

ImageQuant™ LAS 500

Operating Instructions

Original instructions



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1 Introduction

Purpose of this manual

The Operating Instructions provide you with the instructions needed to handle ImageQuant LAS 500 in a safe way.

Prerequisites

In order to operate ImageQuant LAS 500 in the intended way, the following prerequisites must be fulfilled:

- You have read and understood the safety instructions outlined in this Operating Instruction
 - You should be acquainted with the use of general laboratory equipment and with handling of biological materials
 - The instrument is installed according to the instructions in this Operating Instruction
-

About this chapter

This chapter contains important user information, description of safety notices, regulatory information and a general description of the intended use of ImageQuant LAS 500.

In this chapter

This chapter contains the following sections:

Section	See page
1.1 Important user information	6
1.2 Regulatory information	8

1.1 Important user information

Read this before operating the product



All users must read the entire *Operating Instructions* before installing, operating or maintaining the product.

Always keep the *Operating Instructions* at hand when operating the product.

Do not operate the product in any other way than described in the user documentation. If you do, you may be exposed to hazards that can lead to personal injury and you may cause damage to the equipment.

Intended use

ImageQuant LAS 500 is a CCD camera system that produces digital images of chemiluminescent and fluorescent samples or stained gels and membranes. ImageQuant LAS 500 is intended for research use only, and shall not be used in clinical procedures, or for diagnostic purposes.

Safety notices

This user documentation contains safety notices (WARNING, CAUTION, and NOTICE) concerning the safe use of the product. See definitions below.



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. It is important not to proceed until all stated conditions are met and clearly understood.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It is important not to proceed until all stated conditions are met and clearly understood.



NOTICE

NOTICE indicates instructions that must be followed to avoid damage to the product or other equipment.

Notes and tips

Note: *A note is used to indicate information that is important for trouble-free and optimal use of the product.*

Tip: *A tip contains useful information that can improve or optimize your procedures.*

Typographical conventions

Software items are identified in the text by ***bold italic*** text. A colon separates menu levels, thus ***File:Open*** refers to the ***Open*** command in the ***File*** menu.

Hardware items are identified in the text by **bold** text (for example, **Power**).

1.2 Regulatory information

This section describes the directives and standards that are fulfilled by the ImageQuant LAS 500.

Manufacturing information

The table below summarizes the required manufacturing information. For further information, see the EU Declaration of Conformity (DoC) document.

Requirement	Content
Name and address of manufacturer	GE Healthcare Bio-Sciences AB, Björkgatan 30, SE 751 84 Uppsala, Sweden

Conformity with EU Directives

This product complies with the European directives listed in the table, by fulfilling the corresponding harmonized standards.

Directive	Title
2006/42/EC	Machinery Directive (MD)
2004/108/EC	Electromagnetic Compatibility (EMC) Directive
2006/95/EC	Low Voltage Directive (LVD)

International standards

This product fulfills the requirements of the following standards:

Standard	Description	Notes
IEC/EN 61010-1, IEC 610101-2-010, IEC 61010-2-081, UL 61010-1, CAN/CSA-C22.2 No. 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use	EN standard 61010-1 harmonized with EU directive 2006/95/EC

Standard	Description	Notes
IEC/EN 61326-1, FCC Part 15 B Class A, ICES-003 Class A	Electrical equipment for measurement, control and laboratory use - EMC requirements.	EN standard 61326-1 harmonized with EU directive 2004/108/EC
EN ISO 12100	Safety of machinery. General principles for design. Risk assessment and risk reduction.	
EN 60529	Degrees of protection provided by enclosures	
UL94-V2	Standard for safety of flammability of plastic materials for parts in devices and appliances testing	

CE marking



The CE marking and the corresponding EU Declaration of Conformity is valid for the instrument when it is:

- used as a stand-alone unit, or
- connected to other products recommended or described in the user documentation, and
- used in the same state as it was delivered from GE, except for alterations described in the user documentation.

FCC compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: *The user is cautioned that any changes or modifications not expressly approved by GE could void the user's authority to operate the equipment.*

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Environmental Conformity

Directive	Title
2011/65/EU	Restriction of Hazardous Substances (RoHS) Directive
2012/19/EU	Waste Electrical and Electronic Equipment (WEEE) Directive
ACPEIP	Administration on the Control of Pollution Caused by Electronic Information Products, China Restriction of Hazardous Substances (RoHS)
Regulation (EC) No 1907/2006	Registration, Evaluation, Authorization and restriction of Chemicals (REACH)

Regulatory compliance of connected equipment

Any equipment connected to ProductNameHWComplete should meet the safety requirements of EN/IEC 61010-1, or relevant harmonized standards. Within EU, connected equipment must be CE marked.

Light sources

The safety of the LED light sources in this equipment has been assessed by risk analysis in accordance with EN 61010-1.

ImageQuant LAS 500 is equipped with three LED light sources:

LED	Wavelength
Blue Epi light	460 nm
UV Epi light	365 nm

LED	Wavelength
White Epi light	470 to 635 nm

2 Safety instructions

About this chapter

This chapter describes safety precautions, safety labels and emergency procedures for ImageQuant LAS 500, in addition to information about disposal of the instrument.

In this chapter

This chapter contains the following sections:

Section	See page
2.1 Safety precautions	13
2.2 Labels	20
2.3 Emergency procedure	23
2.4 Recycling information	24
2.5 Declaration of Hazardous Substances (DoHS)	25

2.1 Safety precautions

Introduction

ImageQuant LAS 500 is powered by mains voltage and is used to image samples that may be hazardous. Before installing, operating or maintaining the equipment, you must be aware of the hazards described in the user documentation. Follow the instructions provided to avoid personal injury or damage to the equipment.

General precautions



WARNING

Do not use the equipment if smoke, strange noises or strange odors can be perceived, or if the equipment becomes unusually hot. This may result in fire or electric shock.

Stop using the equipment immediately, turn off the power switch and unplug the equipment from the power outlet. Contact your local GE representative to request repair.



WARNING

Do not damage the power supply cord by bending, twisting, heating or allowing them to become pinned under the equipment. Using damaged power cords could result in fire or electric shock.

If the power supply cords are damaged, contact your local GE representative for replacements.



WARNING

Access to power switch and power cord with plug. Do not block access to the power switch and power cord. The power switch must always be easy to access. The power cord with plug must always be easy to disconnect.

2 Safety instructions

2.1 Safety precautions



CAUTION

Use of this equipment in other ways than those specified in the user documentation may result in hazardous UV radiation exposure.



CAUTION

Do not block the vents and ensure that the vents are kept free of dust and dirt. Blockage of the vents can result in overheating of the equipment and malfunction. Place the instrument so that there is at least 20 cm in front of the machine to the walls or other equipment, and 10 cm on all other sides to ensure adequate cooling.



NOTICE

This equipment is for laboratory use only.

Personal protection



CAUTION

Parts of this equipment may emit UV radiation. Avoid exposure. Wear protective clothing and eyewear. UV radiation can cause severe burns and long-term injury to the skin and eyes.



CAUTION

If the door is opened and the interlock has been tampered with, UV and visible light will be emitted.

Do not stare at the light emitted from the light sources. This may impair vision.



CAUTION

Always wear gloves, protective glasses and a lab coat or similar when handling samples.

Installing and moving the instrument



WARNING

Use a proper power cord that complies with the local laws and regulations, and is delivered by GE. Do not change power cord to inappropriate one.



WARNING

In USA and Europe (Belgium, Netherlands, Luxemburg, Germany, France, Italy, Denmark, Greece, Spain, Portugal, Austria, Finland, Sweden, Poland, Hungary, Czech, Slovenia, Slovakia, Estonia, Latvia, Lithuania, and Romania), use the proper power cord included in the product package. In other countries, use the proper power cord delivered separately from the product package by GE. Do not change AC power cord to inappropriate one.



WARNING

Connect the power supply directly to a grounded wall power outlet. The use of extension cords or multiple loads on one electrical outlet could result in fire and electric shock.



CAUTION

Do not place the equipment on unstable tables or on inclined surfaces, as the equipment could be tipped over or fall, resulting in injury.



CAUTION

Do not place the equipment or parts in direct sunlight. This may degrade performance.

2 Safety instructions

2.1 Safety precautions



CAUTION

Turn off the power switch and remove connecting cables before moving the equipment.



NOTICE

Do not connect telephone lines to the LAN connector.

Only the IEC 60950-I/VL 60950-1 standard non-shielded cables are appropriate for connection to this connector.

Operation



WARNING

Do not use the equipment within or near a sink, or in humid or dusty environments. Fire and electric shock could result.



WARNING

If thunder can be heard, do not touch the power supply plug, or electric shock could result.



CAUTION

Reagents used to prepare the sample should be used in accordance with the manufacturer instructions.



CAUTION

Do not lean on the sample door, it might cause breakage to the equipment or the machine to tip over and injure you.



CAUTION

When opening or closing the door use the handle. Take care not to catch objects or fingers in the door when closing.



CAUTION

Do not place heavy objects on the equipment. These may fall and cause injury.



CAUTION

Do not turn the power off during image capture and saving. This may damage the system files.



CAUTION

Do not leave samples in the equipment after exposure. If left, these may degrade and cause damage.



CAUTION

Remove all traces of acidic sample solutions to prevent corrosion in the equipment.



NOTICE

Avoid touching the windows of the light sources and the lens. This may degrade performance.



NOTICE

Do not scratch or drop the filter. This may degrade performance.

2 Safety instructions

2.1 Safety precautions



NOTICE

When using incremental exposure mode, images that are not selected will be deleted at saving.

Maintenance



WARNING

Do not attempt to modify the equipment, or fire and electric shock could result.



WARNING

Do not use excessive amounts of liquids for cleaning the ImageQuant LAS 500, this may result in product malfunction or electric shock.



CAUTION

Wear gloves to prevent direct contact with chemical substances.



CAUTION

Turn the power switch off before cleaning the inside of the equipment.



CAUTION

Unplug the equipment if it will not be used for an extended period.



CAUTION

Take care when connecting the power cord. Do not tug at the power cord, and do not handle the connection plugs with wet hands.



CAUTION

Do not press too hard onto the surface of the touch screen. This may cause the surface to break and lead to injury.



NOTICE

Do not use abrasive cleaning materials, such as a scouring pad, for cleaning. This may scratch the surface.

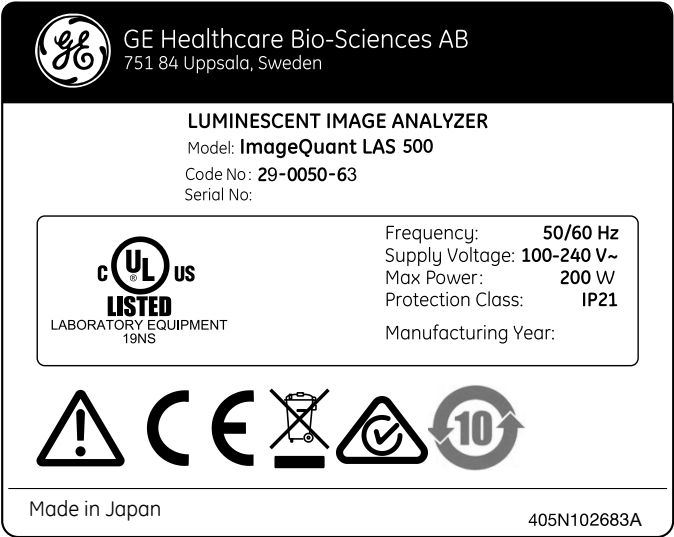
2.2 Labels

Introduction

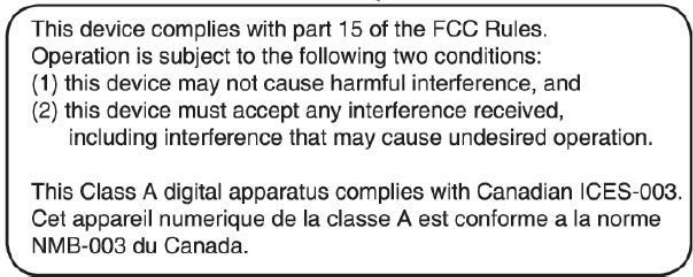
On the exterior of ImageQuant LAS 500 there are labels that describe equipment specifications and precautions necessary to safely use ImageQuant LAS 500. This section lists the symbols used on the instrument and labels and additional information.

Labels on the instrument

The ImageQuant LAS 500 instrument label is located at the rear of the unit.










The FCC and ICES-003 label is located at the rear of the unit.



Symbols on the labels and instrument

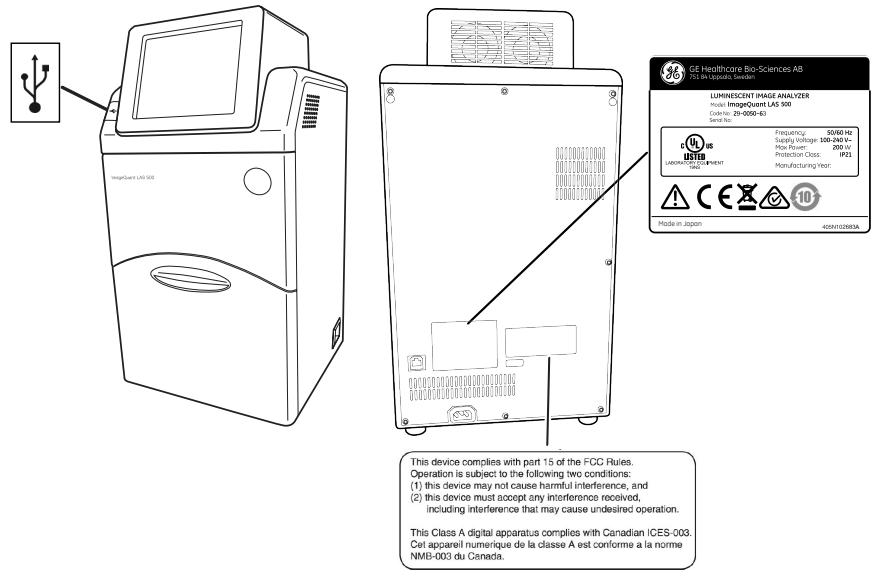
The following symbols are used in the label and on the instrument:

Label	Meaning
	Warning! Read the Operating Instruction before using the system. Do not open any covers or replace parts unless specifically stated in the Operating Instruction.
	The system complies with the requirements for electromagnetic compliance (EMC) in Australia and New Zealand
	The system complies with applicable European directives
	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.
	This symbol indicates that the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronics, for more information see <i>Section 2.5 Declaration of Hazardous Substances (DoHS)</i> , on page 25
	This symbol indicates that the system has been certified by a Nationally Recognized Testing Laboratory (NRTL). An NRTL is an organization that the Occupational Safety and Health Administration (OSHA) has recognized as meeting the legal requirements in USA title 29 of the Code of Federal Regulations (29 CFR) Part 1910.7.
	This symbol indicates the connection point for the USB flash drive on ImageQuant LAS 500

2 Safety instructions

2.2 Labels

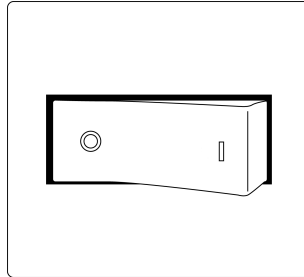
Position of labels and symbols



2.3 Emergency procedure

In case of emergency:

- Turn off the power by pushing the **Power** switch to the **O** position on the bottom right hand side of the instrument.



- Disconnect the power cord from the wall socket.



WARNING

Access to power switch and power cord with plug. Do not block access to the power switch and power cord. The power switch must always be easy to access. The power cord with plug must always be easy to disconnect.

2.4 Recycling information

Introduction

This section contains information about the decommissioning of the ImageQuant LAS 500 system.

Decontamination

The equipment and the accessories must be clean from contaminants before decommissioning and all local regulations must be observed with regard to waste disposal. Samples are to be disposed of according to local regulations.

Disposal, general instructions

When taking ImageQuant LAS 500 out of service, the different materials must be separated and recycled according to national and local environmental regulations.

Disposal of electrical components

Waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of the equipment.



2.5 Declaration of Hazardous Substances (DoHS)

根据SJ/T11364-2006《电子信息产品污染控制标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2006 Marking for Control of Pollution caused by Electronic Information Products.

电子信息产品污染控制标志说明

Explanation of Pollution Control Label



该标志表明本产品含有超过SJ/T11363-2006《电子信息产品中有毒有害物质的限量要求》中限量的有毒有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限。单位为年。

为保证所声明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的期维修和保养要求。

产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所声明的整个产品的环保使用期限。

本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。

This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period during which the toxic or hazardous substances or elements contained in electronic information products will not leak or mutate under normal operating conditions so that the use of such electronic information products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is "Year".

In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.

Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.

This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

有毒有害物质或元素的名称及含量
Name and Concentration of Hazardous Substances

产品中有毒有害物质或元素的名称及含量
Table of Hazardous Substances' Name and Concentration

部件名称 Component name	有毒有害物质或元素 Hazardous substance					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	Pb	Hg	Cd	Cr6+	PBB	PBDE
29-0050-63	X	0	0	0	0	0

- 0: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下
- X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求
- 此表所列数据为发布时所能获得的最佳信息
- 0: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.
- X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.
- Data listed in the table represents best information available at the time of publication.

3 System description

About this chapter

This chapter contains information on the ImageQuant LAS 500 hardware components, accessories, start screen and a feature overview.

In this chapter

This chapter contains the following sections:

Section	See page
3.1 Feature overview	28
3.2 Hardware	29
3.3 Start screen and capture tab	31
3.4 Accessories	35

3.1 Feature overview

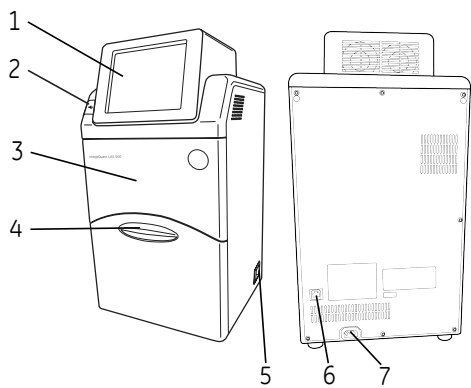
The following features are offered by the ImageQuant LAS 500:

- A highly sensitive CCD camera with 8.3 megapixels
 - Semi-auto and incremental exposure modes provide the best possible images in areas of interest
 - Fast cooling capacity
 - Easy to install and ready to use within 5 minutes after start up
 - Touch screen interface
 - Chemiluminescence imaging with high sensitivity
 - Generation of a combined color image of a chemiluminescence sample image and a white light image of a color marker
 - Fluorescence imaging using blue and UV Epi light sources
 - Photos of stained gels or membranes obtained by white light illumination
 - Intuitive design with easy to use image analyzing tools
-

3.2 Hardware

ImageQuant LAS 500 exterior

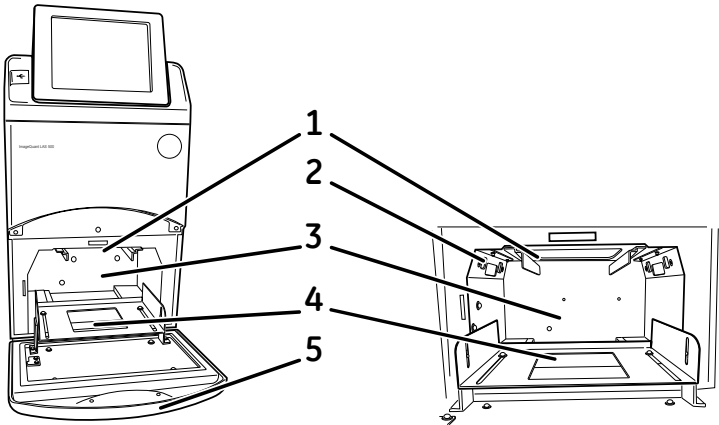
The following illustrations show the main hardware components on the outside of ImageQuant LAS 500.



