FastGene®

FAS-X

Gel Documentation System

Catalog #: GP-FAS-X

TSCHER SAS

Version 1.0

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General Information

Safety information

Please read carefully the following notes to be able to properly use the FastGene® FAS-X imaging system.

⚠ Please wear the appropriate personal protective equipment (amber goggles).
⚠ Please read the safety precautions stated in this operating manual.
⚠ Using FastGene® Blue/Green LED technology will normally not injure eyes, skins, and samples. However, prolonged exposure of human naked eyes with light irradiation in the blue spectrum may increase the probability of suffering from retina diseases. Therefore, we recommend using the amber goggle, when handling the transilluminator while the FastGene® FAS-X is open.
⚠ The transilluminator will get warm due to the operation. The temperature is not harmful and will not cause any defects.
⚠ Operate the FAS-X only if it is connected to a safety socket.
⚠ Place the unit on a level and stable surface with minimal chance of dropping.
⚠ Only use the added power supply or an equal one.
⚠ The transilluminator can heat up after some time

Warranty

The FastGene® FAS-X is warranted against defects in materials and workmanship for 1 year. In case of any defects occurring in the instrument or accessories during this warranty period, NIPPON Genetics EUROPE will repair or replace the defective parts at its discretion without charge.

The following defects, however, are specifically excluded:

- Defects caused by improper operation.
- Repair or modification done by anyone other than NIPPON Genetics EUROPE or an authorized agent.
- Damage caused by substituting alternative parts.
- Use of fittings or spare parts supplied by anyone other than NIPPON Genetics EUROPE.
- Damage caused by accident or misuse.
- Damage caused by disaster.
- Corrosion caused by improper solvent or sample.

For any inquiry or request for repair service, contact NIPPON Genetics EUROPE or your local distributor. Please send a message containing information about the model and serial number of your instrument.

Regulatory notice

IMPORTANT: This NIPPON Genetics EUROPE instrument is designed and certified to meet safety standards and EMC regulations. Certified products are safe to use when operated in accordance with the instruction manual. This instrument must not be modified or altered in any way. Alteration of this instrument will:

- Void the manufacturer's warranty
- Void the safety and EMC certification
- Create a potential safety hazard

NIPPON Genetics EUROPE is not responsible for any injury or damage caused by the use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by NIPPON Genetics EUROPE or an authorized agent.

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Important notice

Please, read the installation instruction carefully before installing the FastGene® FAS-X. This instrument is intended for clinical and research laboratory use with DNA gel activation and it must be operated only by specialized personnel aware of the potential risks associated with the chemical and biological agents normally used with this unit and the health risks associated with blue light radiation. Please wear the amber goggle for your own protection!

Please make sure to connect the instrument only to a safety socket!

General precaution

- Plug the transilluminator on an electric line with ground connection by using the annexed power adaptor.
- Do not pour liquids directly on the transilluminator.
- Switch off the instrument immediately after usage.
- Position the transilluminator to prevent harm to nearby operators.
- Before you switch on the transilluminator, please wear amber googles.
- Clean with ddH_2O, alcohol or appropriate cleaning agents according to the chemicals used.
- Always wear disposable gloves.

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Specifications

Illuminator (built-in)

Built-in Blue-Green light	470-520 nm
View Area	26 x 21 cm

White light transilluminator (acessory)

External white light plate	Build-in battery or power supply via USB port
Dimension	29 x 20 x 0.8 cm
View area	22 x 16 cm
LEDs	Daylight LEDs, colour temp.: 5000 K, CRI = 95
Weight	570 g

Unit

Material	Painted metal
Rated Voltage	100-240 V~, 50/60 Hz for the power adapter
Output power adapter	24V, 6A
Dimension (H x L x W)	532 x 443 x 375 mm
Weight	20 kg
Touchscreen	13,3 inch glove compatible touch screen 1920 x 1080
Software	Integrated imaging FAS-X control software
Internal Storage	128 GB
White light	Integrated Epi white light
Camera	20 MPixel, f 12 mm
Access	Transilluminator with draw function
Connectivity	LAN, 3x USB 3.0
Accessory	Amber goggles, white light transilluminator

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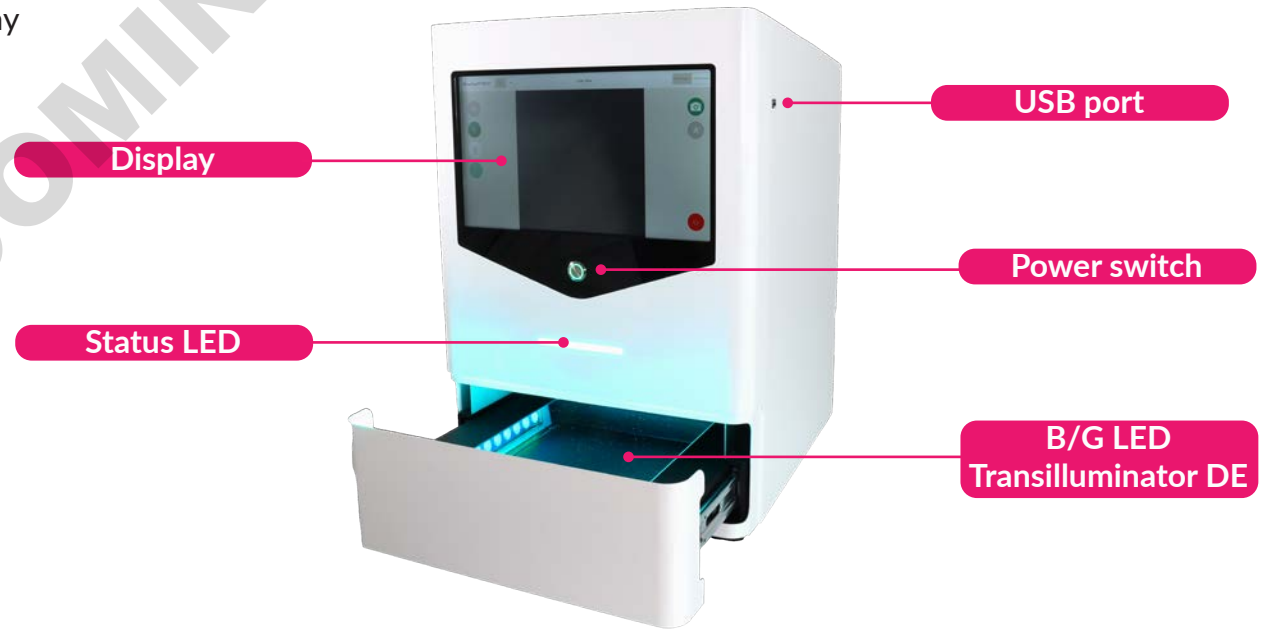
Nomenclature

- Blue/Green LED Transilluminator DE
- USB port
- Amber goggles
- White light transilluminator
- Cables:
    a. Power cable for connecting a power socket with the power adaptor
- Status LED
- Power switch
- Display



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Part I: Installation

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Installation guide - setting up the FAS-X

Place the unit on a level surface with minimal chance of dropping.

Connecting the cables

1. Connect the 24 V 6 A power adapter to a safety socket.

2. Connect the power adaptor with the power inlet of the FastGene® FAS-X on the back of the equipment (*).

If necessary, connect the network cable to the network input.
You can also use USB ports on the back to connect a mouse and/or keyboard (not included).
Only use the equipped power adapter or an equal one.

3. Switch on the unit by pressing the black switch (#) on the back of the FAS-X. The running blue light is displayed on the front of the FAS-X.

Status LED

Please refer to the table below to familiarise yourself with the various status LEDs of the FAS-X when you encounter the following conditions/situations:

Conditions/situations	Status LED
1. FAS-X receives electricity but it is turned off	Only white button
2. Booting	Running white light
3. Software is on	Static blue light
4. Blue/Green light is on	Static Blue/Green light
5. White light is on	Static white light
6. Capturing image with Blue/Green light with or without image preview	Running Blue/Green light until the image is saved
7. Capturing image with white light with or without image preview	Running white light until the image is saved

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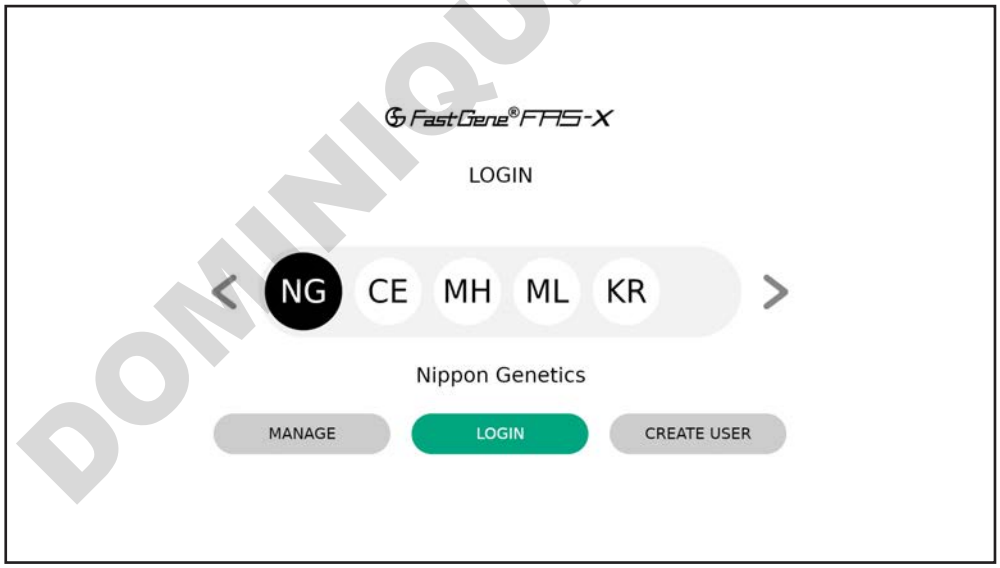
8. Stand by/sleep mode	Pulsating blue light
9. After turning off/deep sleep mode	Running blue light until FAS-X is off. Once the FAS-X is off, the blue light goes off, and the device enters condition/situation number 1 (only white button)
10. Error 1 - any error in the system	Static red light

Starting the software

The software will automatically be launched after the unit is switched on by pressing the power switch (▶) on the front of the FAS-X. The status LED will show a stedy blue light.

The LOGIN window opens when the FAS-X software is started.



Log in to a sample account named NG or directly create a user account(s) with a unique password.

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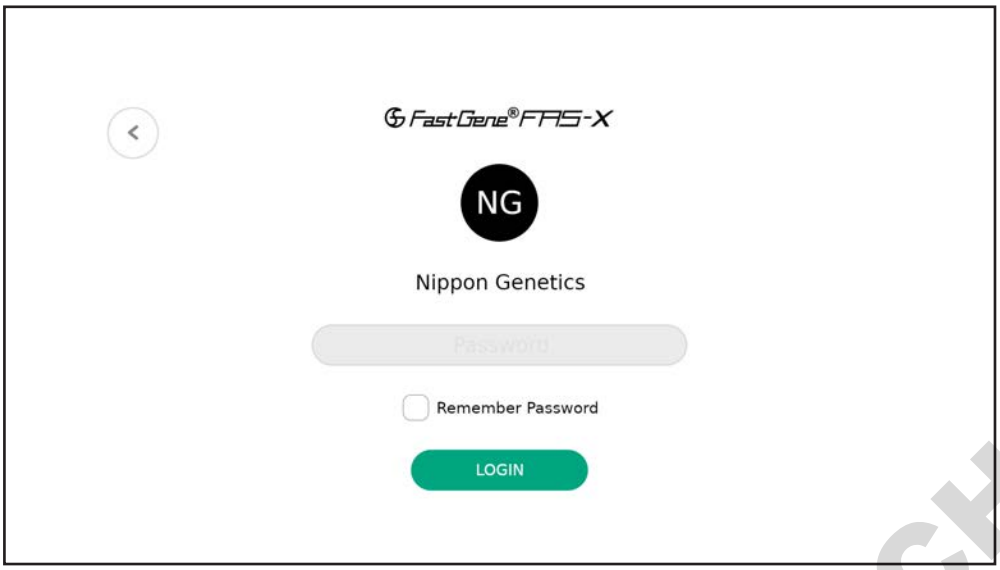
Select NG account to be able to login. The NG account login is password protected to prevent unauthorised access to the gel documentation system.



