



FastGene®

FAS-X

Gel Documentation System

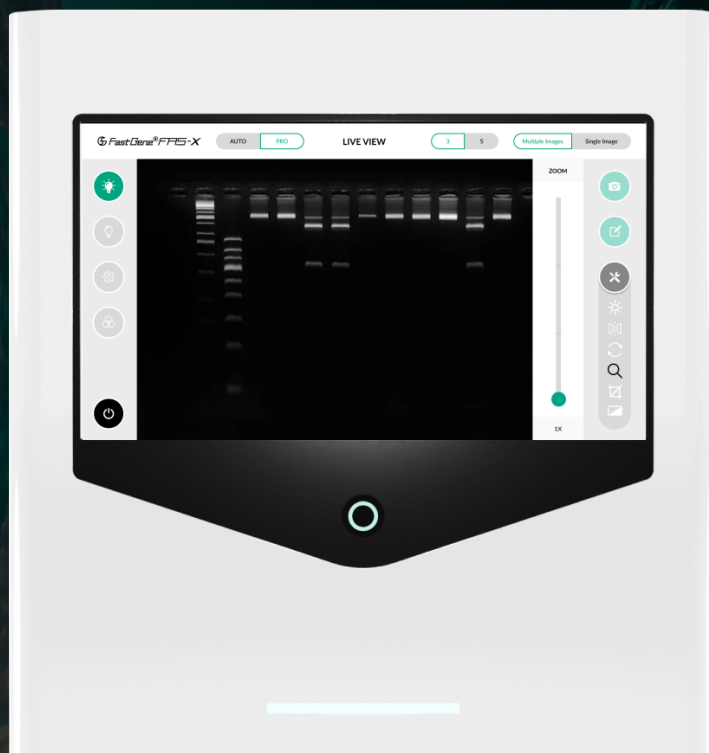
Catalog #: GP-FAS-X

WELCOME TO

FastGene® FAS-X



NIPPON Genetics EUROPE
INNOVATION FOR YOU



Software version: 2.1.0

Manual version: 7.0



+49 2421 55496 0



info@nippongenetics.eu



+49 2421 55496 11



www.nippongenetics.eu



Activate our exclusive service now

... and enjoy your benefits:

- Priority access to latest software updates
 - Fast line to our expert service team
- Sneak peek at new features and accessories

Scan QR code to register



nippongenetics.eu/en/instrument-registration/

It only takes a minute! Register your instrument with NIPPON Genetics EUROPE today to ensure full access to all services and software updates.

Table of contents

<u>1. General information</u>	7
1.1. Safety Information	7
1.2. Warranty	7
1.3. Regulatory notice	7
1.4. Important notice	8
1.5. General precaution	8
<u>2. Specifications</u>	8
<u>3. Nomenclature</u>	9
<u>4. Installation guide - setting up the FAS-X</u>	12
4.1. Connecting the cables	12
4.2. Status LED	12
4.3. Starting the software	13
<u>5. Installation, operation and performance qualification</u>	18
5.1. Protocol acceptance by customer and list of tests performed	18
5.2. List of serial numbers	19
5.3. List of components	19
5.4. Installation qualification	20
5.5. Operation qualification	20
5.6. Performance qualification	21
<u>6. Operating the system</u>	24
6.1. Light source function	24
6.2. System settings function	24
6.2.1. Shoot settings	25
6.2.2. File settings	26
6.2.3. System settings	26
6.2.4. Storage	27



6.2.5. Support	27
6.2.5.1. User settings	28
6.2.5.2. Network settings	29
6.2.5.3. Time settings	32
6.2.5.4. Managing	33
6.2.5.5. Settings Backups	34
6.3. Print function	34
6.4. Shut down function	36
6.5. Capture image function	36
6.6. Gallery function	38
6.6.1 Select	38
6.6.2. Rename	39
6.6.3. Move	39
6.6.4. Eject USB	39
6.6.5. Copy	39
6.6.6. Delete	39
6.6.7. Image editor	40
6.6.8. Annotation	41
6.6.8.1. Box tool	42
6.6.8.2. Text tool	43
6.6.8.3. Line tool	44
6.6.8.4. Arrow tool	45
6.6.9. Back to the parent folder	47
6.6.10. Create new folder	47
6.7. Operation in Auto and Pro mode	48
6.7.1. Switching between Auto and Pro mode	48
6.7.2. Tool Reset	48



6.7.3. Exposure adjustment function	49
6.7.4. Move function	50
6.7.5. Mirror function	50
6.7.6. Rotation function	51
6.7.7. Zoom adjustment function	51
6.7.8. Crop function	52
6.7.9. Filter function	53
6.7.10. Multi-image recording function	53
7. Excision of DNA bands	54
8. Heat protection mode	54
9. Contact details	55

1. General Information

1.1. 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, skin, and samples. However, prolonged exposure of human naked eyes with light irradiation in the blue spectrum may increase the probability of suffering from retinal diseases. Therefore, we recommend using the amber goggles, 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.

1.2. 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.

1.3. 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.

1.4. Important notice

Please read the installation instructions carefully before installing the FastGene® FAS-X. For research use only: this instrument is intended for DNA gel visualization in clinical and research laboratories. It must be operated only by trained laboratory personnel familiar with the potential hazards associated with the chemical and biological agents used with this instrument, as well as the health risks related to blue light radiation. Please wear the amber goggles for your own protection!

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

1.5. General precaution

- Plug the transilluminator on an electric line with ground connection by using the supplied power adapter.
- 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 goggles.
- Clean with ddH₂O, alcohol or appropriate cleaning agents according to the chemicals used.
- Always wear disposable gloves.

2. Specifications

Illuminator (built-in)

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

White light plate (accessory)

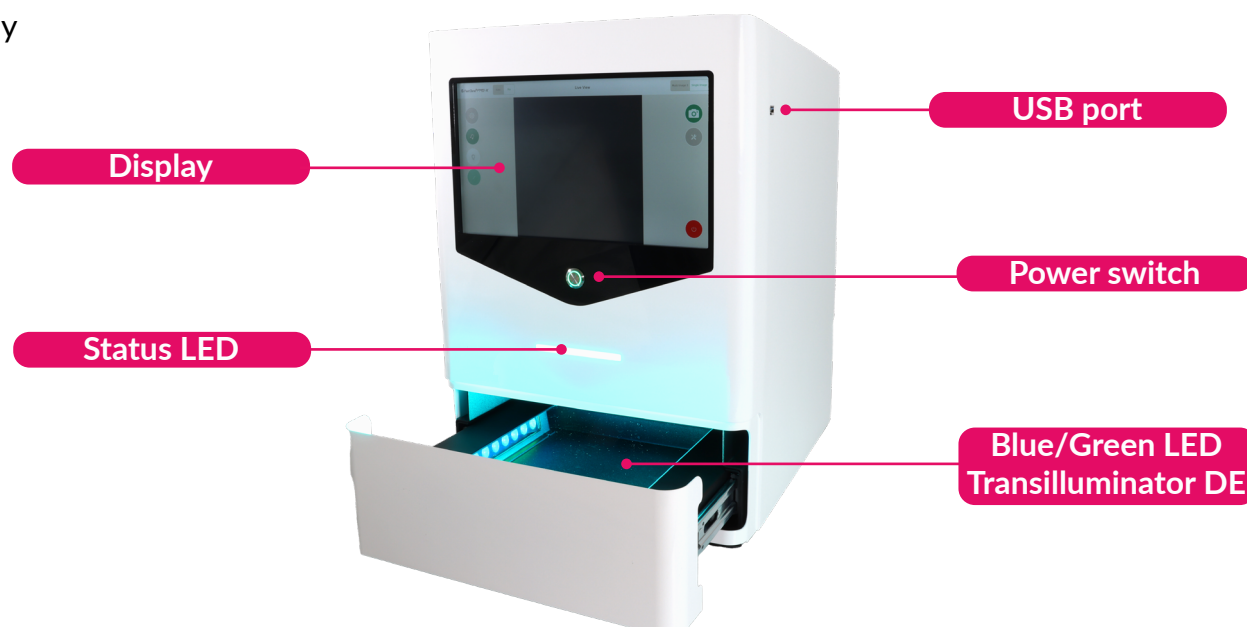
External white light plate	Built-in battery or power supply via USB port
Dimension	29 x 20 x 0.8 cm
View area	22 x 16 cm
LEDs	Daylight LEDs, colour temp.: 5000 K, CRI = 95
Weight	570 g

Unit

Material	Painted metal
Rated Voltage	100-240 V~, 50/60 Hz for the power adapter
Output power adapter	24 V, 5 A
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
Storage	128 GB microSD card
White light	Integrated epi-white LED light
Camera	20 megapixels, f 12 mm
Access	Transilluminator with drawer function
Connectivity	LAN, 3x USB 3.0
Accessory	Amber goggles, white light plate

3. Nomenclature

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





Part I: Installation

4. Installation guide - setting up the FAS-X

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

4.1. Connecting the cables

1. Connect the 24 V, 5 A power adapter to a safety socket.
2. Connect the power adapter 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 supplied 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.



