HistoCore LIGHTNING S

Laser Slide Printer

Instructions for Use
English

Order No.: 14 0610 80101 - Revision K

Always keep this manual with the instrument.
Read carefully before working with the instrument.

The information, numerical data, notes and value judgments contained in this Instructions for Use represent the current state of scientific knowledge and state-of-the-art technology as we understand it following thorough investigation in this field.

We are under no obligation to update the present Instructions for Use periodically and on an ongoing basis according to the latest technical developments, nor to provide our customers with additional copies, updates etc. of this Instructions for Use.

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Statements, drawings, illustrations and other information regarding the contents or technical details of the present Instructions for Use are not to be considered warranted characteristics of our products.

These are determined only by the contract provisions agreed between ourselves and our customers.

Leica reserves the right to change technical specifications as well as manufacturing processes without prior notice. Only in this way is it possible to continuously improve the technology and manufacturing techniques used in our products.

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For the instrument serial number and year of manufacture, please refer to the nameplate on the back of the instrument.

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1. Important information

1.1 Naming conventions

> **Note**
>
> - The full name of the device is HistoCore LIGHTNING S Laser Slide Printer. The device is called the printer to ensure that the Instructions for Use are well legible.

1.2 Symbols and their meanings

⚠ (red)	Danger: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injuries.
⚠ (orange)	Warning: If this danger is not avoided, then this may result in death or serious injury.
⚠ (yellow)	Caution: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
🛈 (blue)	Note: Indicates information which is important but not related to any risk.
→ **Fig. 7-1**	Item number: Item numbers for numbering illustrations. Numbers in red refer to item numbers in illustrations.
<u>OFF</u>	Function key: Function keys to be pressed on the instrument are displayed as bold, gray and underlinded text.
🗑	WEEE symbol: The WEEE symbol, indicating separate collection for WEEE - Waste of electrical and electronic equipment, consists of the crossed-out wheeled bin (§ 7 ElektroG).
�	Manufacturer: Indicates the manufacturer of the product.
⎍	Manufacturing date: Indicates the date when the device was manufactured.
CE	CE Compliance: The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives and regulations.

The CSA test mark means that a product has been tested and fulfills the applicable safety and/or performance standards, including the relevant standards defined or administered by the American National Standards Institute (ANSI), Underwriters Laboratories (UL), the Canadian Standards Association (CSA), the National Sanitation Foundation International (NSF) and others.

UKCA Label:

The UKCA (UK Conformity Assessed) marking is a new UK product marking that is used for goods being placed on the market in Great Britain (England, Wales and Scotland). It covers most goods which previously required the CE marking.

UKRP Leica Microsystems (UK) Limited
Larch House, Woodlands Business Park, Milton Keynes,
England, United Kingdom, MK14 6FG

UK Responsible Person:

The UK Responsible Person acts on behalf of the non-UK manufacturer to carry out specified tasks in relation to the manufacturer's obligations.

Country of Origin: China

Country of Origin:

The Country of Origin box defines the country where the final character transformation of the product has been performed.

Article number:

Indicates the manufacturer's catalog number so that the device can be identified.

Serial number: Indicates the manufacturer's serial number so that a specific device can be identified.

Consult Instructions for Use:

Indicates the need for the user to consult the Instructions for Use.

Warning:

Indicates the need for the user to consult the Instructions for Use for important cautionary information such as warnings and precautions that cannot, for a variety of reasons, be presented on the device itself

Caution:

Indicates the need for the user to consult the Instructions for Use for important cautionary information such as warnings and precautions that cannot, for a variety of reasons, be presented on the device itself.

Alternating current

PE terminal

Stand-by

ON (Power):

In the position of power on

OFF (Power):

In the position of power off

Caution, sharp element
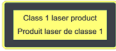
Laser label

Indicates the product is class 1 laser product.

Label

Re-install the laser cover after cleaning or maintenance.

Certification label

Indicates this laser product complies with CFR 1040.10 and 1040.11.

Keep dry:

The package must be kept in a dry environment.
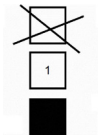
Stack limit:

Maximum number of identical packages that may be stacked, where 1 stands for the number of permitted packages.

This way up:

Indicates the correct upright position of the package.
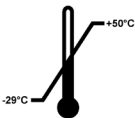
Temperature limit for transport:

Indicates the temperature range permitted for transporting the package.
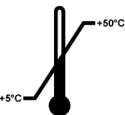
Temperature limit for storage:

Indicates the temperature range permitted for storing the package.

Humidity limitation for transport and storage:

Indicates the humidity range permitted for storing and transporting the package.

Shockdot impact indicator:

In the Shockwatch system, the shock dot shows impacts or shocks that are above a specified intensity through red colouration. Exceeding a defined acceleration (g value) causes the indicator tube to change colour.

Tilt indicator:

Tip-n-Tell indicator to monitor whether the shipment has been transported and stored in an upright position according to your requirements. With a pitch of 60° or more, the blue quartz sand flows into the arrow-shaped indicator window and sticks there permanently. Improper handling of the shipment is immediately detectable and can be proven definitively.

Recycle symbol:

Indicates the item can be recycled where correct facilities exist.

1 | Important information

1.3 Instrument type

All information provided in these Instructions for Use applies only to the instrument type indicated on the cover page. A nameplate indicating the instrument serial number is attached to the rear side of the instrument.

1.4 Intended purpose

The HistoCore LIGHTNING S is intended to be used for on-demand slides printing next to the microtome and the water bath, or for batch slides printing. The device will be used for H&E and/or IHC/ISH slides printing. The device could work in connectivity with an LIS system or as a standalone system.

The Slide stacker is an optional accessory only used for HistoCore LIGHTNING S. When connected to the basic instrument, it automatically collects the printed slides by stack in the order in which they were printed. This accessory is required to support the batch slides printing of HistoCore LIGHTNING S.

The Batch filter, an external filtration unit, is tailored to interface with the HistoCore LIGHTNING S basic instrument. Its function is to reduce odor and dust during slide printing. As an optional accessory, the replacement of the filtration consumables is required to ensure sustained filtration efficacy. In normal use, only access the equipment for occasional operations such as installation or maintenance.

The scanner is a plug-in accessory that connects to the HistoCore LIGHTNING S via a USB interface. It reads 2D codes or barcodes embedded in tissue cassettes or slides, providing print data that initiates a print job on the HistoCore LIGHTNING S.

⚠️ **Warning**

- Any other use of the instrument is considered Off Label use. Failure to observe these instructions may result in an accident, personal injury, damage to the instrument, accessories, or specimens. Proper and intended use includes compliance with all inspection and maintenance instructions, along with the observance of all instructions in the Instructions for Use.

1.5 Qualification of personnel

- The HistoCore LIGHTNING S must be operated by trained laboratory personnel only. The instrument is intended for professional use only.
- All laboratory personnel designated to operate this instrument must read these Instructions for Use carefully and must be familiar with all technical features of the instrument before attempting to operate it.

1.6 Statement for user data security and privacy

Leica Biosystems respects user data security and privacy. Our statement for user data security and privacy below will inform you that the below user data will be collected and used by the instrument.

- Printed Information on slides: printed Information including all information on slides will be collected to track the printing details and retained within encrypted storage.

- Use of usernames and user IDs: User account information including username and password for authentication and authorization will be collected, retained till removal by the Administrator. And the database used to store account information will be encrypted.

2. Safety

2.1 Safety notes

The Instructions for Use includes important information related to the operating safety and maintenance of the instrument.

The Instructions for Use is an important part of the product, and must be read carefully prior to startup and use, and must always be kept near the instrument.

This instrument has been built and tested in accordance with the safety requirements for electrical equipment for measurement, control, and laboratory use.

To maintain this condition and ensure safe operation, the user must observe all notes and warnings contained in the Instructions for Use.

The safety and caution notes in this chapter must be observed at all times. Be sure to read these notes even if you are already familiar with the operation and use of other Leica Biosystems products.

The Instructions for Use must be appropriately supplemented as required by the existing regulations on accident prevention and environmental safety in the operator's country.

⚠️ **Warning**

- The protective devices located on the instrument and the accessories must not be removed or modified. Only qualified service personnel authorized by Leica Biosystems may repair the instrument and access its internal components.
- If the instrument is to be returned to Leica Biosystems for repair, it must be cleaned and decontaminated in the appropriate manner (→ p. 62 − A1. Decontamination Confirmation).

- Before connecting the instrument to the line voltage, ensure that the electrical power requirements of your laboratory match the values on the nameplate of the instrument.
- When installing the power cable, always be sure to route it so that it cannot contact the heated surfaces of the instrument at any time.
- The instrument is designed for indoor use only.
- The instrument must be switched off and unplugged from the power supply during all repair and service work.

2.2 Warnings

The safety devices installed in this instrument by the manufacturer only constitute the basis for accident prevention. Operating the instrument safely is, above all, the responsibility of the owner, as well as the designated personnel who operate, service or repair the instrument.

To ensure trouble-free operation of the instrument, make sure to comply with the following instructions and warnings.

Please note that this instrument is designed to be used in basic electromagnetic environment.

Please note that electrostatic charge may result from direct or indirect contact with the instrument.

2.2.1 Markings on the instrument itself

Warning

- Markings on the basic instrument showing the warning triangle indicate that the correct operating instructions (as defined in this Instructions for Use) must be followed when operating or replacing the item marked. Failure to adhere to these instructions may result in an accident, personal injury, damage to the instrument or accessory equipment.

Warning

- Marking on the Batch Filter showing the warning triangle indicates that the Impact energy level (J) of side surface of Batch Filter is 2. IK Code is IK07.

2.2.2 Transport and installation

Warning

- The packaging has two indicators that indicate improper transport. When the instrument is delivered, check this first. If one of the indicators is triggered, the package was not handled as prescribed. In this case, please mark the shipping documents accordingly and check the shipment for damage.

Warning

- Once unpacked, the instrument may be transported only in an upright position.
- Do not expose the instrument to direct light (window, bulbs with strong light)!
- Only connect the instrument to a grounded power socket. Do not interfere with the grounding function by using an extension cord without a ground wire.
- Do not operate the instrument in rooms with explosion hazard.

Warning

Slides made by other manufacturers must be tested before use.

The test must include the following steps:

- Mechanical compatibility with the instrument.
- Print quality.

Warning

Note that each laboratory must perform its own tests to ensure that the printed content has no trouble withstanding the subsequent treatment of the slides with various reagents.

A wide range of factors beyond Leica's control can have negative effects on the results.

The test conditions stated below can therefore only serve as an outline for individual laboratory test specifications.

The laboratory shall bear full responsibility for the legibility of the imprint after processing with reagents.

2.2.3   Operating the instrument

⚠️ **Warning**

- Use only the provided power cord. It must not be replaced with a different power cord. If the power plug does not fit in your socket, contact our service.
- The instrument is de-energized after disconnection of the power supply through the power cord. In emergencies, disconnect the power plug.
- Do not touch the stacker during operation. Risk of injury.
- The device operator is obligated to conform to the local workplace limit values and to document them.

⚠️ **Warning**

- Do not switch off the instrument while the printing is on-going.

2.2.4   Cleaning and Maintenance

⚠️ **Warning**

- Before any maintenance, switch off the instrument and unplug it from power supply.
- While working and during cleaning, no liquid may get into the interior of the instrument.
- Make sure to put the laser cover back in place after cleaning and maintenance.