The password is NgE.

To create a new user (s), tap *CREATE USER* to define a user name and a password. There is no limit to the number of user accounts that can be created. Remeber that no spaces are allowed in the username.

You can change the username and password or delete the account(s) with a *MANAGE* option at any time.

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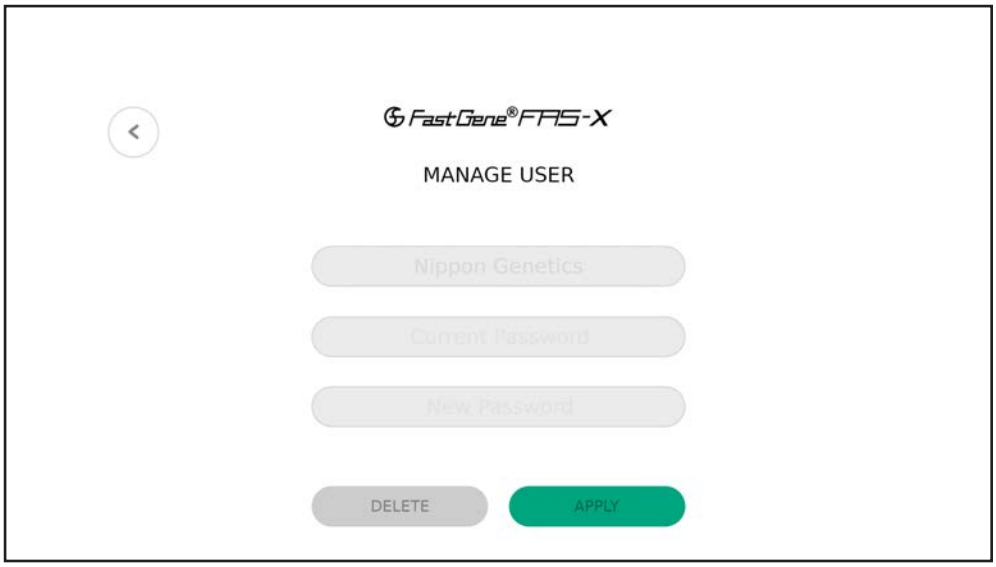
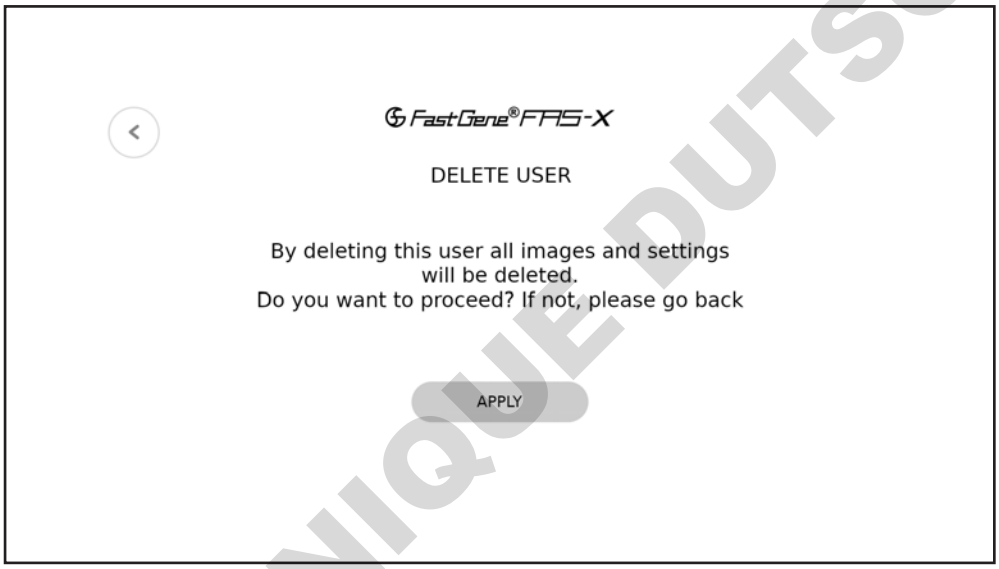


If you don't want to delete the specific user account, you can return to the initial login menu by pressing the head arrow in the upper left corner.



Remember that deleting a user will also delete all images and settings. The system will ask you if you wish to continue.

Password confirmation is a requirement for account deletion.

The FAS-X software is supplied two modes: **Auto** and **Pro** modes. Once logged in, the software will open in Auto mode.

The **Auto** mode automatically optimizes the image capture process for you.

The **Pro** mode gives you full control over the image capture settings.

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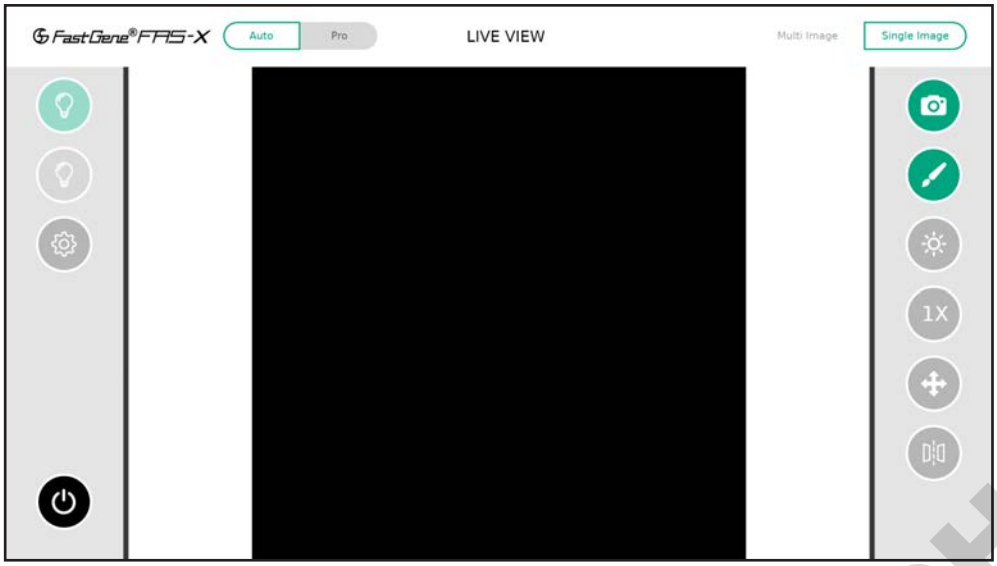
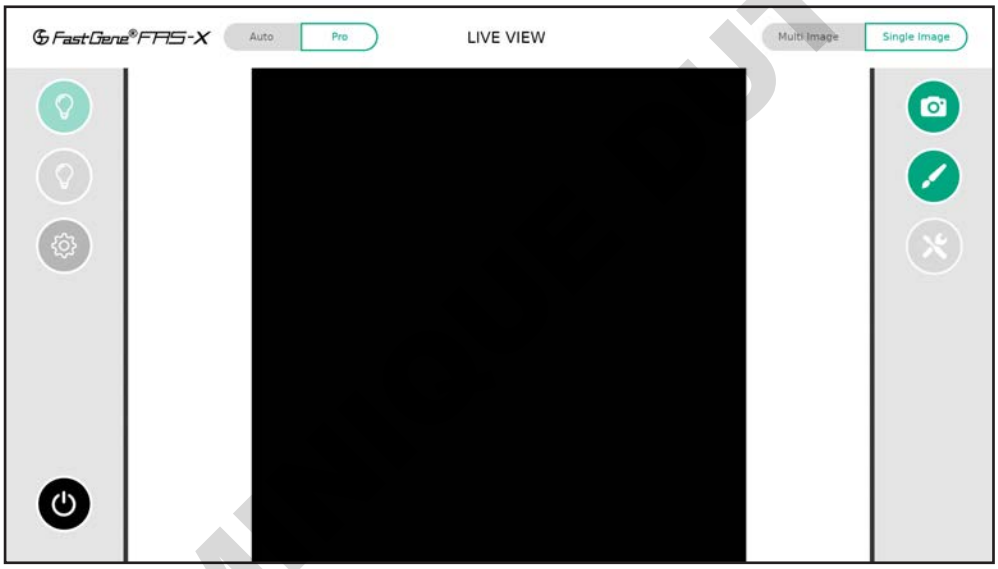
Once logged in, the software will open in Auto mode.



To switch to Pro mode, simply click on the *Pro* button in the top right-hand corner of the software.



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WELL DONE!

The FAS-X is ready to serve you. Please continue with the IQ/OQ/PQ protocol.

Part II: IQ - OQ - PQ

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Installation, operation and performance qualification

FastGene® FAS-X gel documentation system (GP-FAS-X)

Protocol acceptance by customer and list of tests performed

NIPPON Genetics EUROPE recommends signing the IQ, OQ, PQ document when all tests are performed after installation. Operational Qualification should be run iif the instrument is not performing according to the specification. This document is used as the final QC protocol of every unit we produce in Germany. Therefore, we use the lane FC (Factory Control) for our tests.

I have reviewed the IQ/OQ/PQ document and agree that it provides the appropriate procedures for the Installation Qualification/Operational Qualification and Performance Qualification of the FAS-X device and software.

Customer Name	Customer Signature	Date

Reviewer Name	Reviewer Signature	Date

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List of serial numbers

Serial No. Device Date

Serial No. Camera

Serial No. White light plate

List of components

- FAS-X stand-alone system
- Power cable (see part I - installation)
- Amber goggles
- FastGene® Agarose Gel Band Cutter
- White light plate

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Installation qualification

IQ Check List	FC	Customer	Note
Are all components included	x	☐	
No obvious defects on casing	x	☐	
Check drawer, if it is moving easily	x	☐	
Check B/G drawer for defects	x	☐	
Check camera for defects	x	☐	
Check if the drawer can be opened and closed properly	x	☐	
USB with manual	x	☐	
Turn the switch on at the back of the housing and press the bottom at the front – does screen turn on?	x	☐	
FAS-X software opens after switching on	x	☐	
Examination signature		Verification signature	

Operation qualification

OQ Check List	FC	Customer	Note
Check touchscreen	x	☐	
Check Blue/Green LEDs	x	☐	
Check white LEDs	x	☐	
System time setup	x	☐	
Check that no light is detectable when lights are off (black image)	x	☐	
Examination signature		Verification signature	

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Performance qualification

PQ Check List	FC	Customer	Note
Place a gel on the drawer	x	☐	
Using the FAS-X software:			
• Take and save an image	x	☐	
• Change zoom in live view	x	☐	
• Change auto exposure level (Auto mode)	x	☐	
• Change exposure time (Pro mode)	x	☐	
• Change gain (Pro mode)	x	☐	
• Activate filters in live view (Pro mode)	x	☐	
• Rotate the live view image (Pro mode)	x	☐	
• Mirror the live view image vertically/horizontally	x	☐	
• Do multi-image and save one of the images	x	☐	
• Edit a previously saved image	x	☐	
Examination signature		Verification signature	

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Part III: Manual

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Operating the system

The NIPPON Genetics FAS-X software can control all the parameters necessary to acquire an image with the FAS-X.

All of the following functions can be performed or accessed from the main menu and are similar in both Auto and Pro modes.

Light source function

To activate the required light source, click on the green or white bulb. The green bulb activates the Blue/Green LED transilluminator and the white bulb activates the white epi-illuminator. Use Blue/Green LED lamp for fluorescent visualization and white LED lamp for colorimetric visualization.

Blue/Green LED lamp off

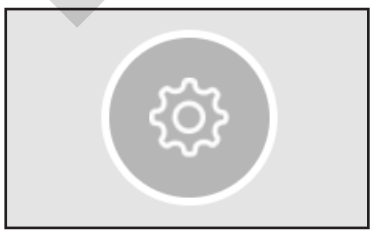
White LED lamp off

Blue/Green LED lamp on

White LED lamp on

To avoid misuse and to prevent the filter wheel from malfunctioning, please wait approximately 1 second before switching between the lights.