4.2. 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

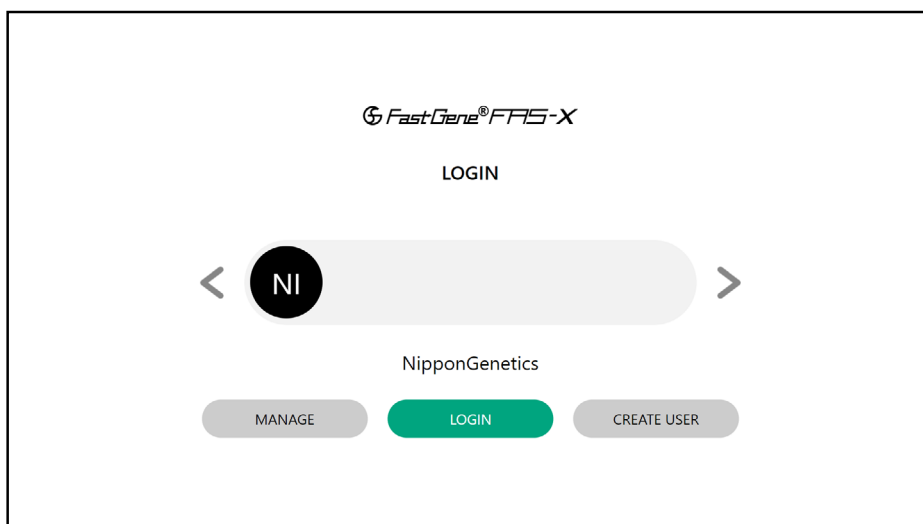
8. Screensaver	Static blue light
9. Overheat protection mode	Static red light

4.3. Starting the software



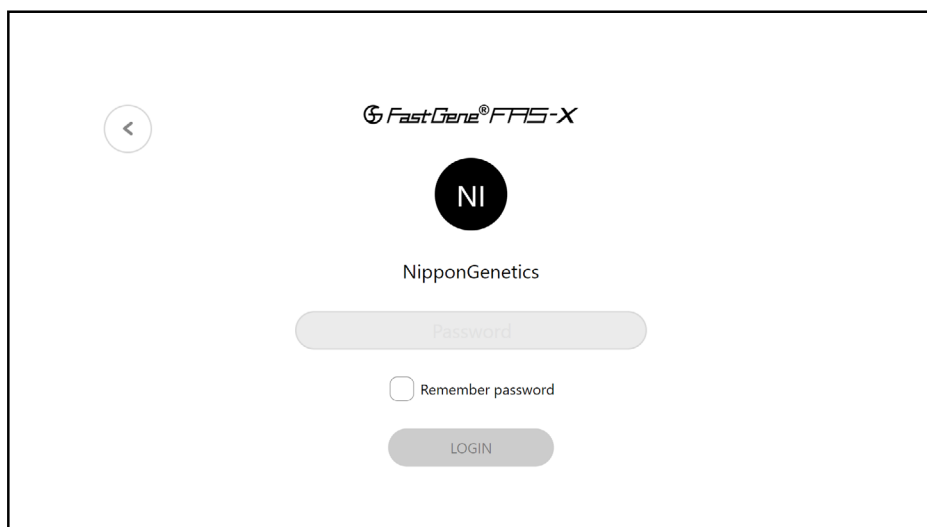
After turning on the black switch (#) on the back of the unit, wait 10 seconds before pressing the power switch (▶) on the front. The software launches automatically after the unit is switched on by pressing the power switch (▶) on the front of the FAS-X. The status LED will show a static blue light. Make sure to press the power switch (▶) firmly for a minimum of half a second. Rapid presses may result in the button failing to respond.

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



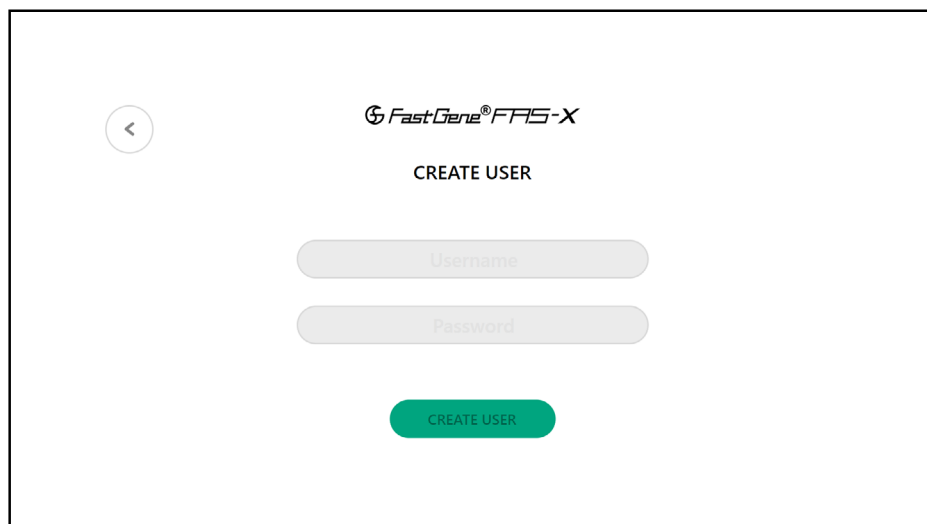
You can log in to the administrator account named *NipponGenetics* or directly create a user account(s) with a unique password. Please note that the space character is not allowed in the user name. It is also possible to create an account without a password.

Select *NipponGenetics* account to be able to log in. The *NipponGenetics* account login is password protected to prevent unauthorised access to the gel documentation system.

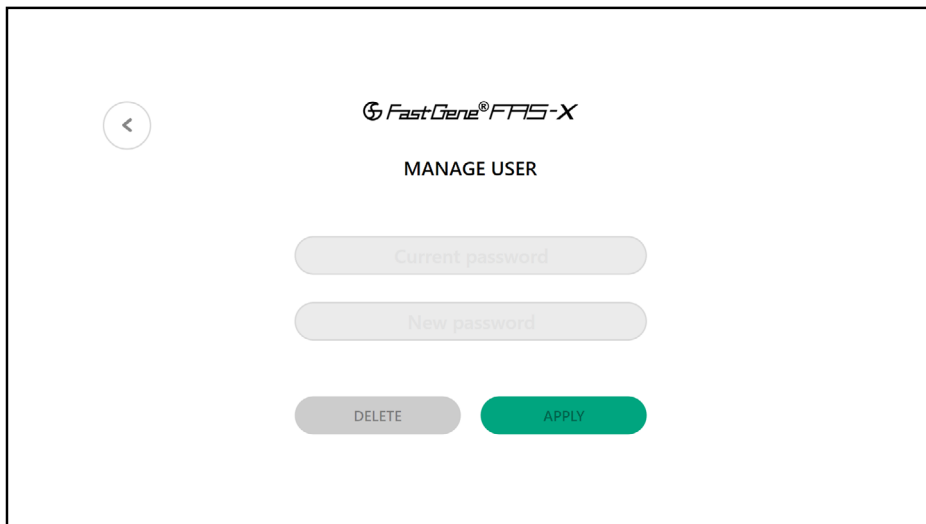


The password is NgE. This can be changed by the person in charge at any time.

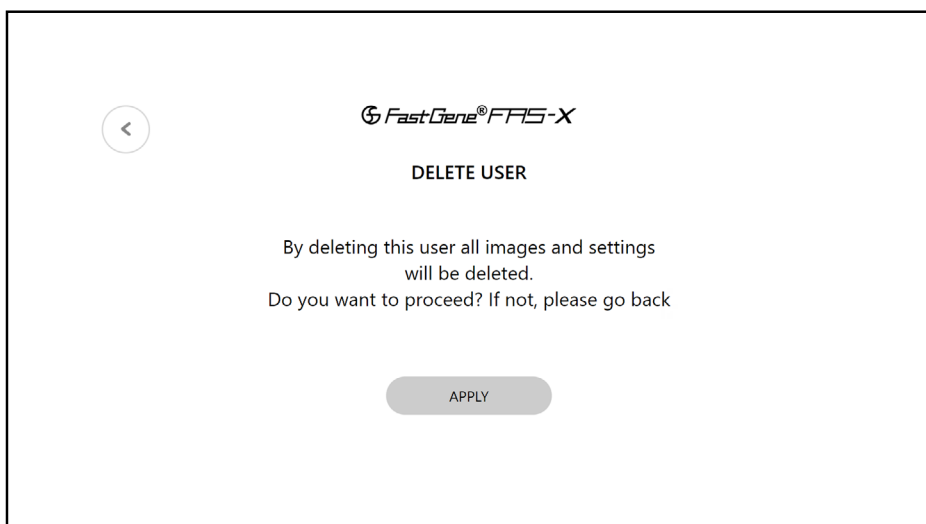
To create a new user(s), tap *CREATE USER* to define a user name and a password. There is no limit to the number of user accounts that can be created. Spaces are not allowed in the username.



You can change the password or delete the account(s) at any time with the current password using the *MANAGE* option on the *LOGIN* screen.



Password confirmation is required for account deletion. If you don't want to delete the specific user account, you can return to the initial login menu by pressing the back 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.

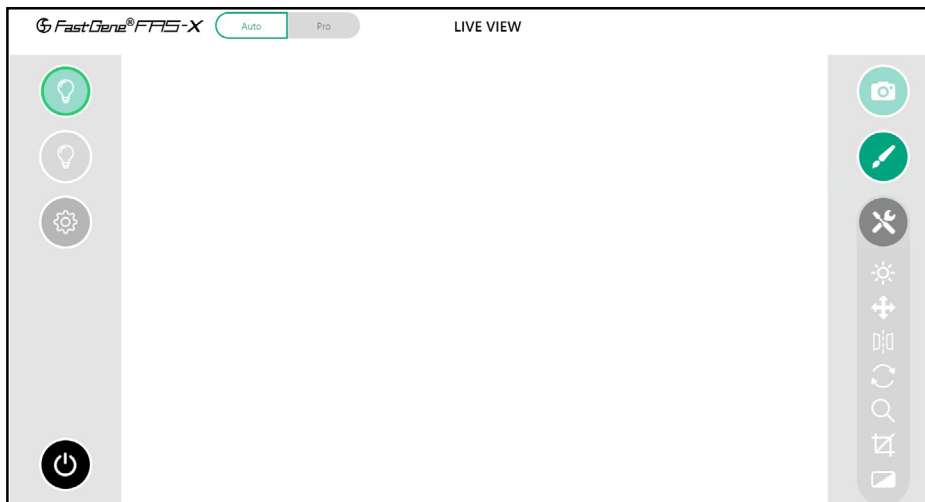
The FAS-X software is supplied with two modes: **Auto** and **Pro** mode.

The **Auto** mode speeds up the process of capturing your images.

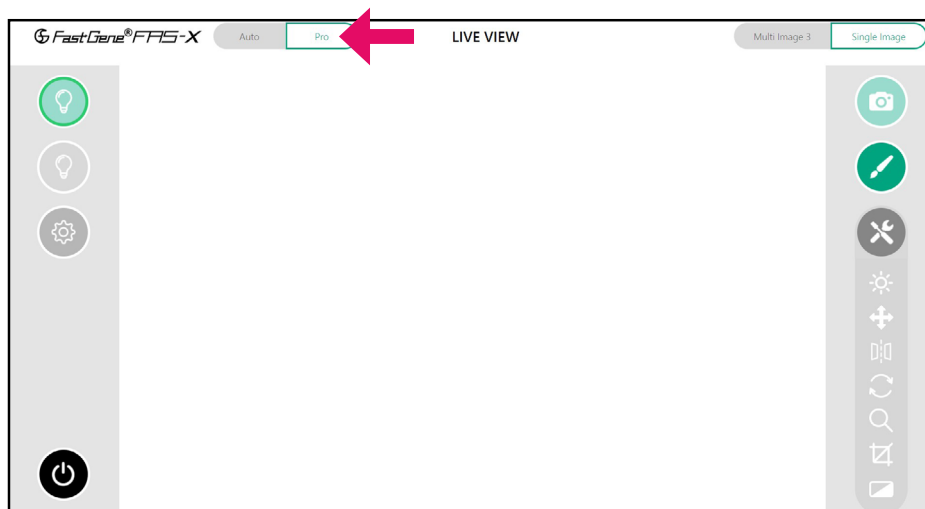


The **Pro** mode gives you more advanced control over the capture settings.

