applied (6500K / daylight)
- **D50:** color temperature according to a standard illuminant D50 white point value is applied (5000K / horizontal daylight)

- **Gamma**

- **Standard:** a value of 2.2 is used
- **Medium:** a value of 1.8 is used
- **Off:** a value of 1.0 is used

- **Current threshold** – Set the desired threshold level in the box.


- **Use selection box** – If selected, only the area inside the box is scanned. It is useful if you only want to scan the area that is equivalent with the size of the coverslip, so external specks will not be scanned.

- **Stitching overlap** – Set the amount how much the FOVs should extend over

- **Measure camera rotation** – Camera rotation angle is measured

- **Alpha blending** – The two images are blended


- **Lower image position** – Moves the upper image sideways in distinctive steps
- **Reset all camera rotation** – Click this button to set camera rotation values to default.


Save settings by clicking  .

-  – **Barcode settings**

By predefining barcode settings, you enable the **Read Barcode** option when using the control software.



To display an image of the barcode area, click  . You can redefine the barcode reading area by dragging the edges of the green square.

To check whether the barcode reading settings are correct, display the barcode digits in the **Barcode** field by clicking  . If the label area is not correctly illuminated, adjust **Barcode LED intensity** value.

Click  to check that barcode settings are correctly set.

**Note:**

If you did not set the barcode type correctly, or there is no barcode in the barcode area, the software will display the following error message: *"Barcode detection unsuccessful! There might be no barcode present."*

- **Barcode reader library**
 - Select **MIL barcode library** or **Embedded barcode library**
- **General Barcode settings**
 - **Inverse barcode color**

Activate to invert foreground and background colors of the barcode.

- **Use barcode compensation**

A compensation images is used during barcode reading

- **Grab new comp**

Click this button to create a new compensation image for barcode

NOTE: New compensation image for barcode can be recorded only if MIL is used for barcode identification.

- **Barcode types**


- **Linear**
- **Stacked linear**
- **Postal**
- **Two-dimensional**
- **Second barcode priority**

The software is capable to read two barcodes at the same time. If activated, the second barcode will be the barcode used for slide identification.

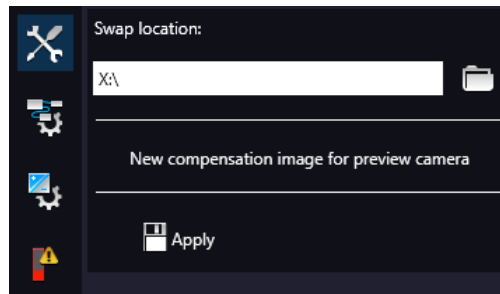
**Note:**

When having two barcodes on the slide, barcode layout must be consequential.

5.5.2 Settings

Activate **Settings** by clicking  at the right side of the main menu bar.

-  – **Basic settings**




On this panel, you can define the Swap file location, and create new compensation image for preview camera if needed. Click **Apply** to accept modifications.

-  – **External application call**

Two of the three settings are responsible for opening external applications (.exe or .bat) as defined (for example, CaseViewer software can be opened after scanning is finished). You can define external application call settings for the following cases:

- Slide Scanning Finished
- Scanning Error Occurred

For **Slide scanning has finished** and **Scanning error has occurred** you can define the external software by entering the file path in the **Application** box, or by browsing for it by clicking .

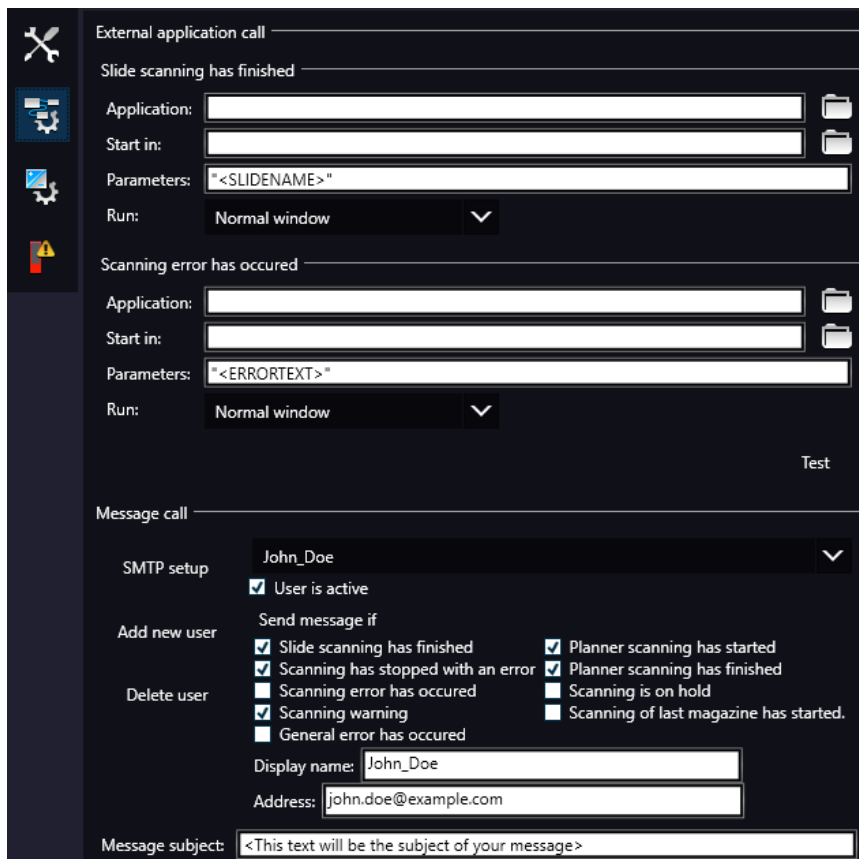
If you define parameters in the **Parameters** field, it will pass them to the software that it starts. If no parameter is defined, then the parameter will not be passed. The default parameters are the following:

- For **Slide scanning has finished**: "<SLIDENAME>" – transfers the slide name
- For **Scanning error has occurred**: "<ERRORTXT>" – transfers the error message

Run defines the window mode that the external application will start in. The following window modes can be set:

- Normal window
- Minimized
- Maximized

You can test whether the **Scanning Error Occurred** settings work by clicking .



In the **Message Call** section of the window complex messaging functions can be defined. Here you can setup parameters of the mail server, add or remove users, and also set the message body in the **Message subject** field by entering a text for example, to inform recipients on the location of the scanner, or the slide set you are working with. Click **Test** to test settings (by sending an e-mail to the address defined in the **E-mail To** field) after you have finished to check their relevancy before applying them.

First click **SMTP setup** to display the E-mail settings window, in which you can dedicate an e-mail server through which the software sends e-mails to the selected recipients.

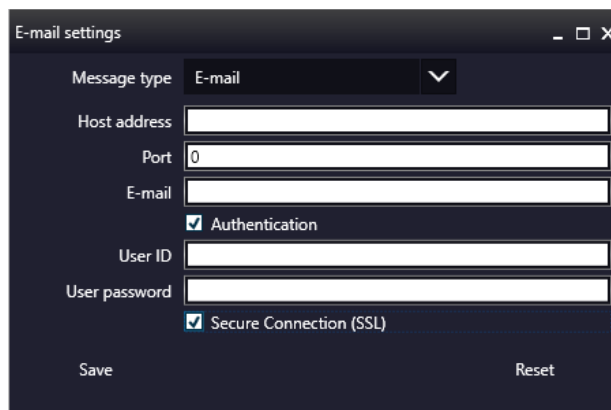

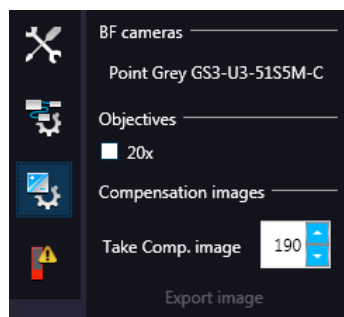


Figure 52 – Messenger Setup window

In the Messenger Setup window the following parameters can be set:

- **Message Type** – E-mail
 - **Host Address**
 - **Port**
 - **E-mail**
 - **Authentication** – **User ID** and **User password** are required.
 - **Secure Connection (SSL)** – If activated, the messages will be sent through secured connection.
 - If you have properly set messenger settings, click **Save**.
 - Click **Add new user** in the **Message Call** section of the External application call settings window then enter **Display name** and **Address** of the recipient. Select message functions under the **Send Message if:** field for the selected recipients (from the drop-down list at the top of the section).
 - Click **Delete user** if you want to remove a user from the list after selection.
-  – **Image compensation**

You can use a saved compensation image whenever compensation-related issues occur (deriving from the slide, illumination, staining or embedding medium irregularities).



- **BF cameras** field displays the active camera. Currently, there is only one active camera for Brightfield mode.
- **Objectives** field displays the objective used for scanning.

There might be specks or minor etches on the surface of the compensation slide that require modifying the threshold settings. Therefore, the scanner will not use those areas for the creation of the compensation images. To modify the threshold settings, set the desired threshold value in the box.

To create the compensation image(s), click **Take Comp. image**. Click the **Stop** button to interrupt the process. The progress bar at the bottom of the window displays the progress of the compensation image creation.