Part	Name	Description
1	Touch screen	User interface
2	USB port	USB 2.0 port for connection of USB flash drive Note: <i>Password protected USB flash drives are not supported.</i>
3	Body	Instrument dark box
4	Door	Instrument door
5	Power switch	Toggle switch: I Power ON O Power OFF
6	Ethernet port	Connector for network cable (Ethernet)
7	Power connector	Connector for AC power cord

ImageQuant LAS 500 interior

The following illustrations show the main hardware components on the inside of ImageQuant LAS 500.



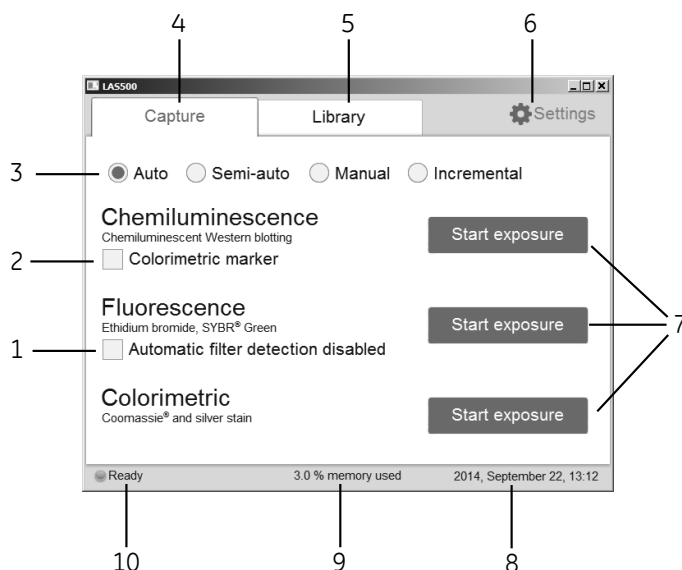
Part	Name	Description
1	Filter loading slot	Slot for orange filter. Used for detection of fluorescence above 560 nm.
2	Epi light sources	Light sources: <ul style="list-style-type: none">• Combined Blue (460 nm) and UV (365 nm) Epi light• White (470 to 635 nm) Epi light
3	Sample chamber	Dark compartment where the tray is placed
4	Tray guide	Supports and positions the tray
5	Door	Instrument door

3.3 Start screen and capture tab

Start screen, capture tab (**Auto**)

The **Capture** tab is shown on the start screen when the ImageQuant LAS 500 startup is complete. This screen allows the selection of capture methods and exposure settings. The **Capture** tab has automatic exposure time, **Auto**, as default at startup.

The following illustration and table show the main components of the **Capture** tab when automatic exposure time is selected.



Part	Function
1	Check the Automatic filter detection disabled box if a fluorescence sample is larger than the image area (15×10 cm) or the automatic filter detection fails.
2	Check the Colorimetric marker box when colorimetric markers are used with chemiluminescent samples.
3	Buttons for selecting exposure options; Auto , Semi-auto , Manual , and Incremental . At startup, the automatic exposure time (Auto) is set to default. Note: <i>For more information about the exposure modes, see Section 5.4.1 Chemiluminescence capture, on page 57 and Section 5.4.2 Fluorescence capture, on page 79.</i>

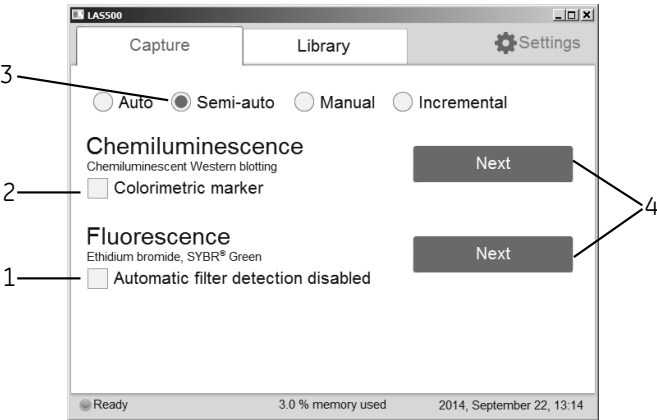
3 System description

3.3 Start screen and capture tab

Part	Function
4	Capture tab: choose imaging method and start the capture.
5	Library tab: image file handling.
6	Settings icon: adjust system and network related settings.
7	Start exposure buttons for one of the following methods: <ul style="list-style-type: none">• Chemiluminescence (with or without colorimetric marker)• Fluorescence (with or without automatic filter detection)• Colorimetric Tap on any of the Start exposure buttons to capture an image.
8	Date and time. The date and time can be set in Settings , see <i>Section 6.3 Date and time, on page 121</i> for further instructions.
9	Number of files stored on the device, as % available memory.
10	Status of the ImageQuant LAS 500; Ready , Not Ready or Capture in progress .

Capture tab (Semi-auto)

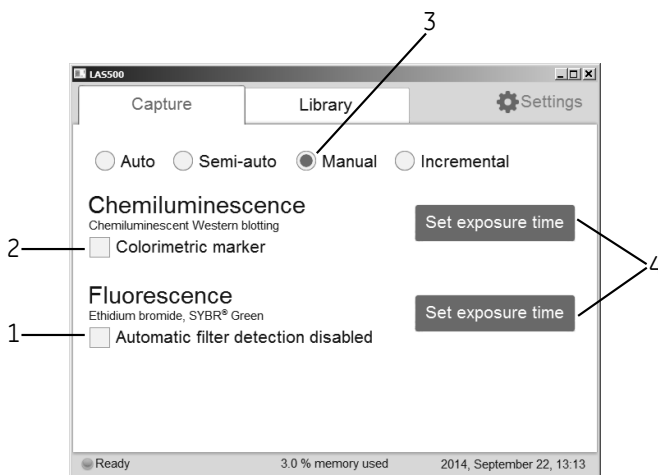
The following illustration and table shows the main components of the **Capture** tab when the **Semi-auto** radio button is selected.



Part	Function
1	Check the Automatic filter detection box when a fluorescence sample is larger than the image area (15×10 cm) or if the automatic filter detection fails.
2	Check the Colorimetric marker box when colorimetric markers are used with chemiluminescent samples.
3	Button for Semi-auto . A short pre-exposure is performed which results in an image. This allows you to select the area of the sample image to focus on. The software automatically calculates the optimal exposure time for the specific area.
4	Next button to set a specific area of interest in the fluorescence or chemiluminescence samples (with or without colorimetric markers) samples.

Capture tab (Manual)

The following illustration and table show the components of the **Capture** tab when the **Manual** radio button is selected.

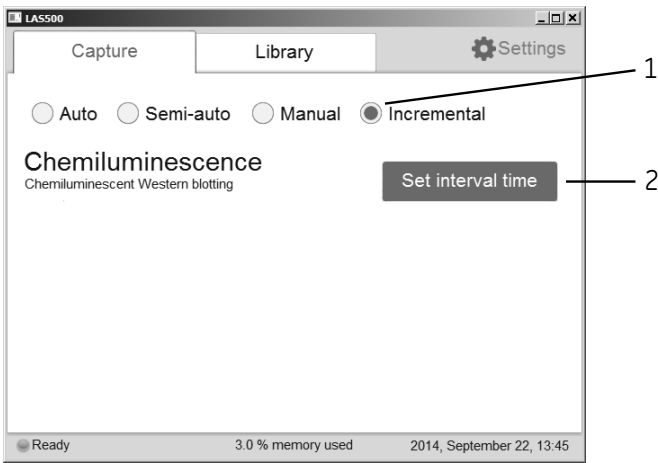


Part	Function
1	Check the Automatic filter detection disabled box when a fluorescence sample is larger than the image area (15×10 cm) or if the automatic filter detection fails.

Part	Function
2	Check the Colorimetric marker box when colorimetric markers are used with chemiluminescent samples.
3	Radio button for Manual . The exposure time will be set manually, see <i>Section 5.4.4 Set the exposure and interval time, on page 96</i> for more information on how to set the time.
4	Tap the Set exposure time button for fluorescence or chemiluminescence samples (with or without colorimetric markers) to set the exposure time.

Capture tab (*Incremental*)

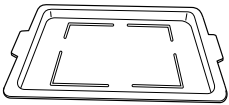
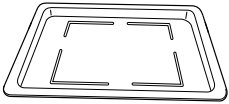


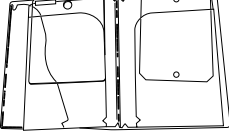

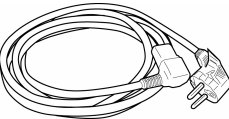
The following illustration and table shows the components of the **Capture** tab when *Incremental* radio button is selected.



Part	Function
1	The Incremental radio button allows the capture of sequential images.
2	The Set interval time button is used to set the number of repetitions and interval times between exposures to capture sequential images for chemiluminescence samples.

3.4 Accessories

The following table show the accessories included in the ImageQuant LAS 500 system.

Part	Description	Article Number
	Protein tray	29005067
	DNA tray	29005066
	White insert for gels or membranes with colorimetric marker and stains	29005069
	Orange filter (560LP) for detection of fluorescence above 560 nm	29005068
	Accessories case	29005070
	AC power cord (For North America)	80648033
	AC power cord (For Europe)	19244801

4 Installation

About this chapter

This chapter contains information on how to unpack, install, and transport the ImageQuant LAS 500 system.

In this chapter

This chapter contains the following sections:

Section	See page
4.1 Site requirements	37
4.2 Unpacking	38
4.3 Instrument set up	41
4.4 Connection to network or USB flash drive	44
4.5 Transport	48

4.1 Site requirements

The following table gives a summary of power supply and environmental requirement.

Parameter	Requirement
Supply voltage	100 to 240 V~
Phases	Single phase (with 3P ground pole)
Frequency	50/60 Hz
Maximum power	200 W
Grounding	<p>ImageQuant LAS 500 must be connected to a grounded AC power outlet.</p> <p>It is necessary to connect the AC power cord of this equipment to a 2P+E type AC outlet for the safety of human bodies, external noise protection and stable operation.</p>
Ambient temperature	<p>Operation: 18°C to 28°C</p> <p>Transportation/Storage: -25°C to 70°C</p>
Placement	<p>The placement of the ImageQuant LAS 500 must fulfill the following requirements:</p> <ul style="list-style-type: none"> • A stable laboratory bench, with a load capacity of 490 N (50 kg) or higher, and levelness within 2° • At least 20 cm of free space in front of the machine and 10 cm on all other sides • Out of direct sunlight
Humidity	<p>Operation: 15% to 70%, non-condensing</p> <p>Transportation/Storage: 5% to 95%, non-condensing</p>

4.2 Unpacking

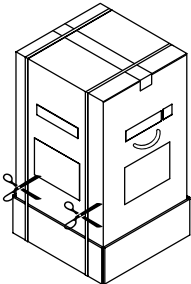
Visual inspection

- Check that all equipment is in the crate according to the packing list.
- Check the equipment for damage and document it carefully if found, before starting installation.

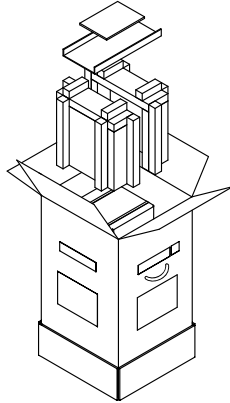
If any equipment is missing or damage are found, contact your GE representative immediately.

Unpacking instruction

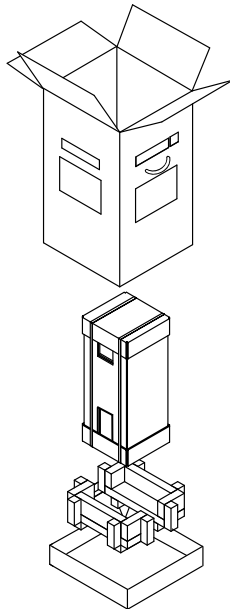
Follow the instructions, to unpack the ImageQuant LAS 500 system:

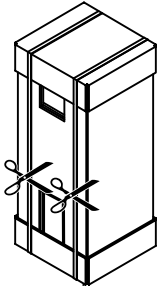
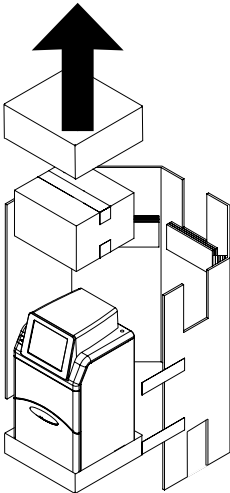
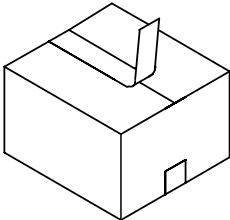
Step	Action
1	Cut the polypropylene bands.
	
2	Remove the tape at the top of the box.

Step	Action
3	Open the top of the box and remove the <i>Operating Instructions</i> and the upper padding.



4	Remove the upper packaging of the box from the bottom packaging, then lift the inner box out of the bottom padding and packaging.
---	-----------------------------------------------------------------------------------------------------------------------------------

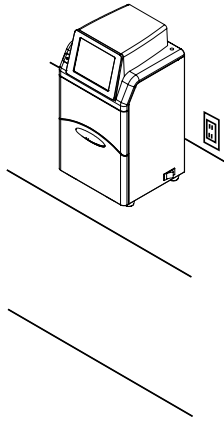


Step	Action
5	Cut the polypropylene bands of the inner box. <div></div>
6	Remove the top packaging of the box, the accessories box, and the packaging surrounding the instrument. <div></div>
7	Unpack the accessories box. <div></div>
8	Continue to <i>Section 4.3 Instrument set up, on page 41</i> to set up ImageQuant LAS 500.

4.3 Instrument set up

Follow the instructions, to set up ImageQuant LAS 500.

Step	Action
1	Lift ImageQuant LAS 500 out of the bottom packaging and place it on a workbench.



CAUTION

Do not place the equipment on unstable tables or on inclined surfaces, as the equipment could be tipped over or fall, resulting in injury.



CAUTION

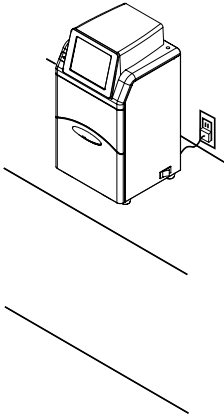
Do not place the equipment or parts in direct sunlight. This may degrade performance.



CAUTION

Do not block the vents and ensure that the vents are kept free of dust and dirt. Blockage of the vents can result in overheating of the equipment and malfunction. Place the instrument at least 20 cm in front and 10 cm on all other sides away from walls or other equipment to ensure adequate cooling.

Step	Action
2	Connect the AC power cord.



WARNING

Use a proper power cord that complies with the local laws and regulations, and is delivered by GE. Do not change power cord to inappropriate one.



WARNING

In USA and Europe (Belgium, Netherlands, Luxemburg, Germany, France, Italy, Denmark, Greece, Spain, Portugal, Austria, Finland, Sweden, Poland, Hungary, Czech, Slovenia, Slovakia, Estonia, Latvia, Lithuania, and Romania), use the proper power cord included in the product package. In other countries, use the proper power cord delivered separately from the product package by GE. Do not change AC power cord to inappropriate one.

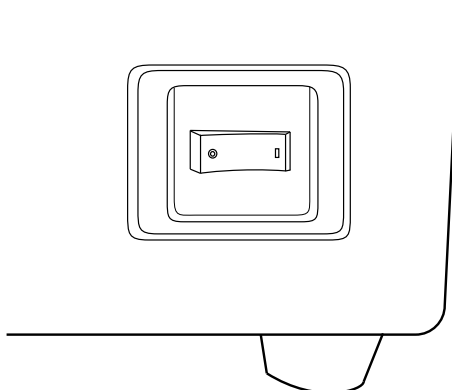


WARNING

Connect the power supply directly to a grounded wall power outlet. The use of extension cords or multiple loads on one electrical outlet could result in fire and electric shock.

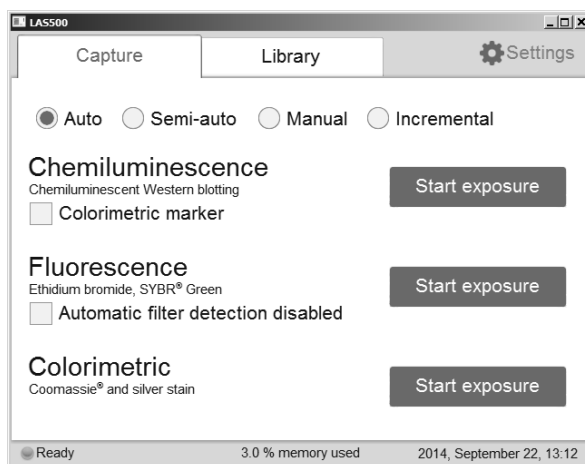
Step	Action
------	--------

- | | |
|---|------------------------------------------------------------------------------------|
| 3 | Turn on the power to the instrument by pushing the power switch to the I position. |
|---|------------------------------------------------------------------------------------|



Result: ImageQuant LAS 500 self-diagnostic starts and a screen with the message **LAS 500 initializing...** appears.

- | | |
|---|-------------------------------------------------------------------------------------------------------------------------|
| 4 | Wait until the start screen is displayed and the message in the lower left corner reads Ready , see image below. |
|---|-------------------------------------------------------------------------------------------------------------------------|



Result: Start-up is now finished.

- | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | Set the date and time by tapping on Settings and choosing Date & Time . For detailed information, go to <i>Section 6.3 Date and time, on page 121</i> . |
| 6 | If desired, go to <i>Section 4.4 Connection to network or USB flash drive, on page 44</i> to install a network. |

4.4 Connection to network or USB flash drive

Virus protection

The ImageQuant LAS 500 does not have any anti-virus software. To avoid disturbances or issues related to computer viruses, the following precautions should be taken:

- Do not connect the ImageQuant LAS 500 directly to the internet. Use an appropriate hardware firewall to protect the instrument from internet related security threats.
- Be careful when connecting USB flash drives to the instrument. If possible, use an anti-virus software installed on an external PC to scan the USB drives for viruses.
- If you, by any reason, suspect that the instrument has been infected by a computer virus, restart the ImageQuant LAS 500 as soon as possible. This should remove the virus from the instrument.