Once logged in, the software will open in mode which was used the last time.



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



WELL DONE!

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



Part II: IQ - OQ - PQ

5. Installation, operation and performance qualification

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

5.1. 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 if 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

The manual can be downloaded either by accessing the link or scanning the QR code:



<https://www.nippongenetics.eu/app/uploads/manual-gp-fas-x.pdf>



Date

5.2. List of serial numbers

Serial No. Device

Serial No. White light plate

5.3. List of components

- FAS-X stand-alone system
- Power cable (see part I - installation)
- Amber goggles
- FastGene® Agarose Gel Band Cutter
- White light plate
- FAT32-formatted USB flash drive with the manual

5.4. 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 Blue/Green light drawer for defects		x	☐	
Check the focus of the camera		x	☐	
Check if the drawer can be opened and closed properly		x	☐	
Turn the switch on at the back of the housing and press the button at the front – does the screen turn on?		x	☐	
FAS-X software opens after switching on		x	☐	
Examination signature		Verification signature		

5.5. 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): set Pro mode, exposure time to 10 sec and gain 0		x	☐	
Examination signature		Verification signature		

5.6. 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		



Part III: Manual

6. Operating the system

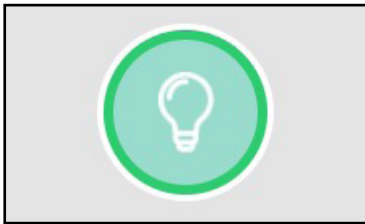
The NIPPON Genetics FAS-X software can control all the parameters necessary to acquire an image with the FAS-X.

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

6.1. 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 epi-white LED light. Use Blue/Green LED lamp for fluorescent visualization and white LED lamp for colorimetric visualization.

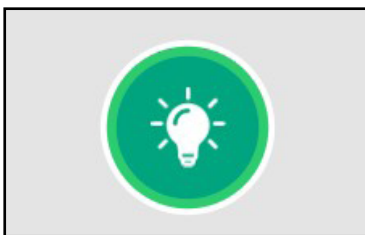
Blue/Green LED lamp off



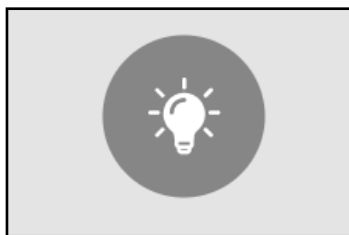
Epi-white LED lamp off



Blue/Green LED lamp on

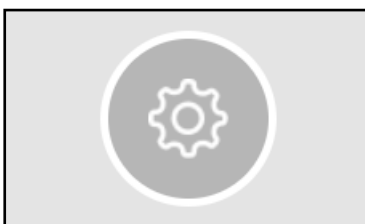


Epi-white LED lamp on



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

6.2. System settings function

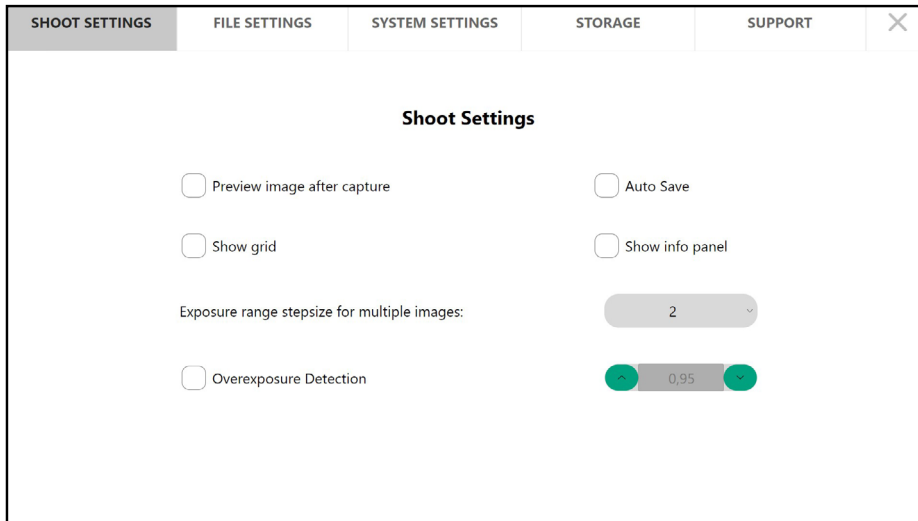


Press the gear icon to get access to the settings menu. Here you change all essential settings of the device:

- Shoot settings
- File settings
- System settings
- Storage
- Support

6.2.1. Shoot settings

The *Shoot Settings* allow you to configure various parameters related to the camera operation and image capture.

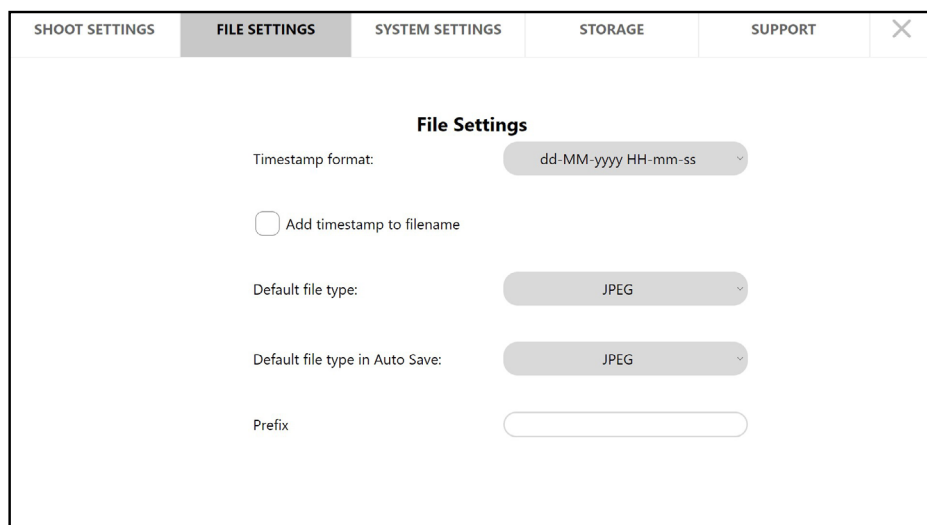


The *Exposure range step size for multiple images* refers to the difference in brightness between different images in the multi-image function in the Pro mode (page 43). The exposure difference between the different images is approximately 12% for level 1, 25% for level 2, 50% for level 3 and 75% for 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*, *Auto Save*, *Show grid*, *Show info panel* and *Overexposure Detection*, can be activated and deactivated for each user at any moment.

The *Overexposure Detection* function displays overexposed areas (red-colored) of an image in the live view. The threshold for this function can be set to values between 0 and 1. A value of 1 corresponds to 100% saturation which means that a pixel which is saturated 100% or higher is displayed red in the image. A value of 0.9 corresponds to 90% saturation which means that a pixel that is saturated 90% or higher is displayed red in the image. The threshold allows fine-tuning the overexposure indicator.

6.2.2. File settings

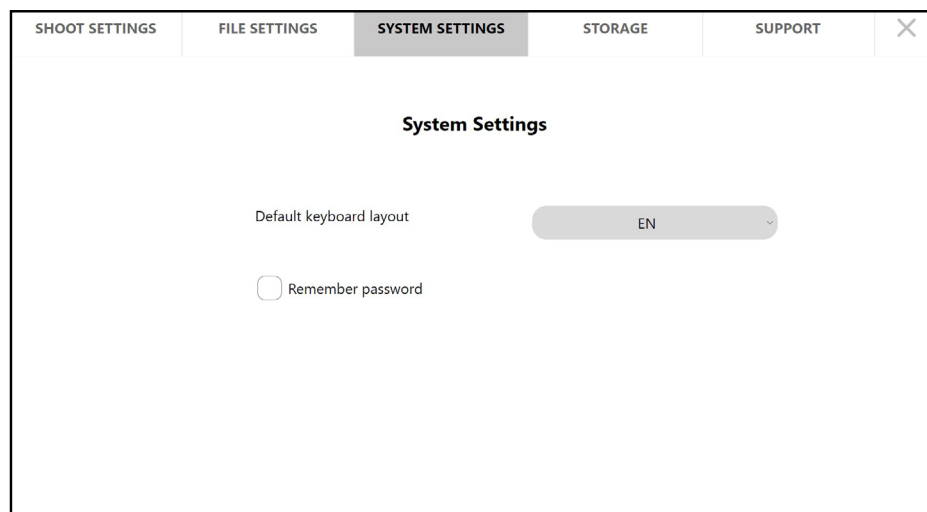


The screenshot shows the 'FILE SETTINGS' tab selected in a settings menu. The menu has tabs for SHOOT SETTINGS, FILE SETTINGS, SYSTEM SETTINGS, STORAGE, and SUPPORT. The 'File Settings' section contains the following options:

- Timestamp format: dd-MM-yyyy HH-mm-ss (dropdown menu)
- ☐ Add timestamp to filename
- Default file type: JPEG (dropdown menu)
- Default file type in Auto Save: JPEG (dropdown menu)
- Prefix: (text input field)

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

6.2.3. System settings



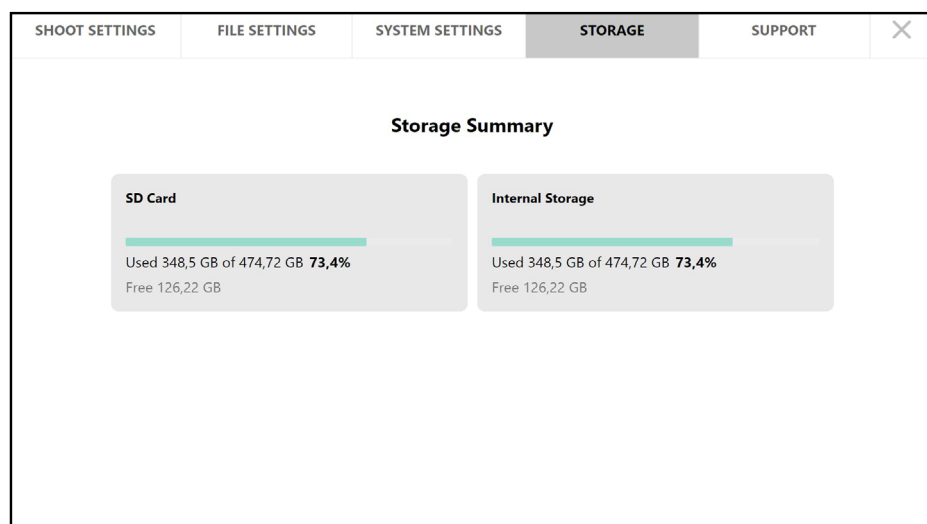
The screenshot shows the 'SYSTEM SETTINGS' tab selected in a settings menu. The menu has tabs for SHOOT SETTINGS, FILE SETTINGS, SYSTEM SETTINGS, STORAGE, and SUPPORT. The 'System Settings' section contains the following options:

- Default keyboard layout: EN (dropdown menu)
- ☐ Remember password

System Settings allows you to choose between German and English keyboard layouts. Additionally, you can enable an option to remember the password of the logged-in account, making your next login faster and more convenient.