System settings function



Press the gear icon to get access to the settings menu. Here you change all essential settings of the device:

- shoot settings
- file settings
- system settings
- support

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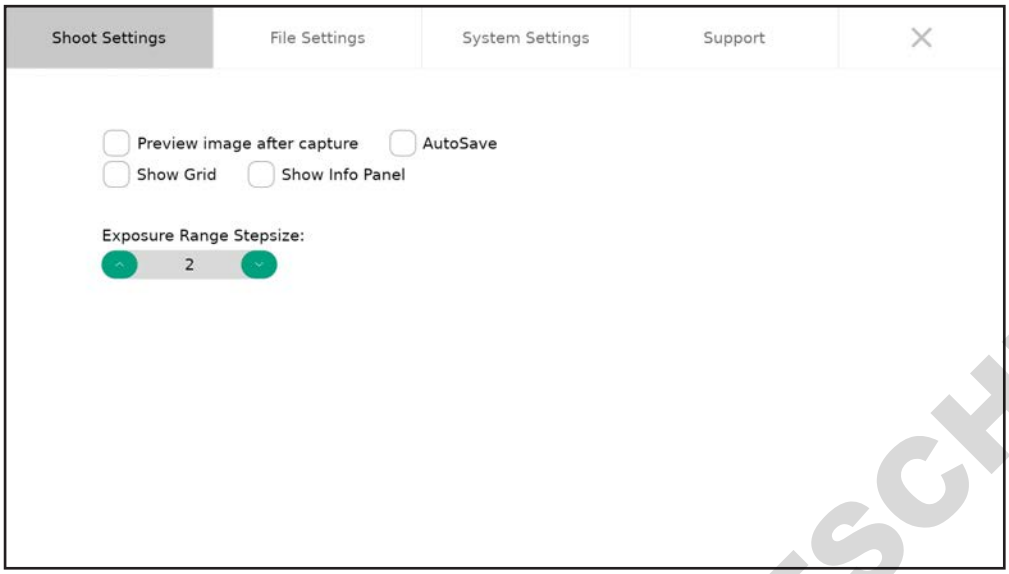
Shoot settings

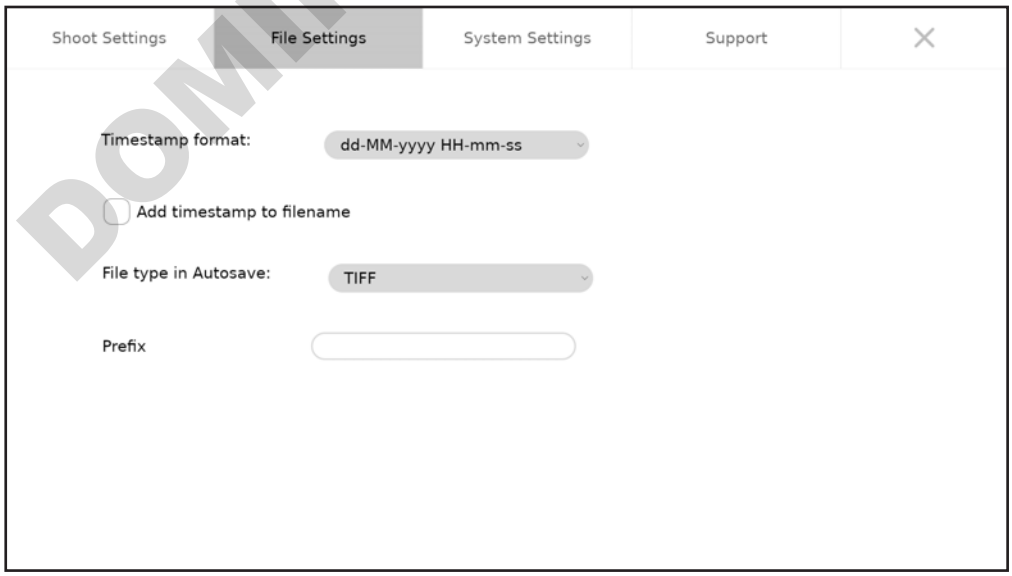
The shoot settings allow you to configure various parameters related to the camera operation and image capture.



The *Exposure Range Stepsize* refers to the image brightness adjustment, allowing you to choose the brightness difference should be between the images in Pro mode multi-image recording (page 42). The exposure difference between the different images is approximately 12% for level 1, 25% for level 2, 50% for level 3 and 75% for level 4. The given exposure time is the midpoint. For example, at 1 second exposure time, level 2 (25%) and multiple-image 3, the images are taken at 0.75, 1, and 1.25 seconds.

Additional features such as *Preview image after capture*, *AutoSave*, *Show Grid* and *Show Info Panel*, can be activated and deactivated at any moment.

File settings



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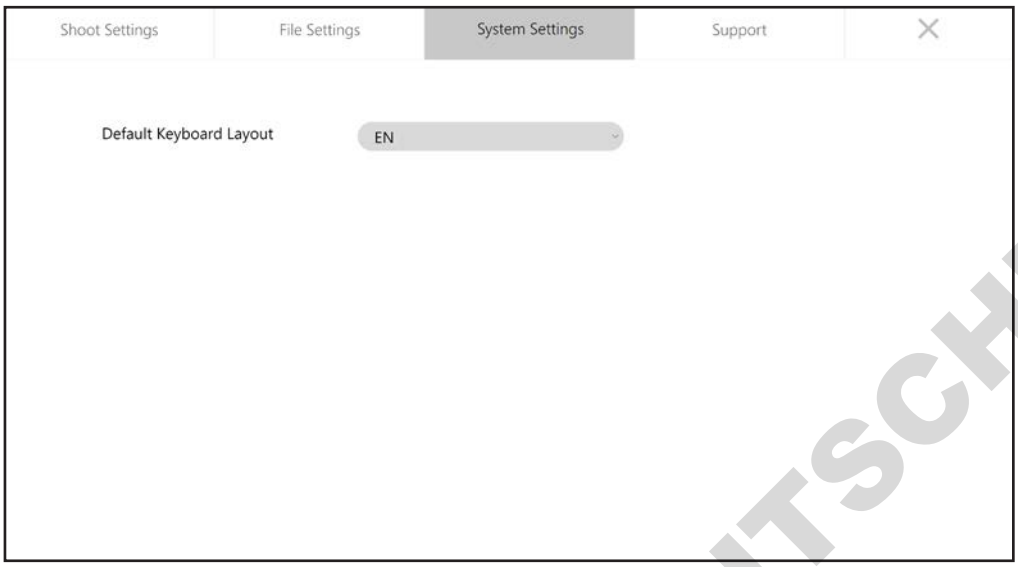
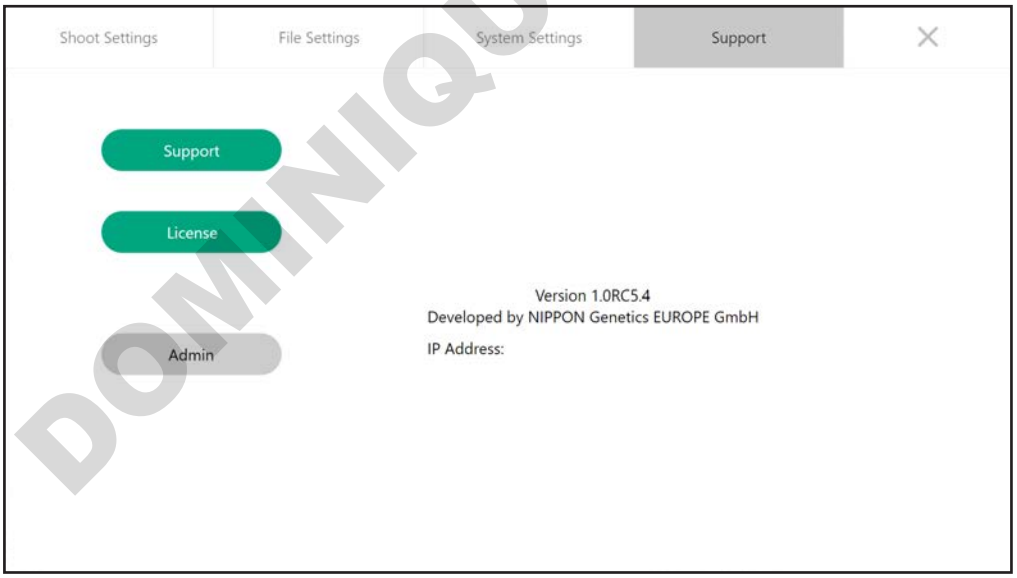
File settings refer to the options you can select to customise how your photos are saved and stored, such as selecting the file type, setting the prefix name, or choosing to add the timestamp to your file name.

System settings



System settings allow you to define the keyboard layout.

Support



The support section provides the resources about the system and contact for technical support.

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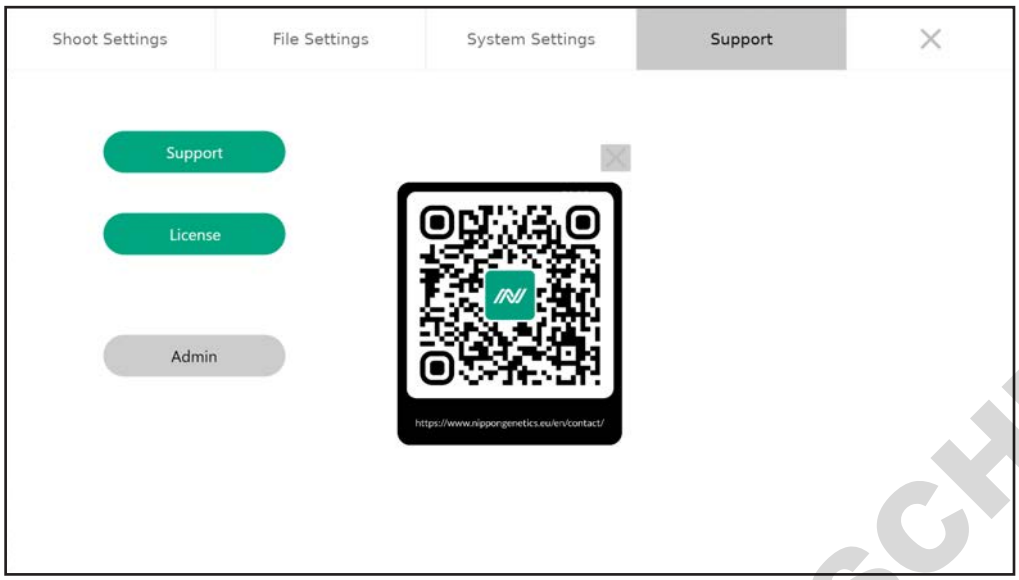
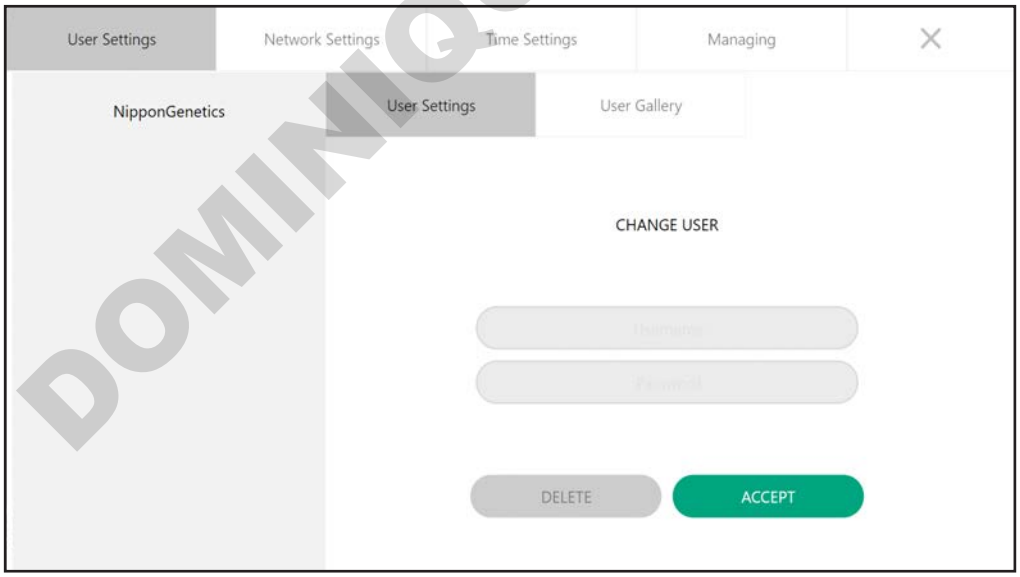
The *Support* button comes with the QR code when pressing on. Once scanned, it will take you directly to our Contact Us page (https://www.nippongenetics.eu/en/contact/). Here you will find all the contact forms you need.