- **Export image** – Save compensation image.

-  – **Emergency slide operations**

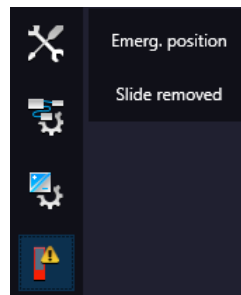
This panel contains control and maintenance functions.

- **Emerg. position**

The slide holder will be moved to a position where the slide can be removed manually after opening the cover (see section [7.3.1 Opening the protective covers](#)).

- **Slide removed**

Click this button to notify the software that you have removed the slide manually.



5.6 Hosting

Hosting a live teleconsultation session gives specialists the opportunity to examine the same Live microscopic image during a real-time counseling even if being in laboratories far away from each other. This means multiple users can connect to the device at the same time. The user of the scanner will be the host with direct access to the scanner.



Note:

Both the client's and the host's scanner software version must be identical.

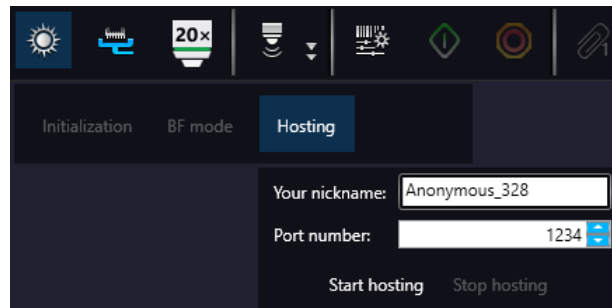
Once client users have connected, they will be able to reach the following functions of scanner:

- Live image
- Preview window
- Profile content
- Stage control.

Each participant see the same live image within the same preview window. The active user can navigate on the slide and set up a scanning profile. The **Start scan** function is also available for the active user. Each participant can make comments in a chat window while examining the slide image.

Hosting a teleconsultation session

1. Select **Hosting** from the microscope mode menu
2. Type in your nickname used during the session
3. Click **Start hosting**
4. The software displays the hosting address and the port number



Join teleconsultation as a client

1. Start the *Lite* version of the scanner software
2. Type in your nickname used during the session
3. Enter **Host address** and **Port number**
4. Click **Connect**

On Client side the following functions are unavailable/inactive:

- Selection box
- Scan properties
- Separate scanning

6 Using Profiles

**Note:**

Saved profile settings cannot be applied if using a different type of Pannoramic scanner.

The following settings are saved in a profile:

Scan Mode

- Brightfield

Scan Options

- Focus frequency
- Compression procedure
- Use of a fixed compensation image (ON/OFF)
- Use of Save focus quality (ON/OFF)
- Use of Stitching (ON/OFF)
- Use of original Bayer size (ON/OFF) – unavailable if Point Grey Grasshopper 3 camera is used

Determination of the area to be scanned

- Use of automatic threshold specimen
- Use of specimen threshold value
- Use of marker pen threshold and specimen threshold values
- Remove coverslip function (ON/OFF)
- Use of scan everything within marked area function (ON/OFF)
- Filling of holes (ON/OFF)
- Use of removing specks according to the set value (ON/OFF)
- Use of saved scan area
- Use selection box (ON/OFF)

Other settings

- Limitation of focus range (ON/OFF)
- Use of extended focus or Z-stack step size and focus level
- Output resolution

7 Troubleshooting and Maintenance

7.1 Safety Information

Check cables, plugs and connections before operation, and if defective or cannot be replaced, contact Thermo Fisher Scientific Service for support.

Check whether the device is compatible with your local line voltage. It can operate at line voltages 100V to 240V and 50/60 Hz.

Only plug the device in a socket with protective grounding (earth) contact.

Do not operate the device in explosive environment.

Disconnect the device from the power outlet before opening it or replacing a part.

The product is not equipped with protection against hazardous materials (infectious, toxic, radioactive, corrosive substances or other effects damaging to health). Decontaminate infectious materials after use.

Slides that are not used any longer do not classify as domestic waste and must be treated as hazardous materials and disposed in compliance with the currently valid legal requirements.

Dust, specks and humidity may decrease or harm the operating capability of the device. Protect it with dust cover when not in use. Switch the power off before covering it.

Avoid touching the lamp bulb. Wait for about 15 minutes to allow the bulb to cool down and disconnect the power plug before changing the bulbs.

Defective devices do not classify as domestic waste. Dispose of the device in compliance with the currently valid legal requirements.

7.1.1 Cleaning the device

Before cleaning, switch off the device and pull the plug out.

Do not let liquid penetrate into the system.

To clean liquid from the device, use a lint-free cotton cloth. You can moisten the cloth with water.