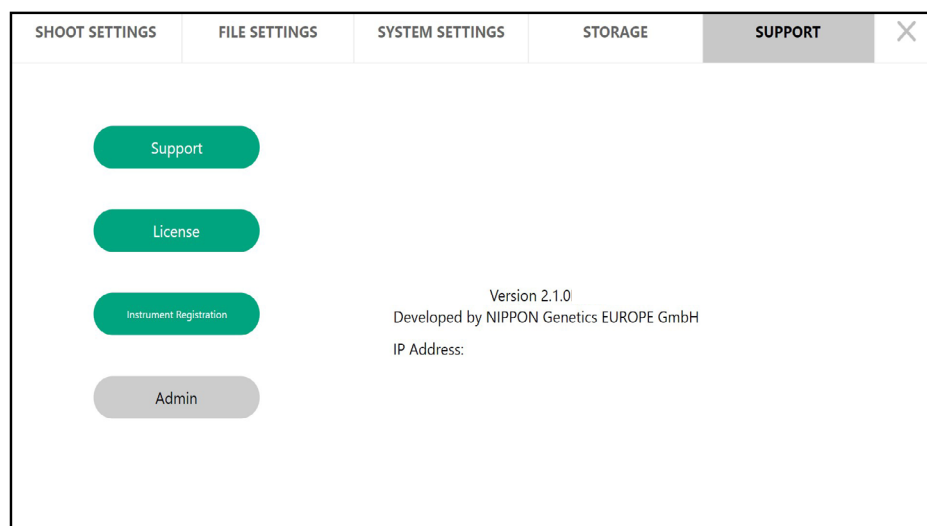
6.2.4. Storage

The storage section provides information on the storage usage of the SD Card and of the internal storage of the FAS-X computer. The storage numbers on the image below are exemplary and do not show the real numbers for the FAS-X instrument. The *SD Card* has a storage of 128 GB and is used for saving the images while the *Internal Storage* is used for the operating system.



6.2.5. Support

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



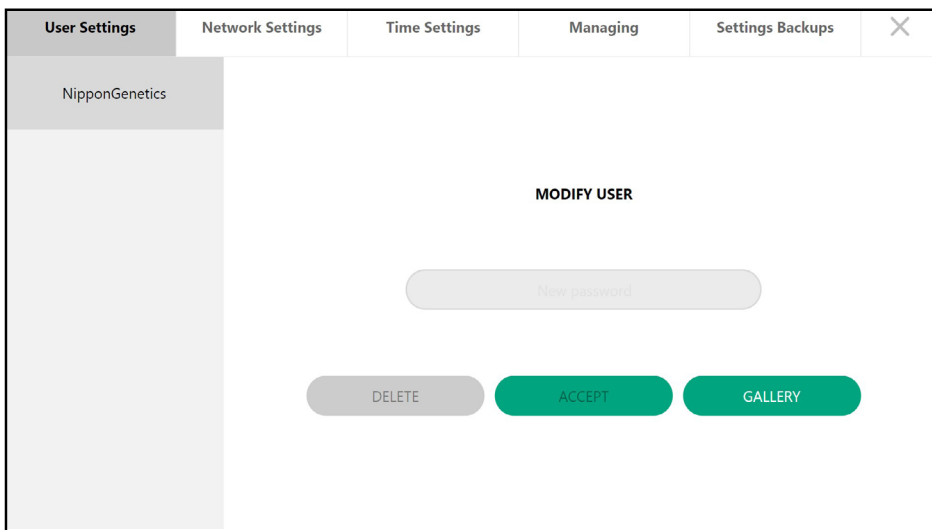
When you press the *Support* button, a QR code is displayed. Once scanned, it will take you directly to our Contact Us page (<https://www.nippongenetics.eu/en/contact/>). There you will find all the contact forms you need.

Similarly, when you press the *Instrument Registration* button, a QR code is displayed too. Once scanned, it will take you directly to our Instrument Registration page (<https://www.nippongenetics.eu/en/instrument-registration/>). There you will find the contact form for instrument registration.

The *License* contains information about the current software license. Future software updates will be available via the internet free of charge. Simply copy the updated file to a USB flash drive formatted with FAT-32 and press *Update*. **We only recommend using the flash drive supplied with the FAS-X. We can't guarantee that other flash drives are recognized by the instrument - even when they are formatted as FAT32.**

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 (see the following pages).

6.2.5.1. User settings



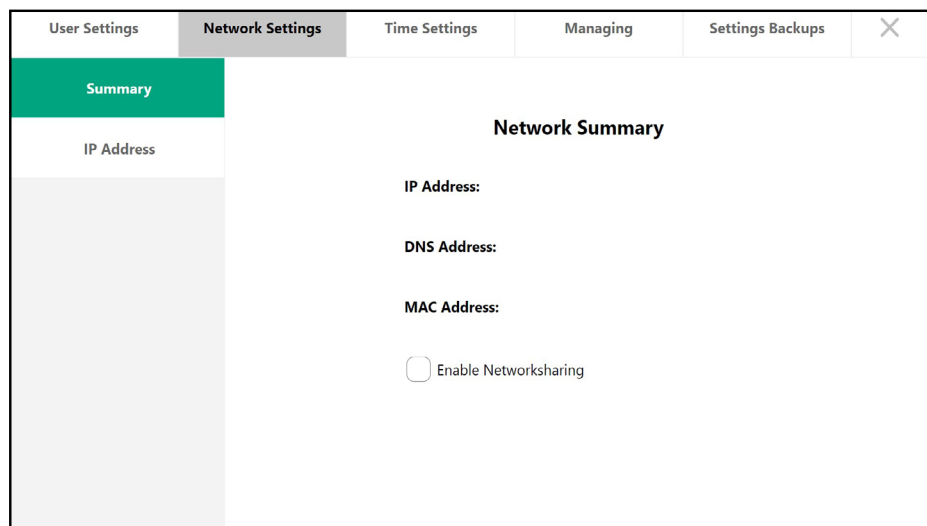
The screenshot shows the 'User Settings' admin panel. At the top, there are five tabs: 'User Settings' (selected), 'Network Settings', 'Time Settings', 'Managing', and 'Settings Backups'. A close button (X) is located to the right of the tabs. On the left side, there is a sidebar with the 'NipponGenetics' account selected. The main content area is titled 'MODIFY USER'. It features a 'New password' input field and three buttons at the bottom: 'DELETE' (grey), 'ACCEPT' (green), and 'GALLERY' (green).

In cases of forgotten passwords or account removal, the administrator can refer to *User Settings* to manage other accounts, including changing password(s). The *GALLERY* (see page 34) option gives you access to the gallery of a selected user.

6.2.5.2. 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



The screenshot shows a web interface for 'Network Settings'. At the top, there are tabs: 'User Settings', 'Network Settings' (which is active), 'Time Settings', 'Managing', and 'Settings Backups'. Below the tabs, on the left, is a sidebar with 'Summary' (highlighted in green) and 'IP Address'. The main content area is titled 'Network Summary' and contains the following information:

- IP Address:
- DNS Address:
- MAC Address:
- ☐ Enable Networksharing

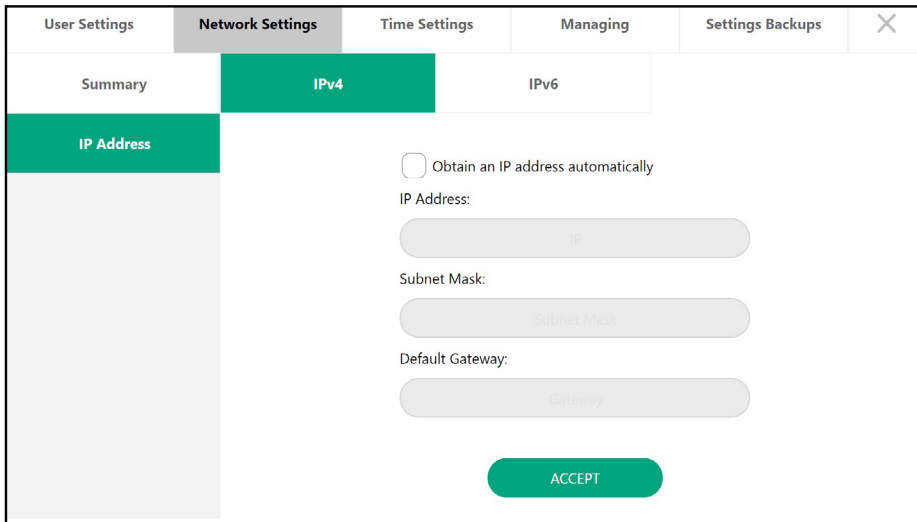
The *Enable Networksharing* function, located at the bottom, allows password-protected access to FAS-X files from multiple computers connected to the same local network. The information of each user is protected by a password. This sharing system is compatible with computers running Windows, Linux and Mac OS operating systems.

Once both FAS-X and the computer to be used are connected to the same local network, follow the steps described below. The following guide shows the necessary steps using Windows operating system as an example. (Please note that an ethernet cable connection is required for the FAS-X.)