3. Instrument components and specifications

3.1 Overview

3.1.1 Instrument components

Fig. 1

Fig. 2
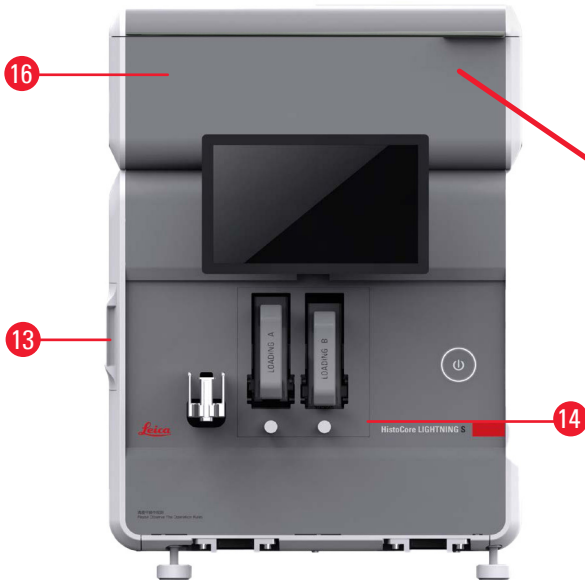
Fig. 3

Fig. 4

Fig. 5

3 Instrument components and specifications

1	Touch screen	11	Connection port to the Slide stacker, type db-9
2	Channel A & B	12	Heat sink
3	Magazine A & B	13	Side maintenance window
4	Slide chute	14	Front maintenance window
5	USB port for Scanner	15	Scanner
6	Ethernet port	16	Batch filter (Optional)
7	Slide stacker (Optional)	17	Exhaust fan (Batch)
8	Standby button	18	Dust bag (Batch)
9	USB ports, type A	19	Batch filter-HEPA carbon
10	Connection port to other device, type B		

3.1.2 Optional accessories

Slide stacker

Fig. 6
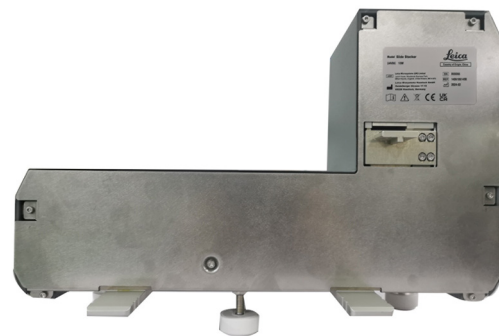
Fig. 7

Batch filter

Fig. 8

Fig. 9

Scanner

Fig. 10

Fig. 11

3.1.3 Side view

Fig. 12
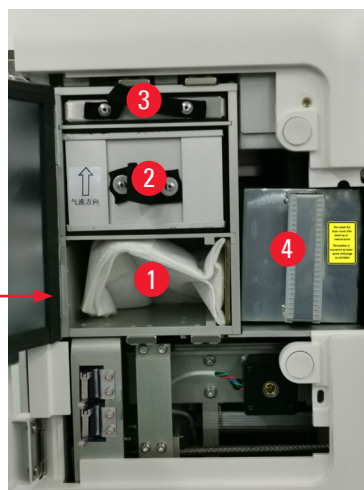
Fig. 13

1	Dust bag	4	Laser cover
2	HEPA filter	5	Side maintenance window
3	Carbon filter		

3.1.4 Rear view
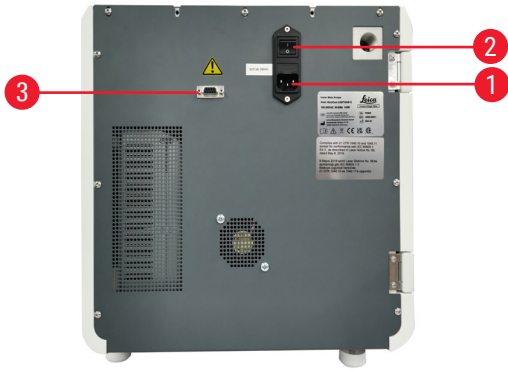
Fig. 14
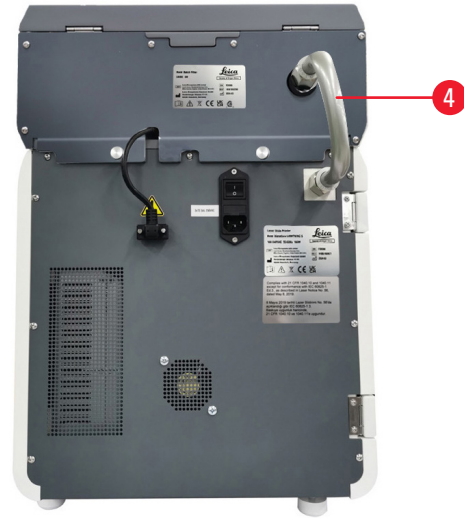
Fig. 15

1	Power inlet socket	3	Power supply of batch filter
2	Main switch	4	Extraction pipe

3.2   Main features of the instrument

The HistoCore LIGHTNING S is a UV laser technology-based microscope slide printer delivering fast and efficient printing. The HistoCore LIGHTNING S promotes switching between batch slides printing and on-demand slide printing to fulfill different needs from laboratory workflow through the features designed as following:

- UV laser module consistently provides stable printing life expectancy for 7 years or 1 million printing times based on the printing contents and time.
- Low risk of printing content fading away and resistance against regular chemical solutions and heat.
- Dual magazines improve the flexibility of switching between H&E and/or IHC staining procedure.
- Compatible with various validated microscope slides, including the popular microscope slides from Leica and local brands.
- Basic and enhanced hazardous fume/particle filtration system separated from on-demand and batch slide printing workflow is environment- and user-friendly.
- Besides the filter system within the printer, a separate filter system which reduces the smell and dust produced during printing workflow is also available.
- Intuitive and simplified user interface to adequately improve the user experience.
- Plug and play barcode scanner reads cassette information and imports the decoded data to the slide label.
- Integrated with HistoCore Water Bath M to achieve the optimal user workflow on section station.

3.3   Technical data

Electrical specifications - Laser Slide Printer	
Nominal supply voltage	100-240 VAC
Nominal supply frequencies	50-60 Hz
Mains supply voltage fluctuations	+/-10%
Power consumption	140 W
Main input fuses	2 x 2.5 A 250 VAC
Electrical specifications - Slide Stacker (Optional)	
Nominal supply voltage	24 VDC
Power consumption	20 W
Electrical specifications - Batch filter (Optional)	
Nominal supply voltage	24 VDC
Power consumption	6 W
Electrical specifications - Scanner (Optional)	
Nominal supply voltage	5 VDC
Power consumption	1.5 W
Dimensions and weight specification - Laser Slide Printer	
Overall size of device in operating mode (Width x Depth x Height, mm)	380 x 220 x 360

3 Instrument components and specifications

Dimensions and weight specification - Laser Slide Printer	
Overall height of the device after installing the batch filter	515 mm
Overall depth of the device after installing the pipe assembling of batch filter	305 mm
Overall footprint of the device after installing the slide stacker	380 mm (W) x 367 mm (D)
Overall size serial packaging (Width x Depth x Height, mm)	565 x 420 x 800
Empty weight (without accessories, kg)	25
Overall weight (with accessories, kg)	37
Device weight including packaging (kg)	36
Dimensions and weight specification - Slide Stacker (Optional)	
Overall size of device in operating mode (Width x Depth x Height, mm)	380 x 189 x 284
Overall size serial packaging (Width x Depth x Height, mm)	485 x 270 x 335
Empty weight (kg)	5.5
Dimensions and weight specification - Batch filter (Optional)	
Overall size of device in operating mode (Width x Depth x Height, mm)	380 x 232 x 170
Overall size serial packaging (Width x Depth x Height, mm)	485 x 270 x 335
Empty weight (kg)	5.5
Dimensions and weight specification - Scanner (Optional)	
Overall size of device in operating mode (Width x Depth x Height, mm)	60 x 59 x 82
Overall size serial packaging (Width x Depth x Height, mm)	160 x 155 x 75
Empty weight (kg)	0.2
Environmental specification	
Operating altitude (meters above sea level) (min/max)	Up to 2000 m
Temperature (operation) (min/max)	+18 to +35°C
Relative humidity (operation) (min/max)	20% - 80% RH non-condensing
Temperature (transit) (min/max)	-29°C - 50°C
Temperature (storage) (min/max)	+5°C to +50°C
Relative humidity (transit/storage)	20% - 85% RH non-condensing
Minimum distance to walls (mm)	100 mm
BTU (J/s)	546 BTU/h

Emissions and Boundary Conditions	
Overvoltage category to IEC 61010-1	II
Pollution degree to IEC 61010-1	II
Means of protection to IEC 61140	Class I
Degree of protection to IEC 60529	IP 20
Heat emission	546 BTU/h
A-weighted noise level, measured at 1 m distance	≤ 60 dB (A) during operation ≤ 50 dB (A) in standby mode
EMC class	A
Laser Class according to IEC60825-1	Class I
Laser Class according to FDA 21CFR_1040.10	Class I

Electrical connections and interfaces	
Power supply	N/A

Performance	
Load Capacity	75 x 2 pcs (dual channel)
Unload capacity	• On demand: 20 pcs. • Batch: 200 pcs.
Printing speed	• Up to 4s/pcs. (15 pcs./min)
Print resolution (theoretical)	2500 DPI
Printing quality (2D code)	Above or equal to Grade B (ISO 29158)
Chemical resistance	Resistant to HE & IHC staining reagents
Printing medium	UV laser

3.4 Print specifications

> **Note**
>
> • Slides to be used in the printer must be stored appropriately in closed containers and protected from dust and moisture.

Only standard specimen slides with imprintable edges can be imprinted in the HistoCore LIGHTNING S. Printing directly onto the glass is not possible.

Marking area dimension:

- Width: 25 mm
- Height: 16 mm - 25 mm

Specimen slides with the following specifications can be processed.

- Clipped corner and non-clipped corner slides
- Length: 75 mm - 76 mm
- Width: 25 mm - 26 mm
- Thickness: 0.9 mm – 1.2 mm
- HE and IHC slides

Recommended Leica slide models

- Xtra
- APEX SAS
- BOND Plus
- PERMASLIDE
- Apex BOND
- PERMAFLEX
- PERMASLIDE Plus

> **Warning**
>
> Slides made by other manufacturers must be tested before use.
>
> The test must include the following steps:
> - Mechanical compatibility with the instrument.
> - Print quality.

Resistance against reagents

⚠	**Warning**
	Note that each laboratory must perform its own tests to ensure that the printed content has no trouble withstanding the subsequent treatment of the slides with various reagents.
	A wide range of factors beyond Leica's control can have negative effects on the results.
	The test conditions stated below can therefore only serve as an outline for individual laboratory test specifications.
	The laboratory shall bear full responsibility for the legibility of the imprint after processing with reagents.

Test conditions

Imprinted slides have to be tested and validated by the user with a variety of reagents in an environment simulating the conditions present during staining.

3.4.1 Printing barcode/2D code

Barcode/2D code type

- QR code
- Data Matrix
- Code 39
- Code 93
- EAN 8
- EAN 13
- UPC-A
- UPC-E
- Code 128A
- Code 128B
- Code 128C

4. Setting up the instrument

4.1 Installation site requirements

- The instrument must not be operated in areas at risk of explosion.
- To ensure proper functioning of the instrument, it must be set up while maintaining a minimum distance of 10 cm from walls and furniture.
- The instrument is designed for indoor use only.
- The power plug/circuit breaker must be freely and easily accessible.
- The power supply must be at a distance of no greater than the length of the power cable – an extension cable must not be used.
- The instrument must be connected to a suitable and grounded power socket. Use only the provided power cable, which is intended for the local power supply.
- The bench must have a sufficient load capacity and rigidity with respect to the weight of the instrument (→ p. 24 − 4.2 Standard delivery-packing list).
- Avoid vibrations, direct sunlight, and large temperature fluctuations. The installation location must be well ventilated and must contain no sources of ignition of any kind.
- The installation location must be protected against electrostatic discharges.