Connect a USB flash drive

The USB flash driver is automatically installed when the USB flash drive is connected to ImageQuant LAS 500.

Note: *Password protected USB flash drives are not supported.*

Connect to a network



NOTICE

Do not connect telephone lines to the Ethernet port.

Only the IEC 60950-1/VL 60950-1 standard non-shielded cables are appropriate for connection to this connector.

Connection to a network enables the addition of **Save locations** and the use of the **ImageQuant LAS 500 web tool**, for more information see *Section 6.2 Save location, on page 118* and *ImageQuant LAS 500 web tool, on page 110*.

There are two options for network set up:

- 1 DHCP
- 2 Static IP

If a DHCP network is used the IP address will be assigned automatically by the DHCP server. If a Static IP network is used the network details have to be entered manually.

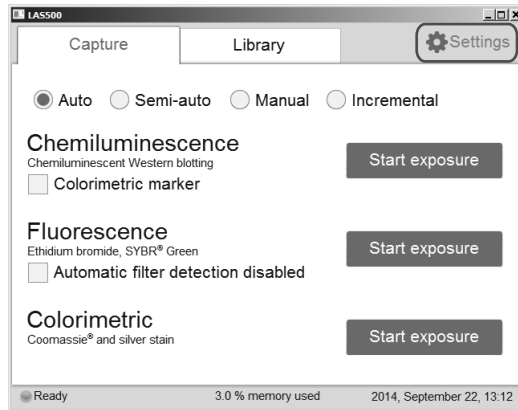
The following subsections give the information necessary to connect to a DHCP network and a Static IP network.

Open the Network window

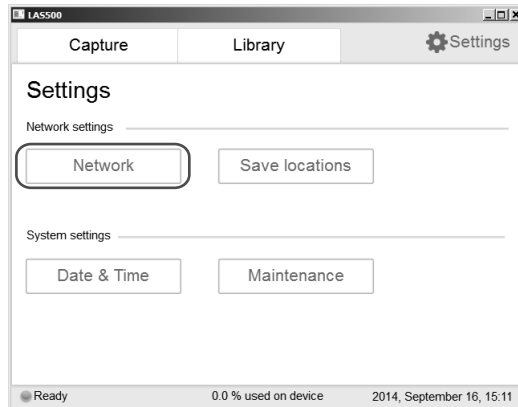
Follow the instructions below, to open the **Network** window:

Step	Action
------	--------

- | | |
|---|---------------------------------------------------|
| 1 | Tap the Settings icon in the start screen. |
|---|---------------------------------------------------|



- | | |
|---|--------------------------------|
| 2 | Tap the Network button. |
|---|--------------------------------|



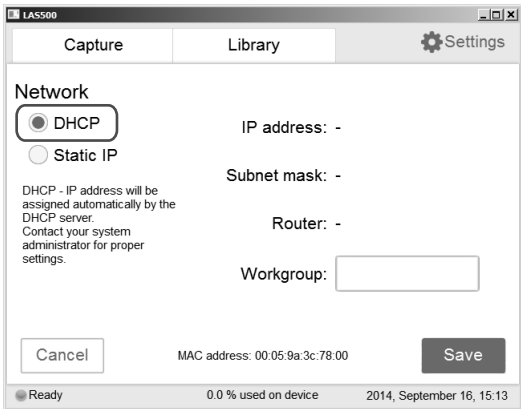
- | | |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | If a connection to a DHCP network is being established, continue to <i>Connect to a DHCP network</i> , on page 46.

If a connection to a Static IP network is being established, continue to <i>Connect to a Static IP network</i> , on page 46. |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Connect to a DHCP network

Follow the instructions below, to connect to a DHCP network:

Step	Action
1	Connect the network cable to the Ethernet port on ImageQuant LAS 500.
2	Tap the DHCP button in the Network window.



- 3 If desired, tap the **Workgroup** field and use the keypad to type the workgroup.
- Note:**
For detailed information on how to use the keypad, go to Keypad, on page 112.
- 4 Tap the **Save** button.
- Result:* An automatic connection to the DHCP network is established within a couple of seconds.

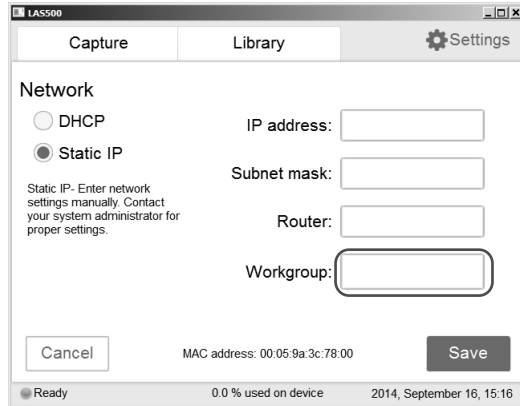
Connect to a Static IP network

Follow the instructions below, to connect to a Static IP network:

Step	Action
1	Connect the network cable to the Ethernet port on ImageQuant LAS 500.

Step	Action
------	--------

- | | |
|---|----------------------------------------------------|
| 2 | Tap Static IP in the Network window. |
|---|----------------------------------------------------|



- | | |
|---|-----------|
| 3 | Tap the : |
|---|-----------|

- **IP address** field and use the keypad to enter the IP address.
- **Subnet mask** field and use the keypad to enter the subnet mask.

If desired, tap the :

- **Router** field and use the keypad to enter the router.
- **Workgroup** field and use the keypad to enter the workgroup.

Note:

For detailed information on how to fill in the network properties and how to use the keypad, see Section 6.4 Network, on page 123 and Keypad, on page 112 respectively.

- | | |
|---|-------------------------------------------------|
| 4 | Tap the Save button to save the changes. |
|---|-------------------------------------------------|

Result: The connection to the Static IP network is established within a couple of seconds.

4.5 Transport

ImageQuant LAS 500 weighs 15 kg.
Before moving the instrument:

Step	Action
1	Turn off the instrument.
2	Disconnect the power cord, USB flash drive and network cable, if present.
3	Remove any loose parts (e.g tray, filter and white insert) from the inside of ImageQuant LAS 500.

5 Operation

About this chapter

This chapter describes how to start and operate the ImageQuant LAS 500 system.

In this chapter

This chapter contains the following sections:

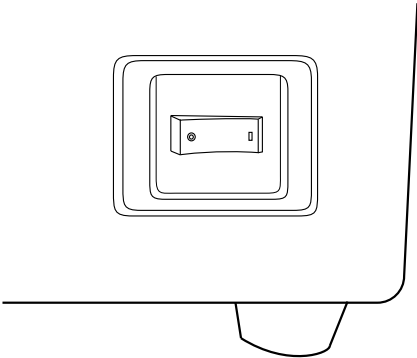
Section	See page
5.1 Start up	50
5.2 Operation overview	52
5.3 Place the sample on a tray	53
5.4 Capture an image	56
5.5 View the images	98
5.6 Save the image	104
5.7 File handling	107
5.8 Software keypad	112
5.9 Shutdown	114

5.1 Start up

Start ImageQuant LAS 500

The following instruction contains all the necessary information to start ImageQuant LAS 500.

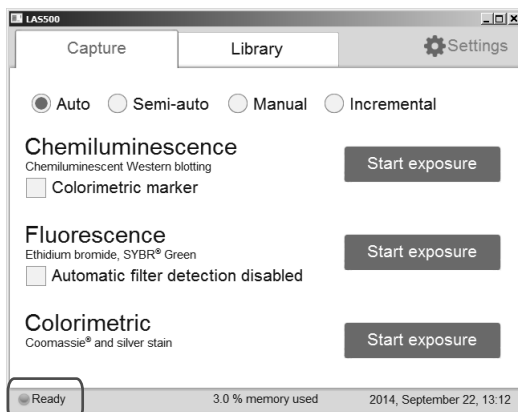
Step	Action
1	Push the power switch on the right side of the instrument to the I position.



Result: ImageQuant LAS 500 self-diagnostic starts and a screen with the message **LAS 500 initializing...** appears.

Step	Action
------	--------

- | | |
|---|-------------------------------------------------------------------------------------------------------------------------|
| 2 | Wait until the start screen is displayed and the message in the lower left corner reads Ready , see image below. |
|---|-------------------------------------------------------------------------------------------------------------------------|



Result: Start-up is now finished.

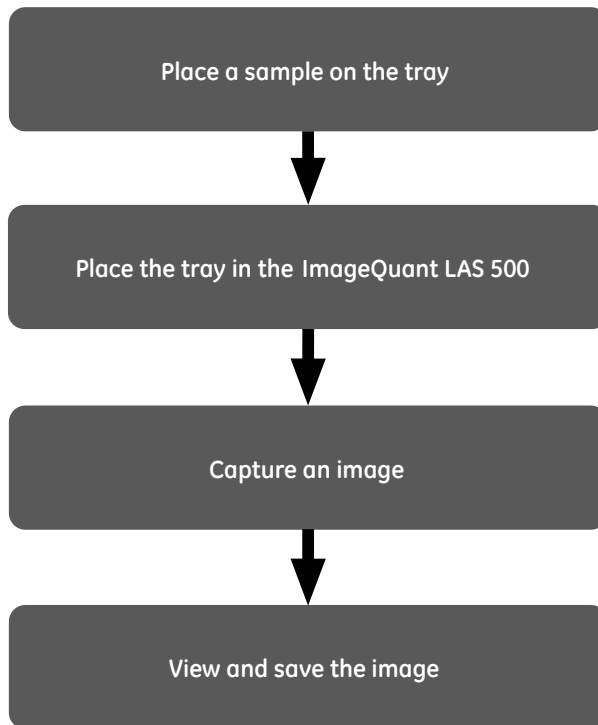
Note:

The self diagnostics will finish within 5 minutes, with the exception of connection to a network environment which may take longer.

5.2 Operation overview

Operation flow chart

The general flow of operation is as follows:



5.3 Place the sample on a tray

Place the sample

This section describes how to choose the appropriate sample tray, how to place the sample on the tray and how to place the tray in ImageQuant LAS 500.

Step	Action
1	Select a suitable sample tray and accessory for the type of capture to be performed from the table below.

Capture method	Sample Type	Tray	White insert	Orange filter
Chemiluminescence	Membrane	Protein tray	No	No
Chemiluminescence with colorimetric marker	Membrane	Protein tray	Yes	No
Fluorescence	Gel (e.g. Deep Purple™)	Protein tray	No	Yes
	Gel (e.g. EtBr/SYBR™ Green) ¹	DNA tray	No	Yes
	Membrane (e.g. Deep Purple)	Protein tray	No	Yes
Colorimetric	Gel (e.g. Coomassie Brilliant Blue™ and Silver stain)	Protein tray	Yes	No
	Membrane (e.g. Ponceau)	Protein tray	Yes	No

¹ To minimize contamination, we recommend the exclusive use of the DNA tray for DNA stains such as EtBr and SYBR Green.

Note:

With regards to third party patents related to sample preparation etcetera, we recommend that you consult a lawyer or patent attorney for obtaining appropriate licenses.

5 Operation

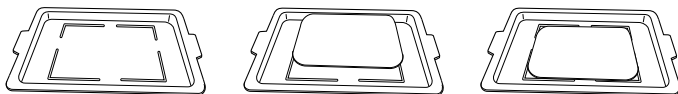
5.3 Place the sample on a tray

Step	Action
------	--------

- | | |
|---|-----------------------------------------------------------------------------------------------------------------------------|
| 2 | Place the sample and if applicable, the white insert, on the sample tray in accordance with the relevant instruction below. |
|---|-----------------------------------------------------------------------------------------------------------------------------|

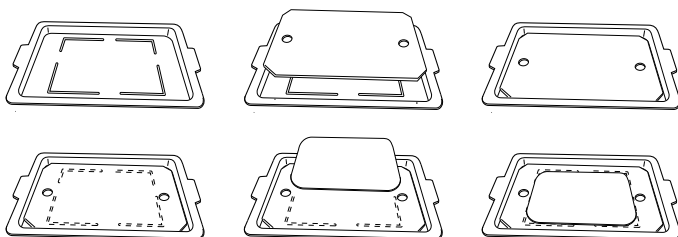
Place membrane or gel on protein tray

Place the gel or membrane within the outlines on the protein tray. Take care not to cover the surrounding area which is used for automatic filter detection and for setting the auto contrast.



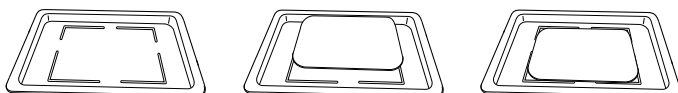
Place white insert and membrane or gel on protein tray

Place the white insert on the protein tray. Place the sample on the white insert, try to place the sample so that it fits within the outlines on the protein tray below the white insert. Take care not to cover the holes of the white insert which are used for automatic filter detection and for setting the auto contrast.

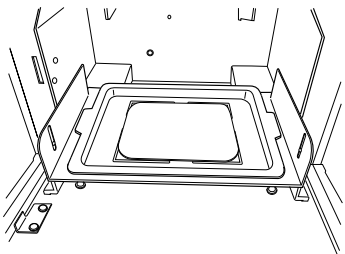


Place gel on DNA tray

Place the gel within the outlines on the DNA tray. Take care not to cover the surrounding area which is used for automatic filter detection and for setting the auto contrast.

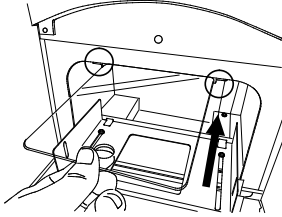


- | | |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Open the door of ImageQuant LAS 500. |
| 4 | Place the tray in ImageQuant LAS 500. Use the tray guide to ensure correct placement. The image below shows the protein tray placed in ImageQuant LAS 500. |



Step Action

- 5 If capturing an image of a fluorescent sample, insert the orange filter.



- 6 Close the door of ImageQuant LAS 500.
-

5.4 Capture an image

Introduction

This section contains all the necessary information to capture an image using one of the following methods:

- Chemiluminescence (with or without colorimetric marker)
 - Fluorescence
 - Colorimetric
-

In this section

This section contains the following sub-sections:

Section	See page
5.4.1 Chemiluminescence capture	57
5.4.2 Fluorescence capture	79
5.4.3 Colorimetric capture	93
5.4.4 Set the exposure and interval time	96

5.4.1 Chemiluminescence capture

Introduction

The instrument captures the light that is emitted during the chemical reaction on the membrane. When a colorimetric marker is present in the sample, an additional color image can be captured using a white light source.

Chemiluminescence exposure options

There are four exposure options for chemiluminescence capture. The table below suggests the options to use in different situations.

When...	Then...
An optimal dynamic range is required:	Select Auto for automatic exposure. A short pre-exposure is performed to determine the signal intensity. The system will use this information to calculate which exposure time will give the highest possible signal below saturation to enable accurate quantification of the sample.
A specific area of a sample is of interest:	Select Semi-auto . A short pre-exposure is performed which results in an image. This allows you to select the area of the sample image to focus on. The software automatically calculates the optimal exposure time for the specified area.
The intensity of the image is inadequate after automatic exposure or a known exposure time is required:	Select Manual exposure and set the exposure time manually.
A sequence of images is required:	Select Incremental exposure and set the number of repetitions and interval time between exposures to capture sequential images.

Note: Do not open the door during exposure as this will stop the exposure and the data will not be saved.

5 Operation

5.4 Capture an image

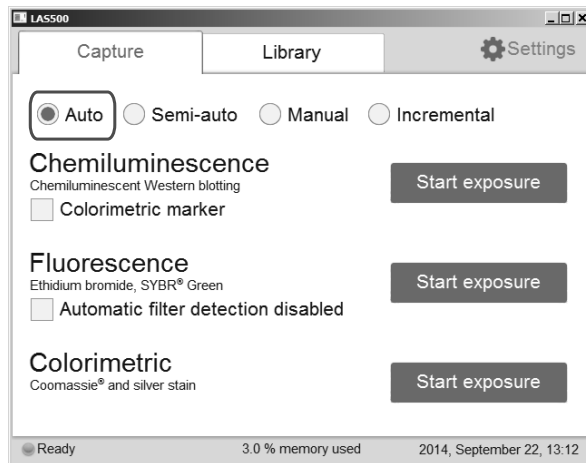
5.4.1 Chemiluminescence capture

Chemiluminescence with automatic exposure time

Follow the instructions below to perform chemiluminescence capture using automatic exposure time.

Step	Action
------	--------

- | | |
|---|----------------------------------------------------------------------------|
| 1 | In the Capture tab, select the Auto button (set as default). |
|---|----------------------------------------------------------------------------|



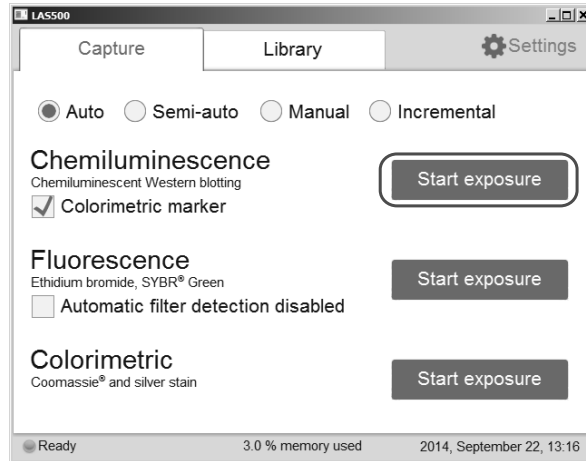
- | | |
|---|-----------------------------------------------------------------------------------------------|
| 2 | If your sample contains a colorimetric marker, then check the Colorimetric marker box. |
|---|-----------------------------------------------------------------------------------------------|



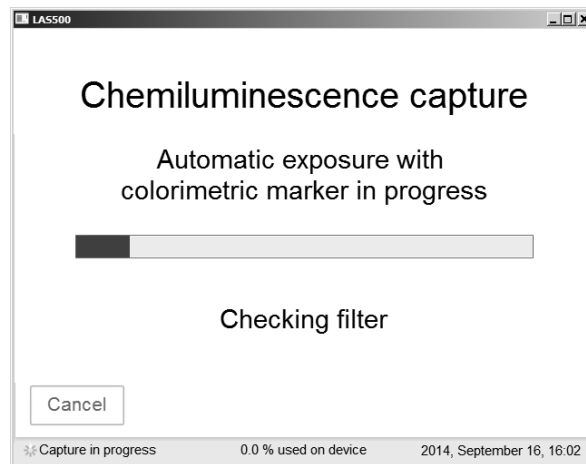
Colorimetric marker

Step	Action
------	--------

3	Tap Start exposure for Chemiluminescence.
---	--------------------------------------------------



Result: Exposure starts after pre-exposure and a progress bar appears on the screen. This indicates the remaining time for the imaging process, the exposure selected and the actual exposure time.