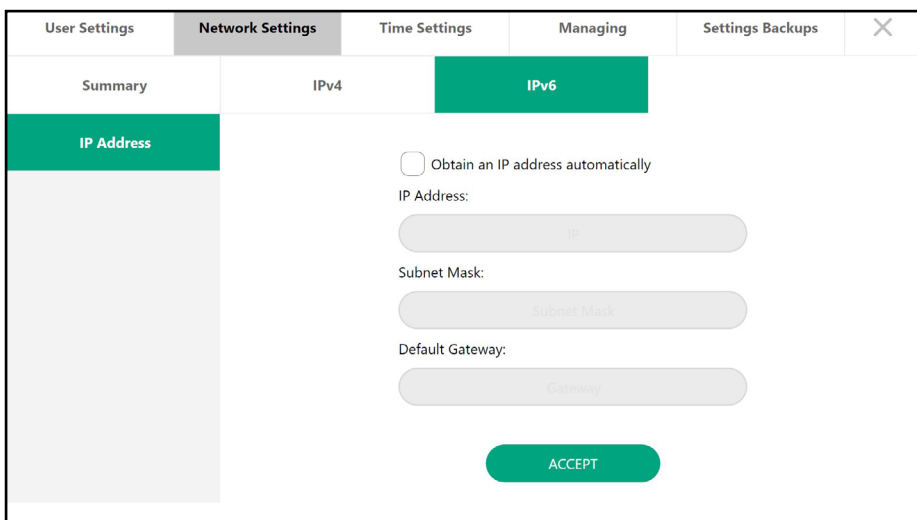
1. Access to the *Network Share* in the *Network Settings* via the *Admin* in the *Support* section of the FAS-X settings.
2. In the *Network Share*, tick the box *Enable Networksharing* to enable access to files and images on the FAS-X from a computer connected to the same local network.
3. Define the IP address.

If you want the FAS-X to obtain an IP address automatically from the local router, tick the box *Obtain an IP address automatically* under *IP Address* in the *Network Settings* and press **ACCEPT**. Based on the IP address provided by the local network admin, select either *IPv4* or *IPv6*.

When the automatic function is enabled, the input fields are disabled (greyed out), and the system automatically obtains a free IP address. This address can be either IPv4 or IPv6, depending on the configuration and availability within your network.

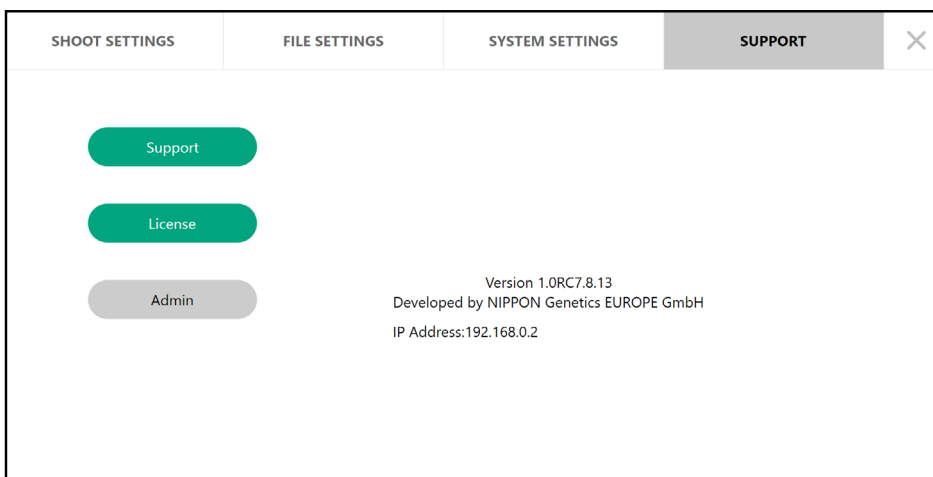


User Settings	Network Settings	Time Settings	Managing	Settings Backups	X
Summary	IPv4	IPv6			
IP Address	☐ Obtain an IP address automatically IP Address: IP Subnet Mask: Subnet Mask Default Gateway: Gateway ACCEPT				



User Settings	Network Settings	Time Settings	Managing	Settings Backups	X
Summary	IPv4	IPv6			
IP Address	☐ Obtain an IP address automatically IP Address: IP Subnet Mask: Subnet Mask Default Gateway: Gateway ACCEPT				

4. Go to the *Support* in the FAS-X settings. There, the current IP address will be displayed.



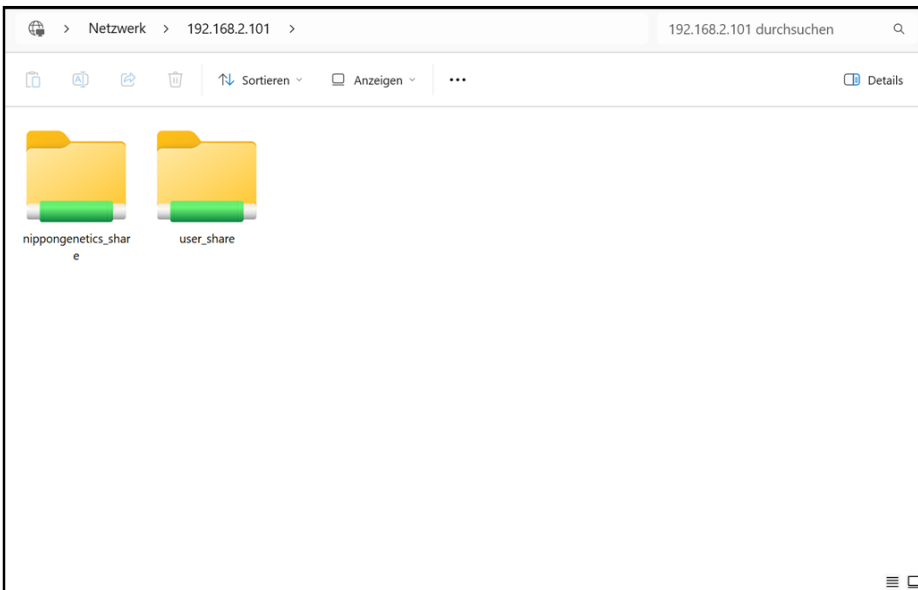
SHOOT SETTINGS	FILE SETTINGS	SYSTEM SETTINGS	SUPPORT	X
Support License Admin Version 1.0RC7.8.13 Developed by NIPPON Genetics EUROPE GmbH IP Address:192.168.0.2				

- Open the file browser on the computer connected to the FAS-X and enter the IP address obtained as described above in the address field as follows and press Enter on the keyboard.

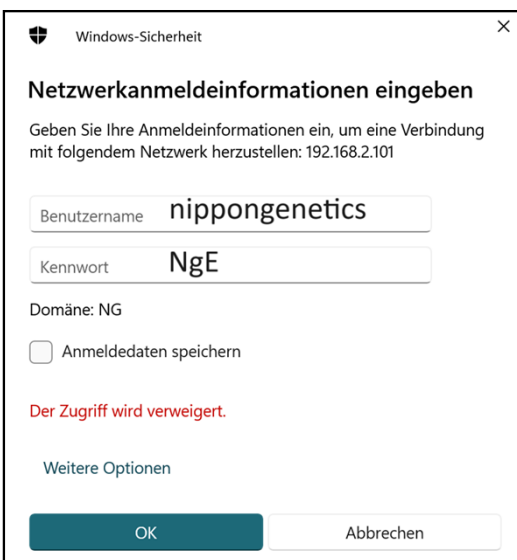


Note: For quick access to your FAS-X, it is recommended to create a shortcut for this IP address. To do this, right-click on an empty space in the file browser and select New followed by Shortcut.

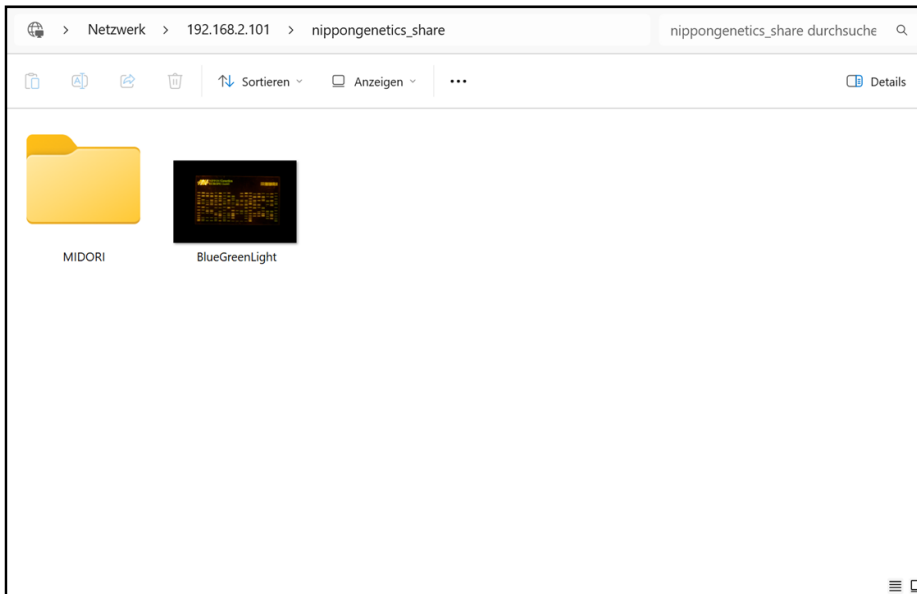
- If the connection to the FAS-X is successful, the list of available users is displayed.



If you want to open *nippongenetics_share*, double-click it. Initially, access will be denied due to the need to have access credentials. Type *nippongenetics* (lower case, without *_share*) as username and its current password, click OK. The screenshot below shows the original password *NgE*, but if the administrator password has been changed, enter the updated password.



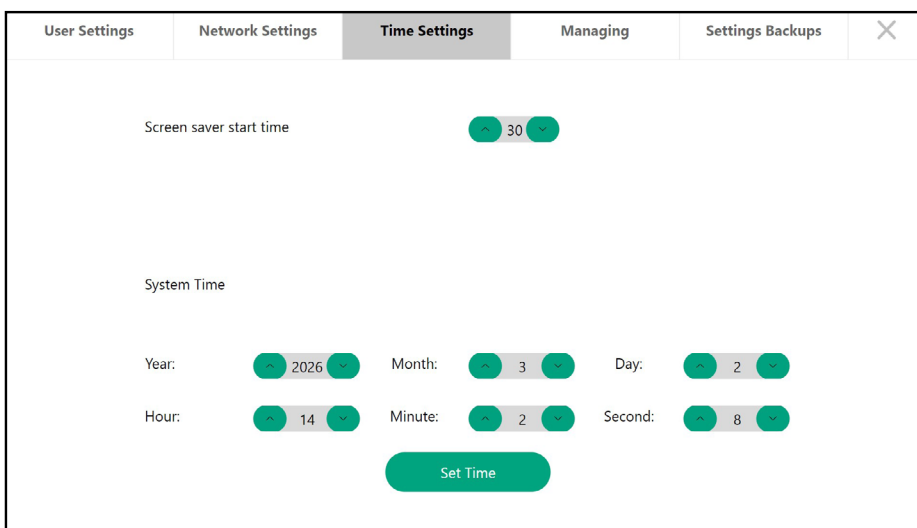
7. You now have access to the user's pictures and folder(s). You can copy the image(s) or folder(s) to your PC.