4.2 Standard delivery-packing list

Quantity		Part description	Order No.
1		HistoCore LIGHTNING S Slide Printer	14 9061 000C1
	1	HistoCore LIGHTNING S basic instrument*	14 0610 61900
	1	Magazine A	14 0610 61745
	1	Magazine B	14 0610 61746
	1	Dust bag	14 0610 61918
	1	Carbon filter	14 0610 61517
	1	HEPA filter	14 0610 61518
	1	Slide chute	14 0610 61758
	1	Laser cover	14 0610 61425
	2	Fuse 5 x 20 mm 2.5 A	14 6000 06339
	1	International bundle Instructions for Use** (incl. English printout and additional languages on a data storage device 14 0610 80200)	14 0610 80001

*Local power cord needs to be ordered separately.
**Note for Japan only: Instead of the international bundle, a printout in Japanese is available. See cover page for order number.

If the supplied local power cord is defective or lost, please contact your local Leica Biosystems representative.

> **Note**
>
> In the scenario of on-demand printing, except the standard delivery, it is recommended to order the validated scanner; for batch printing, it is required to order the slide stacker and recommended to order the batch filter. For details, please refer to (→ p. 61 − 8. Ordering information).

*The components of standard delivery may be updated in the future. And the standard delivery is not the only configuration for HistoCore LIGHTNING S.

> **Note**
>
> • Please check all delivered parts against the packing list and against your order to verify whether the delivery is complete. Should you find any discrepancies, please contact your Leica Biosystems sales office immediately.

4.3 Unpacking the instrument

> ⚠ **Warning**
>
> The packaging has two indicators that indicate improper transport. When the instrument is delivered, check this first. If one of the indicators is triggered, the package was not handled as prescribed. In this case, please mark the shipping documents accordingly and check the shipment for damage.

> **Note**
>
> The transport carton and included retaining elements should be kept in case a return shipment is necessary later. To return the instrument, follow the instructions above in reverse order.

> **Note**
>
> For setting up the instrument, refer to the Instructions for Use supplied with the instrument.

1. Remove the packing strips (→ Fig. 16-1), corner protectors (→ Fig. 16-2), and wrapping film (→ Fig. 16-3).

Fig. 16

2. Remove the tape (→ Fig. 16-4).
3. Remove the flat foam padding (→ Fig. 17-1).
4. Remove the foam (→ Fig. 17-2) to retrieve the accessory box (→ Fig. 17-3).
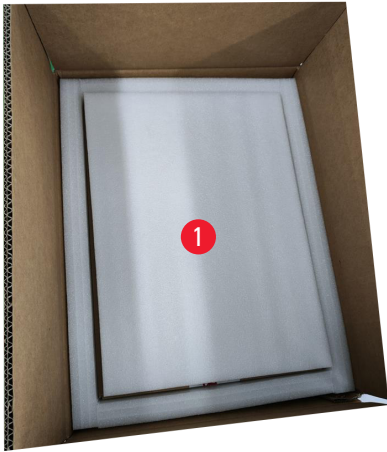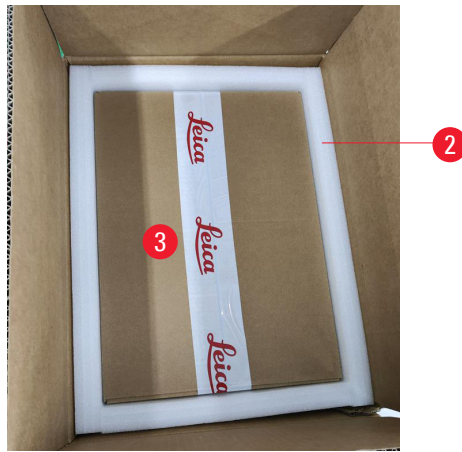
Fig. 17

5. Open the accessory box and take out the HEPA filter (→ Fig. 18-1), carbon filter (→ Fig. 18-2), laser cover (→ Fig. 18-3), slide chute (→ Fig. 18-4), magazine A (→ Fig. 18-5), anti-collision feet, dust bag and time-lag fuse (→ Fig. 18-6).
6. Remove foam (→ Fig. 18-7) and take out magazine B (→ Fig. 18-8).

Fig. 18

7. Remove the upper foam padding (→ Fig. 19-1) and take out the packing list, power cord and Instructions for Use (→ Fig. 19-2).
8. Remove the external cardboard packaging (→ Fig. 19-3).
9. Two persons are required to lift the instrument from its protective cushioning and place it on a stable laboratory bench.

Fig. 19

10. Remove the blue tape (→ Fig. 20-1) and protective foam (→ Fig. 20-2).
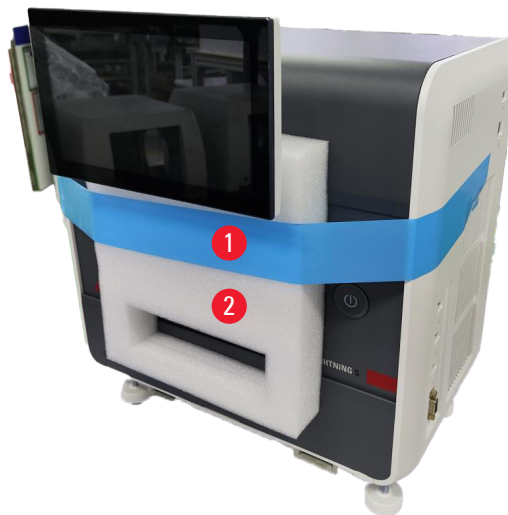

Fig. 20

11. Remove the foam pads (→ Fig. 21-1) from the slots of magazine A and magazine B.
12. Open the maintenance access panel and remove the foam pads (→ Fig. 21-2).

Fig. 21

4.4 Setting up the instrument

Install the following components and make the appropriate adjustments to make the instrument ready for use:

- Remove anchor foam from the instrument.
- Install the dust bag (→ Fig. 13-1). Slide the hardboard side into the slot.
- Install the HEPA filter (→ Fig. 13-2) and the carbon filter (→ Fig. 13-3).
- Install the laser cover (→ Fig. 13-4) to the laser module.
- Install the two magazines (→ Fig. 1-3).
- Install the slide chute for on-demand printing (→ p. 28 − Installing the slide chute for on-demand printing) OR the slide stacker for batch printing (→ p. 29 − Installing the slide stacker and the batch filter for batch printing (Optional)).

Installing the slide chute for on-demand printing

Fig. 22

Insert the slide chute (→ Fig. 22-1) into the instrument for on-demand printing. Ensure that it is firmly attached.

The slide chute has a capacity for collecting up to 20 printed slides.

Installing the slide stacker and the batch filter for batch printing (Optional)

Fig. 23

The slide stacker (→ Fig. 23-2) and batch filter (→ Fig. 23-1) for batch printing are available as optional accessories.(→ p. 61 − 8. Ordering information). Install the slide stacker (→ Fig. 23-2). Install the batch filter (→ Fig. 23-1), make sure the side with ventilation opening is facing the place not easily accessible.

	Note
	• Be careful of collision.

	Note
	• The slide stacker is not designed for hot plugging. Ensure that the instrument is powered off before installing or removing the slide stacker.

Use the slide stacker (→ Fig. 23-2) for batch printing. Make sure that the instrument is switched off using the **main switch** (→ Fig. 14-2) located on the back of the instrument before installing the stacker. Then insert the stacker into the instrument and ensure that it is firmly attached.

The slide stacker has a minimum capacity of 200 slides.

Connection of barcode scanner (Optional)

Connect the barcode scanner by inserting one end of the USB cable into the scanner and the other end into the designated USB port on the instrument. Ensure that the USB port on the instrument is designated for scanner use. (→ Fig. 1-5).

> **Note**
>
> - The scanner (→ Fig. 3-15)is available as optional accessories. (→ p. 61 − 8. Ordering information).

4.5 Switching on/off the instrument

⚠️ **Warning**

- Do not use a power strip to install the power cable.
- The instrument must be connected to a grounded power socket.

Switching on the instrument

1. Plug the power cord into the power inlet socket (→ Fig. 14-1) on the rear side of the instrument. Plug the power cord into a grounded outlet.
2. Press on the **main switch** (→ Fig. 14-2) near the power inlet socket.
3. Press the **standby** button(→ Fig. 1-8) located at the front panel. It will take less than 3 minutes for the instrument to initialize.
4. After the initialization completes successfully, the log-in window is displayed. For further operation, see (→ p. 33 − 5. Operation).

Switching off the instrument

⚠️ **Warning**

- Do not switch off the instrument while the printing is on-going.

You have two options to switch off the instrument after everyday routine use. You do not have to switch the **main switch** on or off each time.

- When there is no job printing, tap Leica logo on the up-right corner of the touch screen (→ Fig. 25-5) and tap **Shut-down**. Confirm with **OK**.
- Switch off the instrument by pressing the **standby** button (→ Fig. 1-8).

Under the circumstances of maintenance or disposal, you must switch off the power supply and then remove the power cable, ensuring that the instrument is stored correctly.

4.6 Moving the instrument

The instrument must be switched off and disconnected from the power supply before moving. Then, remove the slide chute (→ Fig. 1-4) or the slide stacker (→ Fig. 2-7). The magazines (→ Fig. 1-3) can remain in the instrument. If a batch filter (→ Fig. 1-16) is used, remove the batch filter by disconnecting the cable and the extraction pipe (→ Fig. 15-4) connected to the printer.

4.7 Alarm messages

In HistoCore LIGHTNING S, states can occur that require the attention of, or a decision on the part of, the user. In the simplest case, these are confirmations for continuing the printing job. In addition, however, during continuous monitoring of the hardware, errors can be identified that must be eliminated as soon as possible for a printing job to be finished successfully. Correspondingly, all messages are classified into three levels according to their severity.

- Information messages
- Warning messages

• Error messages (→ p. 58 − 7. Troubleshooting)

The system provides audible notifications for warnings and errors. The sound volume levels for buzzer can be set (→ p. 53 − 5.6 Instrument settings).

4.8   Installing printer driver

If you need to install the printer driver, please download the software installation instructions from our website. If you have problems installing the new printer driver, please contact your local Leica sales department.

5. Operation

5.1 Overview

5.1.1 Starting up

Upon launching the master software, the system will conduct an automatic self-check.

5.1.2 Initial login

The system comes pre-figured with an Administrator account, which can be used to create new accounts. The default username is **admin**. The default password is **admin**. At the first login, you will be prompted to create a new password. The new password must be a combination of 6-20 alphanumeric characters.