Note:

Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

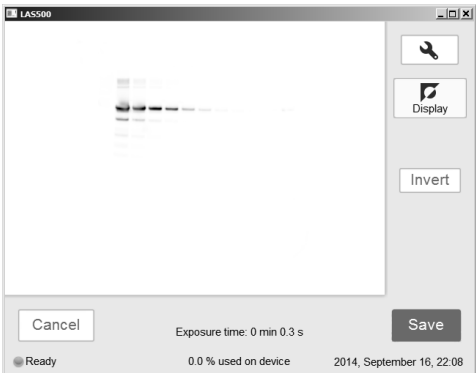
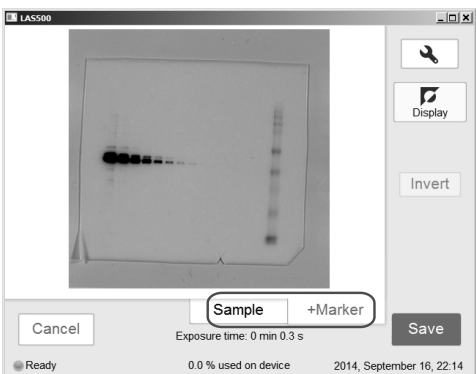
5 Operation

5.4 Capture an image

5.4.1 Chemiluminescence capture

Step	Action
4	When the exposure is finished the image view appears displaying the image. ImageQuant LAS 500 creates a folder containing image files that can be saved. For details see <i>File formats</i> , on page 106.

Step	Action
------	--------

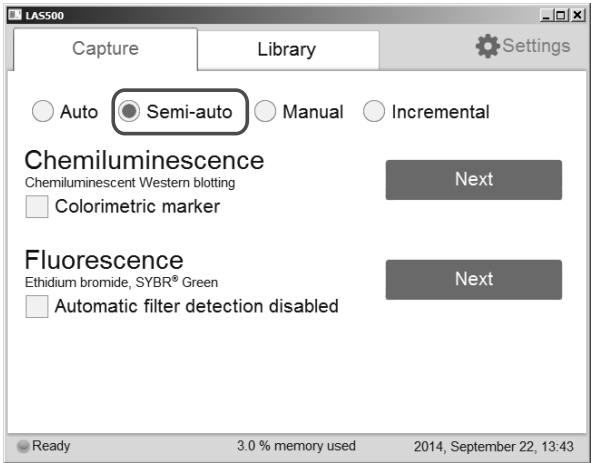
If...	Then...
No colorimetric marker was used	<p>The resulting image is displayed in gray scale.</p> 
Colorimetric marker was used	<p>The resulting images are displayed under Sample and +Marker tabs.</p> <ul style="list-style-type: none"> • Select the relevant tab for the image you wish to display. A selected tab is highlighted with blue text and frame. • Select Sample to see the sample without colorimetric marker. • Select +Marker to see a composite color image of the sample and colorimetric marker images. 

Step	Action
5	Tap Save to save the images. For other options see <i>Options after image capture, on page 78</i> .

Chemiluminescence with
semi-automatic exposure

Follow the instructions below to perform chemiluminescence capture using semi-automatic exposure time.

Step	Action
1	In the Capture tab select the Semi-auto button.



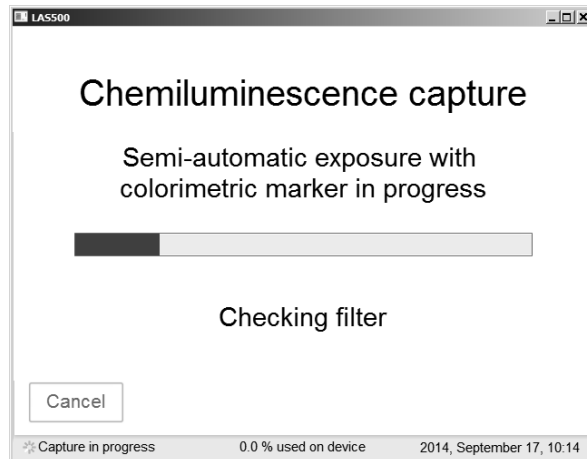
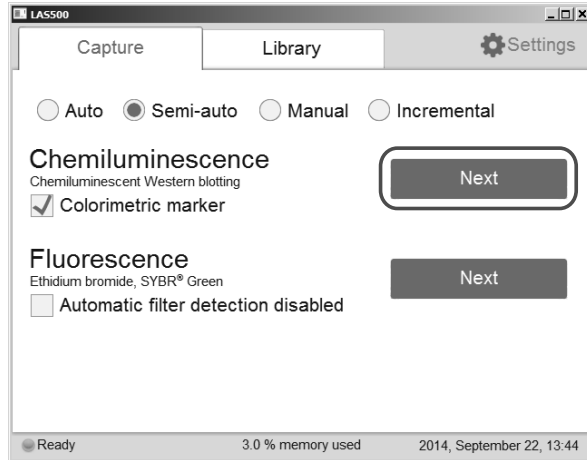
2	If your sample contains a colorimetric marker, then check the Colorimetric marker box.
---	-----------------------------------------------------------------------------------------------



Colorimetric marker

Step	Action
------	--------

3	Tap Next for Chemiluminescence.
---	----------------------------------------




When the pre-exposure is finished a low resolution preview image is displayed.

5 Operation

5.4 Capture an image

5.4.1 Chemiluminescence capture

Step	Action
	


Use the zoom tools and arrows to get an optimal view of the area of interest.

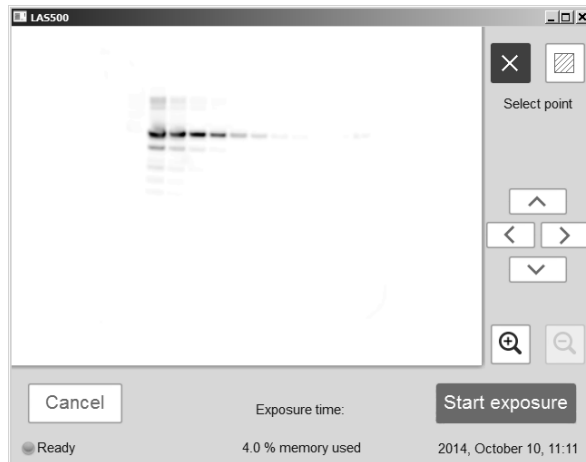
Choose  to zoom in.

Choose  to zoom out.


Note:
*Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.*

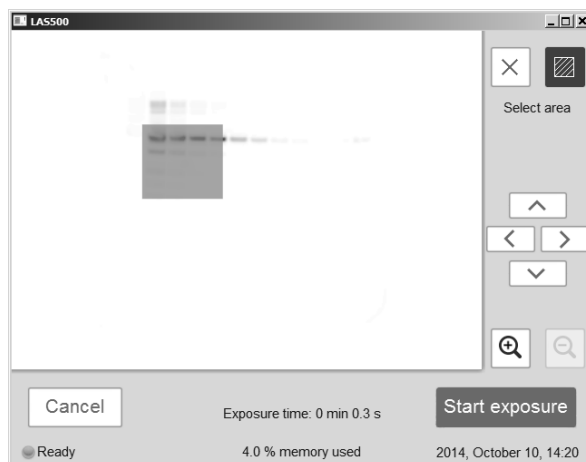
Step	Action
4	Select one of the two options displayed to the right of the image to point out the area of interest:

Option 1: Choose , and select a point of interest in the image.



Result: The selected point is highlighted with an X.

Option 2: Choose , and then select two diagonal corners of an area of interest in the image.



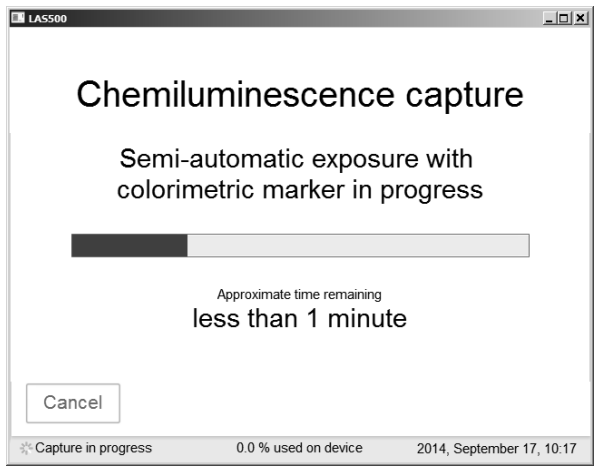
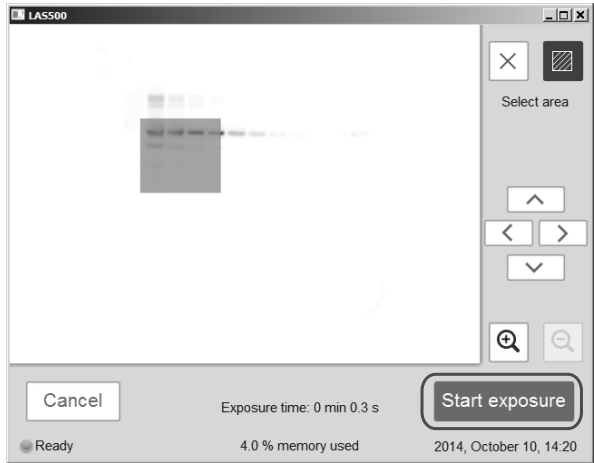
Result: The selected area is highlighted with a square.

5 Operation

5.4 Capture an image

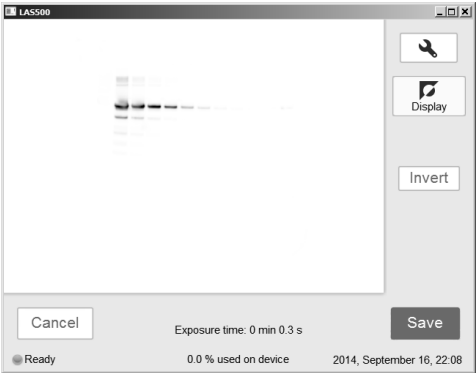
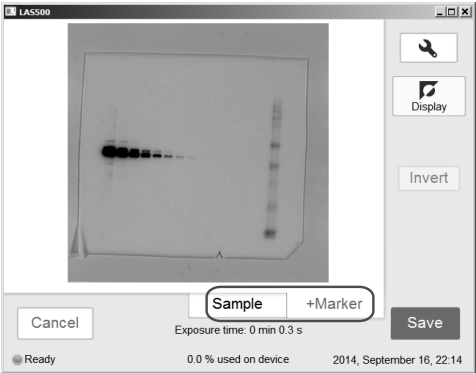
5.4.1 Chemiluminescence capture

Step	Action
	Use the right hand side arrow buttons to move the highlighted point or area.
5	Tap Start exposure and wait for the exposure to finish.



Step	Action
6	When the exposure is complete, image view appears and the images are displayed. ImageQuant LAS 500 creates a folder containing the created image files which can be saved. For details see <i>File formats</i> , on page 106.

Step Action

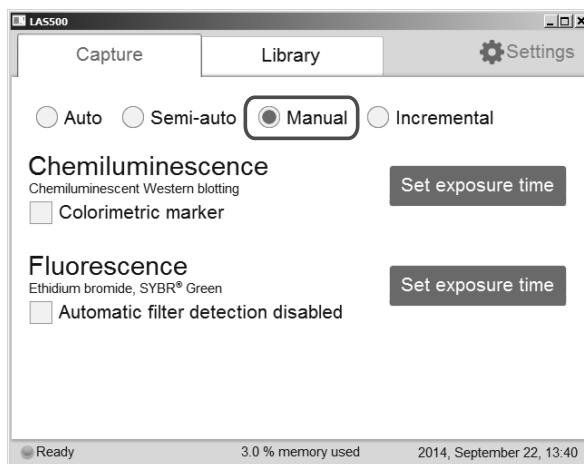
If...	Then...
No colorimetric marker was used	<p>The resulting image is displayed in gray scale.</p> 
Colorimetric marker was used	<p>The resulting images are displayed under Sample and +Marker tabs.</p> <ul style="list-style-type: none">• Select the relevant tab for the image you wish to display. A selected tab is highlighted with blue text and frame.• Select Sample to see the sample without colorimetric marker.• Select +Marker to see a composite color image of the sample and colorimetric marker images. 

Step	Action
7	<p>Tap the Save button to save the images. For other options after capturing see <i>Options after image capture, on page 78</i>.</p> <p>Chemiluminescence capture with colorimetric markers generates three images; one for chemiluminescence capture, one for white light capture (colorimetric marker) and one combined color image of the chemiluminescence and white light capture.</p>

Chemiluminescence with manual exposure

Follow the instructions below to perform chemiluminescence capture using manually set exposure time.

Step	Action
1	In the Capture tab, select the Manual radio button.



2	If your sample contains a colorimetric marker, then check the Colorimetric marker check box.
---	-----------------------------------------------------------------------------------------------------

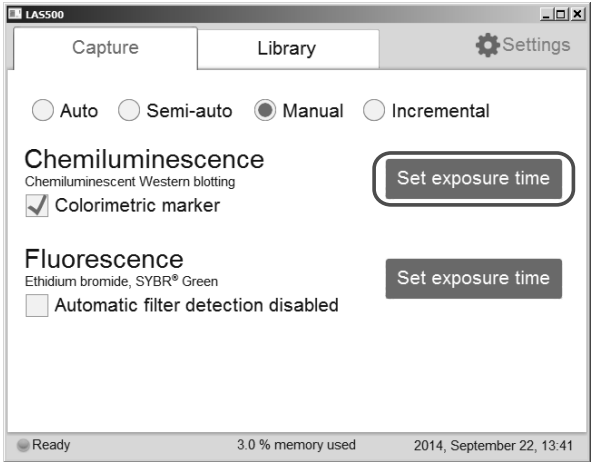


5 Operation

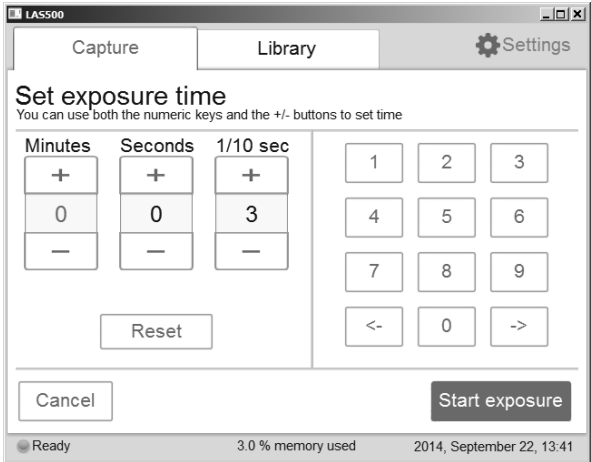
5.4 Capture an image

5.4.1 Chemiluminescence capture

Step	Action
3	Tap Set exposure time for chemiluminescence.



Result: The **Set exposure time** view opens.

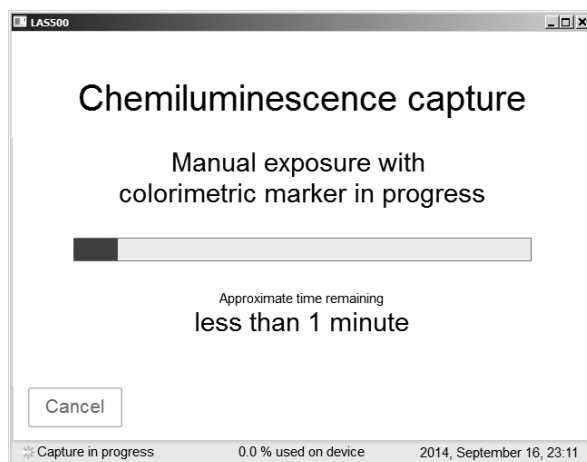
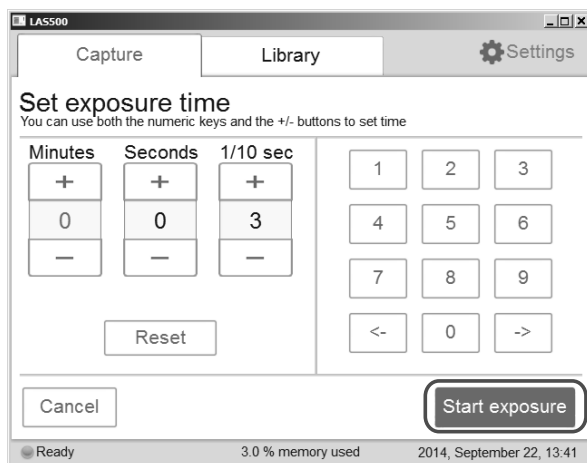


Note:
Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

4	Enter a new time.
---	-------------------

Step	Action
------	--------

- | | |
|---|----------------------------------------------------------------|
| 5 | Tap Start exposure and wait for the exposure to finish. |
|---|----------------------------------------------------------------|



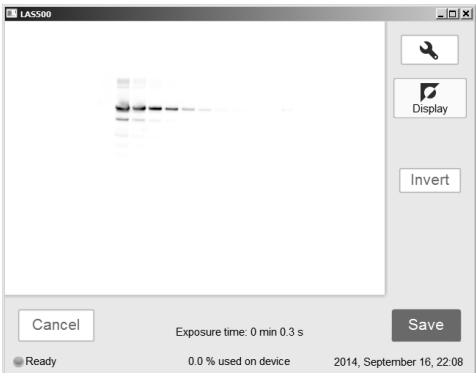
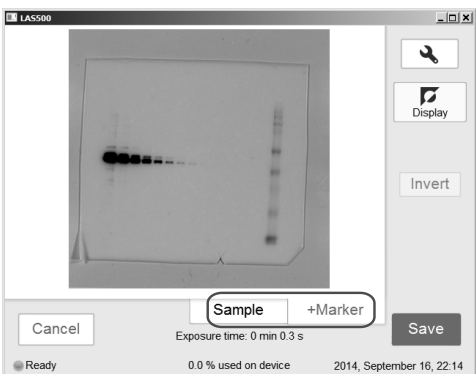
5 Operation

5.4 Capture an image

5.4.1 Chemiluminescence capture

Step	Action
6	When the exposure is finished the image view appears displaying the image. ImageQuant LAS 500 creates a folder containing image files that can be saved. For details see <i>File formats</i> , on page 106.

Step	Action
------	--------

If...	Then...
No colorimetric marker was used	<p>The resulting image is displayed in gray scale.</p> 
Colorimetric marker was used	<p>The resulting images are displayed under Sample and +Marker tabs.</p> <ul style="list-style-type: none"> • Select the relevant tab for the image you wish to display. A selected tab is highlighted with blue text and frame. • Select Sample to see the sample without colorimetric marker. • Select +Marker to see a composite color image of the sample and colorimetric marker images. 