The *License* contains information about the current software licence. The future software updates will be available free of charge. Simply insert the drive and press *Update*.

The *Admin* button opens the admin panel, which is only available to users with admin rights, namely the NipponGenetics account. It allows you to manage other user accounts, opt for local connectivity for effortless data transfer, set the system time and date, and restore the FAS-X to its default configuration.

User settings



User settings with admin rights enable you to change the password of a particular user account in situations such as a forgotten password, or delete an inactive account without the need of a password. The *User Gallery* gives you access to the gallery of a selected user (see page 33).

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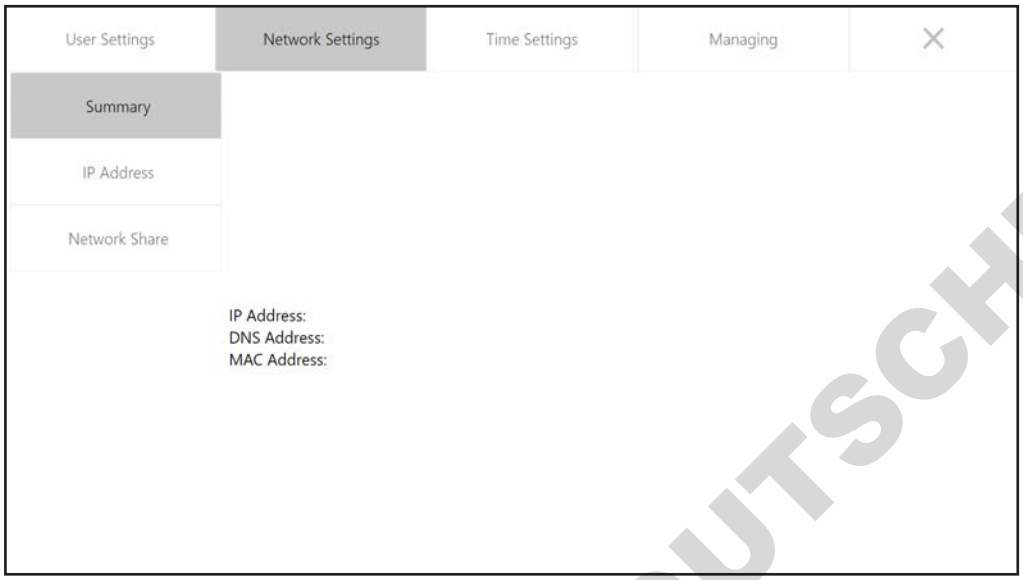
Network settings

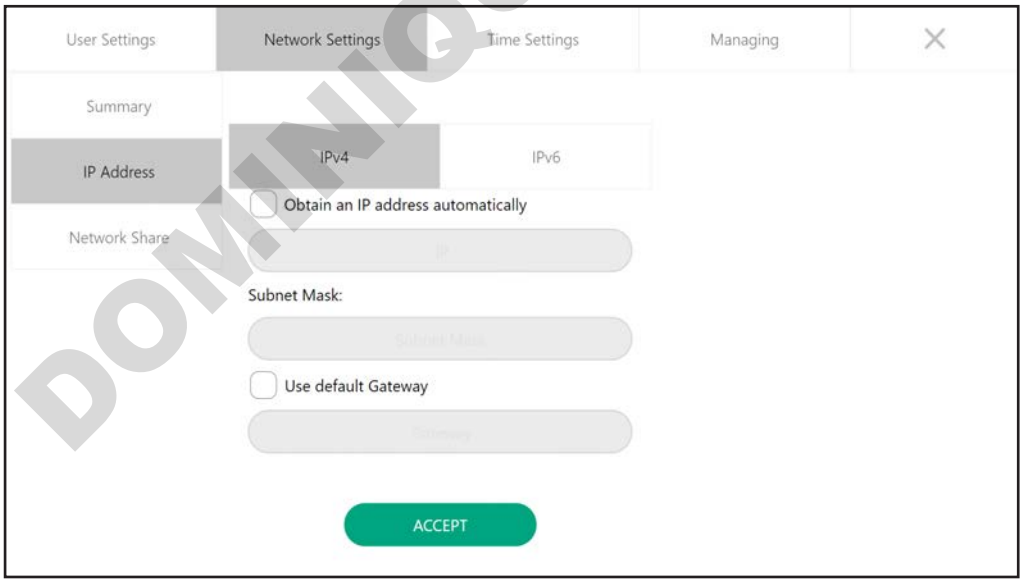
The ***network settings*** offer a summary of the network identifiers (IP address, DNS address, and MAC address) once connected to a local network and the ability to connect locally for potential data sharing.

Summary of the network identifiers



Obtain IP address if not yet defined

Please tick the box to automatically obtain an IP address in the local network and then press *ACCEPT*.



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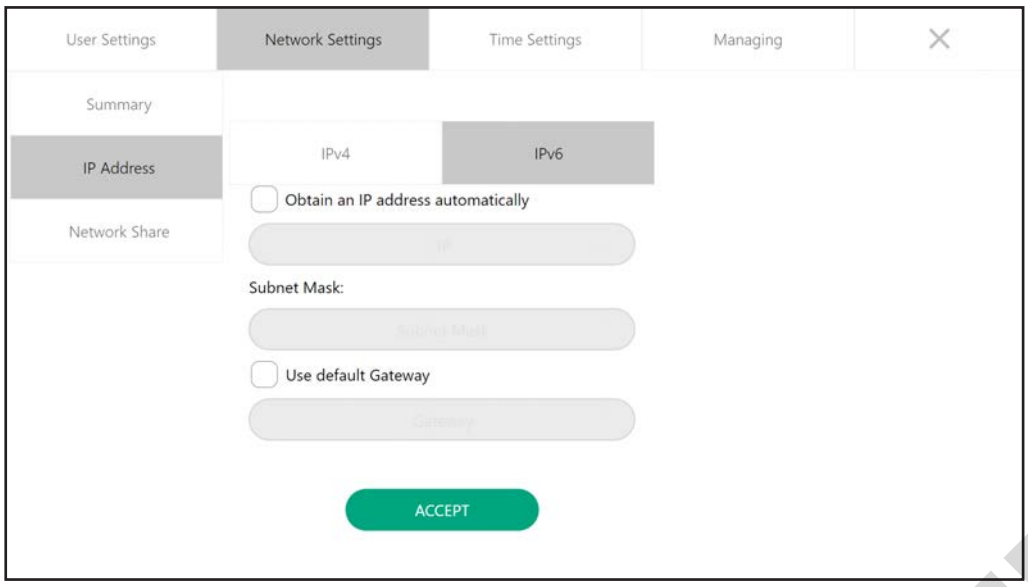
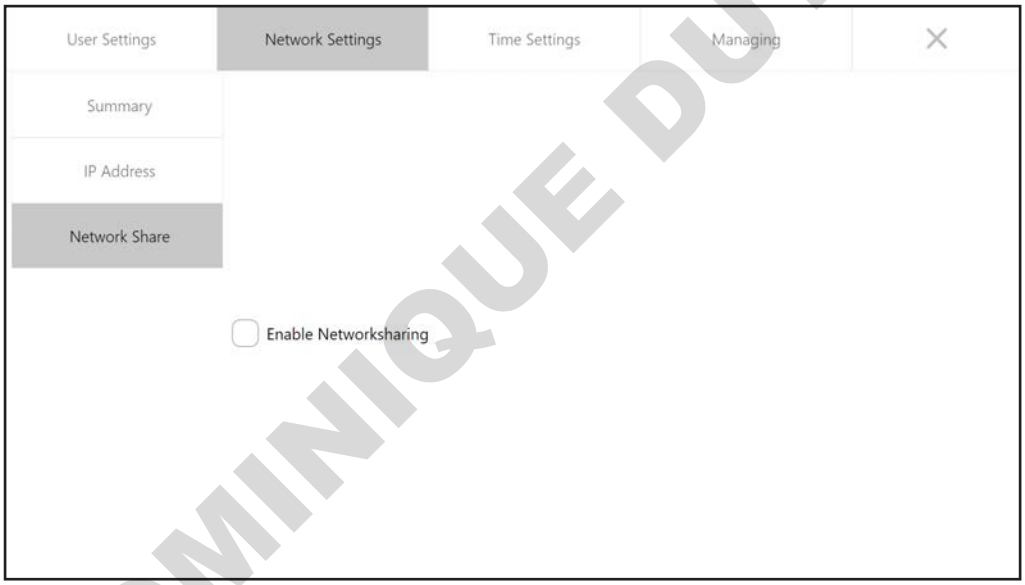


Note that IPv4 is the old standard for defining IP addresses, while IPv6 is the new standard.

Network share for local connection



Please tick the box to enable the access of the files and images in the FAS-X on the computer connected to the same local network.

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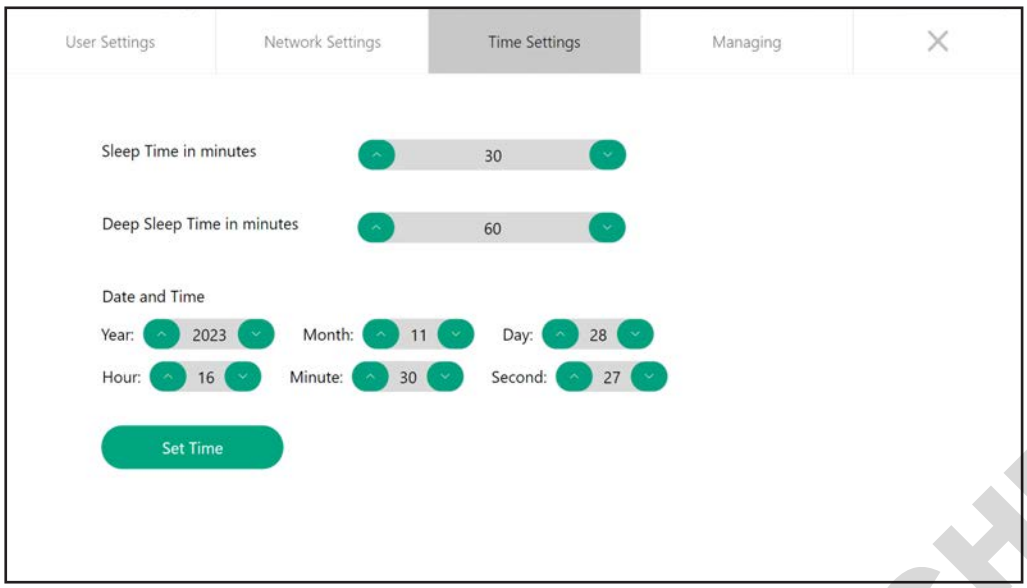
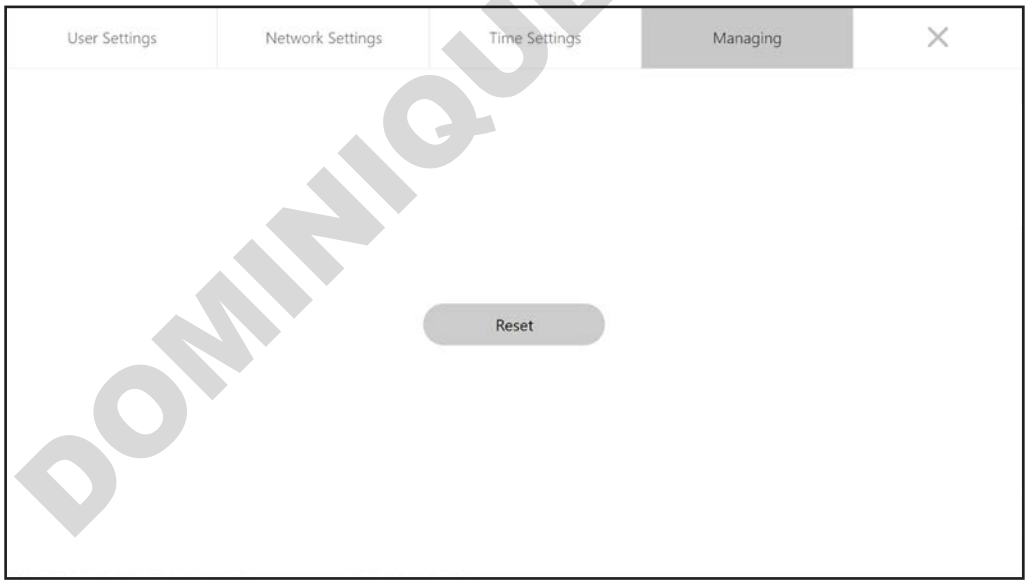
Time settings



Time settings refer to the configuration and adjustment of various time-related parameters of the FAS-X. These include:

- sleep time (start the stand-by mode),
- deep sleep time (shut down the system), and
- date and time of the system.