To clean greasy surfaces, it is recommended to apply **soapy water** on a piece of lint-free cotton cloth and gently rub the surface.

7.1.2 Preventive maintenance

To prevent fungus growth

- Do not leave the equipment in an unconditioned environment with a storage temperature above 60°C (140°F) or below 0°C (32°F), which may damage the equipment.
- Maximum operating temperature is 35°C with a relative humidity of less than 75%.

- Install it in a room with proper air ventilation.
- Do not let dust or fingerprints remain on optical surfaces.

7.2 Troubleshooting

This section describes the most common troubleshooting solutions for the Pannoramic products. If any problem arises that does not have solution in this manual, contact the service personnel.

The product does not start

- **Power supply is interrupted**
 1. Make sure that the 24V external power supply is on.
 2. Check cable connections.

Control software has stopped

- **Name of currently selected slide for digitization already exists and is open in Pannoramic Viewer**
 - Close virtual slide in Pannoramic Viewer.
- **Slide jammed**
 1. Exit the application software.
 2. Switch off the power supply and disconnect the power cable.
 3. Remove the protective cover of the Pannoramic DESK II. Follow the steps in section [7.3.1 Removing the protective cover](#).
 4. Remove slide manually (see section [7.3.2 Removing a slide](#)).
 5. Reattach protective covers.
 6. Connect power plug and turn power supply on.
 7. Launch the scanner software.

Virtual slide is improperly focused almost across its entire surface

- **Focus range enabled**
 - Disable **Limiting focus range**.

Poor image quality

- **Imaging error (for example, chromatic aberrations)**
 - Contact Thermo Fisher Scientific Service for support.

**Warning!**

Do not modify the camera driver settings, as the default factory settings give the most accurate images.

Virtual slides show poor stitching in Pannoramic Viewer

- **Scan camera not properly adjusted (for example, due to loose fixture)**
 - Contact Thermo Fisher Scientific Service for support.

Slide is often positioned incorrectly

- **Guiding fault in transport system**
 - Contact Thermo Fisher Scientific Service for support.

Digitization process is extremely slow

- ***Extended focusing* option is activated**
 - Deactivate the **Extended focusing** option if not required.
- **Z-stack option is activated**
 - Deactivate the **Z-stack** option if not required.

Image is out of focus

- **Focus range limit is activated**
 - Deactivate the **Limiting focus range** option.
- **Focus range setting is incorrect**
 - Change focus range setting.

All individual images show a shading effect

- **Algorithm failed to find empty image fields**
 - Capture a reference image with a blank slide

7.3 Maintenance

This section describes the most common maintenance solutions that can be performed by the user of the product. For maintenance solutions not described in this manual, contact the service personnel.

7.3.1 Removing the protective cover

To perform maintenance work and because of slide jamming, the protective cover of the Pannoramic DESK II need to be removed in order to eliminate the problem. First, make sure that the running digitization procedure is interrupted prior opening the cover.

Before removing the cover, exit the control software, switch off the 24 V power supply and disconnect the power cables.