5 Operation

5.4 Capture an image

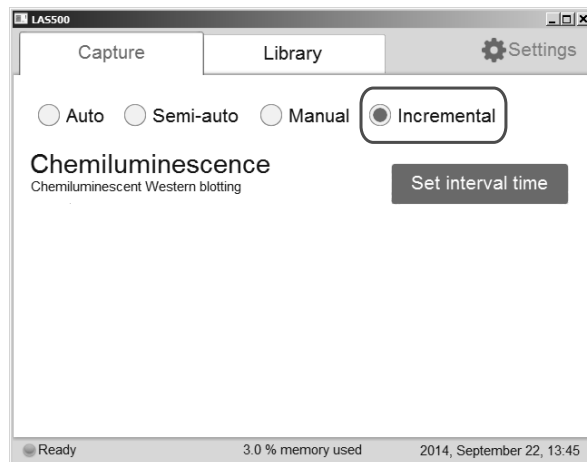
5.4.1 Chemiluminescence capture

Step	Action
7	<p>Tap the Save button to save the images. For other options after capturing see <i>Options after image capture</i>, on page 78.</p> <p>Chemiluminescence capture with colorimetric markers generates three images; one for chemiluminescence capture, one for white light capture (colorimetric marker) and one combined color image of the chemiluminescence and white light capture.</p>

Chemiluminescence with incremental exposure

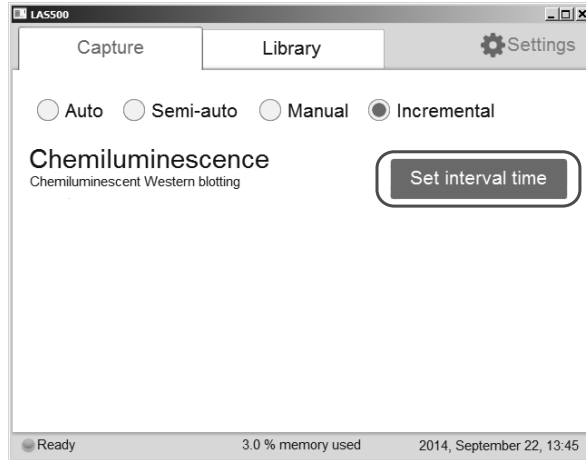
Follow the instructions below to perform chemiluminescence capture using incremental exposure time.

Step	Action
1	In the Capture tab, tap the Incremental button.

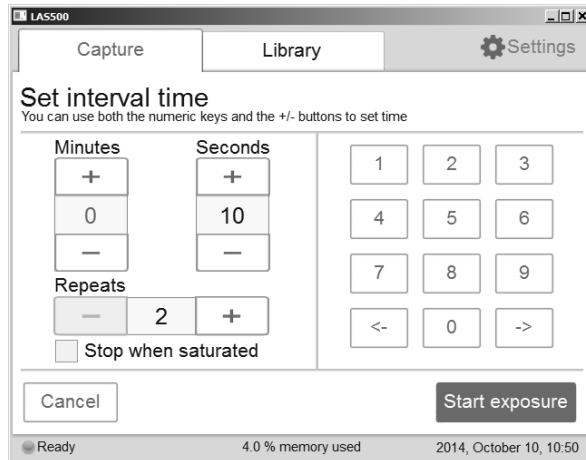


Step	Action
------	--------

- | | |
|---|----------------------------------------------------------------|
| 2 | Tap the Set interval time button for chemiluminescence. |
|---|----------------------------------------------------------------|



Result: The **Set interval time** view opens.



Set the number of repetitive exposures in the **Repeat** field using the plus and minus buttons.

Repeats



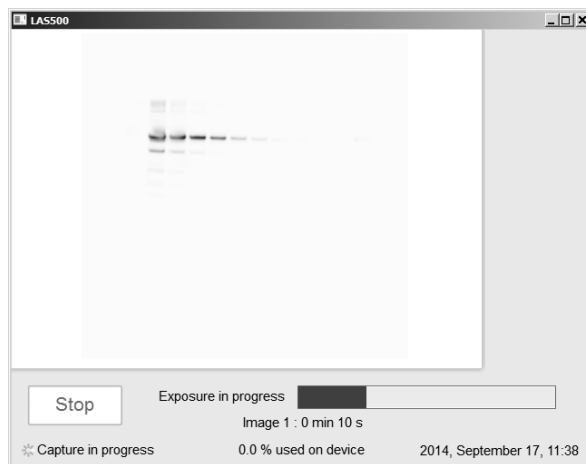
5 Operation

5.4 Capture an image

5.4.1 Chemiluminescence capture

- | Step | Action |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Check the Stop when saturated box if you wish the exposure to stop when the pixel intensity of the accumulated exposed images reaches saturation.

Note:
<i>The Stop when saturated function overrides the set repetitive exposures.</i> |
| 4 | Set Interval time by entering a value. |
| 5 | Tap Start exposure and images are captured repeatedly for the set time period (or until saturated). |



Result: The number of images matching the selected repetitions are displayed as they are exposed. A progress bar indicates the time remaining for imaging.

Step	Action
------	--------

- | | |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | <p>When the exposure is complete, the image view displays the images. Navigate among the images by selecting the left or right arrows. Use the Intensity tool to check pixel intensity and the Contrast tool to change the contrast of the images. When more than one image is taken with the incremental exposure, the new contrast setting will be applied to all the images.</p> <p>ImageQuant LAS 500 creates a folder containing the created image files that can be saved. For details see <i>File formats, on page 106</i>.</p> |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



5 Operation

5.4 Capture an image

5.4.1 Chemiluminescence capture

Step	Action
7	Use the Select button to select the images you wish to save. Then select the Save button. Note: <i>If more than one image is selected, then the Library view will open after saving the images.</i>



Options after image capture

Select one or more of the following actions after capturing:

- To save the image select **Save**. This allows images to be reopened later with the image tools. See [Section 5.6 Save the image, on page 104](#) and [Section 5.7 File handling, on page 107](#) for further instructions.
- To modify the display settings or view details of the image, select the image tools to the right of the image. See [Image tools, on page 100](#) for further instructions.
- To discard an image without saving select **Cancel** and confirm in the following dialog.

5.4.2 Fluorescence capture

Introduction

Fluorescence image capture is performed with Epi-illumination (UV and Blue).

Fluorescence exposure options

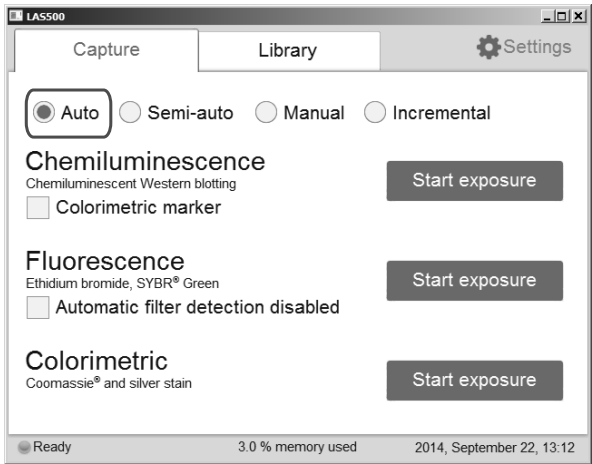
There are three exposure options for fluorescence image capture. The table below suggests which option to use in different situations.

When...	Then...
An optimal dynamic range is required:	Select Auto for automatic exposure. A short pre-exposure is performed to determine the signal intensity. The system will use this information to calculate which exposure time will give the highest possible signal below saturation to enable accurate quantification of the sample.
A specific area of a sample is of interest:	Select Semi-auto . A short pre-exposure is performed which results in an image. This allows you to select the area of the sample image to focus on. The software automatically calculates the optimal exposure time for the specified area.
The intensity of the image is inadequate after automatic exposure or a known exposure time is required:	Select Manual exposure and set the exposure time manually.

Fluorescence with automatic exposure

Follow the instructions below to perform fluorescence capture using automatic exposure time.

Step	Action
1	In the Capture tab, select the Auto radio button (set as default).

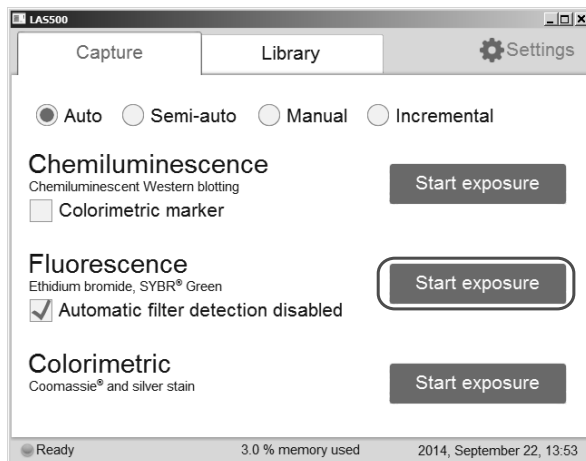


2	Check the Automatic filter detection disabled box , if the fluorescence sample is larger than the image area (10×15 cm) or if the automatic filter detection fails.
---	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

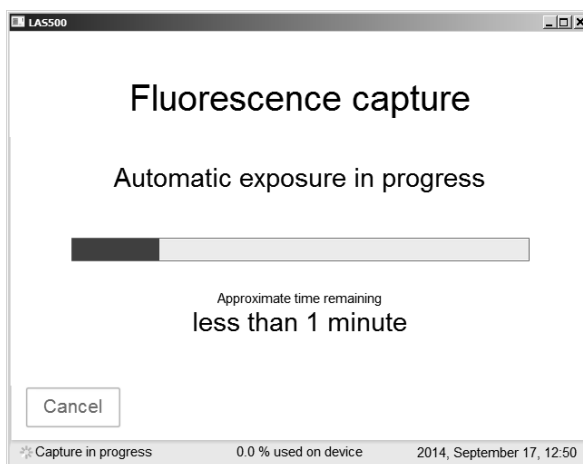
☒ **Automatic filter detection disabled**

Step	Action
------	--------

- | | |
|---|--------------------------------------------------------|
| 3 | Tap the Start exposure button for fluorescence. |
|---|--------------------------------------------------------|



Result: The exposure will begin following a pre-exposure. A progress bar appears on the screen indicating the time remaining of the imaging process, the exposure selected and the actual exposure time.



Note:

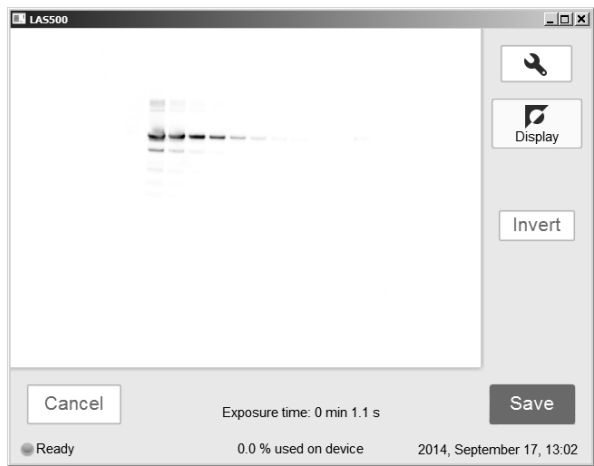
Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

5 Operation

5.4 Capture an image

5.4.2 Fluorescence capture

Step	Action
4	When the exposure is complete, image view appears and the image are displayed. ImageQuant LAS 500 creates a folder containing the image files that can be saved. For details see <i>File formats</i> , on page 106.



Result: The resulting image is displayed in gray scale.

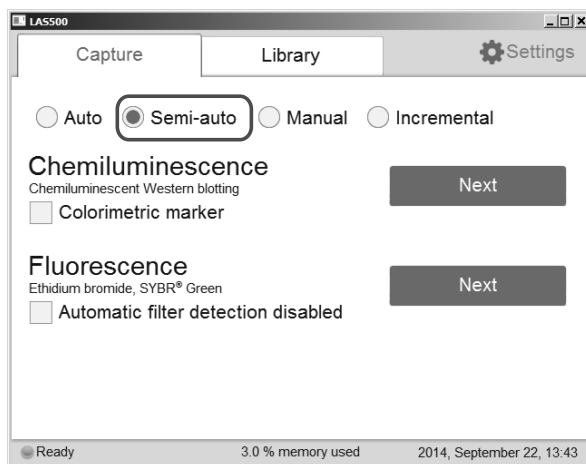
5	Tap the Save button to save the images. For other options after capturing see <i>Options after image capture</i> , on page 92.
---	---------------------------------------------------------------------------------------------------------------------------------------

Fluorescence with semi-automatic exposure

Follow the instructions below to perform fluorescence capture using semi-automatic set exposure time.

Step	Action
------	--------

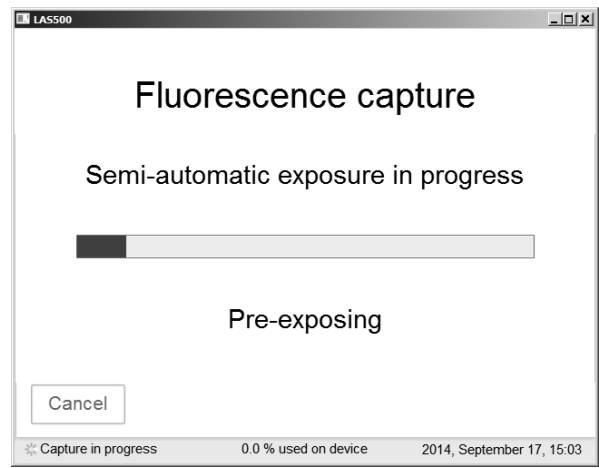
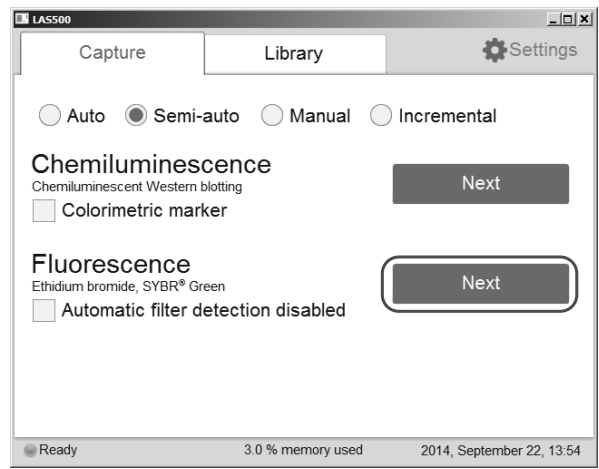
- | | |
|---|----------------------------------------------------------|
| 1 | In the Capture tab, select the Semi-auto . |
|---|----------------------------------------------------------|



- | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Check the Automatic filter detection disabled box, if the fluorescence sample is larger than the image area (10×15 cm) or if the automatic filter detection fails. |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

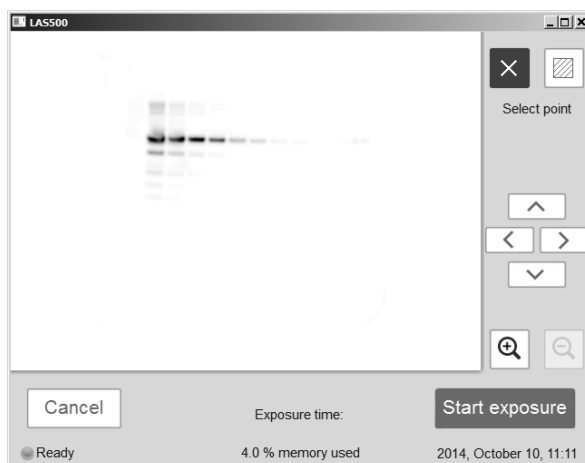
☒ **Automatic filter detection disabled**

Step	Action
3	Tap the Next button for fluorescence.



When the pre-exposure is finished, a low-resolution preview image is displayed.

Step	Action
------	--------



Use the zoom tools and arrows to get an optimal view of the area of interest.


Choose  to zoom in.

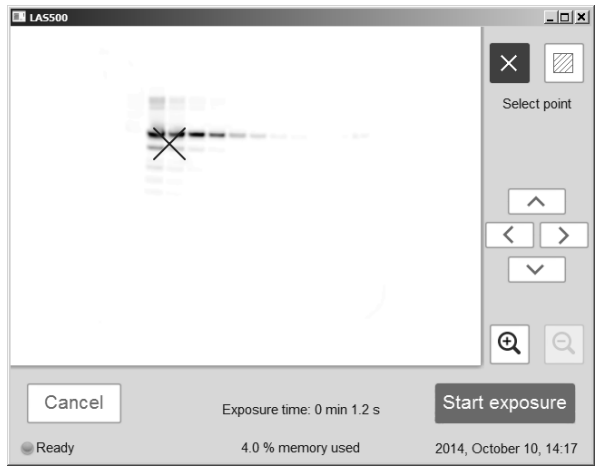
Choose  to zoom out.

Note:


Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

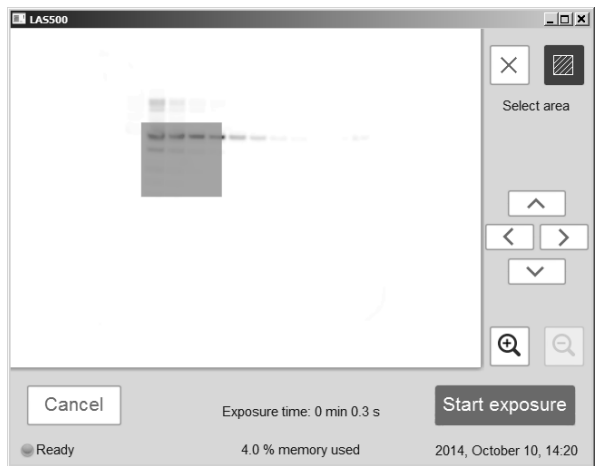
Step	Action
4	Choose one of the two options displayed to the right of the image to point out the area of interest:

Choose , and select a point of interest in the image.



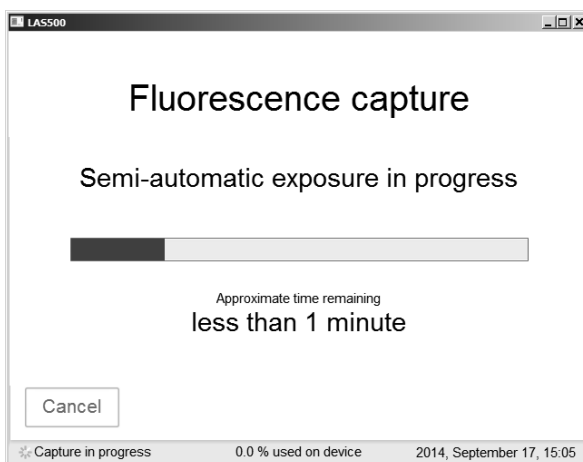
Result: The selected point is highlighted with an X.

Choose , and then select two diagonal corners of an area of interest in the image.



Result: The selected area is highlighted with a square.

Step	Action
	Use the right hand side arrow buttons to move the highlighted point or area.
5	Tap Start exposure and wait for the exposure to finish.