Managing



In the *Managing* section, it is possible to reset the FAS-X to its original factory settings. Please note that the reset function deletes all users and their corresponding settings and images.

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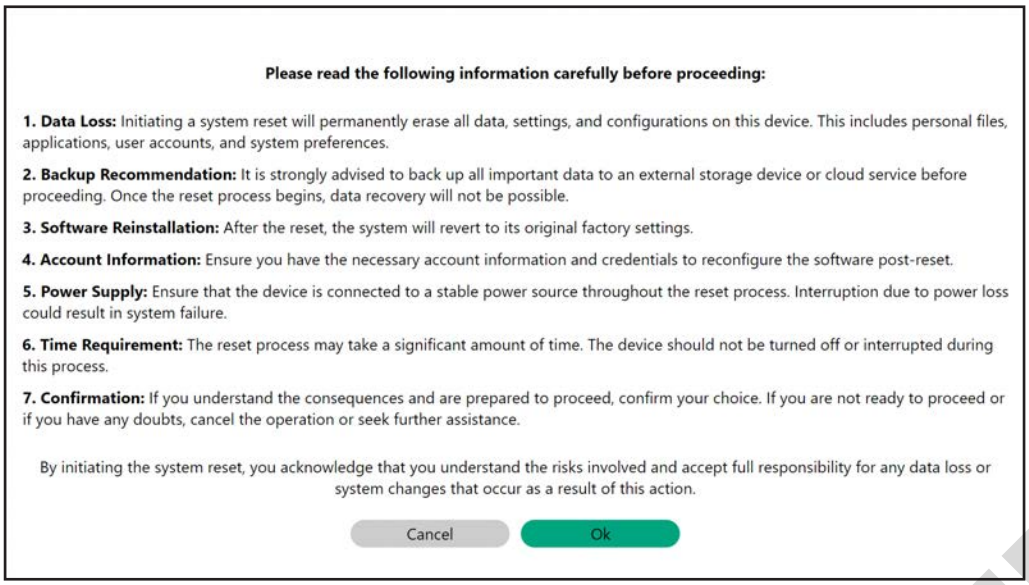
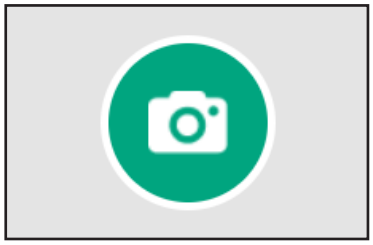


Shut down function

Press the shutdown button in the software to shut down the unit, put it to sleep, or log out.

If the unit is switched off, wait 15 seconds before switching it on again to to let the system completely shut down. In the event of a crash, switch the system off and on again from the back before pressing the front button of the FAS-X.

Capture image function



The image is captured and saved to the computer‘s hard drive or to a network location selected by the user.

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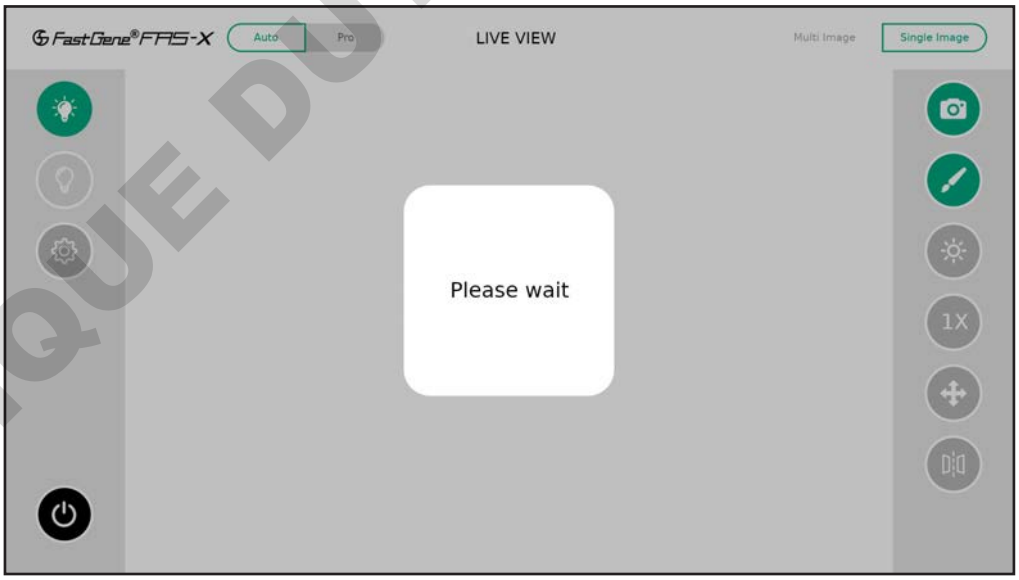
If the AustoSave mode is activated (see shoot settings), the image is automatically saved as soon as it is captured. If the AustoSave mode is inactivated (see shoot settings), the Save screen will open automatically after the image has been captured. Here you can change the name. The process is as follows:

1 - Position the gel centrally

2 - Adjust the zoom/ brightness accordingly

3 - Capture the image



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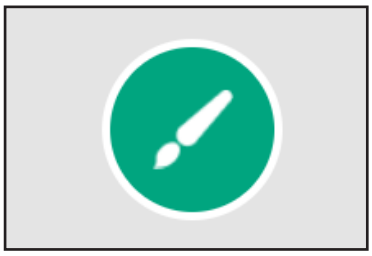
4 - On the Save Screen, name the image and choose the file tpe.

5 - Click *Save*.

Gallery function



All your saved recordings are available in the gallery at any time.

In the gallery section, you can easily manage your own data: delete the selected image(s)/folder(s), create new folder(s), move folder(s), edit the image with the *Image Editor*, print your image(s) directly and move the images to the folder(s) you have created.

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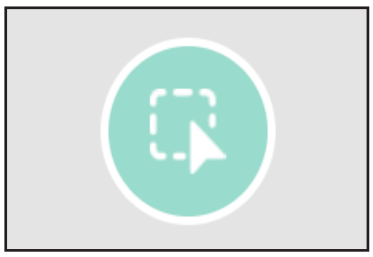
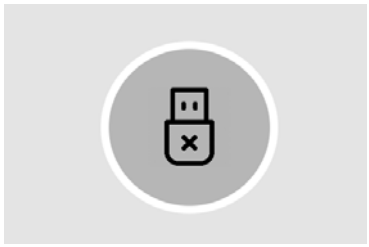
Select



When clicked on, this function will become active thus allowing you to select the image(s)/folder.

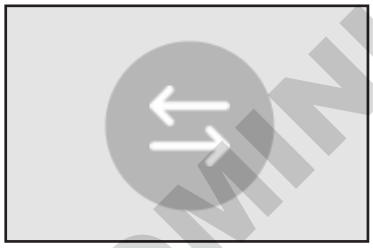
This will select everything in the gallery. Press twice to deselect your selection.

Eject USB



Safely disconnect a USB device (such as a USB flash drive, external hard drive, or other removable storage device). **Important: If you remove your storage device without ejecting it securely, you risk losing your data.**

Transfer



Transfer the selected images and folders to the USB stick.

Delete

Delete selected images and folders.

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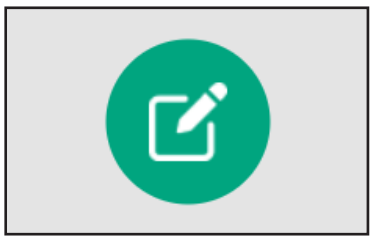
Image editor



Edit the selected image by adjusting image properties.

Open the *Image Editor* when the image to be edited is selected.

Here you can find and use the same image settings - such as movement, flipping, rotating, zooming and filters - as during the capture process (see Operation in Auto mode and Operation in Po mode sections). This allows you to fine-tune the settings of the image for a better analysis.

Don't forget to press *Save* button. You can save the image as new, keeping the original, or replace the original with the modified image by overwriting it. All modified images are stored in the gallery.

Editing multiple pictures is also possible. To begin, simply select all the images you want to edit in the gallery, and then proceed to open *Image Editor*. The selected images are displayed on the left. Edit each image individually as mentioned previously.

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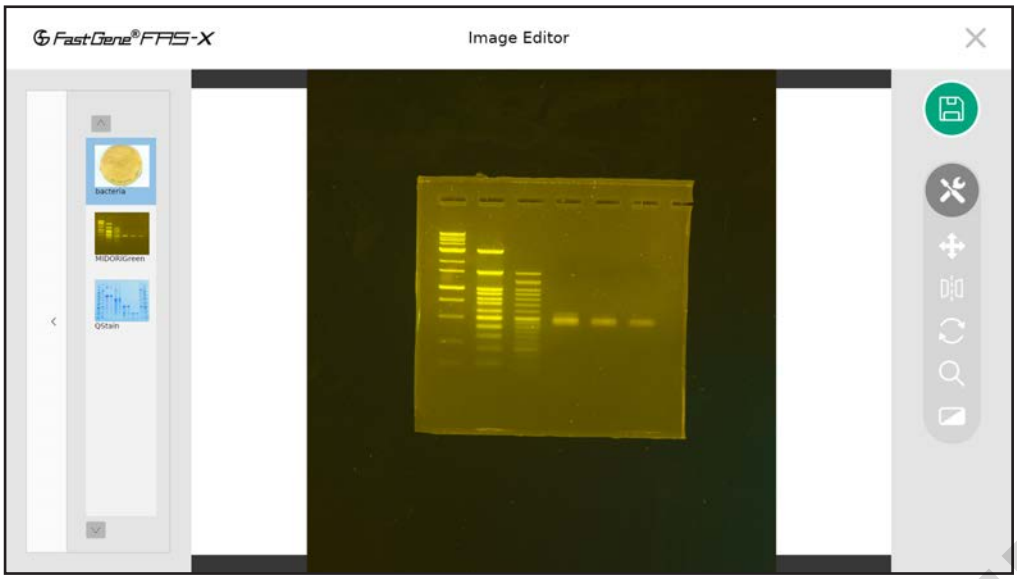
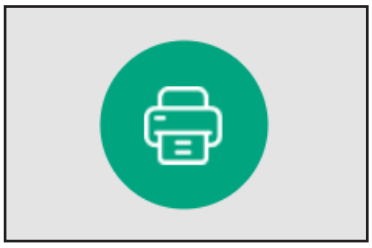
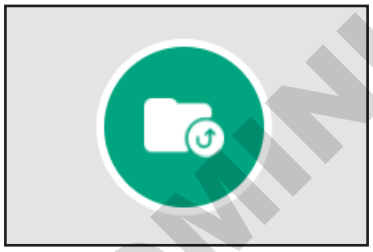


Print



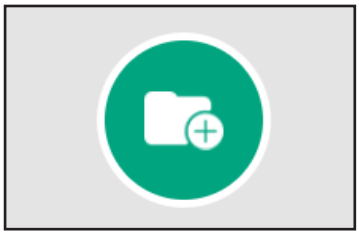
Print the selected image. This button will only be displayed if a printer is connected to the FAS-X.
The supported printers are Sony UP-X898MD and Sony UP-D897.