6.2.5.3. Time settings

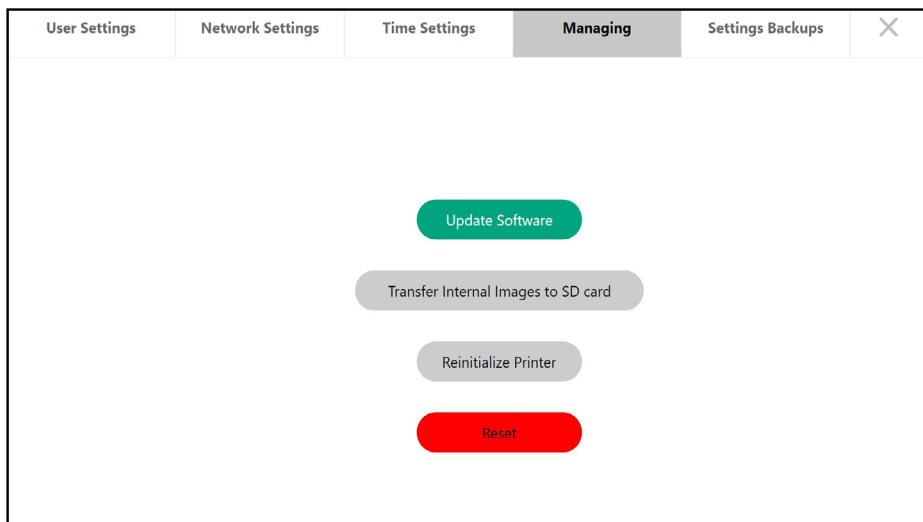
Time settings refer to the configuration and adjustment of various time-related parameters of the FAS-X. These include:

- screen saver start time (minimum 3 minutes), and
- date and time of the system.

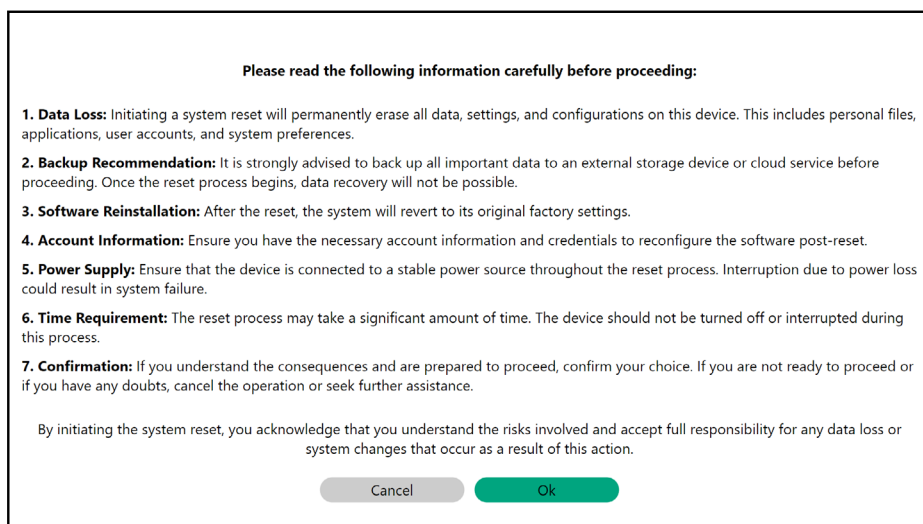


6.2.5.4. Managing

In the *Managing* section, it is possible to update the software, transfer images from the internal storage to the SD card, reinitialize the printer, and reset the FAS-X to its original factory settings. Updating the software is done through a USB flash drive with FAT32 formatting.

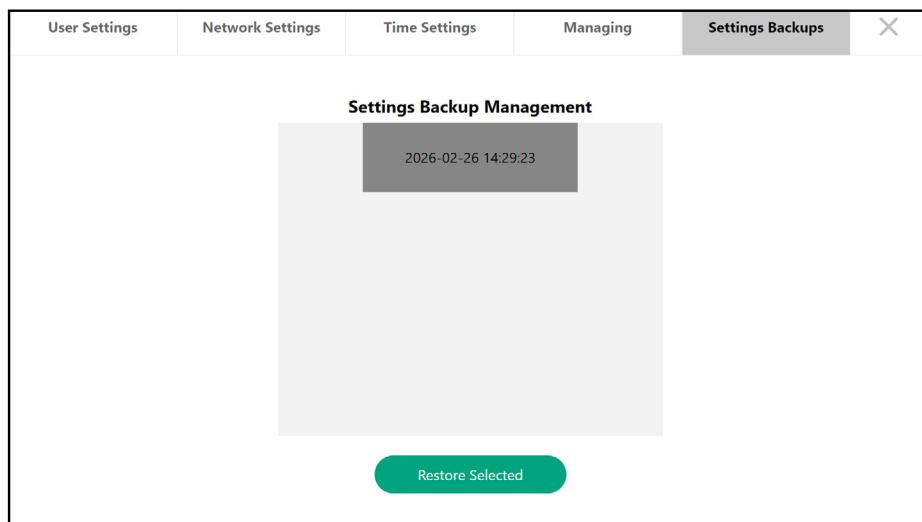


Please note that the reset function deletes all users and their corresponding settings and images (image below). It is not possible to transfer images from the backup back onto the FAS-X.

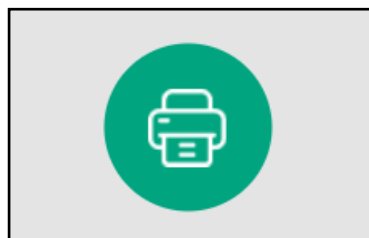


6.2.5.5. Settings Backups

In the rare event that the user accounts went missing they can be recovered in the *Settings Backups* menu. The user account information will be backed up for the last three days with three timestamps for each day. Images captured after the selected timestamp cannot be recovered. If you experience this issue, please contact the NIPPONG Genetics EUROPE support team.



6.3. Print function



Print the selected image. You can print your image during live sample visualization or from the gallery after saving it. **Please note, this button will only be displayed when a printer is correctly connected to the FAS-X.** The supported printers are UP-X899MD, X898MD (discontinued) and UP-D897 (discontinued).

You only need to set up the printer once. Follow the steps recommended by the manufacturer. The following guide is an example of setting up the Sony UP-X898MD. The steps are similar for the Sony UP-X899MD.

1. Connect the power supply to the printer.
2. Connect the printer cable to the FAS-X.
3. To set up the printer, the correct driver needs to be selected.

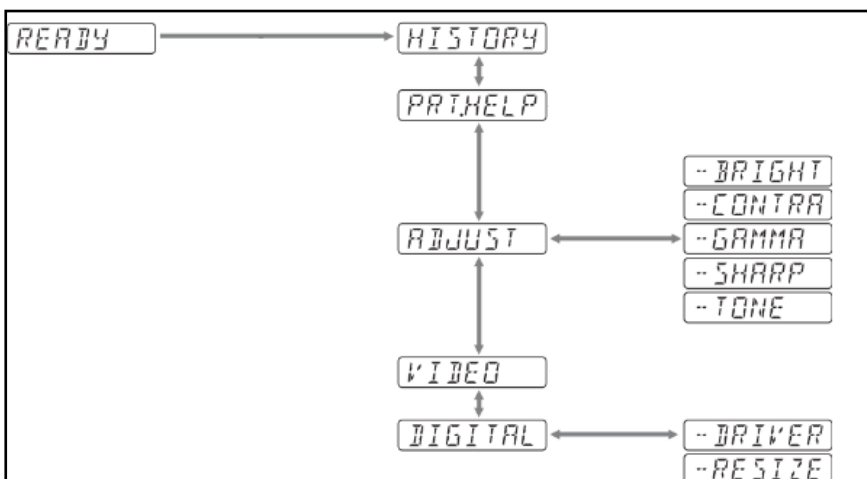
To do this, navigate to the small digital section screen on the printer by pressing the button indicated by the arrow (next page). First press the button and then pull down until you read *Digital*.



You only need the button marked by the arrow to finalize the process.

4. Once you have navigated to *Digital*, press the button to select it and navigate until you read *Driver* (displayed as the first option).
5. Select *Driver* by pressing the button.
6. Pull the button down until the **UP-897** driver is found. Press the button to select it.

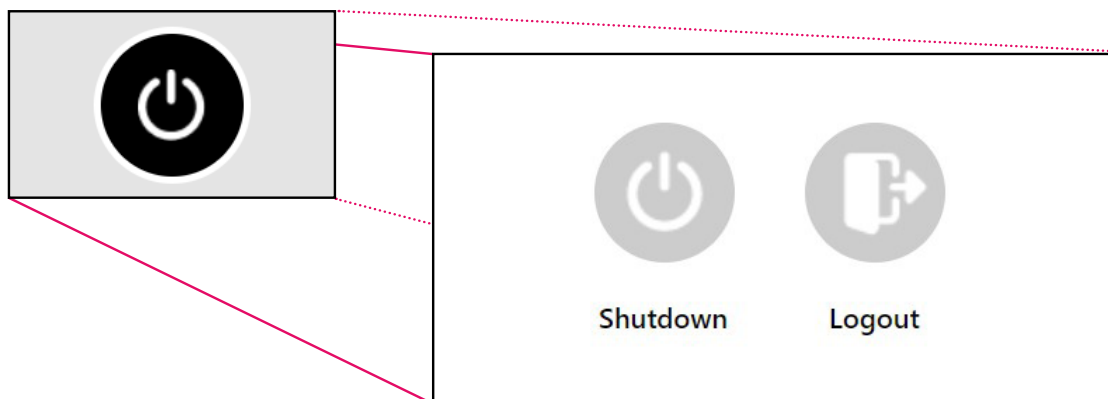
The figure below summarises the steps required to correctly set up the driver for the Sony UP-X898MD:



The driver has been set up correctly and the printer has been successfully installed in the FAS-X.

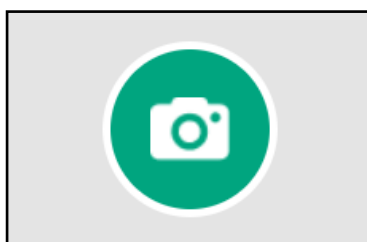
6.4. Shutdown function

Press the shutdown button in the software to shut down the unit or log out the user.