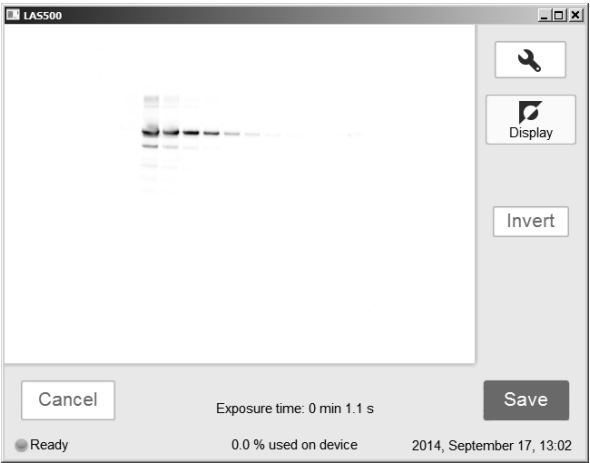


5 Operation

5.4 Capture an image

5.4.2 Fluorescence capture

Step	Action
6	When the exposure is complete, image view appears and the image are displayed. ImageQuant LAS 500 creates a folder containing the image files that can be saved. For details see <i>File formats</i> , on page 106.



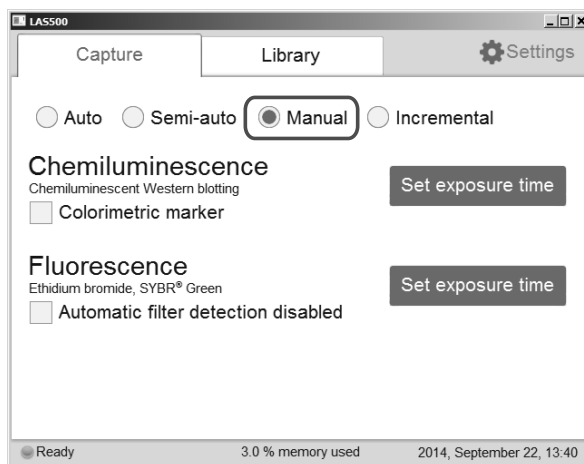
7	Tap the Save button to save the images. For other options after capturing see <i>Options after image capture</i> , on page 92.
---	---------------------------------------------------------------------------------------------------------------------------------------

Fluorescence with manual exposure

Follow the instructions below to perform fluorescence capture using manually set exposure time.

Step	Action
------	--------

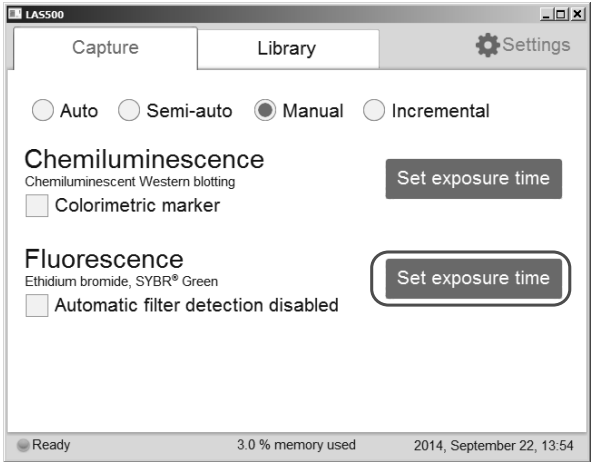
- | | |
|---|-------------------------------------------------------------------|
| 1 | In the Capture tab, select the Manual radio button. |
|---|-------------------------------------------------------------------|



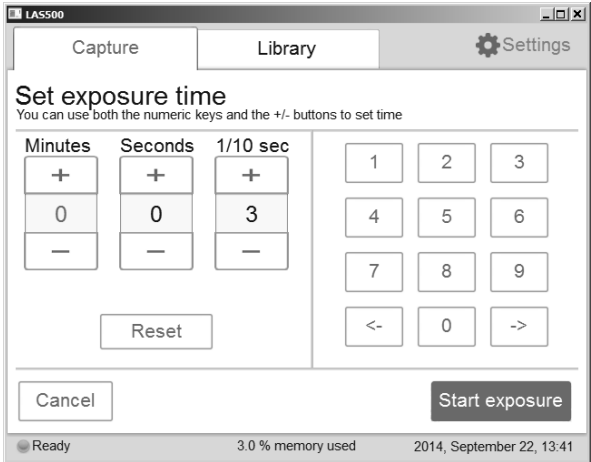
- | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Check the Automatic filter detection disabled box, if the fluorescence sample is larger than the image area (10×15 cm) or if the automatic filter detection fails. |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

☒ **Automatic filter detection disabled**

Step	Action
3	Tap the Set exposure time for fluorescence.



Result: The **Set exposure time** view opens.

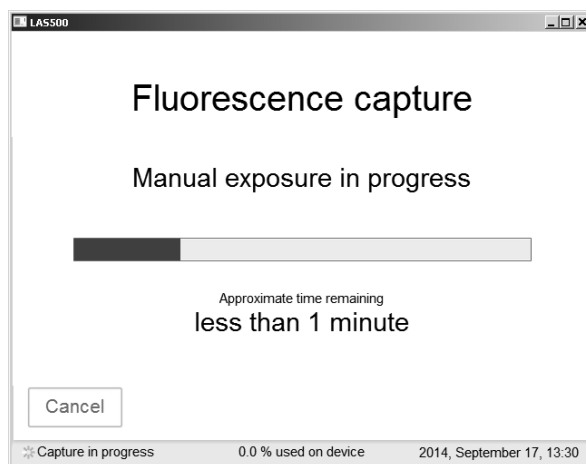
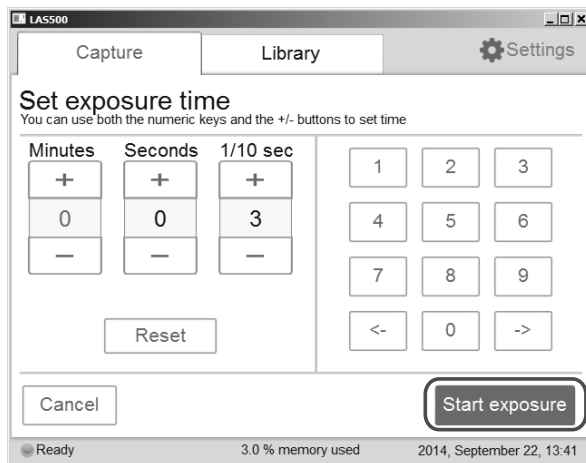


Note:
Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

4	Enter the new time.
---	---------------------

Step	Action
------	--------

- | | |
|---|----------------------------------------------------------------|
| 5 | Tap Start exposure and wait for the exposure to finish. |
|---|----------------------------------------------------------------|



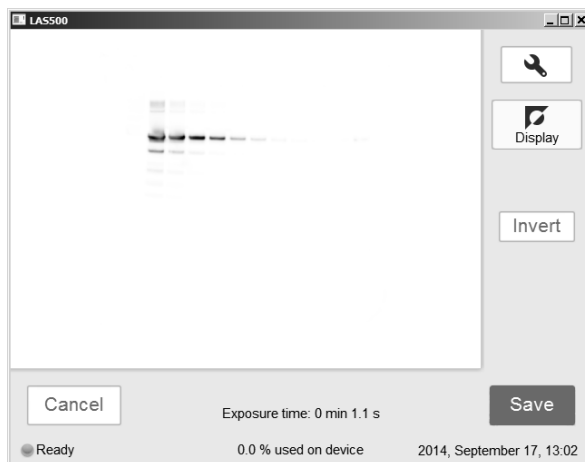
5 Operation

5.4 Capture an image

5.4.2 Fluorescence capture

Step	Action
------	--------

- | | |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | When the exposure is finished, the image view displays the image. ImageQuant LAS 500 creates a folder containing image files that can be saved. For details see <i>File formats</i> , on page 106. |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



- | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------|
| 7 | Tap the Save button to save the images. For other options after capturing see <i>Options after image capture</i> , on page 92. |
|---|---------------------------------------------------------------------------------------------------------------------------------------|

Options after image capture

Select one or more of the following actions after capturing:

- To save the image select **Save**. This will allow images to be reopened later with the image tools. See *Section 5.6 Save the image*, on page 104 and *Section 5.7 File handling*, on page 107 for further instructions.
- To modify the display settings or view details of the image, select the image tools to the right of the image. See *Image tools*, on page 100 for further instructions.
- To discard the image without saving select **Cancel** and confirm the following dialog.

5.4.3 Colorimetric capture

Introduction

The colorimetric capture uses an epi-white illumination light source located at the top of the ImageQuant LAS 500 interior.

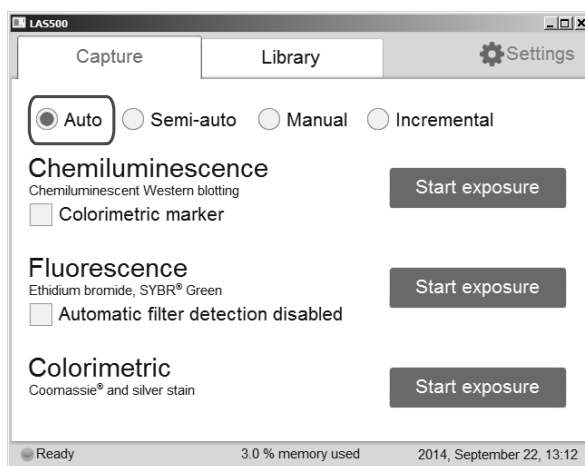
The images are by default created with automatic exposure time.

Automatic colorimetric capture

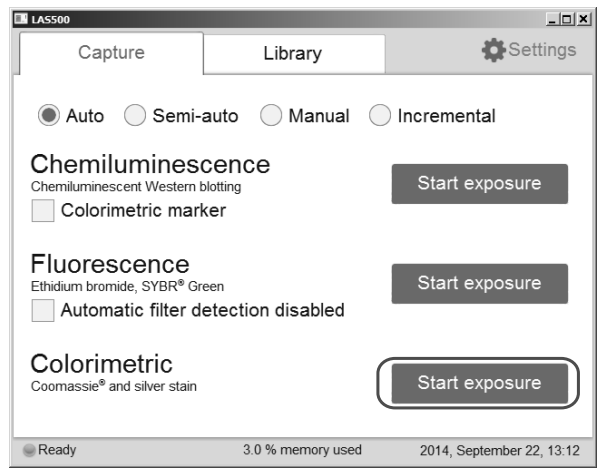
Follow the instructions below to perform colorimetric capture using automatic exposure time.

Step	Action
------	--------

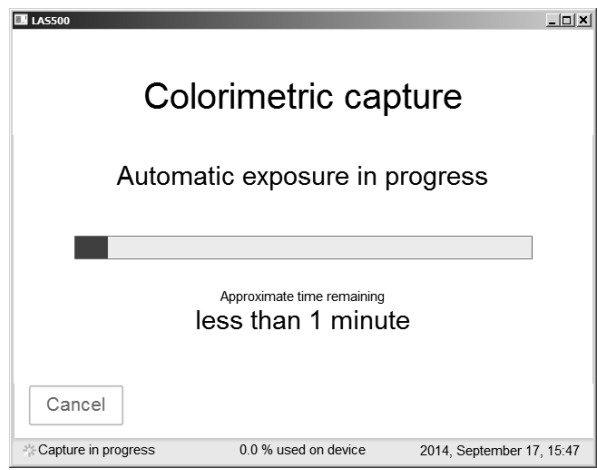
- | | |
|---|----------------------------------------------------------------------------|
| 1 | In the Capture tab, select the Auto button (set as default). |
|---|----------------------------------------------------------------------------|



Step	Action
2	Tap the Start exposure for colorimetric.



Result: The exposure will begin following a pre-exposure. A progress bar appears on the screen indicating the time remaining of the imaging process, the exposure selected and the actual exposure time.



Note:
Selecting **Cancel** will cancel the exposure and the **Capture** view will appear.

Step	Action
3	When the exposure is complete, image view appears and the image are displayed. ImageQuant LAS 500 creates a folder containing the image files that can be saved. For details see <i>File formats</i> , on page 106.



Result: The resulting image is displayed in gray scale.

4	Tap the Save button to save the images. For other options after capturing see <i>Options after image capture</i> , on page 95.
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Options after image capture

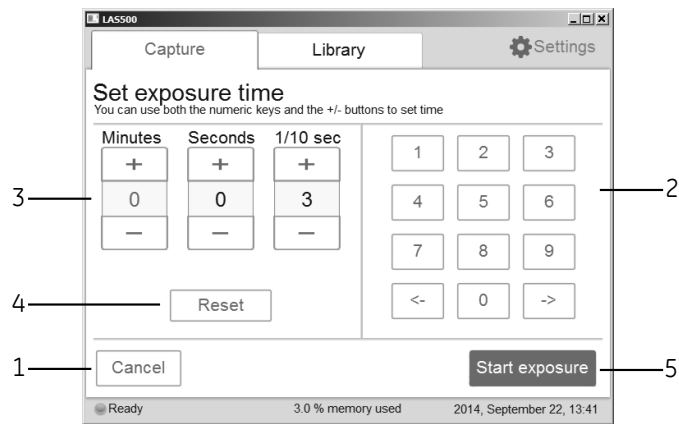
Select one or more of the following actions after capturing:





- To save the image select **Save**. This will allow images to be reopened later with the image tools. See *Section 5.6 Save the image*, on page 104 and *Section 5.7 File handling*, on page 107 for further instructions.
- To modify the display settings or view details of the image, select the image tools to the right of the image. See *Image tools*, on page 100 for further instructions.
- To discard the image without saving select **Cancel** and confirm the following dialog.

5.4.4 Set the exposure and interval time

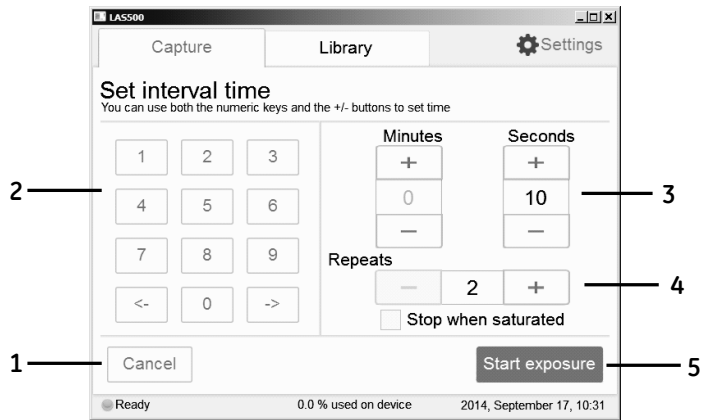
The following information describes the components and function of the **Set exposure time** and **Set interval time** windows.





Set exposure time



Part	Function
1	Tap Cancel to leave the Set exposure time screen and return to the Capture tab.
2	Use the  and  button to move between the Minutes , Seconds , and 1/10 sec fields. Tap the numeric keys to set the time in the selected field.
3	Tap Minutes , Seconds , or 1/10 sec to select the unit of time to change. Increase or decrease the exposure time by tapping  or  .
4	Tap Reset to set the exposure time to zero.
5	Tap Start exposure to start image capture.

Set interval time

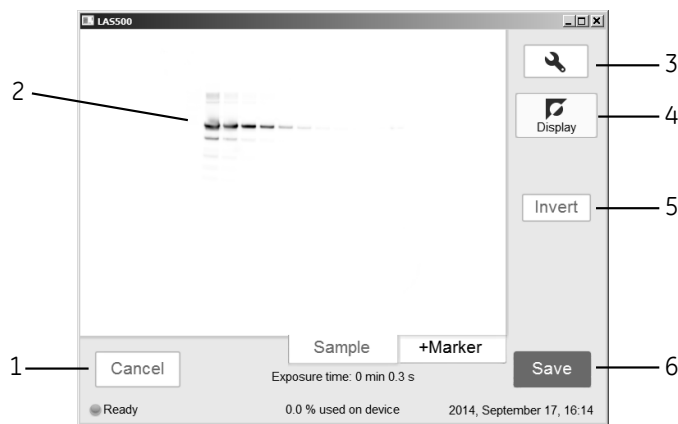


Part	Function
1	Tap Cancel to leave the Set interval time screen and return to the Capture tab.
2	Use the  and  button to move between the Minutes , Seconds , and 1/10 sec fields. Tap the numeric keys to set the time in the selected field.
3	Tap Minutes , Seconds , or 1/10 sec to select the unit of time to change. Increase or decrease the exposure time by tapping  or  .
4	Tap Reset to set the exposure time to zero.
5	Tap Start exposure to start image capture.

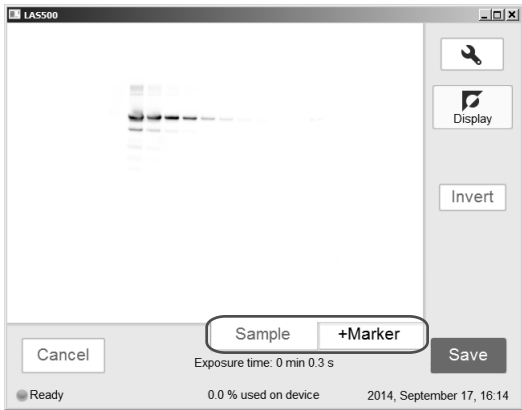
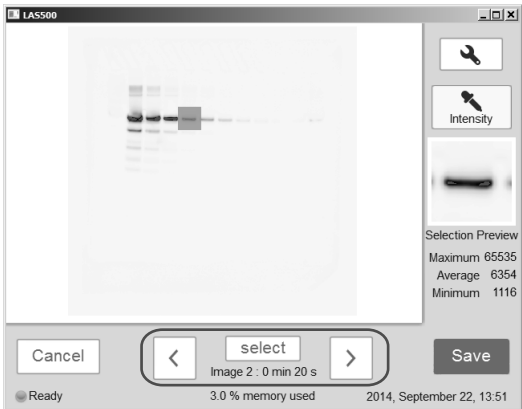
5.5 View the images

When the image capture is complete, the images are displayed on the screen. The content shown varies with the capture methods and exposure options.

The following illustration and table describe the image result view.



Part	Function
1	Tap Cancel to leave the image view screen without saving the image.

Part	Function
2	<p>Display of the captured image.</p> <p>Note: For chemiluminescence capture with colorimetric markers, the image from the chemiluminescence capture is viewed in the Sample tab, and the chemiluminescence capture and colorimetric marker combined image is viewed in +Marker tab in the image view.</p>  <p>Incremental exposure displays a series of images one at a time as they are exposed. Navigate among the images using forward and backward arrows.</p> 
3	<p>Tap the Image tools to display the Images tools menu. For detailed information about the Images tools menu, go to Tools menu, see <i>Image tools</i>, on page 100.</p>

Part	Function
4	Indicator shows which image tool is selected. In this example the Display tool is selected.
5	This area shows which factor(s) of an image that can be visually modified. In this example, the Invert button under the Display tool is shown.
6	Save button. Tap this button to save the image. For detailed information about how to save an image, see <i>Section 5.6 Save the image, on page 104</i> .