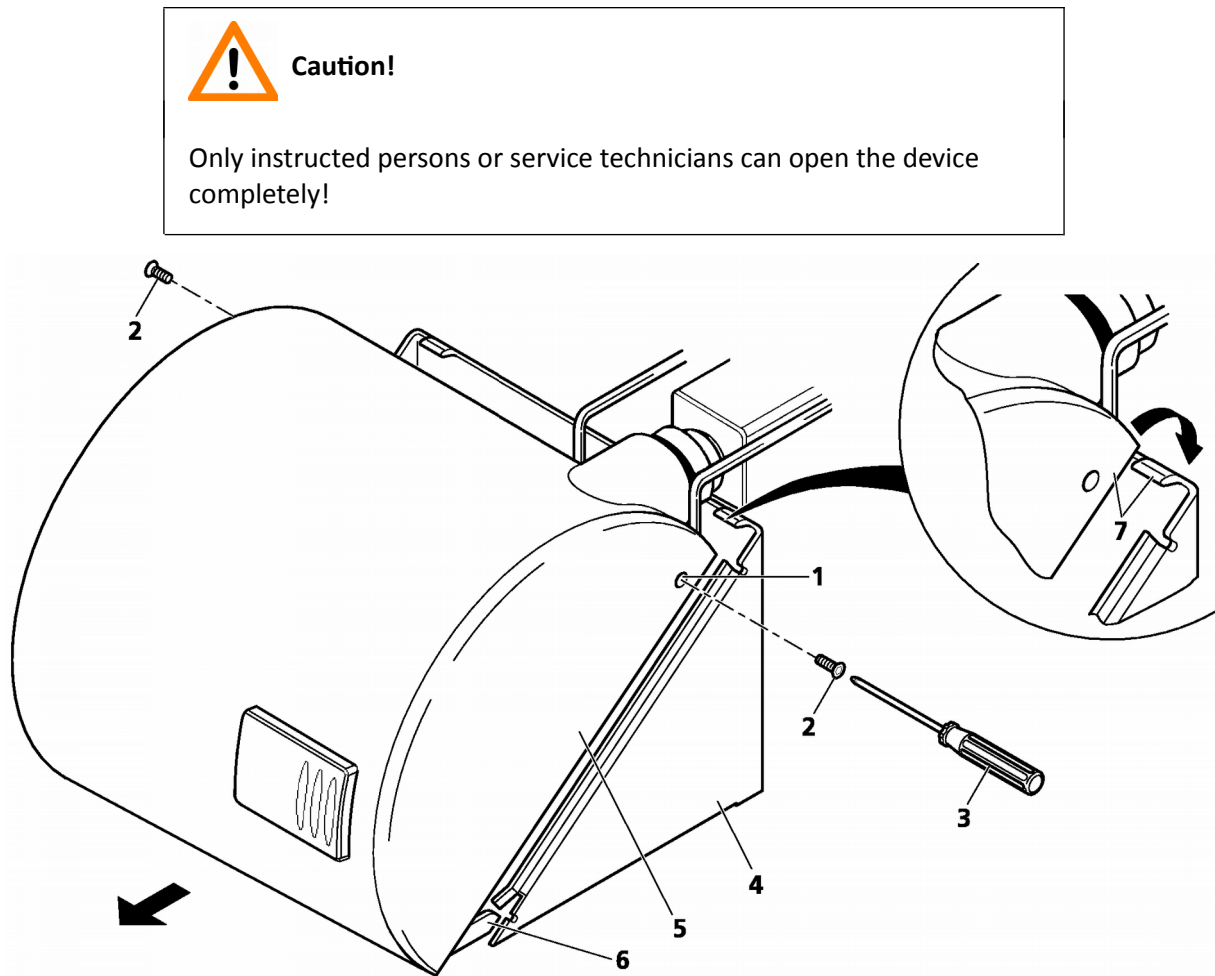


Figure 53 – Removing/reattaching the cover

1. Remove both Allen screws **(2)** located at the left and right sides of the cover **(1)** by using an Allen screwdriver **(3)**.
2. Carefully push the cover **(5)** horizontally frontward with light pressure until it can be removed completely from the basic unit **(4)**.
3. When you have finished maintenance or repair work, reattach the cover. Push it horizontally towards the basic unit **(4)** until the two protruding guide pins **(6)** fit into the corresponding recesses of the basic unit.
4. Note that the rear part of the cover must be pushed over the top part of the blue basic unit **(7)**.
5. To lock the cover in place, insert the screws again and fasten them.

**Caution!**

Make sure that no cables are squeezed as you replace the cover(s).

7.3.2 Removing a slide

If a slide got jammed or has suffered breakage during the process of digitization, stop the process and, if possible, move the slide holder to a position where the slide can be easily removed.

**Warning!**

Crush hazard! Before you remove a jammed slide, cancel the running digitization process, terminate the software session and turn the power off.

Any manipulation performed on a mechanical component must be followed by a complete device initialization routine (software restart).

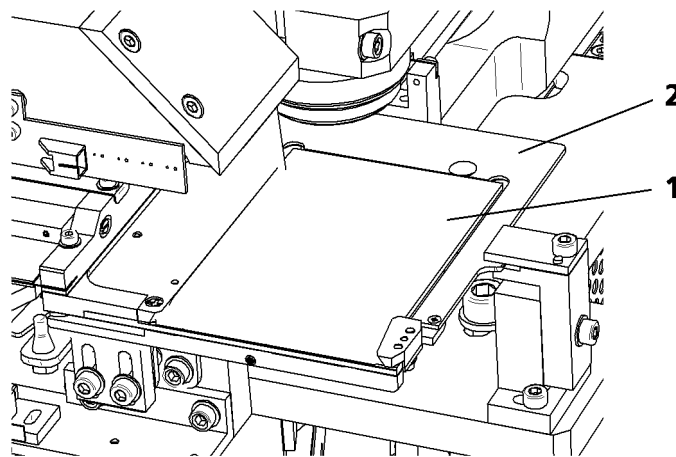


Figure 54 – Removing a slide

1. Exit control software.
2. Switch off power supply and disconnect power cable.
3. Remove the cover (see section [7.3.1 Removing the protective cover](#)).
4. Throw fixing lever **(3)** forward to the left.
5. Remove the slide **(1)** from the holder **(2)**.