5.1.3 Main Menu

After system start-up, the homepage and navigation bar will be displayed. You can start printing after system warmup (→ Fig. 24-1). The software features a function bar at the top of the screen. Tap a button on the function bar to access specific screens or menus offering options for related functionalities.
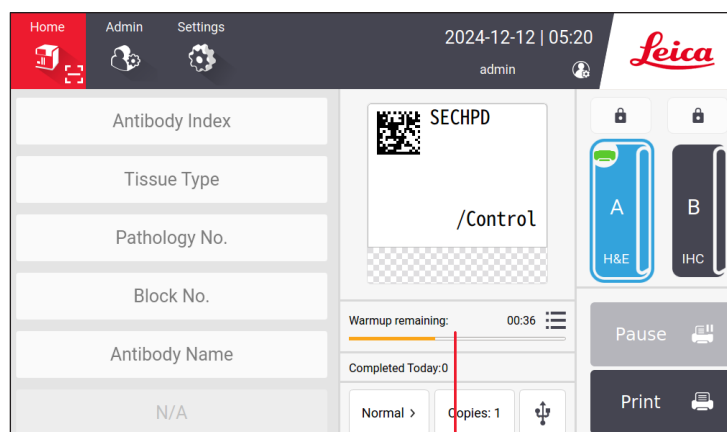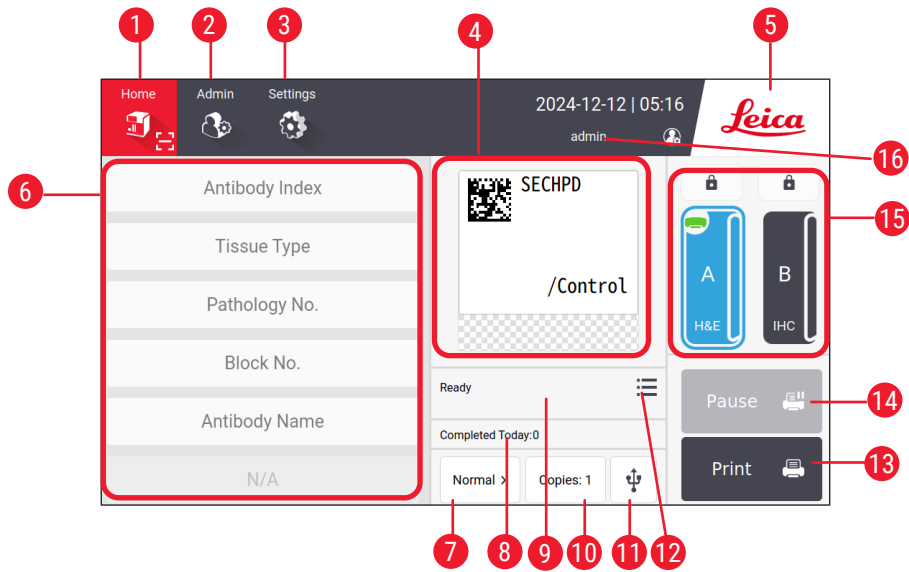

Fig. 24

Fig. 25

1	Home	9	Print progress of current job
2	Admin	10	Print copies
3	Settings	11	Print slides through a USB
4	Preview of the label template, showing the fixed items on the label template	12	Access to print job queue/print history
5	Tap Leica icon to shut down the system	13	**Print** button
6	Fields for entering editable items	14	**Pause**/**Continue** button
7	Print options	15	Channels and channel locks
8	Daily statistic	16	Active user

5.1.4 Access level

The HistoCore LIGHTNING S has two access tiers: Operator and Administrator. Select **Admin** > **Users** to view all the users.
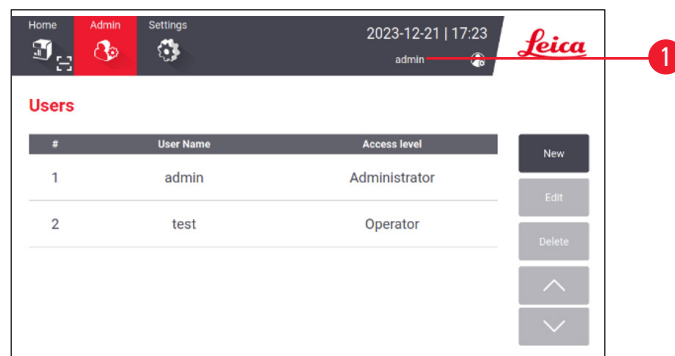

Fig. 26

- Operators are allowed to perform all routine tasks, such as printing slides, setting templates and adjusting the instrument settings.

- Administrator possess all the privileges of the Operators, with the additional capabilities to create or delete operator accounts, assign template (→ p. 49 − 5.5.1 Assign template), and reset the lifetime of dust bags and filters (→ Fig. 55-9).

Users access the system using a username and password. The username is displayed on the upper right corner of the touchscreen (→ Fig. 26-1).

To change users, tap the displayed username (→ Fig. 26-1), select **Switch User**, then log in with a different username and password.

5.1.5 Using the software

The instrument functions are controlled via the touchscreen interface.

Buttons

Interact with the touchscreen to access menus, screens and dialog boxes, and to initiate and terminate tasks. Active buttons are highlighted (→ Fig. 27-1); unactive buttons are grayed out (→ Fig. 27-2).

Fig. 27

Keyboards

Virtual keyboards facilitate text and number entry as required. There are two types: alphanumeric (for text and numbers) (→ Fig. 28-1) and numeric (for numbers only) (→ Fig. 28-2). These virtual keyboards mimic the layout of a computer keyboard, featuring on-screen buttons for input.
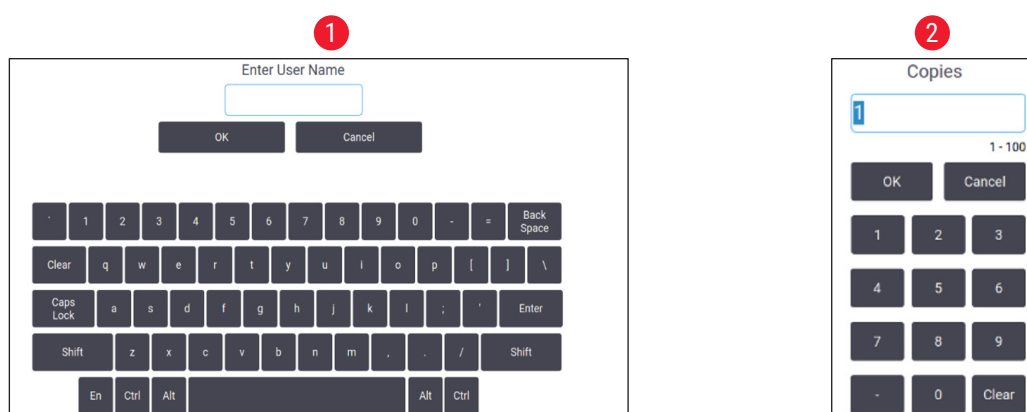

Fig. 28

The instrument accommodates the connection of 2.4G wireless keyboard and mouse for on-screen inputs. Use any of the USB ports (→ Fig. 1-9) located on the right side of the instrument to connect to a computer keyboard. The system is designed to support input in different languages.

5.1.6 Adding/Editing/Deleting a user account

> **Note**
>
> • The password shall have 6-20 characters mixed with numbers and English letters.

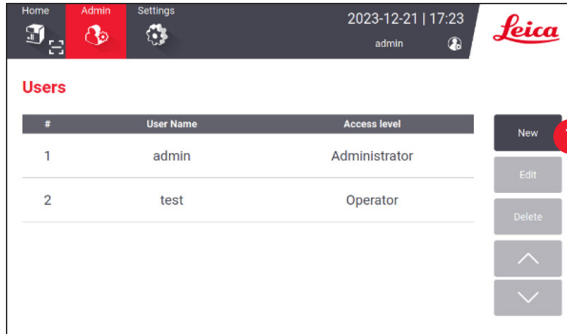#### Adding a user account

Fig. 29

1. Tap **Admin** > **Users**.
2. Tap **New** (→ Fig. 29-1).
3. Enter the user name once and the password twice.
4. Tap **OK**.

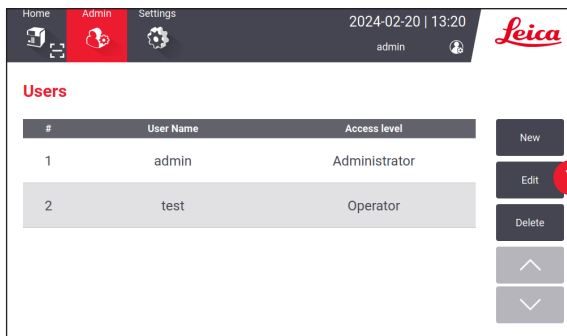#### Editing a user account

Fig. 30

1. Tap **Admin** > **Users**.
2. Select a user account from the list and tap **Edit** (→ Fig. 30-1).
3. Change the password.
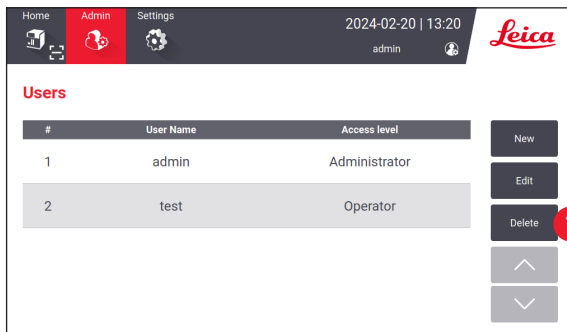4. Tap **OK**.

Deleting a user account

Fig. 31

1. Tap **Admin** > **Users**.
2. Select an operator account from the list and tap **Delete** (→ Fig. 31-1). The Admin account cannot be deleted.
3. Tap **OK**.

5.1.7 Log-out

The system is programmed to automatically log out after a default period of 30 minutes of no operation. Users can adjust the automatic log-out interval to any duration ranging from 5 to 480 minutes (→ p. 53 − 5.6 Instrument settings).

To log out manually, follow below steps.

1. Tap the username icon (→ Fig. 26-1).
2. Select **Log out** and decide on the subsequent action to take.

5.2 Loading slides

The system features two slots for slide insertion. Before operation, ensure that both slide magazines are filled with slides. Load slides in accordance with the directional indicator present on the magazine.

Each magazine can hold up to 75 slides. Pay attention to the maximum volume indicator on the magazine. Slides must not be loaded beyond this mark to prevent them from toppling over. The magazines will be inserted to their corresponding channels.

The two channels cannot interchangeable as backups unless they are configured for the same slide type (→ p. 49 − 5.5.1 Assign template).

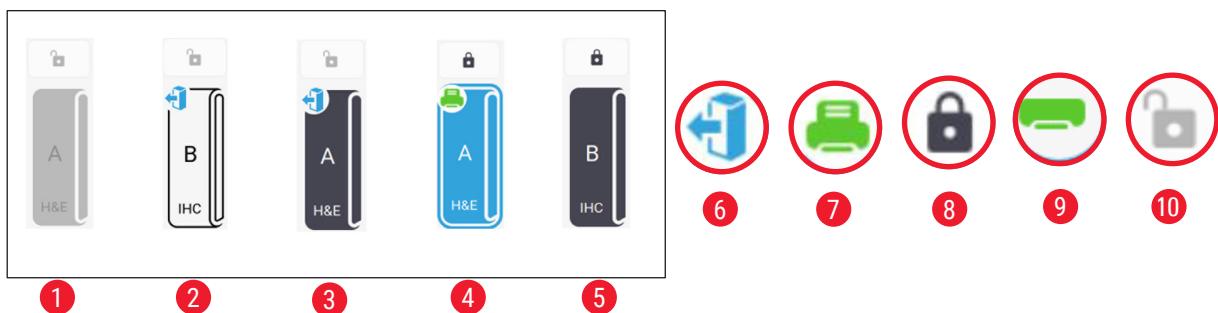The channels can exhibit the following statuses.

Fig. 32

1   No magazine in the channel.
2   The magazine is in the channel without slides.
3   The magazine is in the channel with slides.
4   The channel is in currently engaged in the printing process.
5   The channel is locked with slides.
6   The magazine can be unloaded.
7   The channel is currently engaged in the printing process.
8   The channel is locked.
9   The channel is selected and ready for printing.
10   The magazines can be inserted or pulled out.

When handling slides, follow the steps below.

> **Note**
> • Wear gloves or exercise appropriate caution to ensure safety when handling slides.
> • Do not load slides that already have tissue sections applied to them.

1. Press and hold one of the channels (→ Fig. 25-15) until the icon on the left corner changes to the unloaded status (→ Fig. 32-6).
2. Remove the empty magazine by pulling it away from the instrument.
3. Load slides into the magazine with the painted end of the slide facing upwards and towards you.
4. Insert the magazine back into its channel. Make sure it is securely in place.
5. Tap the button of the channel that you are going to use. The slides will then be prepared for printing.

5.3 Printing slides

5.3.1 On-demand printing

> **Note**
>
> - Press down the flap on the slide chute (→ Fig. 33-1) for slide single printing to avoid accidental activation of the sensor. Promptly remove the slide after printing is finished to avoid the risk of the slide falling.
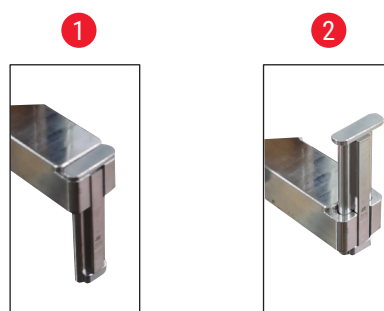> - Keep the flap raised (→ Fig. 33-2) for printing multiple slides.