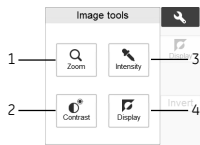
Image tools

An image can be visually modified and examined with the **Image tools** found on right of the screen. The tools can be used immediately after image capture and on previously saved images. One or several of the tools can be used to modify or to examine the images.

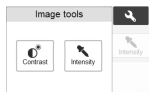
Note: *The original image data remains unaltered.*

The tools can be accessed by tapping on the tool button, .

The following image and table shows and describes the components of the tools menu.


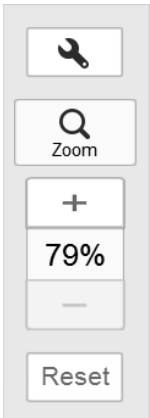







Only **Contrast** and **Intensity** tools are available when taking images of samples in Incremental mode.






Part	Function
1	Zoom button: tap on this button to select the zoom tool.
2	Contrast button: tap on this button to select the contrast tool.
3	Intensity button: tap on this button to select the intensity tool.
4	Display button: tap on this button to select the display tool.

The following table describes each tool in the image tools menu in detail.

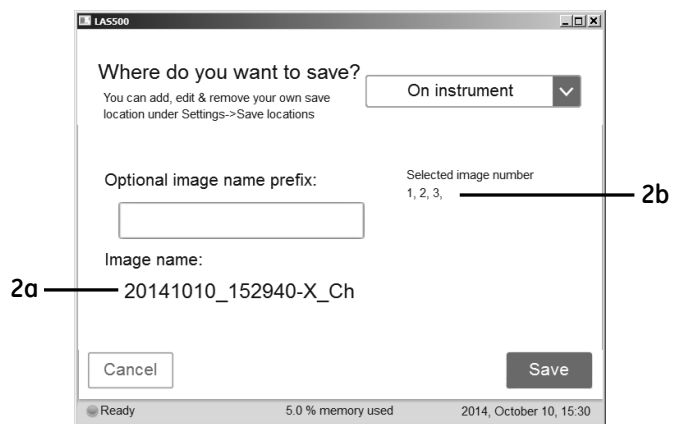
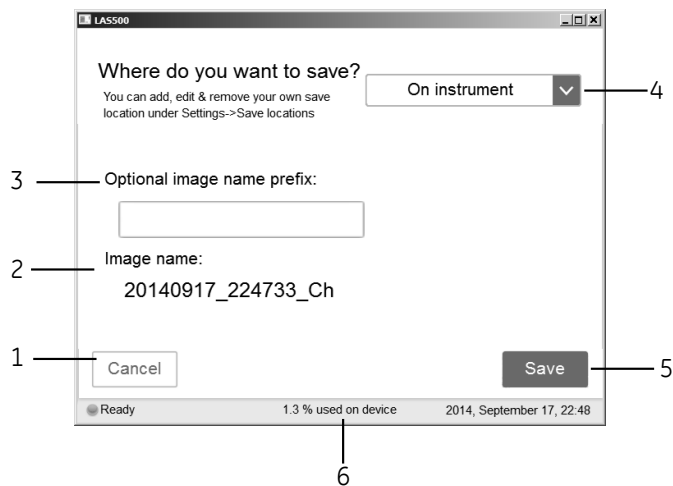
Description	Illustration
<p>Open the Zoom tool by selecting the zoom button in the image tools menu.</p> <p>Use the plus or minus buttons to zoom in or out in the image.</p> <p>When zooming in, arrows appear in the image view. Use the arrows, or point to the image and drag, to position the image on the screen. If a different tool is selected when the image is zoomed in, the selected zoom will be kept until saved.</p>  <p>Use the Reset button to return to the original zoom view</p> <p>Note: <i>The Zoom tool is not available for incremental imaging.</i></p>	

Description	Illustration
<p>The contrast tool is opened by tapping on the Contrast button in the Image tools menu.</p> <p>Use the  and  buttons to change the brightness of the image.</p> <p>Use the  and  buttons to change the contrast of the image.</p> <p>For samples with colorimetric marker the contrast tool can be used for setting the contrast of the chemiluminescent sample in the combined color image. The chosen contrast is saved with the combined color image.</p> <p>Image histogram</p> <p>The histogram shows the intensity distribution by plotting the number of pixels for each intensity value in the image. The horizontal axis represents variation of intensity. The vertical axis represents the number of pixels at a given intensity.</p> <p>The blue and red lines indicate the min/max range of the grayscale in the displayed image.</p>	

Description	Illustration
<p>Open the Intensity tool by selecting the intensity button in the image tools menu.</p> <p>Select an area of interest in the image. The selected area will be displayed to the right of the image. The maximum, average and minimum intensities in the area of interest are displayed under the image.</p>  <p>Note: <i>For incremental images, navigate between the images using the forward and backward arrows. Point to a specific area of interest to display the maximum pixel intensity and the average pixel intensity in the area.</i></p> <p>Tip: <i>If the intensity is too low or too high, consider capturing the image with a different exposure time.</i> <i>High intensity results in saturation and prevents quantitative analysis. Saturation occurs close to 65 500 intensity levels.</i></p>	
<p>The Display tool is displayed by default after capturing or opening an image.</p> <p>The Invert button inverts the displayed image, that is it changes a white background with black bands to a black background with white bands.</p> <p>Note: <i>The Display tool is not available for incremental imaging.</i></p>	

5.6 Save the image

Save window



Part	Function
1	Cancel button: Tap on this button to return to the result window without saving.

Part	Function
2	<p>Image name field: Area where the automatically created name for the file is displayed.</p> <p>Note: <i>The automatic name consists of the date, followed by the time of the reading and the method used indicated by Ch (Chemiluminescence), Co (Colorimetric), or FI (Fluorescence).</i></p> <p>If several images are selected in Incremental mode, the number of the selected image is shown in X (2a) and the number of selected images is displayed in 2b.</p>
3	<p>Optional image name prefix field: Used to enter an optional personalized image name prefix.</p> <p>Tap on the Optional image name prefix field and use the keypad to add a prefix to the image file name. For more information on how to use the keypad, go to <i>Keypad, on page 112</i>.</p> <p>Note: <i>The prefix will be added to the beginning of the file name.</i></p>
4	<p>Where do you want to save? field: Tap on the drop down menu to choose where to save the file.</p> <p>Note: <i>Image(s) can be saved on the device. However, it is recommended to use a USB flash drive or a network.</i></p>
5	<p>Save button: Tap on this button to save the file.</p>
6	<p>Number of files stored on the device, as % of used device memory.</p>

Note: *It is also possible to add a network save location, for more information on how to add a save location, go to **Add a new save location**, on page 118.*

Memory handling

The ImageQuant LAS 500 is equipped with a flash drive that allows for storage of a finite number of images on the instrument. It is recommended that you regularly remove images from the instrument to maintain available storage space. If the instrument flash drive runs full, the oldest images will be removed automatically when a new image is captured.

File formats

The image files are stored in the formats described in the table below.

Imaging method	File format of saved image
Chemiluminescence	16-bit tif image
Chemiluminescence with colorimetric marker	Folder containing the following files: <ul style="list-style-type: none">• 16-bit tif image of the chemiluminescent sample• 16-bit tif image of the colorimetric marker• jpg combined color image of the chemiluminescent sample and the colorimetric marker
Fluorescence	16-bit tif
Colorimetric	16-bit tif

Tip: The combined jpg image with chemiluminescent sample and colorimetric marker can be used for approximate molecular weight determination.
The individual tif images (sample image and marker image) can be used for accurate molecular weight calibration using appropriate analysis software, such as ImageQuant TL.

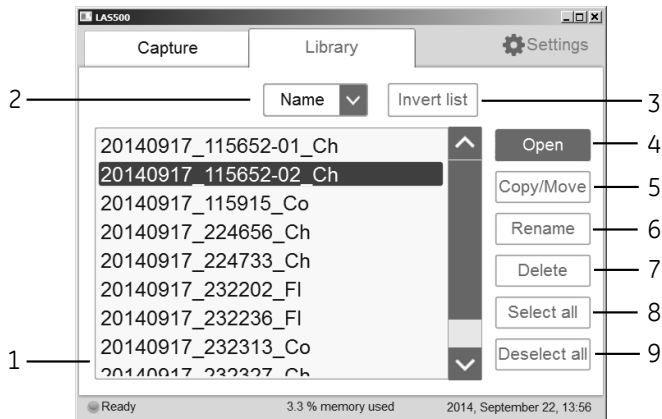
5.7 File handling

Description

In the **Library** tab, image files can be deleted, copied, moved, renamed or opened. The files can be sorted by method, name, and date. The order of the file list can be inverted. If the ImageQuant LAS 500 is connected to a network, there is a possibility to use the **ImageQuant LAS 500 web tool** to copy and/or delete files from the system.

Library tab layout

The image and table below shows and describes the components of the **Library** tab.



Part	Function
1	List of the stored files
2	Drop down menu to change the parameter that the files are sorted after. The files can be sorted by: <ul style="list-style-type: none"> • Name • Date • Method
3	Invert list button: tap on this button to invert the list.

Part	Function
4	Open button: tap on this button to open a file.
5	Copy/Move button: tap on this button to copy or move files.
6	Rename button: tap on this button to rename files.
7	Delete button: tap on this button to delete files.
8	Select all button: tap on this button to select all files.
9	Deselect all button: tap on this button to deselect all files.

Description of *Library* functions

Select and deselect all

The **Select all** and **Deselect all** buttons are used to select or deselect all of the files in the library.

Delete files

The following instruction provides the necessary information to delete files from the device.

Step	Action
1	Tap the files to select the files to delete.
2	Tap Delete . <i>Result:</i> the following window opens: <div data-bbox="372 1152 783 1474"><div>Delete image file(s)</div><div>Are you sure you want to delete the image file(s)?</div><div><div>Yes</div><div>No</div></div></div>
3	Tap Yes to delete the files.

Copy or move files

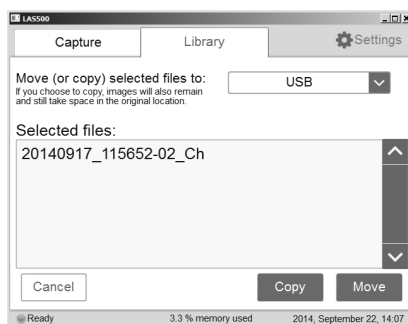
The following instruction shows how to copy and move files.

Step	Action
------	--------

1	Tap the files to select the files to be copied or moved.
---	----------------------------------------------------------

2	Tap on Copy/Move .
---	---------------------------

Result: the following window opens:



3	Select the location to copy or move the files in the Move (or copy) selected files to: drop down menu.
---	---------------------------------------------------------------------------------------------------------------

4	Tap Copy to copy files to the desired location. Tap Move to move files to the desired location.
---	------------------------------------------------------------------------------------------------------------------

Note:

When a file is copied the file will also remain in the original location, thus existing in two places.

Rename files

The following instruction provides the necessary information to rename files.

Step	Action
------	--------

1	Tap on the file to select the file to be renamed.
---	---------------------------------------------------

2	Tap on the Rename button.
---	----------------------------------

Result: The keypad appears.

3	Use the keypad to change the name of the file. Tap on Done to save the changes. For detailed information on how to use the keypad, go to <i>Keypad</i> , on page 112.
---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Open files

The following instruction provides the necessary information to open files.

Step	Action
------	--------

1	Tap on the file to be opened.
---	-------------------------------

Step	Action
2	Tap Open to open the file.
3	If desired, use the Image tools to adjust the view of the image. For detailed information about Image tools , go to <i>Image tools</i> , on page 100. Note: <i>When using the Image tools to adjust an image opened from the Library tab, the adjustments can not be saved.</i>
4	When finished, tap Ok to return to the Library tab.

ImageQuant LAS 500 web tool

Introduction

The **ImageQuant LAS 500 web tool** can be used to copy or delete files on the ImageQuant LAS 500 at a remote location.

Prerequisites

To be able to access **ImageQuant LAS 500 web tool** the following conditions must be fulfilled:

- The ImageQuant LAS 500 and the computer must be connected through a local network.
- The system IP address must be known.

The system's IP address is found in the **Network** window. Access the **Network** window by tapping the **Settings** icon in the start screen and then tapping the **Network** button in the **Settings** window.

Note: *DHCP networks has a dynamic IP address assignment, meaning that the IP address may vary between times of connection. When using a DHCP network connection check from time to time that the IP address is still accurate. If the IP address has changed, use the new IP address.*

Access web tool

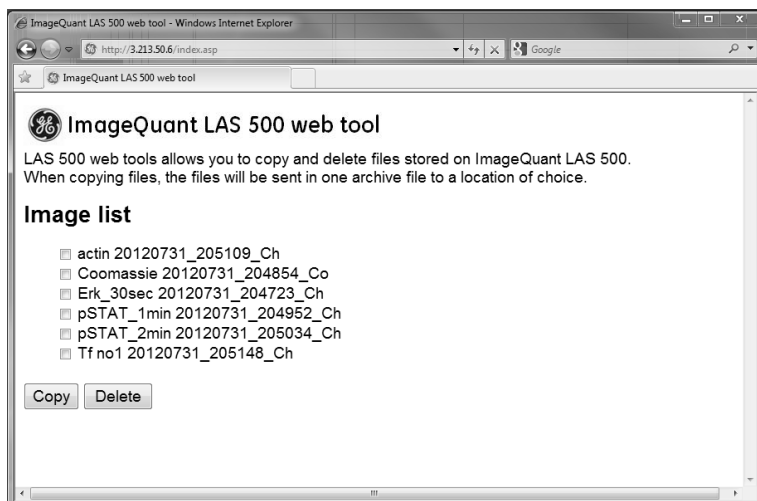
Follow the steps below to set up and access web tool.

Step	Action
1	Open a web browser of choice on the computer.

Step	Action
------	--------

- | | |
|---|-------------------------------------------------------------------------------|
| 2 | Type in the system's IP address in the browser address field and press enter. |
|---|-------------------------------------------------------------------------------|

Result:



Note:

*Depending on the network environment, a reboot of the system may be required for **ImageQuant LAS 500 web tool** to be available. If the web page does not appear after restart, contact your local network administrator.*

- | | |
|---|-------------------------------------------------------------------------------|
| 3 | Select the files to be copied or deleted by clicking in the file's check box. |
|---|-------------------------------------------------------------------------------|

Note:

The maximum number of files that can be copied at one time is 20. If there are more files to be copied, repeat the procedure.

- | | |
|---|----------------------------------------|
| 4 | Tap Delete to delete the files. |
|---|----------------------------------------|

Tap **Copy** to copy the files.

Note:

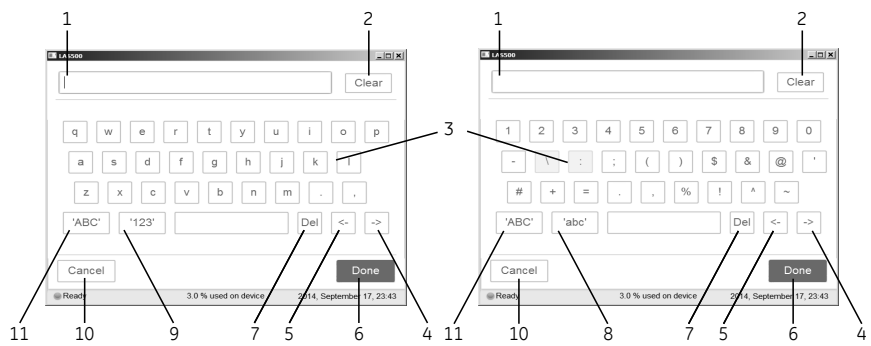
The copied files will be downloaded in a zip-file with a name that is automatically generated. The download location and procedure will vary with the chosen web browser's download settings.

5.8 Software keypad

Keypad

The keypad appears when the user taps on text fields to enter for example save location name or prefix, or to rename a file.

The following illustration and table shows the main components of the keypad. The image to the left shows the alphabetic view of the keypad (with lower case letters) and the image to the right shows the numeric and symbol view of the keypad.



Part	Function
1	Text field where the written text is entered.
2	Clear button: tap this button to remove all written text in the text field.
3	Keypad area.
4	Tap to move forwards in the text.
5	Tap to move backwards in the text.
6	Done button: tap on this button to save the changes.
7	Del button: tap on this button to delete one letter at a time.
8	'abc' button: tap to change to the lowercase keypad.
9	'123' button: tap to change to the numeric and symbol keypad. Note: <i>Tap on the 'abc' or the 'ABC' button to return to the alphabetic keypad.</i>

Part	Function
10	Cancel button: tap to return to previous window without saving the changes.
11	'ABC' button: tap to change to the uppercase keypad.

5.9 Shutdown

Shut down the ImageQuant LAS 500 system

To optimize instrument life time and to minimize unnecessary power consumption, shut down the instrument when image captures and analyses have been completed for the day. If the ImageQuant LAS 500 instrument is used around the clock, restart the system at least once a day to remove temporary files that may take up unnecessary memory space.

To switch off the instrument push the power switch to the **O** position.

6 System settings

About this chapter

This chapter contains information on the ImageQuant LAS 500 software function, interface and settings.

In this chapter

This chapter contains the following sections:

Section	See page
6.1 Introduction to the Settings window	116
6.2 Save location	118
6.3 Date and time	121
6.4 Network	123
6.5 Maintenance	125

6.1 Introduction to the **Settings** window

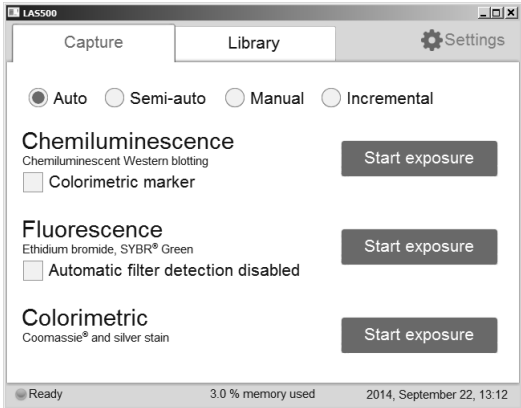
Description

From the **Settings** window the settings for save location, date and time, network and maintenance can be set.

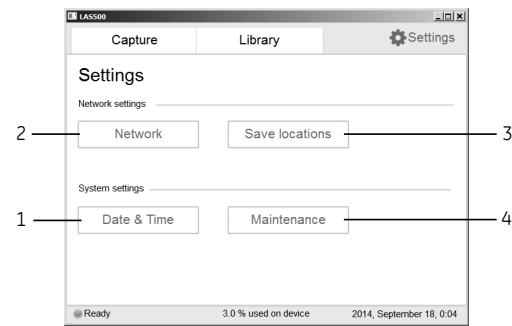
Opening settings window

The following instruction provides the necessary information to open the settings window.

Step	Action
1	In the Capture window tap on the Settings icon.