Back to the parent folder



Once inside a folder, you can return to the parent folder.

Create new folder



Create new folder

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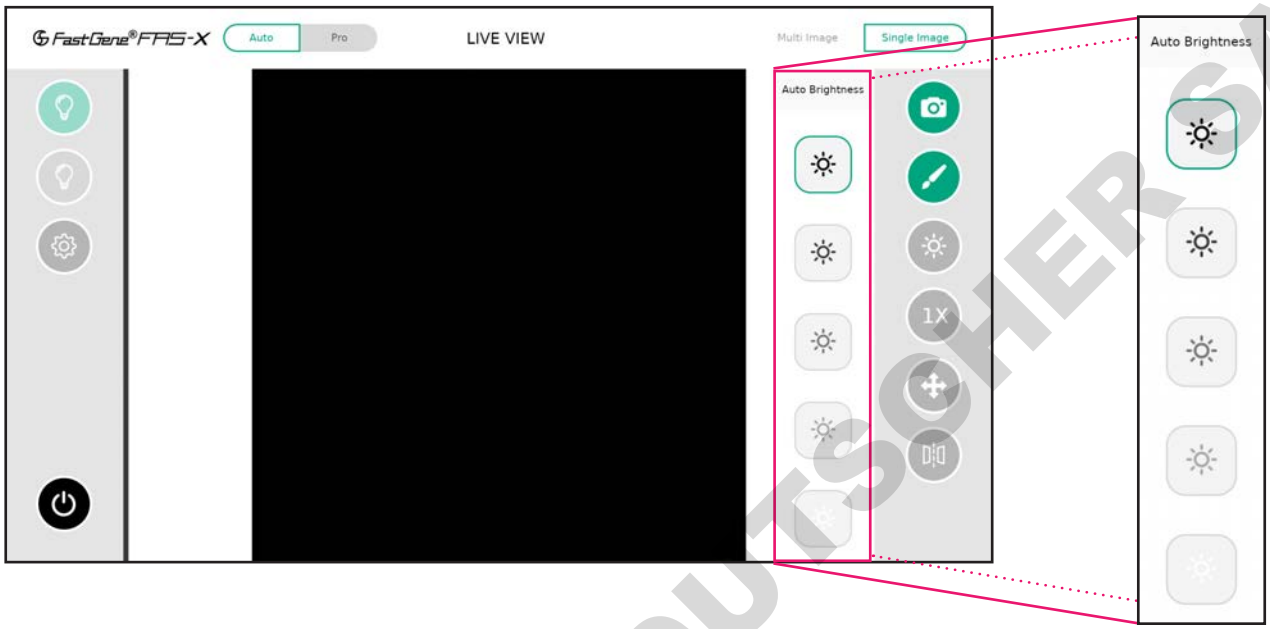
Operation in Auto mode

Exposure adjustment function

In Auto mode, you can adjust the brightness (5 different levels) according to the signal intensity of your sample(s).



The dark sun symbol represents the longer exposure time, while the brightest sun represents the shortest exposure time. **Note that the same exposure time will produce different results for Blue/ Green and white LED light sources.**

Zoom adjustment function

In the Auto mode, there are three different zoom levels: 1x, 2x, and 4x.

The default zoom is set to 1x. Tap once to zoom in to 2x and twice to zoom in to 4x. Reverse the process to zoom out. The images below represent the layout of different zoom levels:

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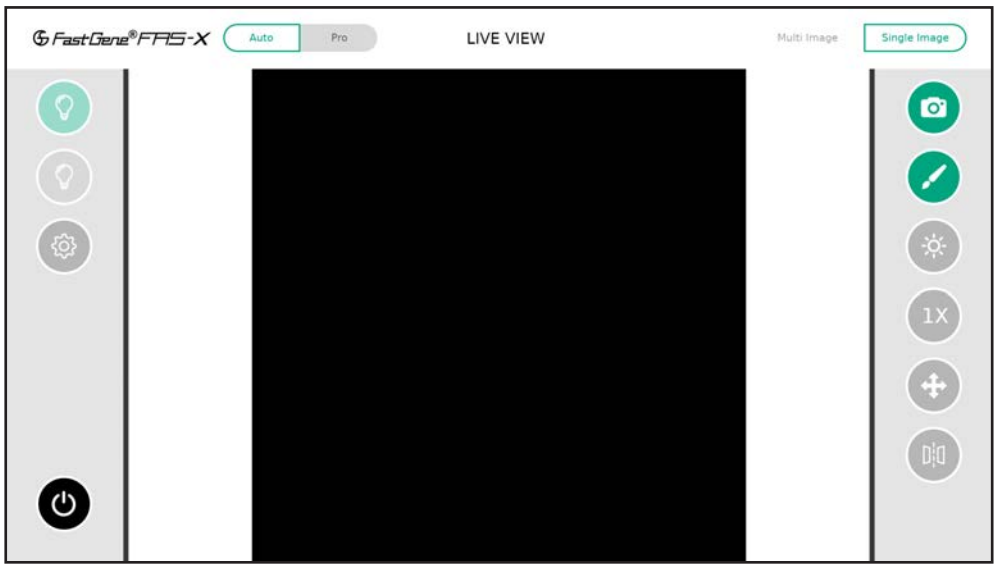
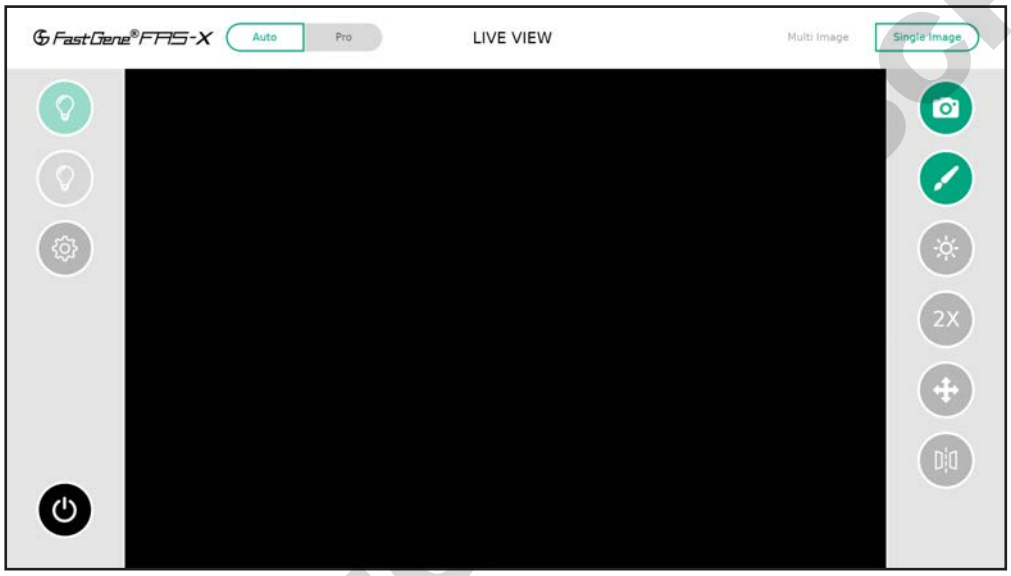
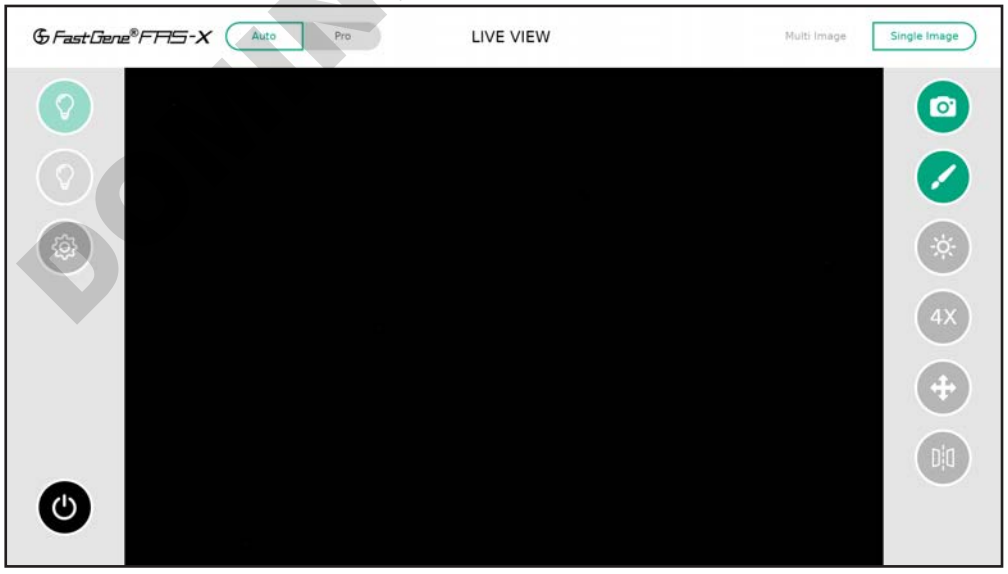