Fig. 33

To print the slides on-demand, follow the steps below.

1. Install the slide chute (→ p. 28 − Installing the slide chute for on-demand printing).
2. Load the slides (→ p. 38 − 5.2 Loading slides).
3. Tap the button of the channel (→ Fig. 25-15) that is going to be used.
4. Tap the print preview area (→ Fig. 25-4) to select a template.
5. For single slide printing, manually input the required information (→ Fig. 25-6), or scan the barcode or 2D code. An audible sound will confirm a successful recognition of the barcode or 2D code. Then tap **Print** (→ Fig. 25-13).
6. When printing multiple slides, tap the button of print copies (→ Fig. 25-10) to enter the quantity of the prints, and manually input the necessary information in the text fields (→ Fig. 25-6). Tap **Print**.
7. Tap **Pause** (→ Fig. 25-14), if needed. The system will complete the current slide printing, and halt the subsequent slide transport.
8. Tap the access icon (→ Fig. 25-12) to view the print job queue, and edit print jobs, if necessary.
9. Tap **Continue** (→ Fig. 25-14) to continue printing.
10. Unload the printed slides after printing is completed or unload the print slides at a timely manner when the slide chute reaches to the maximum volume of 20 slides.

The first slide printed will be positioned at the top of the stack in the slide collection area.

5.3.2 Batch printing

> **Note**
>
> - The slide stacker and the enhanced hazardous fume/particle filtration system for batch printing shall be ordered.
> - Before installing the stacker, make sure the instrument is turned off through the power switch located at the rear side. Insert the stacker securely into the instrument.

To print batches of slides, follow the steps below.

1. Install the slide stacker (→ p. 29 − Installing the slide stacker and the batch filter for batch printing (Optional)).
2. Load the slides (→ p. 38 − 5.2 Loading slides).
3. Tap the button of the channel (→ Fig. 25-15) that is going to be used.
4. Tap the print preview area (→ Fig. 25-4) to select a template.
5. Manually input the necessary information in the text fields (→ Fig. 25-6). Use a dash (-) between the information of the first slide and last slide (→ Fig. 34-1), or use a point (.) to separate the slides to be printed (→ Fig. 34-2).
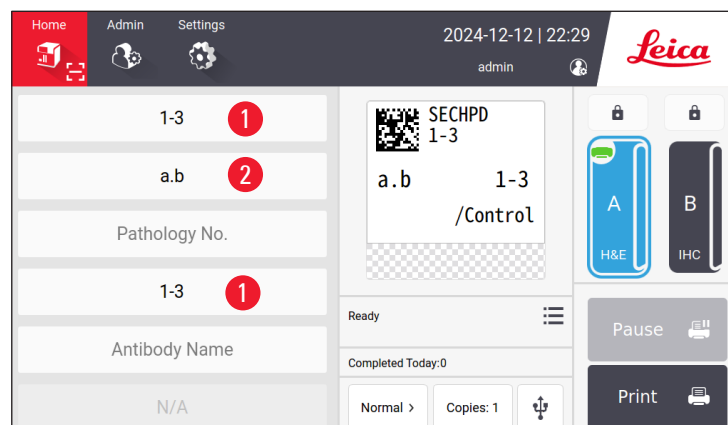

Fig. 34

6. Tap **Print** (→ Fig. 25-13). The print job preview screen is displayed.

Fig. 35

7. Double-check the print information using **Up/Down** button. In case of any mistake, select the error slide, and tap **Delete**.
8. Tap **OK** to initiate batch printing. You can monitor the progress of the current print job (→ Fig. 36) on the Main menu.
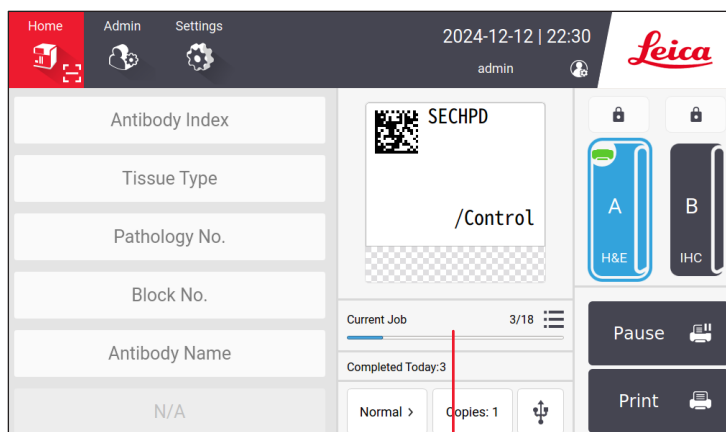

Fig. 36

9. Promptly remove the printed slides after the print job is done or when the slide stacker reaches to the maximum volume. The maximum volume of the slide stacker is 200 slides, organized into 8 stacks with each stack containing 25 slides.

Once the slides are printed, the first slide that was printed will be located at the top of the first stack on the far right within the slide stacker.
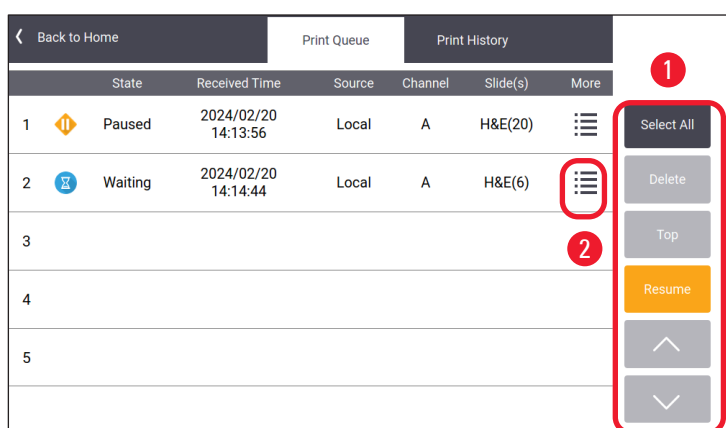
5.3.3 Editing print jobs

Fig. 37

Tap the button (→ Fig. 25-12) on the Home page to access print job queue/print history. Tap the **Print Queue** button, then the job queue is displayed (→ Fig. 37). You can use **Select All** to select all the print jobs; use **Delete** to cancel a print job; use **Top** to prioritize a print job; use **Resume** to continue a print job (→ Fig. 37-1). Tap the **More** (→ Fig. 37-2) to view the details of the selected job.

Fig. 38

The green icon (→ Fig. 38-1) indicates that the priting job is completed.

Fig. 39

Tap the **Print History** button, then the print history is displayed (→ Fig. 39). Tap the **More** button (→ Fig. 39-1) to view the details of the selected job.

5.3.4 Printing slides via LIS

The system supports remote slide printing via LIS control. For detailed instruction on establishing a connection to LIS, please see (→ p. 51 − 5.5.3 LIS configuration).

5.3.5 Printing slides via USB

The system supports slide printing using a print list file imported from a USB.

Tap the USB printing button (→ Fig. 25-11). Follow the on-screen instructions to proceed with the printing process.

5.3.6 Merge printing

Information from two blocks for one patient could be combined and printed on one slide.

Before starting merge printing, make sure that:

ⓘ The scanner is properly connected to the printer and both devices are operational.

ⓘ The selected template must be an H&E template.

ⓘ The pathology number and wax block number are editable and available.

ⓘ The **Scan Code Delimiter** (→ Fig. 40-1) is set.

1. Install the slide stacker (→ p. 29 – Installing the slide stacker and the batch filter for batch printing (Optional)).
2. Load the slides (→ p. 38 – 5.2 Loading slides).
3. Go to **Setting** > **Print** > **On Demand Prining Settings**, Select the **Scan Code Delimiter** (→ Fig. 40-1).

On Demand Printing Settings

Auto-print after Scan

> Off ▼

Scan Code Delimiter

> Caret(^) ▼ ①

Merge Print Delimiter

> Comma(,) ▼

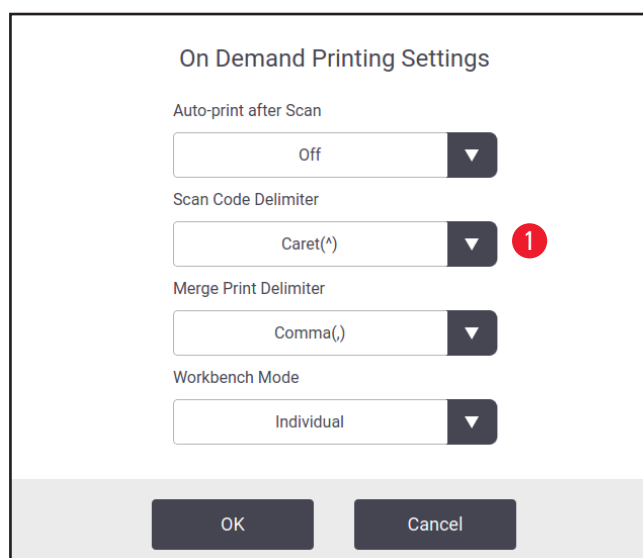Workbench Mode

> Individual ▼

OK   Cancel

Fig. 40

4. Tap the button of the channel (→ Fig. 25-15) that is going to be used.
5. Tap the print preview area (→ Fig. 25-4) to select a template.
6. Tap **Print options** (→ Fig. 25-7) to switch between **Normal** and **Merge**. You can also tap and hold **Print options** for three seconds, until a window pops up, select **Merge** and press **OK**.
7. Scan the two blocks of one patient and press **Print**.
8. Remove the printed slides after the print job is done.

5.4 Templates administration

Template administration allows for the customization of how data fields and barcodes appear on the printed material. To tailor the template layout to your specific needs, you can adjust various elements, such as the length of printing area, printing direction, item positions, fonts, font sizes and barcodes. It is important to leave a sufficient margin around the edges of the template and around barcodes.

The system has 4 pre-configured printing templates for laboratory use, including 1 horizontal template (1 HE with 2D code) (→ Fig. 41-2) and 3 vertical templates (1 HE with 2D code (→ Fig. 41-1), 1 IHC with 2D code (→ Fig. 41-4)), and 1 IHC with barcode (→ Fig. 41-3)). The pre-configured templates are identified by the Leica icon (→ Fig. 41-5).
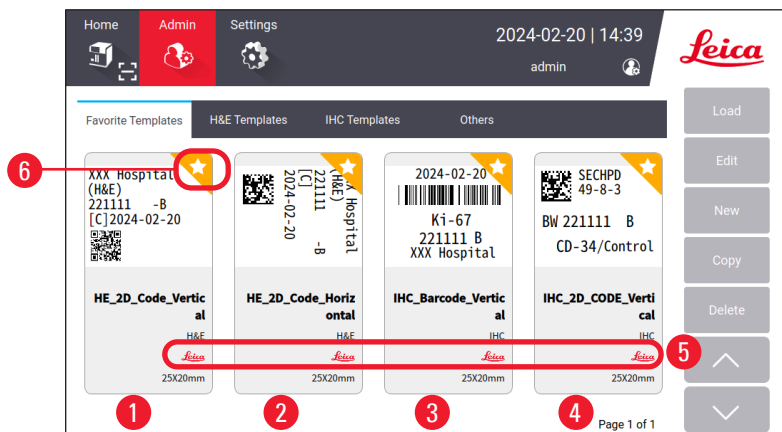

Fig. 41

Pre-configured templates can serve as the foundation for customized templates but cannot be deleted.

To quickly choose a template, tap the preview box (→ Fig. 25-4) on the Main menu. From here you can access all templates. You may also tap **Admin** > **Template** to view the same list of available templates.

5.4.1 Favorite templates

You can designate up to four templates as "favorites". Favorite templates are marked by the white star against an orange background (→ Fig. 41-6) on the top right corner of the templates. Tap the star to mark or unmark a template as a favorite.