If you shutdown the system, power it off after 15 seconds using the black power switch at the back of the unit. After powering the unit on using the switch at the back of the unit, wait 15 seconds before starting the system using the silver front button. In the event of a crash, switch the system off and on again using the black power switch at the back and wait 15 seconds before pressing the silver front button of the FAS-X.

6.5. Capture image function



For each user, the image is captured and stored locally.

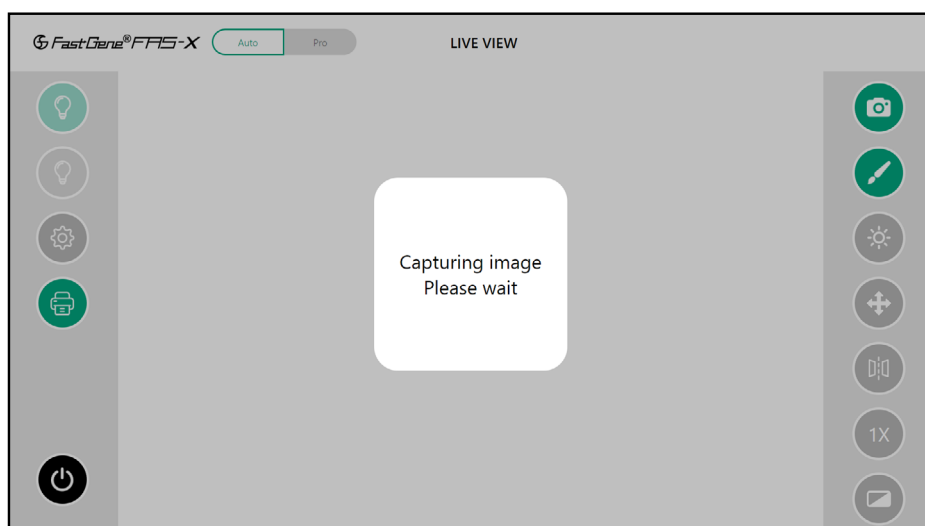
If the *Auto Save* mode is activated (see shoot settings, page 25), the image is automatically saved as soon as it is captured with the current date and time.

If the *Auto Save* mode is inactivated (see shoot settings, page 25), the save screen will open automatically after the image has been captured. Here you can change the name.

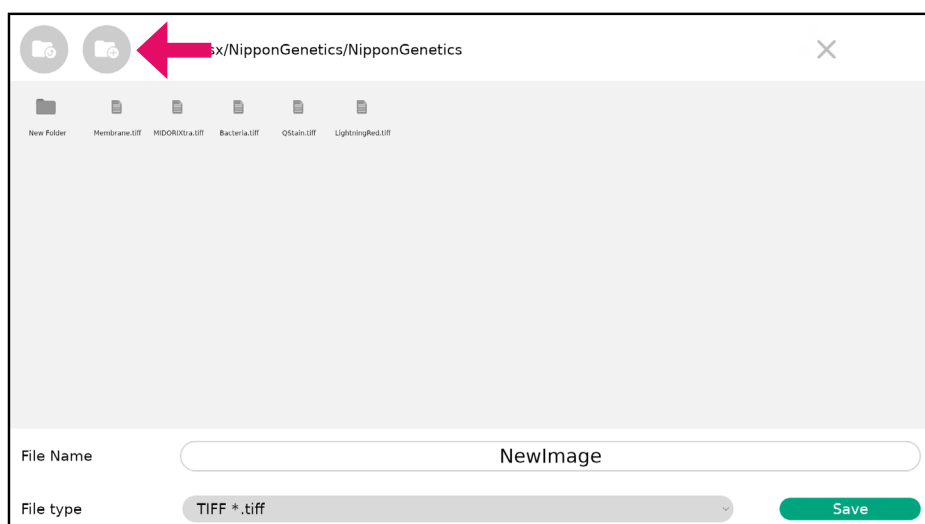
The system also allows for intuitive image manipulation using a two-finger gesture for zooming, moving, and rotating the image.

The process to capture an image is as follows:

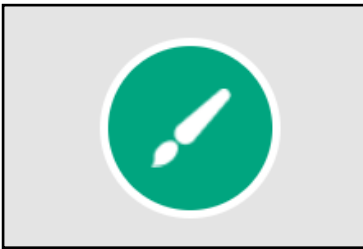
1. Position the gel centrally;
2. Adjust zoom/exposure accordingly;
3. Capture the image;



4. On the save screen, name the image and choose the file type. An option to create new folder(s) (see arrow in image below) and save the images in them is also available on the Save screen;
5. Click **Save**.



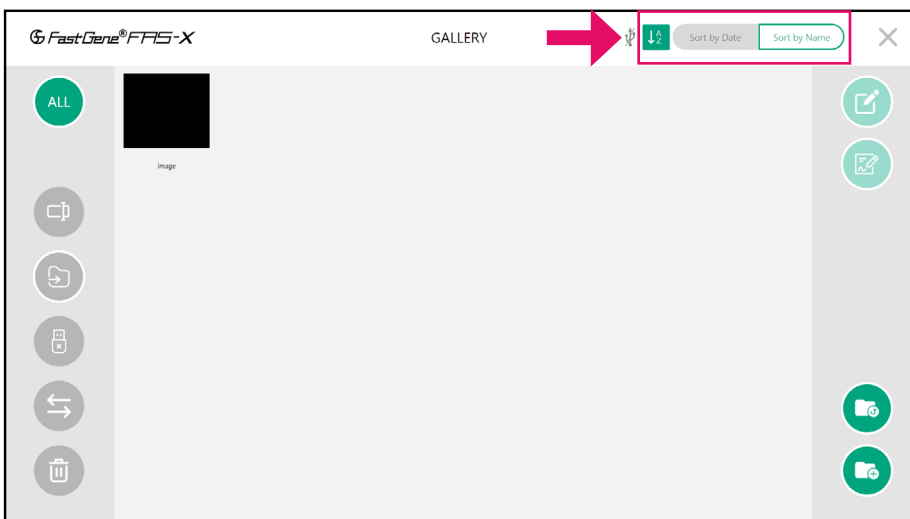
6.6. Gallery function



All saved images and their folders are available in the gallery of the respective user account.

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 images with the *Image Editor*, annotate images with the annotation tools, print your image(s) directly and move the images to the folder(s) you have created.

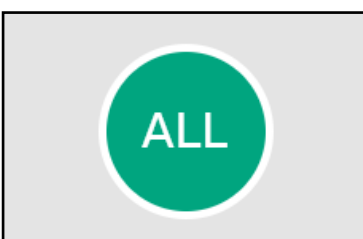
The gallery has two sort options: by date and by name (indicated by the rectangle in the image below). Each sort can be arranged ascending (A to Z) or descending (Z to A). The USB indicator shows if flash drives are detected and the number of connected USB flash drives (indicated by the arrow in the image below). The FAS-X supports up to three USB flash drives.



6.6.1. Select

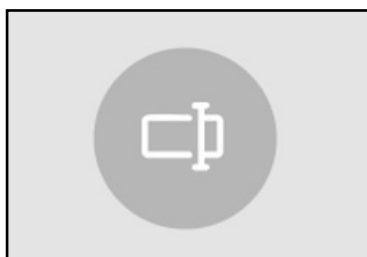
The FAS-X has three selection modes in the Gallery:

- Single-selection mode: tap one image or folder for single selection
- Multi-selection mode: select one image, and press and hold, another folder or image for a few seconds – this will enable the multi-selection mode which allows you to (de-) select multiple images and folders. Press and hold again an image or folder to deactivate the multi-selection mode. Alternatively, you can also press the *ALL* button to deselect every selection.



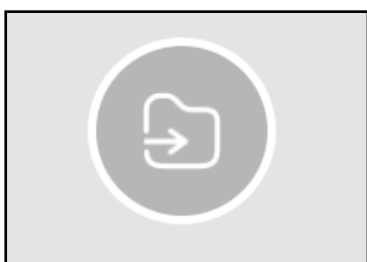
- Select *ALL* button: The *ALL* button will select all images and folders in the gallery. Press a second time to deselect your selection.

6.6.2. Rename



Rename folders or images.

6.6.3. Move



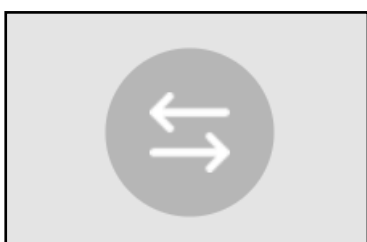
Move files or folders to a different destination within the gallery.

6.6.4. Eject USB



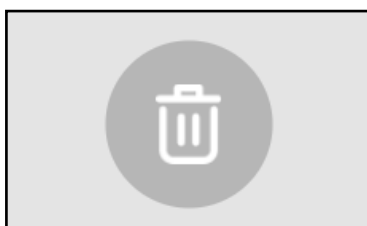
Safely disconnect a USB device (such as a USB flash drive, external hard drive, or other removable storage device). **Important: If you remove your storage device without ejecting it securely, you risk losing your data.**

6.6.5. Copy



Copy or copy & delete the selected images and folders to the USB flash drive.

6.6.6. Delete



Delete selected images and folders.

6.6.7. Image editor



Edit the selected image by adjusting image properties.

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



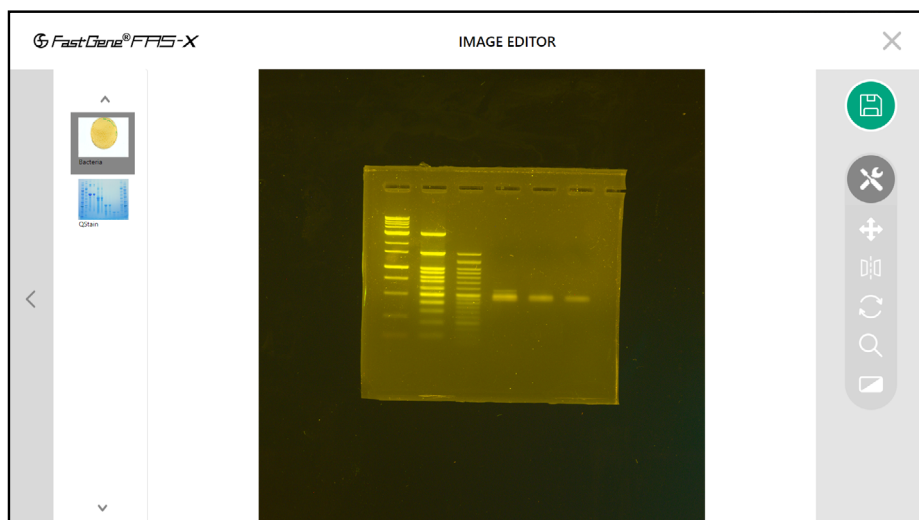
Here you can find and use the same image settings - such as movement, flipping, rotating, zooming and filters - as during the capture process (see Operation in Auto mode and Operation in Pro mode sections). This allows you to fine-tune the settings of the image for a better analysis. Keep in mind that the original data is retained, enabling you to reset both the applied image settings and filters. The same applies to when capturing an image with the filters on; you can deactivate them later in the *Image Editor*.