Settings window



Part	Function
1	Date & Time button: tap this button to change the date and/or time.
2	Network button: tap this button to change the network settings.
3	Save locations button: tap this button to add, remove or edit locations and to save images.
4	Maintenance button: tap this button to update software or to export a log file.

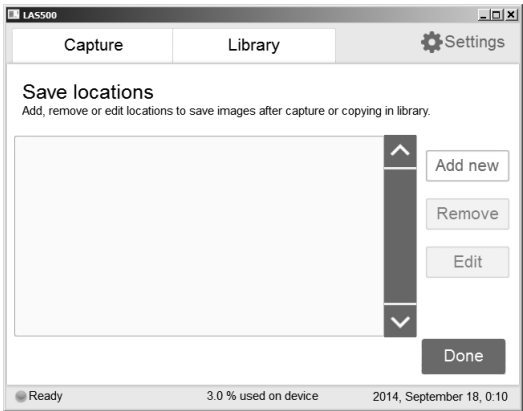
6.2 *Save location*

Add a new save location

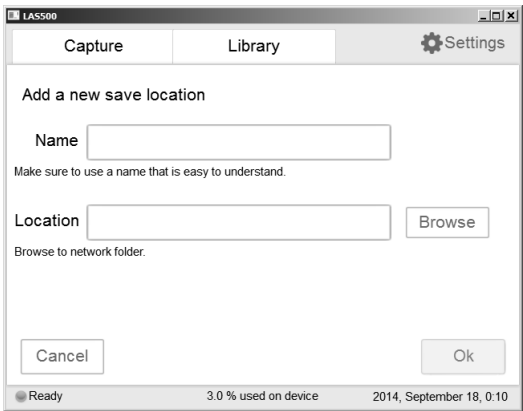
This table provides the necessary instructions to add a save location.

Note: *To enable access to a save location over the network, the folder needs to be shared and read/write privileges must be added for ImageQuant LAS 500.*

Step	Action
1	Tap on Save locations to open the Save locations window. <i>Result:</i> The following window will appear:



2	Tap on the Add new button in the Save locations window. <i>The following window will appear:</i>
---	-------------------------------------------------------------------------------------------------------------------



Step	Action
3	Tap the Name field and use the keypad to enter the desired name for the save location. For detailed information on how to use the keypad, go to <i>Keypad, on page 112</i> .
4	Tap the Location field and use the keypad to enter the network location directly and go to the Step 6 below, or tap the Browse button next to the Location field. Note: <i>The network settings need to be properly configured before a network folder can be added as a save location. For information on how to configure a network, go to Section 4.4 Connection to network or USB flash drive, on page 44.</i>
5	Choose a save location from the list and tap on the Use this location button.
6	Tap Ok to save the location.

Remove save location

This table provides the necessary instructions to remove a save location.

Step	Action
1	Tap on the Save locations button to open the Save locations window.
2	Tap on the location that is to be removed.
3	Tap on the Remove button.
4	To remove the location tap on the Yes button.

Edit save location

This table provides the necessary instructions to edit a save location.

Step	Action
1	Tap on the Save locations button to open the Save locations window.
2	Tap on the Edit button.
3	If desired, edit the name for the save location in the Name: field.

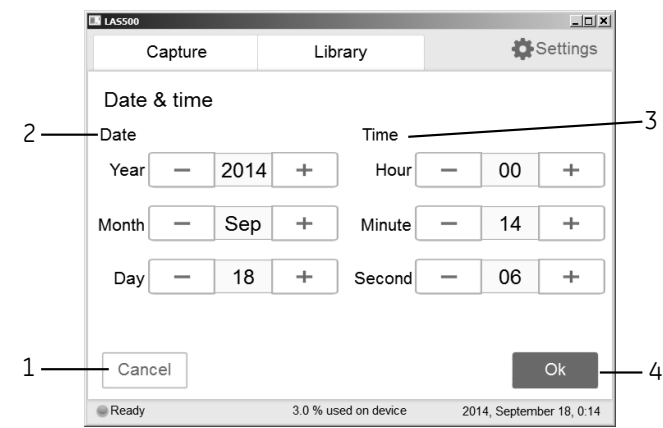
6 System settings

6.2 **Save location**

Step	Action
4	<p>If desired, edit the folder for the save location by tapping the Browse button next to the Location field.</p> <p>Note:</p> <p><i>The network settings need to be properly configured before a network folder can be added as a save location. For information on how to configure a network, go to Section 4.4 Connection to network or USB flash drive, on page 44.</i></p>
5	<p>To save the changes, tap on the Ok button.</p>

6.3 Date and time

Date & time window



Part	Function
1	Cancel button: return to the Settings window without saving the changes.
2	Date field: set year, month, and day.
3	Time field: set hour, minute, and second.
4	Ok button: save the changes to date and time and return to the Settings window.

Change date

Tap in the **Year**, **Month**, or **Day** field, and use the **+** and the **-** buttons to change the value of the selected field.

Change time

Tap in the **Hour**, **Minute**, or **Second**, and use the **+** and the **-** buttons to change the value of the selected field.

6 System settings

6.3 Date and time

Save the changes to *Date & time*

Tap on the ***Ok*** button to save the changes to the ***Date & time***.

Tap on the ***Cancel*** button to leave the ***Date & time*** window without saving the changes.

6.4 Network

DHCP Network

For a DHCP Network the IP address will be automatically set by the DHCP server. For detailed instructions on how to connect to a DHCP network, go to *Connect to a DHCP network, on page 46*. Tap on the **Network** button in the **Settings** window, to see the settings for the IP address, subnet mask, router, and the workgroup for the DHCP network.

Change the name of a workgroup

Step	Action
1	Tap in the Workgroup field to change the name of the workgroup. <i>Result:</i> A window with a keypad and a space to enter the name will appear.
2	Use the keypad to enter the desired name. For detailed information on how to use the keypad, go to <i>Keypad, on page 112</i> .
3	Tap on the Done button to save the workgroup name and return to the Network window.
4	Tap on the Save button to save the changes.

Static IP

For static IP the network details are entered manually. For detailed instructions on how to connect to a Static IP network, go to *Connect to a Static IP network, on page 46*. Tap on the **Network** button in the **Settings** window to see the settings for the IP address, subnet mask, router (optional), and the workgroup for the Static IP network.

Changes of Static IP settings

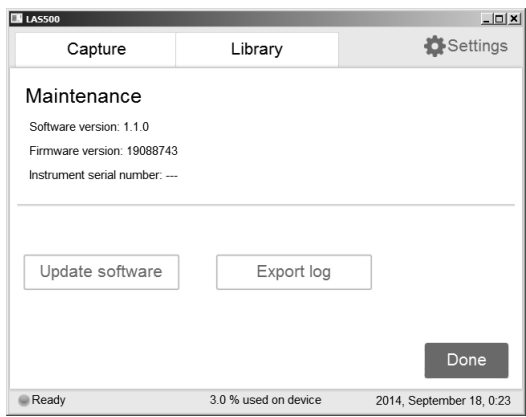
Step	Action										
1	<p>If desired, change one or several of the following network properties using the instructions in the table below.</p> <table><tr><th>Property</th><th>Action</th></tr><tr><td>IP address</td><td>Tap in the IP address field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.</td></tr><tr><td>Subnet mask</td><td>Tap in the Subnet mask field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.</td></tr><tr><td>Router</td><td>Tap in the Router field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.</td></tr><tr><td>Workgroup</td><td>Tap in the Workgroup field. Use the keypad to enter the new name. Tap Done to save the changes, or Cancel to go back to the Network window.</td></tr></table>	Property	Action	IP address	Tap in the IP address field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.	Subnet mask	Tap in the Subnet mask field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.	Router	Tap in the Router field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.	Workgroup	Tap in the Workgroup field. Use the keypad to enter the new name. Tap Done to save the changes, or Cancel to go back to the Network window.
Property	Action										
IP address	Tap in the IP address field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.										
Subnet mask	Tap in the Subnet mask field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.										
Router	Tap in the Router field. Use the keypad to enter the new address. Tap Done to save the changes, or Cancel to go back to the Network window.										
Workgroup	Tap in the Workgroup field. Use the keypad to enter the new name. Tap Done to save the changes, or Cancel to go back to the Network window.										
2	<p>Tap on the Save button to save the changes.</p>										

6.5 Maintenance

General information

In the top of the **Maintenance** window the following information can be found:

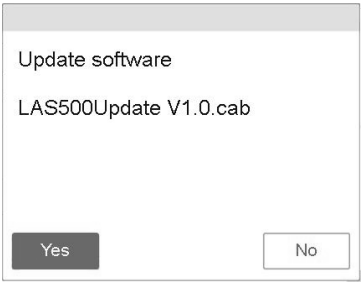
- Software version
- Firmware version
- Instrument serial number



Update software

This table provides the necessary instructions to update the software.

Step	Action
1	Connect the USB flash drive provided by GE containing the update file.
2	Tap the Update software button. The following window will appear:



Step	Action
3	Tap Yes to update the software.
4	To return to the Settings window and tap Ok .

Export log

This table provides the necessary instructions to export a log.

Step	Action
1	Tap Export log . <i>Result:</i> A text file will be created containing the export log file.
2	To return to the Settings window tap Ok .

7 Maintenance

About this chapter

To ensure optimal performance, ImageQuant LAS 500 and accessories should be maintained regularly. This chapter describes the maintenance that should be performed on a regular basis.



NOTICE

Before performing any maintenance on or inside the ImageQuant LAS 500, be sure to turn off the power switch and remove the power plug from the electrical outlet.

In this chapter

This chapter contains the following sections:

Section	See page
7.1 Cleaning the exterior	128
7.2 Cleaning sample trays and filter	129
7.3 Regular inspections	130

7.1 Cleaning the exterior

Use a soft dry cloth to clean the exterior of ImageQuant LAS 500. For marks that are hard to remove, wipe with a soft cloth slightly dampened with a neutral detergent, then wipe with a new clean, dry cloth.

To clean the interior of the instrument, use a non-fluorescent cleaning agent for biochemical use. If using a neutral domestic detergent, the detergent residue may fluoresce when an image is captured.



CAUTION

Wear gloves while cleaning. There may be residues of hazardous chemicals.



CAUTION

When the touch screen is cleaned do not press too hard onto the surface. This may cause the surface to break and lead to injury.



NOTICE

Do not use organic solvents. These may damage the surface.

7.2 Cleaning sample trays and filter

After using a sample tray, wash it in water using a soft sponge soaked in a cleaning agent. It is recommended to use a neutral domestic detergent for cleaning the trays. The cleaning agent should be non-fluorescent to avoid that residues fluoresce when images are captured.

The trays can also be washed using one of the following:

- 70% ethanol
- Mild detergent
- Isopropanol
- 6% H₂O₂

After cleaning, rinse the tray in water and allow to air dry.

To clean the filter use a soft sponge soaked in a non-fluorescent neutral detergent.



CAUTION

Wear gloves while cleaning. There may be residues of hazardous chemicals.



NOTICE

Do not use organic solvents. These may damage the surface.



NOTICE

Do not use abrasive cleaning materials, such as a scouring pad, for cleaning. This may scratch the surface.

7.3 Regular inspections

Regularly inspect the ImageQuant LAS 500 to ensure the following:

- The power supply plug is firmly secured in the power outlet.
- The power cord and supply plug do not become overheated.
- The power cord is not damaged in any way.
- The ventilation holes in the equipment are free from dust and dirt.

8 Troubleshooting

About this chapter

This chapter describes problems that can occur with the ImageQuant LAS 500 system and suggestions of possible solutions.

In this chapter

This chapter contains the following sections:

Section	See page
8.1 Problems with the captured image	132
8.2 Strange sounds and odors	133
8.3 Problems with ImageQuant LAS 500	134
8.4 Problems with ImageQuant LAS 500 Control Software	135

General

This chapter describes various problems that could occur with the ImageQuant LAS 500 system. Suggestions of possible solutions are provided.

Follow this procedure, if an error occurs:

- 1 Take note of the error code and error message on the monitor.
 - 2 Turn off the power to ImageQuant LAS 500 and turn it back on again after about ten seconds.
 - 3 If the error persists and cannot be resolved with this troubleshooting guide, contact your GE representative.
-

8.1 Problems with the captured image

Problem	Cause	Action
An appropriate image does not appear	Image is overexposed	Shorten the exposure time
	Image is underexposed	Make the exposure time longer
	The tray or filter are dirty	Clean the tray and filter, as instructed in <i>Chapter 7 Maintenance, on page 127</i>
	The size of the object to be exposed does not coincide with the exposed area	Place the membrane or the gel correctly on the tray and place the tray at the correct tray position, as instructed in <i>Section 5.3 Place the sample on a tray, on page 53</i>
Light leaks on the image	Exposure to direct sunlight	Avoid placing ImageQuant LAS 500 in direct sunlight
The image appears misty	Dew condensation in the optical system	Wait until the operation environment meets the required specifications
Unevenness is seen on the image	One of the UV LEDs is broken.	Turn the power off and contact your GE representative
	The sample tray is not correctly positioned	Place the tray correctly at the appropriate tray position

8.2 Strange sounds and odors

Problem	Cause	Action
The camera generates a strange noise	Camera failure	Turn off the ImageQuant LAS 500 power switch immediately and contact your GE representative
The camera generates a strange odor	Camera failure	Turn off the ImageQuant LAS 500 power switch immediately and contact your GE representative
The camera emits smoke	Camera failure	Turn off the ImageQuant LAS 500 power switch immediately and contact your GE representative
ImageQuant LAS 500 generates a strange odor	ImageQuant LAS 500 failure	Turn off the ImageQuant LAS 500 power switch immediately and contact your GE representative
ImageQuant LAS 500 emits smoke	ImageQuant LAS 500 failure	Turn off the ImageQuant LAS 500 power switch immediately and contact your GE representative

8.3 Problems with ImageQuant LAS 500

If the error persists even after the following actions have been taken, contact your GE representative.

Problem	Cause	Action
ImageQuant LAS 500 do not start	Power cord not connect- ed	Connect the power cord correctly
ImageQuant LAS 500 door cannot be opened and closed.	Foreign object is present in the door hinges	Remove the foreign object
	The hinges are dam- aged.	Contact your GE representative
The light source is lit even when the ImageQuant LAS 500 door is opened	Interlock failure	Turn off the power immediately and contact your GE representative

8.4 Problems with ImageQuant LAS 500 Control Software

If the error persists even after the following actions have been taken, contact your GE representative.

Problem	Cause	Action
After exposure, no image is displayed on the monitor	The light source does not function properly	Contact your GE representative
	The sample is not in position	Check the sample position
The machine instructs to insert the filter even though it is inserted	The white insert holes may be covered	Move or change the sample size so that the white insert holes are not covered
	The tray may have residues of fluorescent substances	Clean the tray
	The sample may cover parts of the tray that is needed for filter detection	Move or change the sample size so it does not cover relevant parts

9 Specifications

ImageQuant LAS 500 specifications

Parameter	Data
Image sensor	Peltier cooled, 8.3 megapixel CCD
Image sensor temperature	-25°C
Cooling down time	<5 minutes
Lens	F1.4/30 mm
Light source	Blue Epi light: 460nm
	UV Epi light: 365nm
	White Epi light: 470 to 635 nm
Operation	Fully automated (auto exposure, no focus or other adjustment or calibrations needed)
Maximum sample size	105 X 105 mm
Greyscale	65 536 levels (16 bit)
Exposure time	1/10 seconds to 1 hour
Dynamic range	4.8 orders of magnitude
Image output	Grey scale 16 bit (tif)
	Color image (jpg)

Dimensions and weight

Unit	Dimension	Weight
ImageQuant LAS 500	300(W) x 570(H) x 280(D) mm	15 kg

Power supply

Parameter	Data
Input voltage	100 to 240 V~
Voltage variation	±10%
Frequency	50/60 Hz
Max power	200 W

Environmental conditions

Parameter	Condition
Free space required around ImageQuant LAS 500.	Operation panel side: 20 cm
	Right: 10 cm
	Left: 10 cm
	Side opposite to operation panel: 10 cm
	Top: 10 cm
Placement	A stable laboratory bench with a load capacity of 490 N (50 kg) or higher
	Levelness tolerance: 2°
Other conditions	<ol style="list-style-type: none"> 1 Take into consideration the work flow and ancillary facilities when planning the installation. 2 Required construction and electricity/air conditioning work must be completed prior to installation. 3 It is not desirable, to have a heat source near the ImageQuant LAS 500 air intakes, even if the other environmental requirements have been met. 4 Do not install the equipment near a window to avoid direct sunlight. Attach a blind to nearby windows. 5 Do not place objects near the power outlet to maintain easy access to the power cord for disconnection in case of emergency.

9 Specifications

Parameter	Condition
Floor vibration conditions	<p>(1) Operating time Oscillation: 0.03G (5 to 60 Hz) Impact :1G</p> <p>(2) Non-operating time Oscillation: 0.4G (5 to 60 Hz) Impact :2G</p>
Operating temperature/humidity conditions	<p>Temperature: 18°C to 28°C (with temperature fluctuation below 10°C per hour or lower) Humidity: 15% to 70% RH (no dew condensation)</p> <p>Note: <i>When the above conditions cannot be satisfied, take appropriate actions.</i></p>
Transportation/storage conditions	<p>Temperature: -25 to 70°C Humidity: 5% to 95% RH (no dew condensation)</p> <p>Note: <i>When the above conditions cannot be satisfied, take appropriate actions.</i></p>
Installation location conditions	<ol style="list-style-type: none"> 1 Do not install the equipment where the temperature can vary widely 2 Do not install the equipment near a heat source such as a radiator 3 Do not install the equipment where it may get wet or flooded. 4 Do not install the equipment where it may be exposed to corrosive gas 5 Do not install the equipment in a dusty environment 6 Do not install the equipment in a place constantly or excessively exposed to vibration or impacts 7 Do not install the equipment in a place exposed to direct sunlight
Operation site	Indoor use
Maximum operating altitude	2000 m or lower
Overvoltage category	Transient overvoltage category II

Parameter	Condition
Rated pollution applied	Pollution Degree 2
Noise	70 dB(A) or lower Fast Lmax ≤ 60dB(A), and average Leq ≤ 54dB(A)
Degrees of protection provided by enclosure	IP21

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For local office contact information, visit
www.gelifesciences.com/contact

GE Healthcare Bio-Sciences AB
Björkgatan 30
751 84 Uppsala
Sweden

www.gelifesciences.com/quantitative_imaging

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GE Healthcare Europe GmbH
Munzinger Strasse 5, D-79111 Freiburg, Germany

GE Healthcare UK Limited
Amersham Place, Little Chalfont, Buckinghamshire, HP7 9NA, UK

GE Healthcare Bio-Sciences Corp.
800 Centennial Avenue, P.O. Box 1327, Piscataway, NJ 08855-1327, USA

GE Healthcare Japan Corporation
Sanken Bldg. 3-25-1, Hyakunincho Shinjuku-ku, Tokyo 169-0073, Japan