5.4.2 Creating/Editing/Copying/Deleting a template

Creating a new template

1. Tap the preview box (→ Fig. 25-4) on the Home page or tap **Admin** > **Template**.
2. Tap one of the three tabs (→ Fig. 42-1): **H&E templates**, **IHC templates** or **Others**.
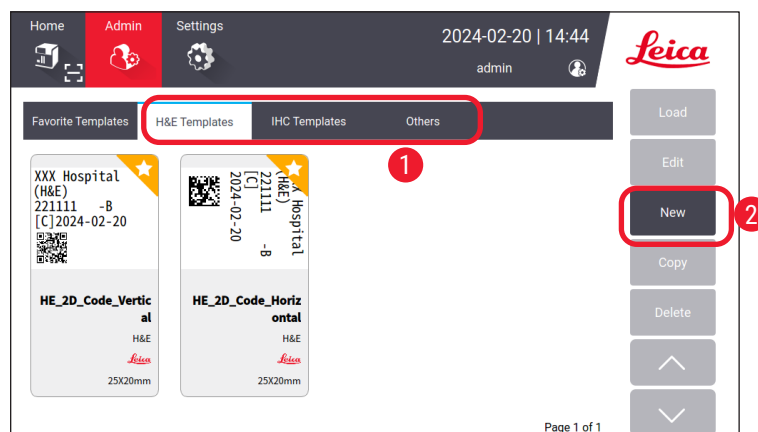
Fig. 42

3. Tap **New** (→ Fig. 42-2). The **Basic Settings** screen (→ Fig. 46) is displayed.
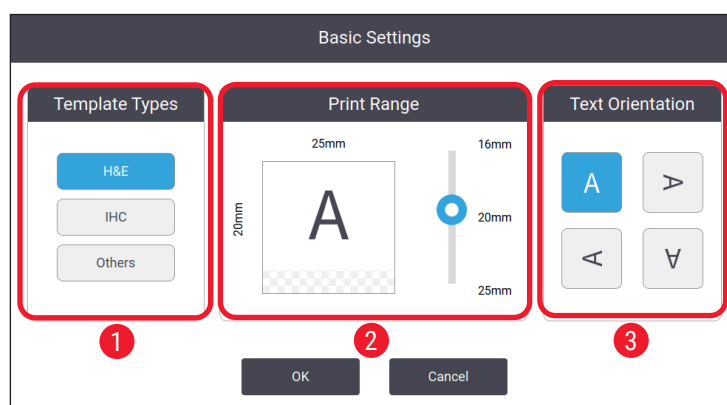

Fig. 43

4. Define the template types (→ Fig. 46-1), print range (→ Fig. 46-2) and text orientation (→ Fig. 46-3).
    A. Select the template type, for example, **H&E**. After it is created successfully, the new template will be displayed under the **H&E template** tab.
    B. Set the length of print range. Make sure that the settings matches the actual painting size of the slides. The default length of painting is 20 mm. You may set the length between 16 mm to 25 mm with an increment of 1 mm.
    C. Set the text orientation.
5. Tap **OK**. The keyboard for entering the template name is displayed.
6. Enter the template name, and tap **OK**. The **Edit Template** screen is displayed (→ Fig. 44).
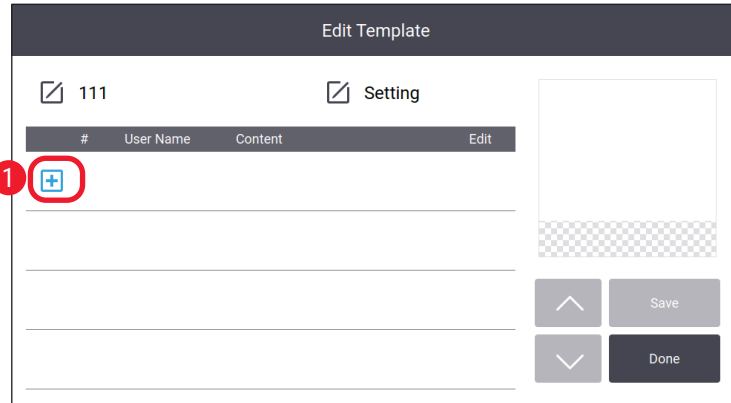
Fig. 44

7. Define the items on the template. In addition to Timestamp, QR code and barcode, the system allows up to 6 editable entries or a total of 10 entries on a template. You may create new items by selecting customized item. Take setting the **Pathology number** for example.
    A. Tap the plus symbol (→ Fig. 44-1) at the beginning of the line. The **Template item configuration** screen is displayed.
    B. Select the item, for example, **Pathology number**. The configuration items of the pathology number (→ Fig. 45) are displayed on the **Template item configuration** screen.
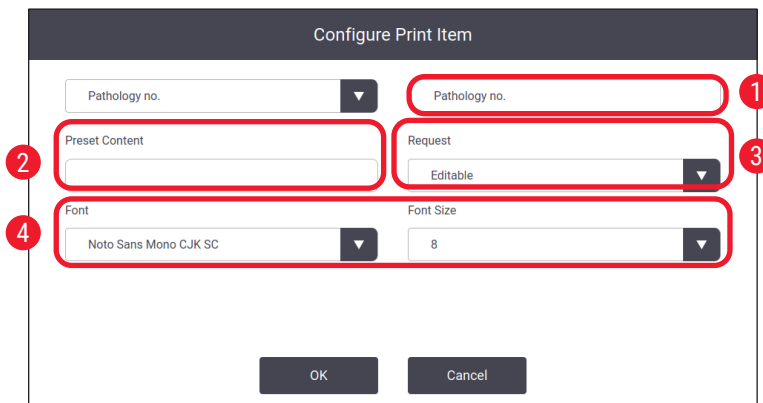

Fig. 45

C. Rename the item if required (→ Fig. 45-1).
D. Enter the preset contents (→ Fig. 45-2). The preset contents shall be within the maximum number of characters that might appear in actual printing requests.
E. Set this item as editable or fixed (→ Fig. 45-3). Once it is set to be editable, you need to enter the information to the fields (→ Fig. 25-6) on the Main menu before printing.
F. Set the font and font size (→ Fig. 45-4).
G. Tap **OK**.
H. The item is displayed in the list (→ Fig. 46). Move the item in the preview box to the desired position (→ Fig. 46-1).
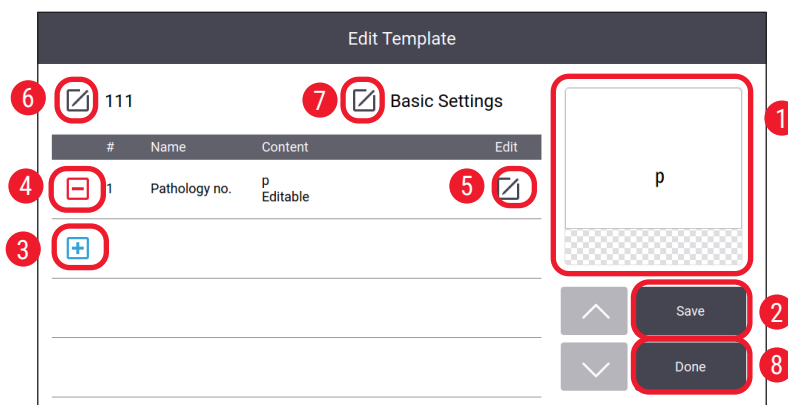
Fig. 46

I. Tap **Save** (→ Fig. 46-2) to save the settings.

J. Tap the plus symbol (→ Fig. 46-3), repeat Step B to Step I, and continue to add more items on the template.

K. To edit an existing item, refer to the steps in the Editing templates (→ p. 47 − Editing templates).

Please note:

- Timestamp is a fixed item by default.
- The information to be contained in the 1D/2D code is editable.
  8. Tap **Done** (→ Fig. 46-8). The new template is displayed under the corresponding template tab.

Editing templates

ⓘ Only when the system is idle can the templates be edited.

Fig. 47

1. Tap the preview box (→ Fig. 25-4) on the Home page or tap **Admin** > **Template**.
2. Tap one of the three tabs (→ Fig. 47-1): **H&E templates**, **IHC templates** or **Others**.
3. Select the template to be edited, and tap **Edit** (→ Fig. 47-2). The **Edit Template** screen (→ Fig. 48) is displayed.
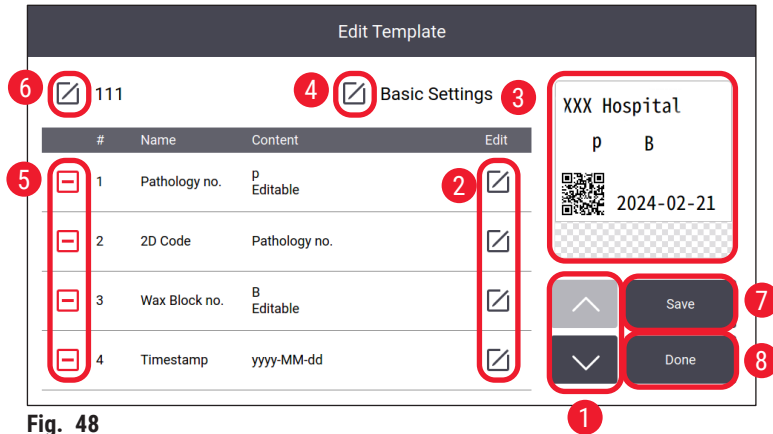
Fig. 48

4. Tap the up and down buttons (→ Fig. 48-1) to view all items on the template.
5. To edit an item, tap the edit button (→ Fig. 48-2) at the end of the line, and the setting screen is displayed. Make changes as required and tap **OK**.
6. To change the text layout of the template, move the item in the preview box (→ Fig. 48-3) to the desired position.
7. To change the basic settings of the template, tap the **Setting** button (→ Fig. 48-4), and the **Basic Setting** screen is displayed. Make changes as required and tap **OK**.
8. To remove an item on the template, tap the minus symbol (→ Fig. 48-5).
9. To add an item on the template, tap the down button until reaching the end of the list, and tap the plus symbol. Follow sub-step B to I in Step 7 to create a new template section (→ p. 44 – 5.4.2 Creating/Editing/Copying/Deleting a template).
10. To rename the template, tap the edit button (→ Fig. 48-6) before the template name.
11. Tap **Save** (→ Fig. 48-7) to save the settings.
12. Tap **Done** (→ Fig. 48-8).

Please note:

- Timestamp is a fixed item by default.
- The information in the 1D/2D code is editable.

Copying templates

You may create a new printing template by copying a pre-installed template or a customized template.

1. Tap the preview box (→ Fig. 25-4) on the Main menu or tap **Admin** > **Template**.
2. Tap one of the three tabs (→ Fig. 47-1): **H&E templates**, **IHC templates** or **Others**.
3. Select the template that is to be copied, and tap **Copy** (→ Fig. 47-3). A template name with suffix "(2)" to the original template name is automatically generated. Update with a new name and tap **OK**.
4. The **Edit Template** screen is displayed (→ Fig. 48). Follow the steps in the Editing templates (→ p. 47 – Editing templates) if you need further modifications.

Deleting templates

ⓘ Only when the system is idle can the templates be deleted.

1. Tap the preview box (→ Fig. 25-4) on the Main menu or tap **Admin** > **Template**.
2. Select the template to be deleted.
3. Tap **Delete** and confirm with **OK**.

5.5 Print settings

ⓘ Only when the system is idle can the print settings be changed.