Zoom 1x



Zoom 2x



Zoom 4x

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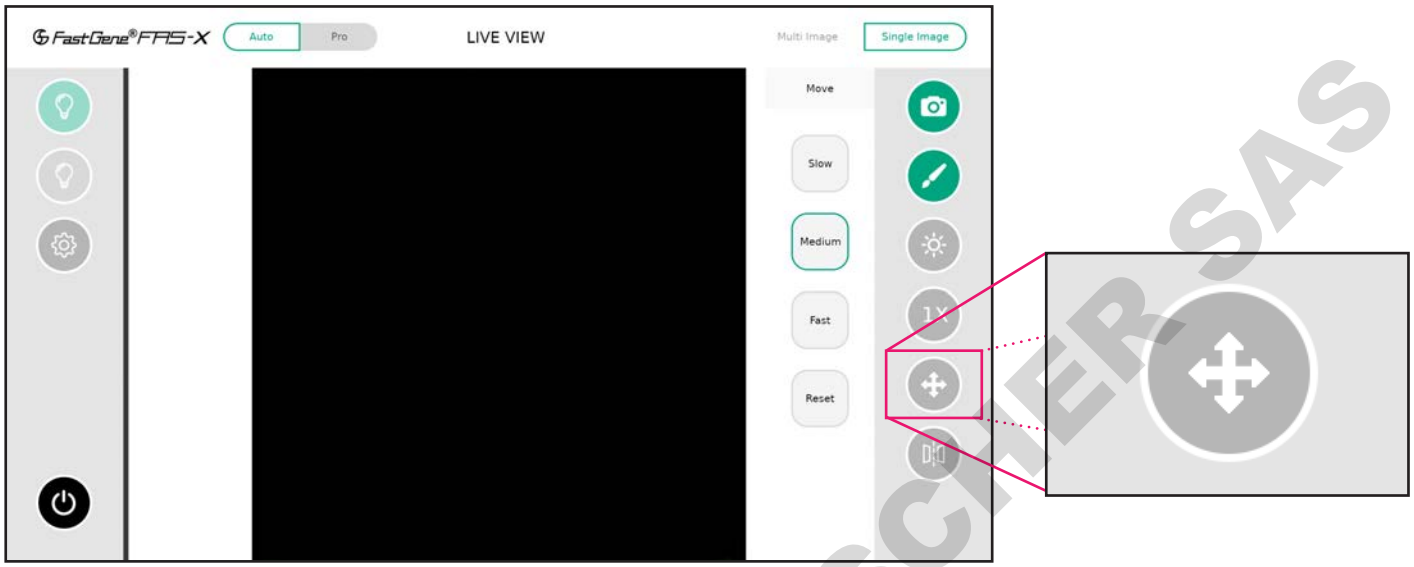
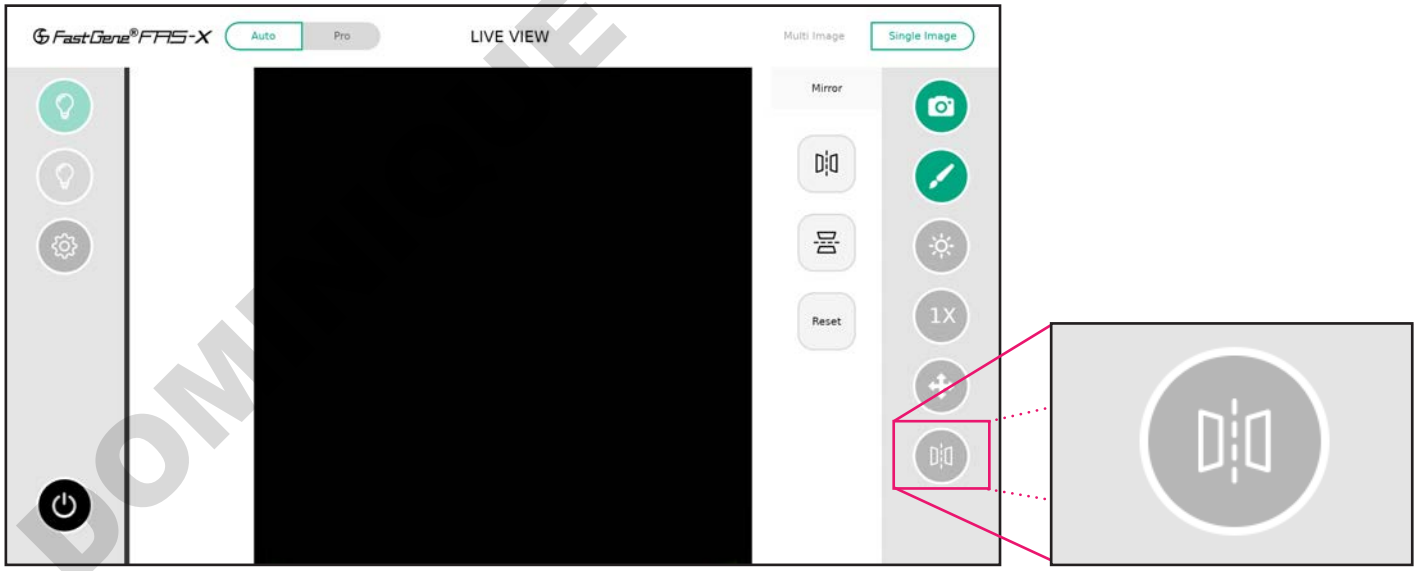
Move function

Use the *Move* function to position the bands of interest in the centre of the display after zooming in.



Mirror function

This function allows you to flip the image horizontally or vertically. Additionally, you have the option to reset the mirroring.



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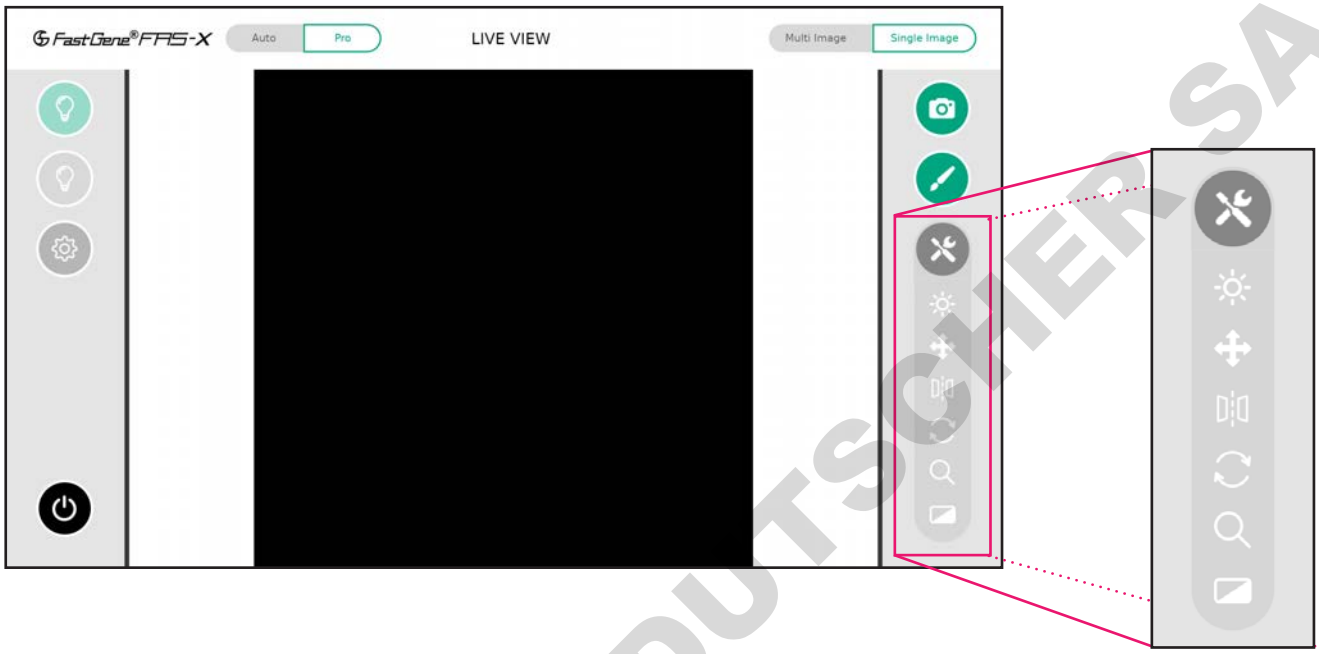
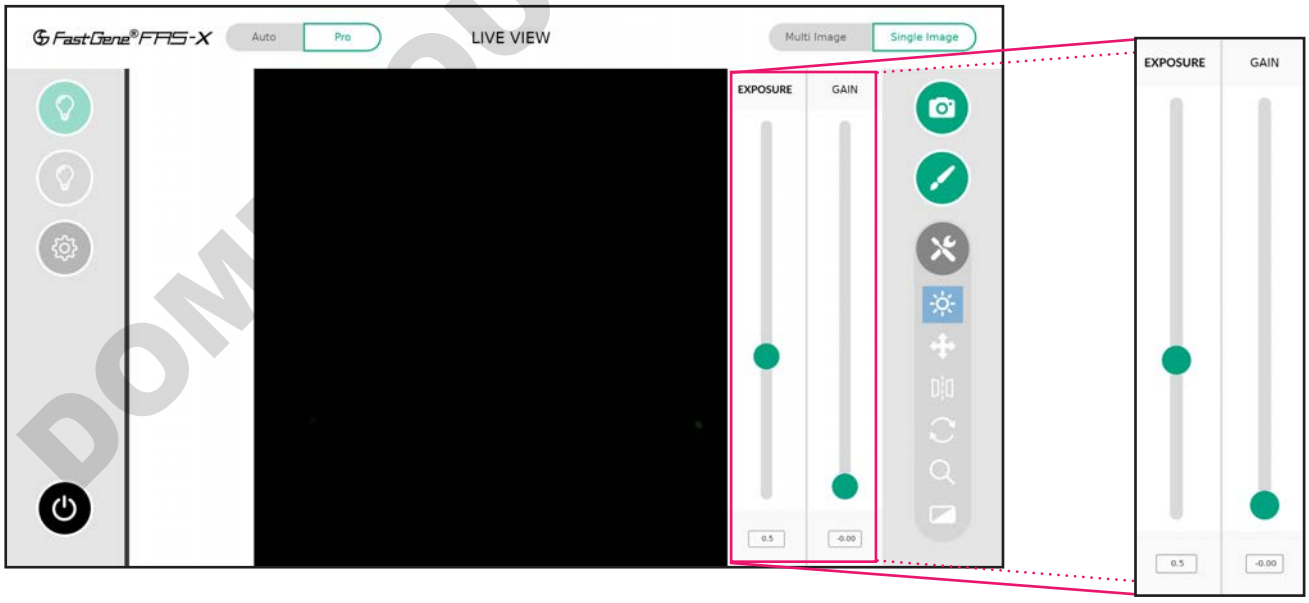
Operation in Pro mode

To operate in Pro mode, switch from Auto to Pro mode in the top left corner.

To access the exposure time, move, mirror, rotate, zoom, and filter options tap on the tools icon to expose them.



Exposure adjustment function



In Pro mode, the exposure time of the sensor is shown in seconds or milliseconds depending on the set value.

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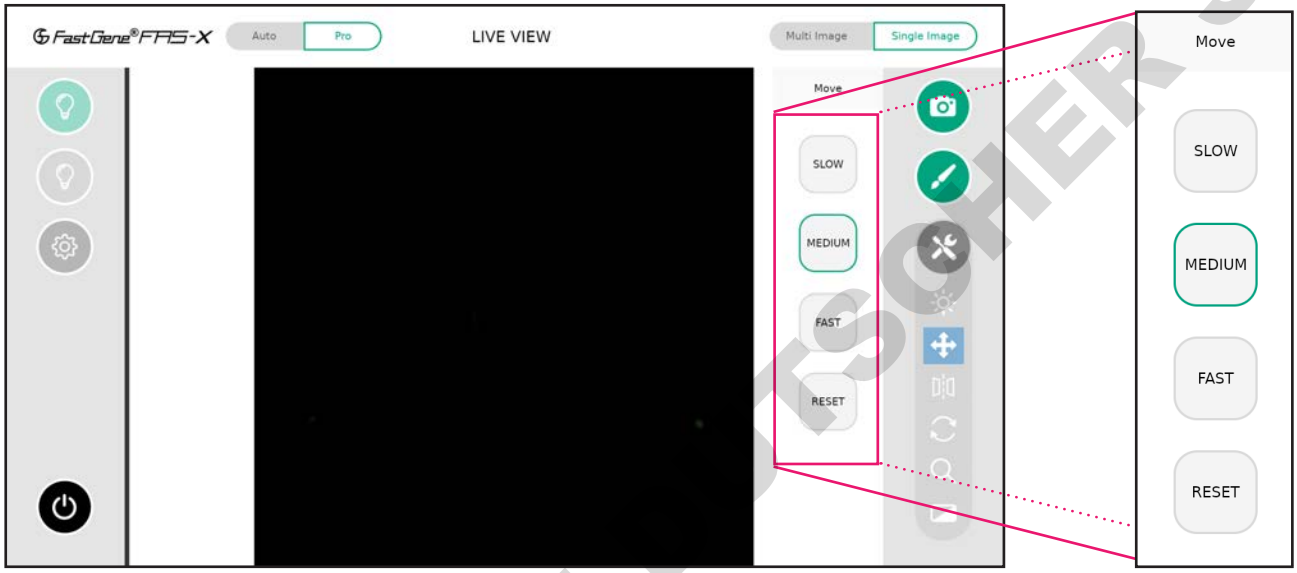
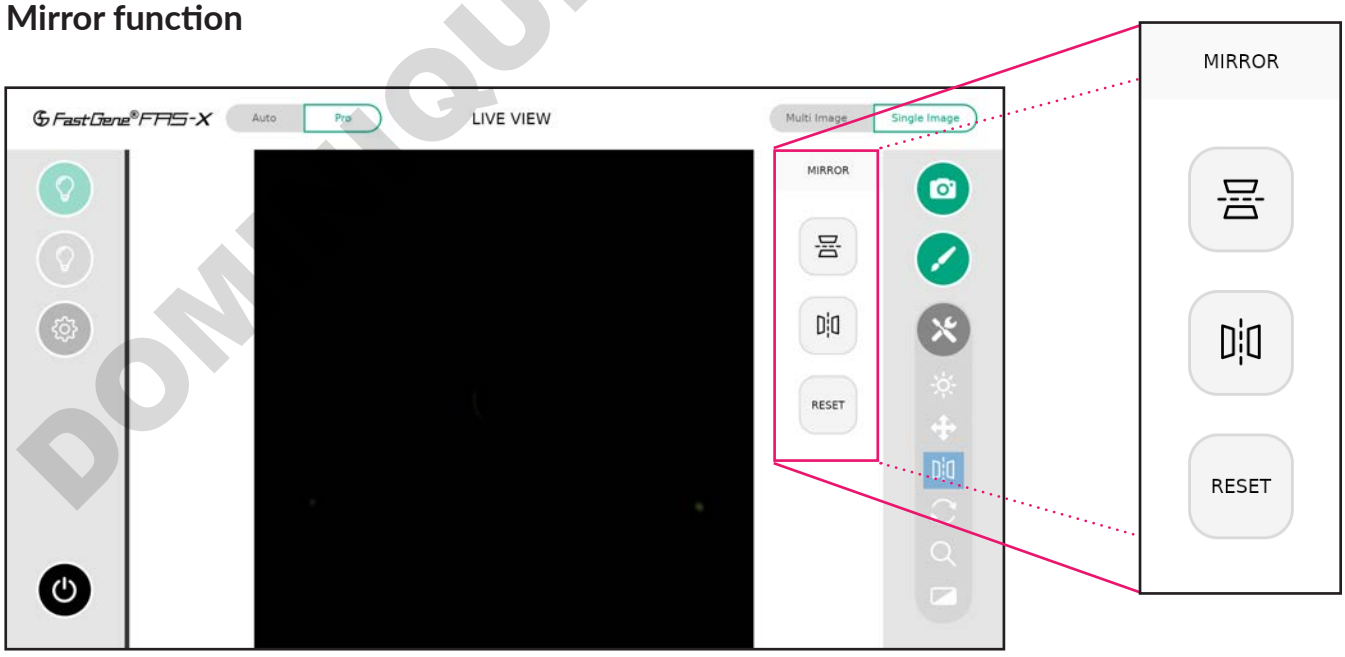
The exposure time range is 13 µs to 10 seconds. You can change the values by entering a number in the numeric field or using the button to increase or decrease the exposure time. The gain can be changed in the same way.