Warning!

If the slide is broken, make sure to remove all pieces completely from the device. The edge of the broken area of the slide is sharp and it can lead to injury and contagion! Broken slide can be removed only by a well-trained person!

6. Swing fixing lever **(3)** back to the right towards the holder.
7. Reattach the cover (see section [7.3.1 Removing the protective cover](#)).
8. Connect the power cable of the power supply to the power outlet and switch on the power supply.
9. Launch control software.

7.3.3 Transporting Pannoramic DESK II

The following procedure shows how to transport Pannoramic DESK II.

**Caution!**

Do not lift or transport Pannoramic DESK II by holding its protective covers!

**Note:**

The base unit does not have carrying handles for transporting. One or two persons can carry the base unit by holding it by its base plate. You can find the weight data of the base unit in section **8. Technical Data**.

**Caution!**

Be sure that the scan camera is not moved during transportation.

To transport Pannoramic DESK II do the following:

1. Turn power supply off and detach all cables.
2. Transport Pannoramic DESK II.
3. After finishing transportation, reestablish cable connections.

**Caution!**

Readjust camera angle if necessary after transporting and reinstalling the Pannoramic DESK II!

8 Technical Data

Dimensions (width x depth x height)

| | |
|-----------------------|--|
| Base unit | approx. 380 mm (W) x 306 mm (D) x 249 mm (H) |
| 24V 100W power supply | approx. 189 mm x 90 mm x 44 mm |

Weight

| | |
|-----------------------|-----------------|
| Base unit | approx. 24.3 kg |
| 24V 100W power supply | approx. 550 g |

Ambient conditions

Transportation / shipment (packed)

| | |
|---------------------------------|----------------|
| Permissible ambient temperature | -40°C to +70°C |
|---------------------------------|----------------|

Storage

| | |
|--|---------------|
| Permissible ambient temperature | +0°C to +60°C |
| Permissible relative air humidity (non-condensing) | 75% |

Operation

| | |
|-----------------------------------|---------------------|
| Permissible ambient temperature | +10°C to +35°C |
| Permissible relative air humidity | 75% |
| Altitude at installation site | max. 2000 m |
| Atmospheric pressure | 500 hPa to 1060 hPa |
| Degree of pollution | 2 |

Operating data

| | |
|---|---|
| Intended site | closed room facilities |
| Electrical protection class | I |
| Internal protection degree | IP 20 |
| Electrical safety | in compliance with IEC 61010-1:2010, IEC 61010-2-101:2015, IEC 61010-2-081:2015 |
| Over-voltage category | II |
| Radio interference suppression | in accordance with EN 55011 class B |
| Noise immunity | in accordance with EN 61326-2-6:2012 |
| Base unit input voltage | 24V DC \pm 1V |
| Power consumption of the complete device | 60 VA |

SINPRO MPU101-108 – 24V external mains power supply unit

| | |
|---------------------------------------|---|
| Intended site | closed room facilities |
| Electrical protection class | I |
| Internal protection degree | IP 20 |
| Electrical safety | in compliance with UL 2601-1, TÜV EN 60601, CE EN60601-1-2:2001 |
| Over-voltage category | II |
| Radio interference suppression | in accordance with CISPR-11 EN 55011 class B |
| Line input voltage | 100 V AC to 240 V AC |
| Line input frequency | 50 / 60 Hz |
| Power consumption | max. 100 VA |
| Secondary voltage | 24V DC |
| Secondary current | max. 4.8 A |

Light sources

| | |
|---|--|
| Transmitted light source | Multichannel LED-based with wide Red, Green, Blue emission |
| Average service life of transmitted light source | ~ 30000 hrs |

Slide identification

Slides are identified by a VRmagic VRmC-8+ PRO preview camera. Label area is saved as an image and the barcode is interpreted as a character string.

Scan camera

| Point Grey Grasshopper 3 (GS3-U3-51S5M-C) Global Shutter Type CMOS (Sony IMX250) | |
|---|---------------------------|
| Pixel size | 3.45µm × 3.45µm |
| Camera resolution | 2448 (H) × 2048 (W) pixel |
| Frames rates | 75 fps |
| Bit-depth | 10-bit / 12-bit |
| Pixel resolution with 20x objective and 0.63x C-mount adapter | 0.27µm |
| Pixel resolution with 20x objective and 1x C-mount adapter | 0.17µm |
| Pixel resolution with 40x objective and 0.63x C-mount adapter | 0.14µm |
| Pixel resolution with 40x objective and 1x C-mount adapter | 0.09µm |
| Connection type | USB 3.0 |