Tap **Settings** > **Print** to configure the settings.
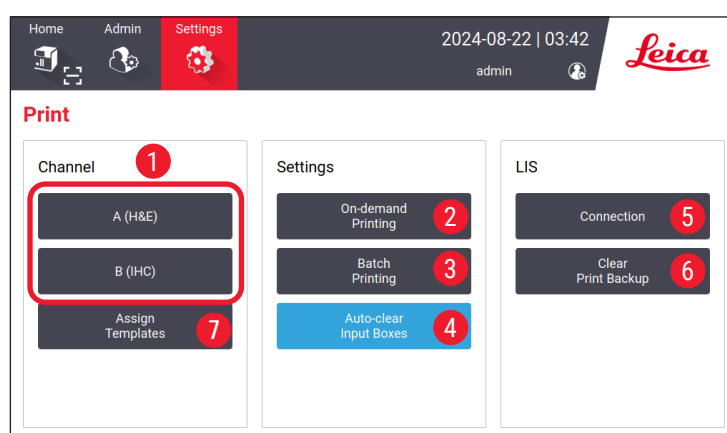
Fig. 49

5.5.1 Assign template

The slide type is available in **H&E**, **IHC**, or **Customized**. Tap the button of **A (H&E)** or **B (IHC)** (→ Fig. 49-1) to select the type. The confirmed selection will be shown on the channel buttons (→ Fig. 25-15) on the Home page.

Admin can assign templates to Channel A and Channel B by clicking **Assign Templates** (→ Fig. 49-7) and choose the templates you want to use (→ Fig. 50).

Fig. 50

HistoCore LIGHTNING S

5.5.2 Print settings

On-demand printing

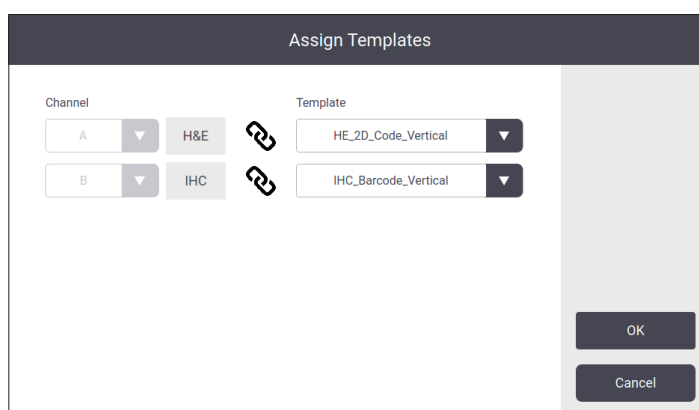Tap **On-demand Printing** (→ Fig. 49-2), and the On-Demand Printing Settings interface (→ Fig. 51) is displayed.
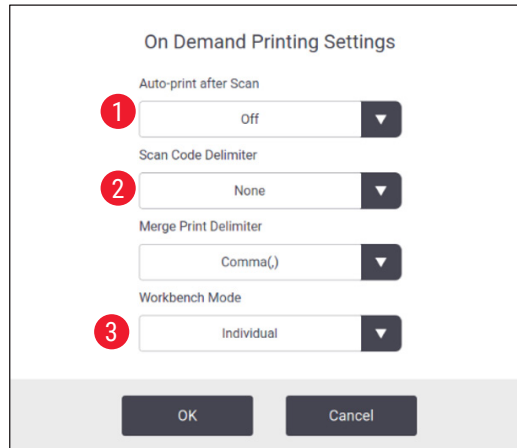
Fig. 51

You can set the items as follows.

- Set **On/Off** automatic printing after scanning the barcode or 2D code (→ Fig. 51-1). If it is **On**, printing will automatically start after successful scanning. If it is **Off**, printing must be initiated manually.
- Set **Scan code Delimiter** (→ Fig. 51-2). If it is set to use delimiters, the cassette information acquired by scanning will be filled in seperate fields (→ Fig. 25-6) on the Home page. If it is **None**, cassette information will be filled in one field.
- **Workbench Mode** (→ Fig. 51-3): **Individual** or **Cooperative**. If it is **Cooperative**, you will be prompted to choose a role as a sectioning operator or a floating operator during login.

Batch printing

Tap **Batch Printing** button (→ Fig. 49-3), and the **Batch Printing Settings** interface (→ Fig. 52) is displayed.
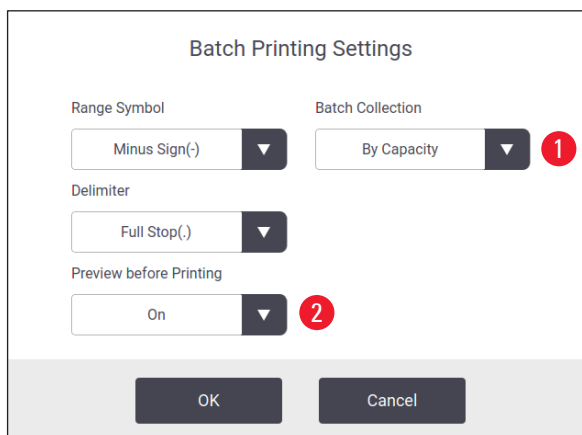
Fig. 52

Set **By Capacity/By Job** (→ Fig. 52-1), and **On/Off** preview (→ Fig. 52-2) before printing.

Auto-clear Input

Set enable/disable to clear entry automatically after the printing process starts (→ Fig. 49-4).

5.5.3 LIS configuration

The system supports remote slide printing via LIS.

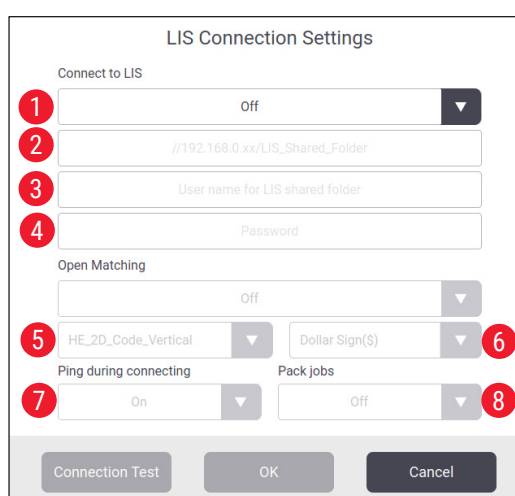Tap **Settings** > **Print** > **Connection** (→ Fig. 49-5) to configure the connection to LIS.

Fig. 53

- Activate the connection to LIS (→ Fig. 53-1).

- Set LIS shared folder path (→ Fig. 53-2). It is recommended to create a shared folder as a root folder, for example, //192.168.0.xx/LIS_Shared_Folder, then set the folder of "//192.168.0.xx/LIS_Shared_Folder" as the shared folder. Setting any subfolders under the root folder as the shared folder may result in failure to access.
- Set the username of the LIS shared folder (→ Fig. 53-3).
- Set the password of the LIS shared folder (→ Fig. 53-4).
- Select a print template (→ Fig. 53-5) from the available template list.
- Select a punctuation (→ Fig. 53-6) to separate different text fields.
- Enable **Ping during connecting** (→ Fig. 53-7) to check if the printer is connected to the assigned IP address. Or access the defined folder directly without enabling **Ping during connecting**. Please note, it is recommended to enable **Ping during connecting** but some users may not be able to use it due to network settings.

> **Note**
>
> - Under batch printing, each file is viewed as a separate task even there is only one slide required in the task. If there are eight such tasks, each stack of the slide stacker will be occupied by a slide. After the eight tasks are finished, a window (→ Fig. 54) pops up and reminds the user to move the slides on the slide stacker. To save the slide stacker space, **Pack tasks** is provided.

- Activate **Pack jobs** (→ Fig. 53-8) if needed. Once it is on, 25 slides will be viewed as one print task.
  a. If the number of slides in one pack is ≤ 25, printing will stop and one slide stack will be occupied.
  b. If the number of slides in one pack is > 25 and ≤ 50, printing will stop and two slide stacks will be occupied. The **Pack jobs** can better utilize the space of the slide stackers.

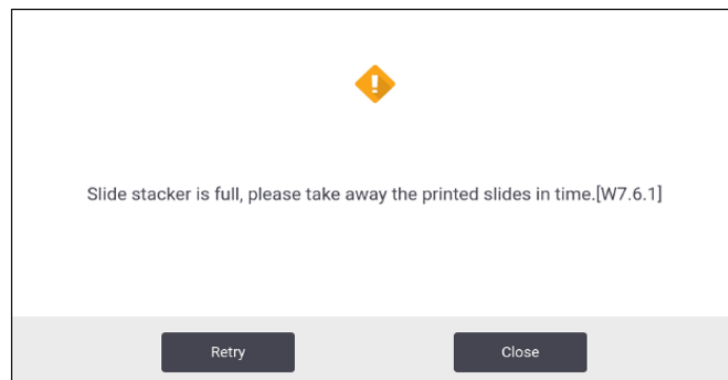

Fig. 54

- Tap **Connection Test** to check if the connection to LIS is good.
- Tap **OK** to complete the connection settings to LIS.

Clear print backup

Tap the button (→ Fig. 49-6) to delete printing backup files.

5.5.4 Printing request from another devices

The system supports printing request from other devices. Contact Leica Biosystems service for more information.

5.6 Instrument settings

Tap **Settings** > **Device**, the device settings interface is displayed.
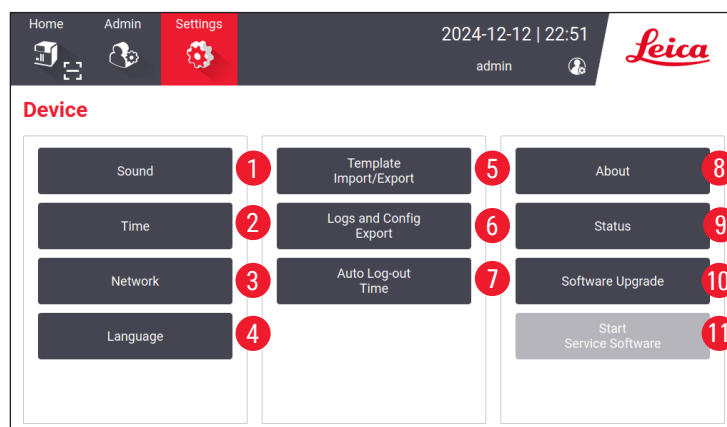
Fig. 55

1   Sound volume for buzzer
2   System time
3   Network for the printer
4   System languages
5   Import/Export print template
6   Export logs and printing settings
7   The auto log-out duration should be set between 5 - 480 minutes
8   View the device name, serial number, and software version
9   View the status of dust bag, laser print head, carbon filter and HEPA filter of standard filter, and batch filter-HEPA carbon of batch filter. The administrator can reset the lifetime of the dust bag, carbon filter, HEPA filter and batch filter-HEPA carbon
10   For software updates, please contact Leica service personnel or local Leica sales representatives
11   Launch Service Software

6. Cleaning and maintenance

6.1 Cleaning the instrument

- Prior to cleaning the instrument, always switch off the power supply and unplug the power cord.
- When handling cleaning detergents, follow the instructions of the manufacturer and make sure all laboratory regulations in force in your country are complied with.
- To clean the exterior surfaces, use a mild and ph-neutral commercial household cleaner.
- You shall not use: alcohol, cleaning materials containing alcohol (glass cleaner!), abrasive, and solvents containing acetone or xylene! The painted surfaces and the touch screen of the instrument are not resistant to xylene or acetone!
- No liquid shall come into contact with the electrical connections or spill into the interior of the instrument!
- During all cleaning procedures, puncture-resistant gloves and eye protection are to be worn to protect against injury caused by debris (especially glass).
- During vacuuming, direct the air stream generated by the vacuum away from yourself or anyone in the area to avoid possible injury from glass particles.
- Make sure to put the laser cover back in place after cleaning and maintenance.

Slide guiding mechanisms

The printer needs to be cleaned with a brush weekly in the case of heavy use (or monthly in the case of light use) to remove any debris, especially glass dust.