Move function

In Pro mode, you can adjust the movement mode - from slow, medium and fast - to position the bands of interest in the centre of the transilluminator.



Mirror function



Just like in Auto mode, in Pro mode you can mirror the picture horizontally or vertically. It is also reset the mirroring.

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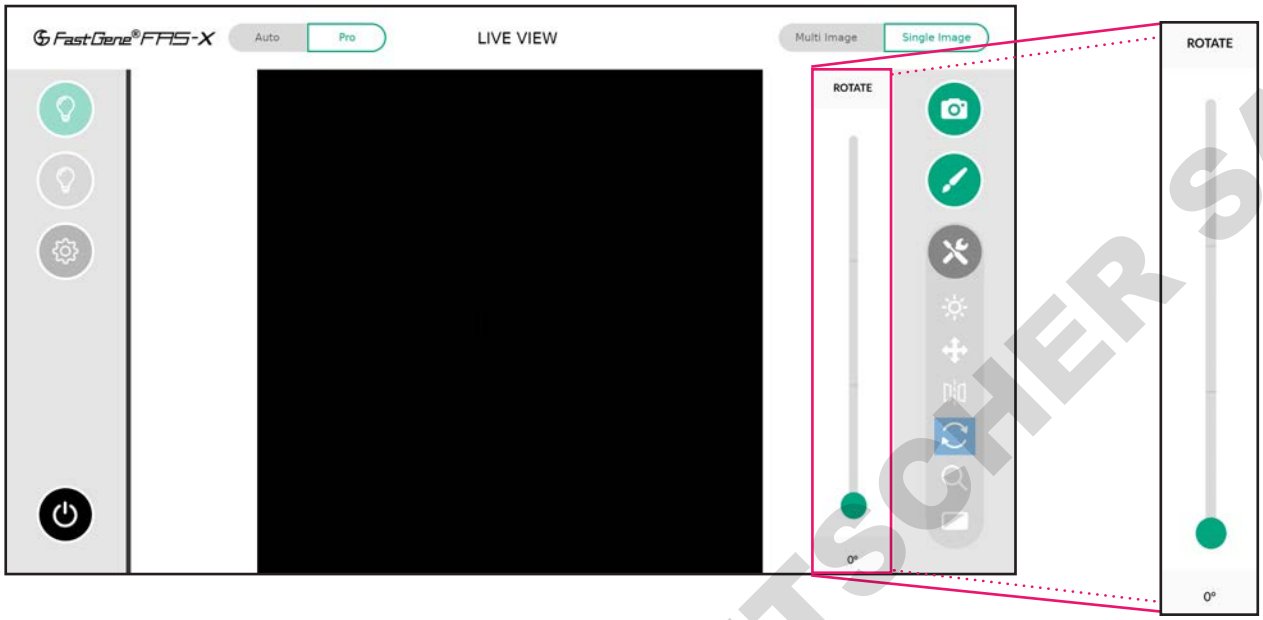
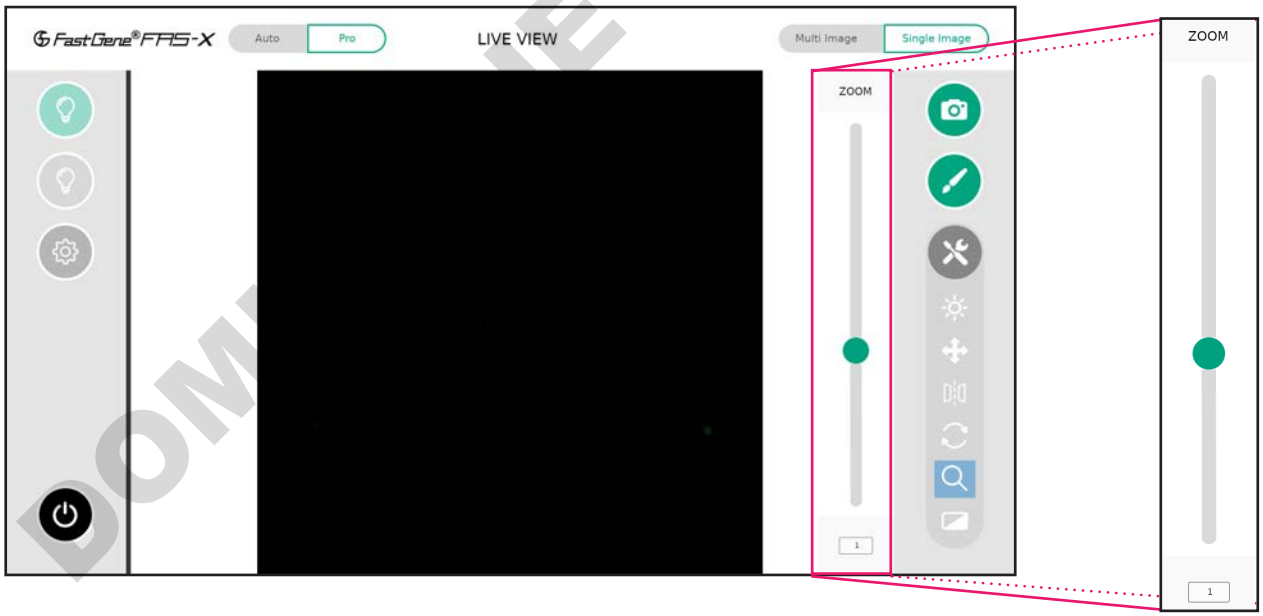
Rotate function

The *Rotate* function is exclusive to Pro mode. If the object is not placed in the correct orientation, you can rotate the image by using the slider, the buttons or type in the desired angle.



Zoom adjustment function



Unlike Auto mode, which offers pre-defined zoom levels, Pro mode allows you to digitally zoom in and out using the button to slide up and down, or type in a value.

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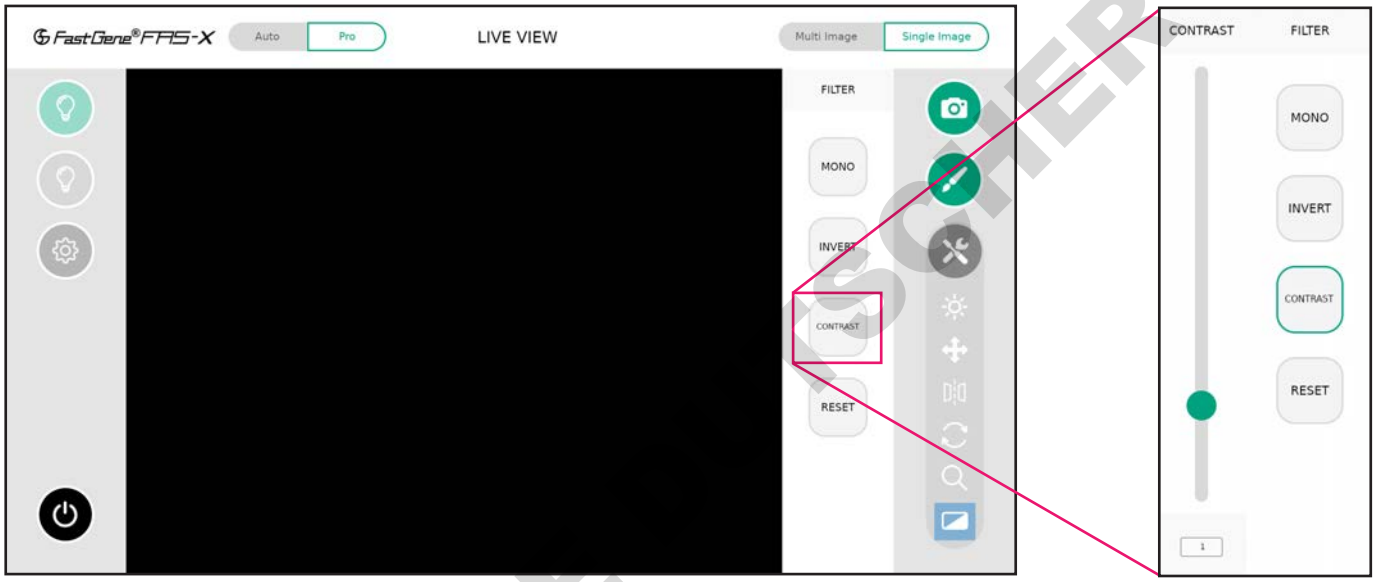
Filter function

It is possible to change the image from colour to greyscale with the *Mono* option.

The *Invert* option inverts the grey values, turning white to black and black to white.

The *Contrast* option allows you to adjust the the difference between the light and dark areas of your gel image.

The *Reset* button will restore and keep the original settings.



Multi-image recording function

The functionality of Pro mode extrends to multi-image recording (3 or 5 images) with different exposure times. This allows to scan and easily select the perfect exposure. The steps of the exposure time can be set in the settings menu (see page 23).

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Excision of DNA bands

Excise the DNA band

1. Open the drawer to access the transilluminator.
2. Please wear the amber goggles to identify the desired bands and to protect your eyes from potentially too intense Blue/Green light.
3. Turn on the Blue/Green light by pressing the green light button in the software (see above).
4. With the help of a scalpel or band cutter, excise DNA band of interest.

Heat Protection and sleep mode

To save energy and prevent the system from running continuously, you can set a sleep time in the *Settings* menu. To wake up the unit, press the power button. In addition, the Blue/Green transilluminator will switch off after 30 minutes of inactivity to protect the transilluminator from overheating. Please wait 5 minutes to turn it on again.

Contact details

Please contact us for additional information: **info@nippongenetics.eu**

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