Control computer, minimum system requirements

| | |
|-------------------------|---|
| Operating System | Microsoft Windows 7 SP1 64-bit EN |
| CPU | Intel Core i5-4590 |
| RAM | 8 GB DDR3-1600 |
| Hard disk | 1 TB |
| Optical drive | DVD-RW |
| Display | 96 dpi |
| Graphics | SXGA (1280 × 1024, True color) |
| Input devices | keyboard, mouse |
| Ports | 2 x Fire Wire (1394 A & 1394 B), 4 x USB 2.0, GB Ethernet |

Appendix – Packaging instructions

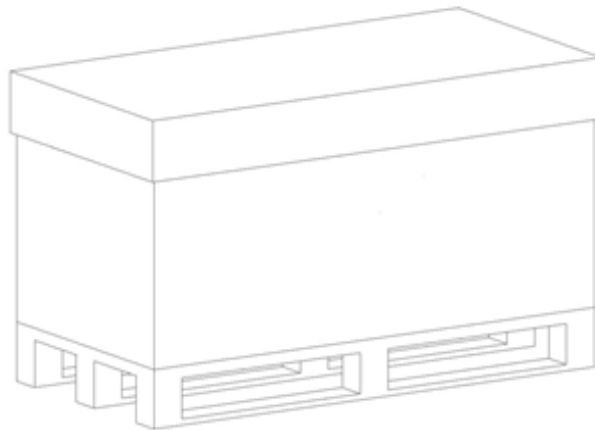


Figure 1.

Preparations

1. Unload the slide from the device by using the scanner software. Remove your slide.
2. Close the scanner software normally.
3. Turn off the scanner with the main switch located on the backside of the device. Disconnect all the cables of the scanner.
4. Remove the cover from the device by losing 1-1 screw on the side of the scanner.
5. Remove the main camera and camera adapter.
6. Place back and mount the cover of the scanner.
7. Turn off and disconnect all the cables of the workstation and display.

Main parts and their accessories

1. BOX 1 – Big carton box
 - a) fixing foams for the angles of the scanner box
2. BOX 2 – DESK II scanner – large carton box
 - a) Scanner unit

3. BOX 3 – carton box dedicated for the PC
 - a) PC (placed inside the dedicated foam)
 - b) power cable for PC
 - c) power cable for scanner
 - d) USB cable of the scanner
 - e) keyboard and mouse (has a separated small carton box)
4. BOX 4 – Accessories (3 pcs)
 - a) dongles (MATROX/3DView/license), driver CDs
 - b) main camera
 - c) cables
 - d) air duster & sensor cleaning pen (if any)
 - e) objective cleaning papers (if any)
 - f) demonstration samples (if any)

Packaging

The whole system is packed in a big carton box. This is divided into two areas with a vertical carton slab:

“Space 1” for accessories (PC, cables, etc.)

“Space 2” for BOX 2 (scanner)

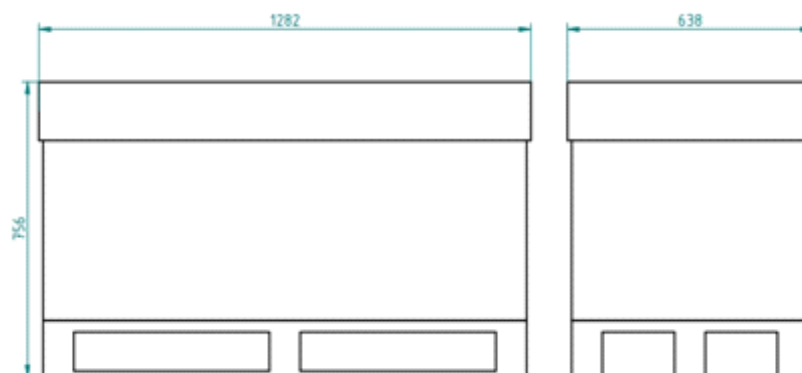


Figure 2.

1. BOX 2 – scanner box
2. Fixing foams for underneath BOX 2
3. Fixing foams for above BOX 2
4. Bottom part of BOX 1
5. Top of BOX 1
6. BOX 3
7. BOX 4