Cleaning the following components marked by an arrow is of particular importance:
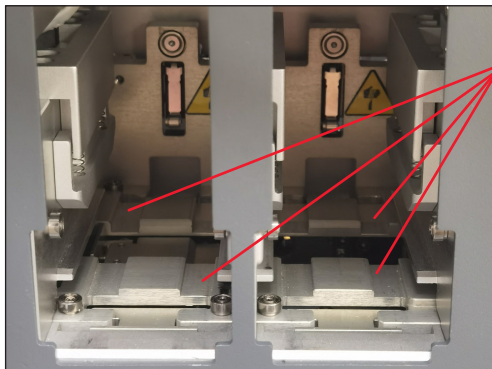
Fig. 56

Load station

Always ensure that the guide of magazine holders (→ Fig. 56-1) is debris free especially for glass dust. Use a brush to wipe off the debris or glass dust. The recommended cleaning frequency is once a month.

Fig. 57

Transport station

Always ensure that the guide below the laser module (→ Fig. 57-1) is debris free especially for glass dust. To do so, open the lid of side maintenance window (→ Fig. 4-13), then remove the laser cover (→ Fig. 13-4). Use a brush to wipe off the debris or glass dust. The recommended cleaning frequency is once a month.
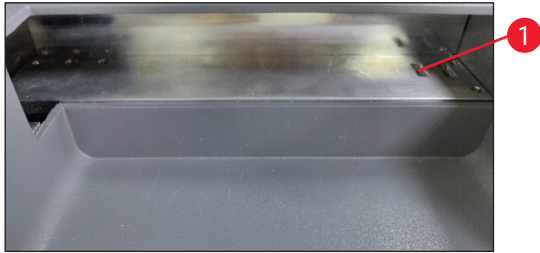
Fig. 58

Slides stacker (batch module)

Always ensure that there's no obstacles or debris covering the sensors on the upper right corner (→ Fig. 58-1). Otherwise, the slide printing would be interrupted till the error is eliminated.
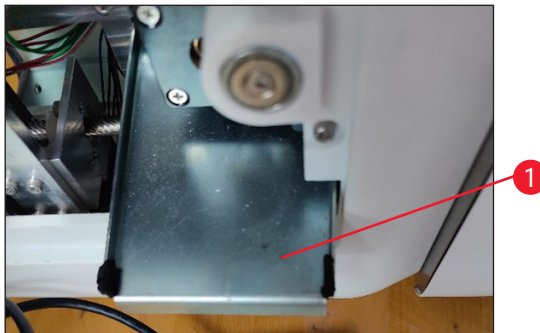

Fig. 59

The waste tray for broken glass

The waste tray for broken glass (→ Fig. 59-1) is located at the left below the transport station and can be accessed after opening the lid of side maintenance window. It prevents glass dust and broken glass from falling into the interior of the instrument. The waste tray can be pulled out sideways by grasping the bended handle.

Broken glass can easily be removed - use a brush to remove any glass in the whole waste tray.

It is highly recommended not to carry out the cleaning activity on the waste tray. It shall be conducted by Leica service personnel while carrying out the preventive maintenance yearly.
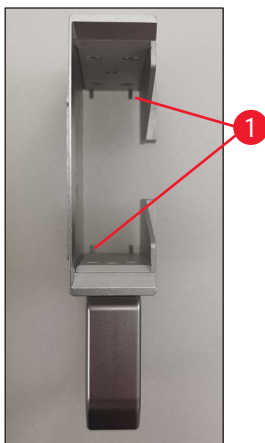
Fig. 60

Slides magazine

Always ensure that there's no debris or glass dust remained on the four bottom supporting feet of the slides magazine. Wipe off the feet every time prior to uploading the slides onto the magazines.

F-theta lens

Clean the F-theta lens every 6 months using lint-free cloth or lens wipes.To do so, follow below steps.

1. Open the lid of side maintenance window (→ Fig. 4-13).
2. Remove the laser cover (→ Fig. 13-4) of the laser module.
3. Use the lint-free cloth or lens wipes to clean the F-theta lens. Make sure to remove any dust from the lens.

4. Re-install the laser cover (→ Fig. 13-4) of the laser module.
5. Close the lid of side maintenance window (→ Fig. 4-13).

Outer surfaces

- Clean the outer surfaces (including those of the automated slide unload station) with a mild detergent and subsequently dry the surface with a slightly moistened cloth.
- Do not use any solvents for cleaning the outer surfaces and the lid!

Basic Instrument Screen

- Before cleaning the touch screen, turn off the instrument by tapping the **Leica** icon (→ Fig. 25-5). Use a lint-free cloth moistened with 70% ethanol to wipe the screen. Avoid using abrasive cleaners or strong solvents. If needed, use the plastic scraper to remove visible paraffin. Clean the screen weekly for optimal maintenance.

Scanner Screen

- Gently wipe the scanner with a lint-free cloth moistened with 70% ethanol. Do not use abrasive cleaners or strong solvents. Clean the screen weekly for optimal maintenance.

6.2 Changing the dust bag/carbon filter/HEPA filter (standard filter)

> **(!) Note**
>
> - For on-demand printing workflow: The dust bag (→ Fig. 13-1) should be changed once a month at the latest or after 4,000 prints. The carbon filter (→ Fig. 13-3) and HEPA filter (→ Fig. 13-2) should be changed by quarter at the latest or after 20,000 prints.

When the dust bag, the carbon filter or the HEPA filter reach their maximum service life, a warning message will pop up on the screen and remind you to replace them. To do so, follow below steps:

1. Open the lid of side maintenance window (→ Fig. 12-5).
2. Open the cover and replace the dust bag, the carbon filter and/or the HEPA filter.

6.3 Changing the dust bag/batch filter-HEPA carbon (batch filter)

> **(!) Note**
>
> - For batch printing workflow: The dust bag (→ Fig. 5-18) of batch filter should be changed once a month at the latest or after 20,000 prints. The batch filter-HEPA carbon (→ Fig. 5-19) should be changed by quarter at the latest or after 60,000 prints.

When the dust bag and/or the batch filter-HEPA carbon reach their maximum service life, a warning message will pop up on the screen and remind you to replace them. To do so, follow below steps.

1. Open the lid of batch filter (→ Fig. 4-16).
2. Replace the dust bag, and/or the batch filter-HEPA carbon.

6.4   General maintenance

The printer is virtually maintenance-free.

To ensure smooth operation of the instrument over many years, we do recommend the following:

- Clean the instrument thoroughly on a regular basis.
- Regularly remove dust from the ventilation slots on the back of the instrument using a brush or a small vacuum cleaner.
- Have the instrument inspected once per year by a qualified service engineer authorized by Leica.
- At the end of the warranty period, enter a service contract. For more information, please contact your local Leica technical service center.

6.5   Replacing fuses

Use only the supplied replacement fuses. Both fuses must have the same rating (check the imprint). Replace the fuses in pairs.

7. Troubleshooting

7.1 Error codes

When an instrument error occurs, an error code will appear on the screen. The table below lists the error codes that may be displayed.

Follow the instructions in the column of User action. For further instructions, please refer to (→ p. 63 − A2. Warranty and Service).

Error code	Description	Instrument behavior	User action
2.1.10	Abnormal status, remove debris	Stop before self-test.	1. Restart the instrument and check if the error code still exists.
			2. If the error code still exists, call service.
4.1.10	Loading magazine B error	Stop printing and slides transportation.	1. Remove stuck slides on load station B according to on-screen guidance.
			2. If the error code still exists, call service.
4.1.12	Loading magazine A error	Stop printing and slides transportation.	1. Remove stuck slides on load station A according to on-screen guidance.
			2. If the error code still exists, call service.
4.1.13	Loading channel error	Stop printing and slides transportation	1. Remove stuck slides on transportation area according to on-screen guidance.
			2. If the error code still exists, call service.
5.3.10	Unloading transferring error	Stop printing and slides transportation.	1. Remove stuck slides on unloading channel according to on-screen guidance.
			2. If the error code still exists, call service.
5.3.11	Slide orientation error in magazine A.	Stop printing, then perform self-test.	1. Pull out magazine A to check slide orientation.
			2. Re-load slides with printing area towards the user.
			3. If the error code still exists, call service.
5.3.12	Slide orientation error in magazine B	Stop printing, then perform self-test.	1. Plug out magazine B to check slide orientation.
			2. Re-load slides with printing area towards the user.
			3. If the error code still exists, call service.
7.6.10	Batch unloading error	Stop printing and slides transportation.	1. Shut down the instrument.
			2. Dis-assemble batch station to remove stuck slides.
			3. Assemble batch station.
			4. Power on.
			5. If the error code still exists, call service.

Error code	Description	Instrument behavior	User action
7.6.11	Batch collecting error	Stop printing and slides transportation.	1. Shut down the instrument. 2. Remove stuck slides on batch collecting channel. 3. Power on. 4. If the error code still exists, call service.

7.2 Power failure

- Check whether there is a general power failure (no power).
- Check whether the power plug is inserted correctly into the wall outlet and whether the wall outlet is switched on, if applicable.
- Check whether the power switch is switched on correctly. The primary fuses may be defective. Replace with new ones.

7.3 Possible faults

Problem	Possible cause	Corrective action
Printing density is low.	• Dust on F-theta lens • Laser power damps after long time aging.	• Call service for maintenance of F-theta lens. • Suggest replacing laser module after 1 million prints.
Laser doesn't work.	• Laser needs warm-up after power on • Laser is over-temperature.	• Please wait 3 minutes after power-on to execute printing task. • Shut down the instrument.
Dust and fume overflow.	• Filter expired.	• Exchange filter and dust bug according to suggested frequency.
Slides jamming on load station.	• Slides are stuck together and fail to exit. • Debris at the bottom of the magazine. • Debris on the loading rail.	• Use qualified slides specified in the Instructions for Use. • Clear the magazine. • Clear the loading track.
Magazine jamming during magazine channel selection.	• Debris in the up/down rail of the magazine. • Debris in the down rail and the magazine cannot lower down.	Open the maintenance windows and clear the up/down rail.

8. Ordering information

Part description	Order No.
Scanner	14 0610 61591
Slide stacker	14 0610 61490
Batch filter	14 0610 62260
Magazine A	14 0610 61745
Magazine B	14 0610 61746
Dust bag	14 0610 61918
Carbon filter	14 0610 61517
HEPA filter	14 0610 61518
Dust bag - Batch	14 0610 62288
Batch filter-HEPA Carbon	14 0610 62291
Slide chute	14 0610 61758

A1. Decontamination Confirmation

Any product that is to be returned to Leica Biosystems or serviced on site must be properly cleaned and decontaminated. Please find the dedicated template for confirming decontamination by using the search function on our website at www.LeicaBiosystems.com. This template must be used to enter all required data.

If a product is returned, a copy of the completed and signed decontamination certificate must either be enclosed or handed over to a service technician. The user shall be responsible for products that are returned without a completed decontamination certificate or with a missing decontamination certificate. Return shipments that are classified by the company as a potential hazard source will be returned to the sender at his/her own expense and risk.

A2. Warranty and Service

Warranty

Leica Biosystems Nussloch GmBH guarantees that the contractual product delivered has been subjected to a comprehensive quality control procedure based on the Leica in-house testing standards, and that the product is faultless and complies with all warranted technical specifications and/or agreed-upon characteristics.

The scope of the warranty is based on the contents of the contract concluded. The warranty terms of your Leica sales organization or the organization from which you have purchased the contractual product shall apply exclusively.

Service information

If you are in need of technical customer support or spare parts, please contact your Leica representative or the Leica dealer where you purchased the instrument.

The following information about the instrument is required:

- Model name and serial number of the instrument.
- Location of the instrument and name of a contact person.
- Reason for the service call.
- Date of delivery.

⚠️ **Warning**

To prevent damage to the instrument and specimens, only those accessories and spare parts that have been authorized by Leica may be installed or used with the instrument.

Decommissioning and disposal

The instrument or parts of the instrument must be disposed of according to existing applicable, local regulations.

Physical life

The physical life of the equipment is 7 years or 1 million times printing. Physical life of this product is determined according to actual situation after launching product in local market. Users have to maintain the product according to the requirements of the Instructions for Use and have to ensure that the product can be used safely and effectively.

Notes

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