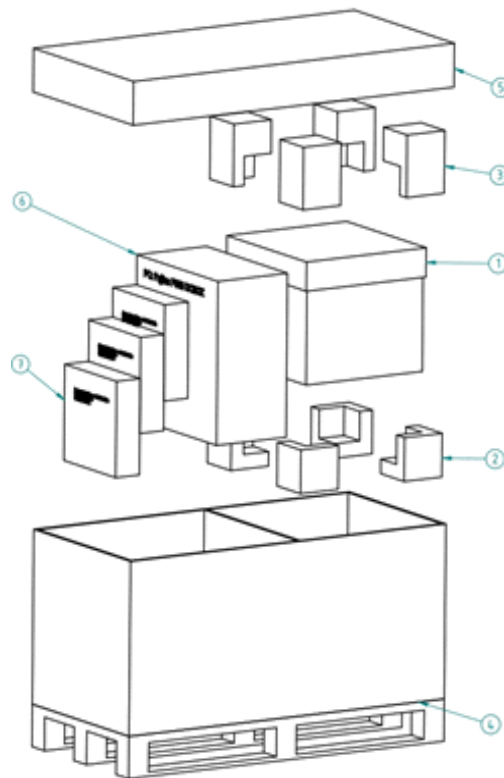


Figure 3.

Packing the DESK II scanner

The most sensitive and most heavy unit is the DESK II scanner. Please handle it with care, the weight of the device is about 20-22 kg.

Place the scanner to the nylon bag.

The structure of the BOX 2 including the rubber foams is shown on Figure 4. The shape of the foam in the box defines the orientation how the scanner should be placed inside, so first please examine it!

The scanner should be lifted up by holding the scanner at its motherboard between its feet and taken inside the BOX 2's lower part onto the foams inside it.

The shape of the rubber foam defines the orientation, how they should put on. After the scanner and foams are taken in, you can place the upper part of the box of the scanner. Now place the BOX 2 into BOX 1 and place the fixing rubber foams around.

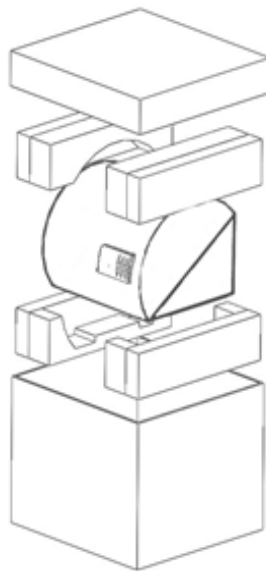


Figure 4.

Packing the accessories

Place inside BOX 1 all the accessories of the scanner. BOX 3 and any BOX 4 should be next to each other. Fill the gaps with pellets.

Closing the package

Place the top to BOX 1. Secure it with strap.

Handling of the package

Please be aware to observe the following instructions on **Figure 5.**:





| Designation | Symbol | Explanation |
|---------------------------|---|---|
| Top |  | The package must always be transported, handled and stored in such a way that the arrows always point upwards. Rolling, swinging, severe tipping or tumbling or other such handling must be avoided. The cargo need not, however, be stored "on top". |
| Fragile, Handle with care | | The symbol should be applied to easily broken cargoes. Cargoes marked with this symbol should be handled carefully and should never be tipped over or slung. |
| Keep dry |  | Cargoes bearing this symbol must be protected from excessive humidity and must accordingly be stored under cover. If particularly large or bulky packages cannot be stored in warehouses or sheds, they must be carefully covered with tarpaulins. |
| Recycling |  | This indicates that an object is capable of being recycled. |
| CE |  | The symbol shows that the device complies with the essential requirements of the relevant European health, safety and environmental protection legislation, in practice by many of the so-called Product Directives.. |
| Fragile, keep dry | FRAGILE KEEP DRY | The symbol should be applied to easily broken cargoes. Cargoes marked with this symbol should be handled carefully and should never be tipped over or slung. Cargoes bearing this symbol must be protected from excessive humidity and must accordingly be stored under cover. If particularly large or bulky packages cannot be stored in warehouses or sheds, they must be carefully covered with tarpaulins. |



Figure 5.

Index

| | |
|-------------------------|---|
| B | |
| Barcode..... | 18, 22, 28, 76, 77 |
| Brightfield..... | 12, 17, 80, 83 |
| C | |
| CaseCenter..... | 18 |
| CaseViewer..... | 18 |
| Compensation image..... | 80, 83 |
| Control software..... | 17, 27, 28, 29, 76, 85, 87, 89 |
| F | |
| Focus..... | 12, 17, 83, 85, 86 |
| M | |
| Marker..... | 83 |
| P | |
| Pannoramic..... | 6 |
| Pannoramic DESK II..... | 6, 8, 9, 10, 12, 13, 15, 17, 19, 23, 27, 29, 30, 85, 87, 90 |
| Pannoramic Viewer..... | 18, 85, 86 |
| Preview..... | 20, 22, 28, 93 |
| S | |
| Scan..... | 12, 14, 17, 75, 80, 83, 86, 90, 93 |
| Scanner..... | 6, 80 |
| Z | |
| Z-stack..... | 17, 83, 86 |

*