Don't forget to press the *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 will be displayed on the left (as shown on the image below). Edit each image individually as mentioned previously.

Note: To avoid losing edits, save each edited image before proceeding to the next one. Edits are discarded if you navigate away without saving. The recommended workflow is:

1. Edit the first image and save;
2. Move to the second image, edit, and save;
3. Repeat for each subsequent image.

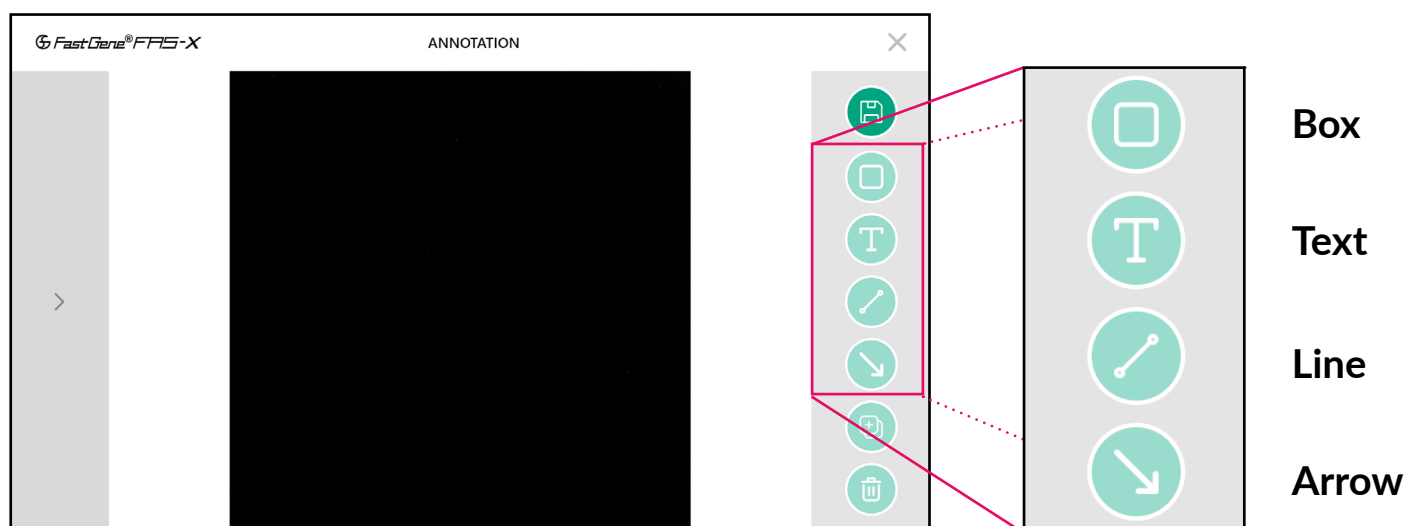


6.6.8. Annotation



You can open any previously captured image in the gallery and add annotations directly to it. Highlight bands, add text, or include notes to make your analysis more organized and comprehensive.

The annotation functions allow you to annotate the image with four tools: box, text, line, arrow.

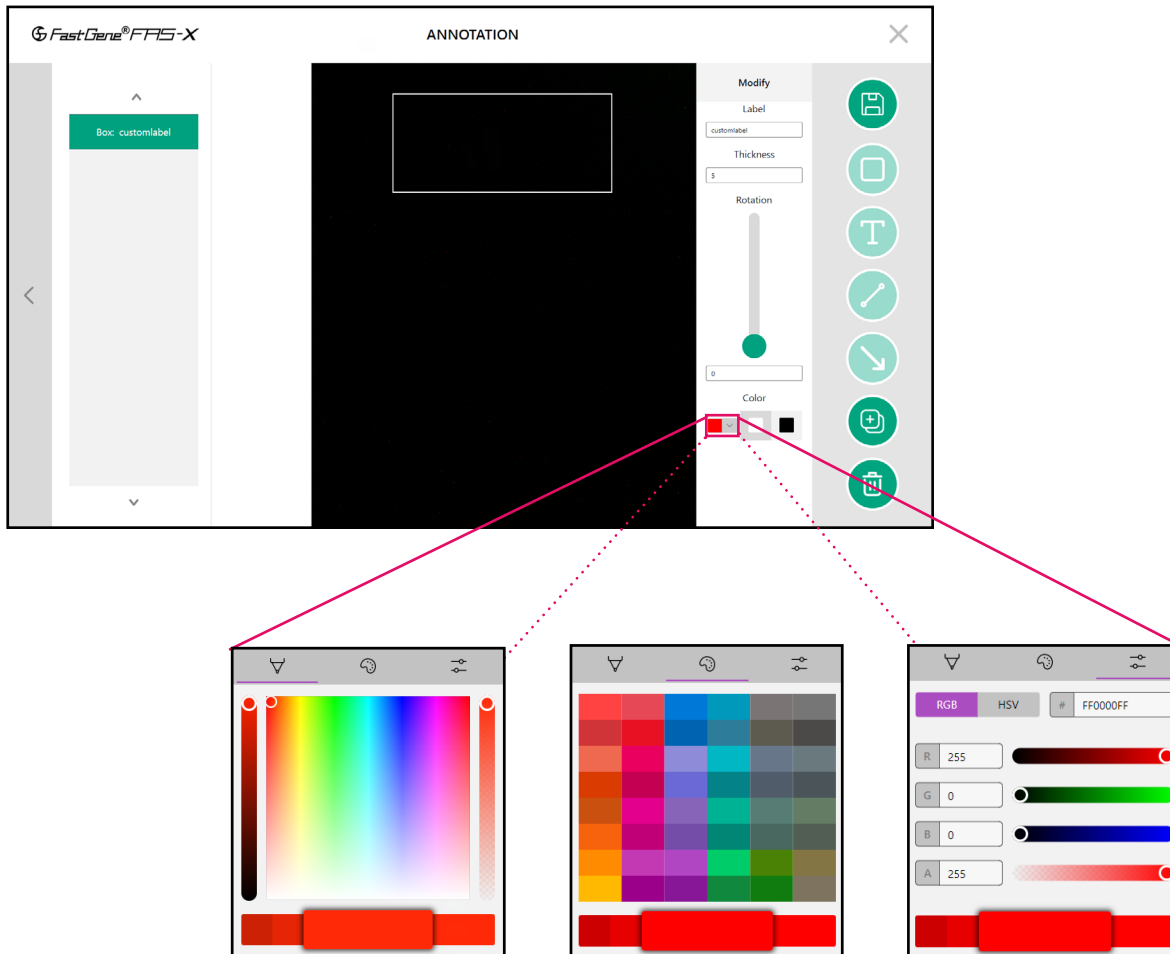


The tools offer a variety of customizations.

6.6.8.1. Box tool



The box tool is designed to help you highlight specific bands or entire lanes on your image with ease.



Its functions include:

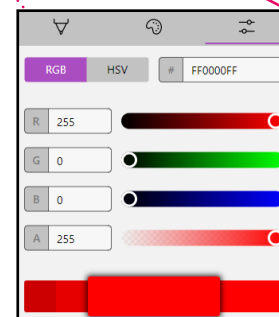
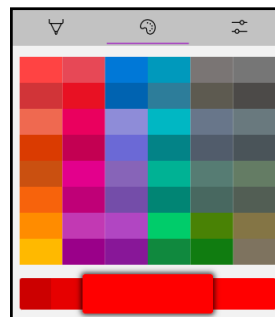
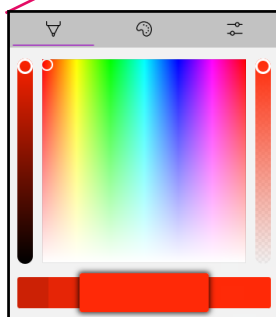
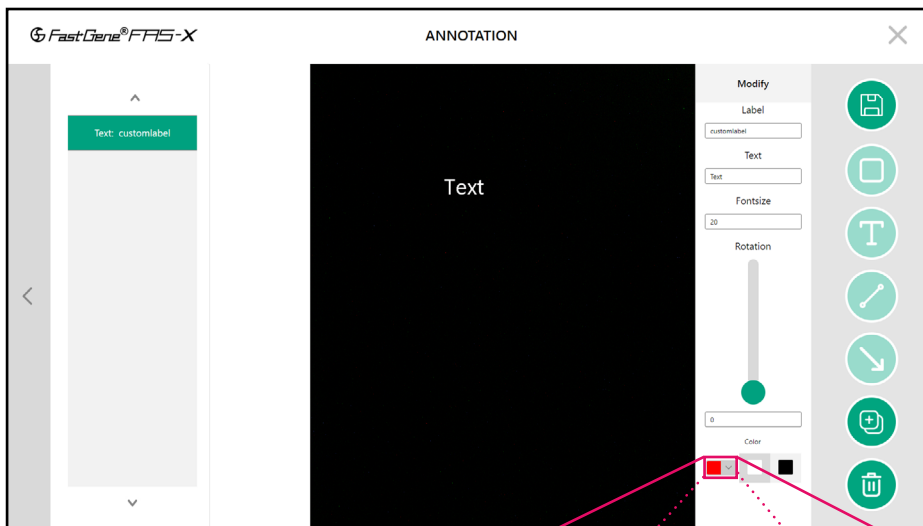
- Labeling and sorting elements, or assigning custom names to each annotation in the left panel, which can be opened by ;
- Adjusting the box thickness;
- Choosing from a selection of custom colors, including quick access to black and white options for easy selection.

6.6.8.2. Text tool



The text tool allows you to add text directly onto your image. Its features include:

- Labeling and sorting elements, or assigning custom names to each annotation in the left panel;
- Rotating the text using the slider or by entering a specific value;
- Customizing the text size;
- Choosing text color from a palette of custom options, including black and white for quick selection.



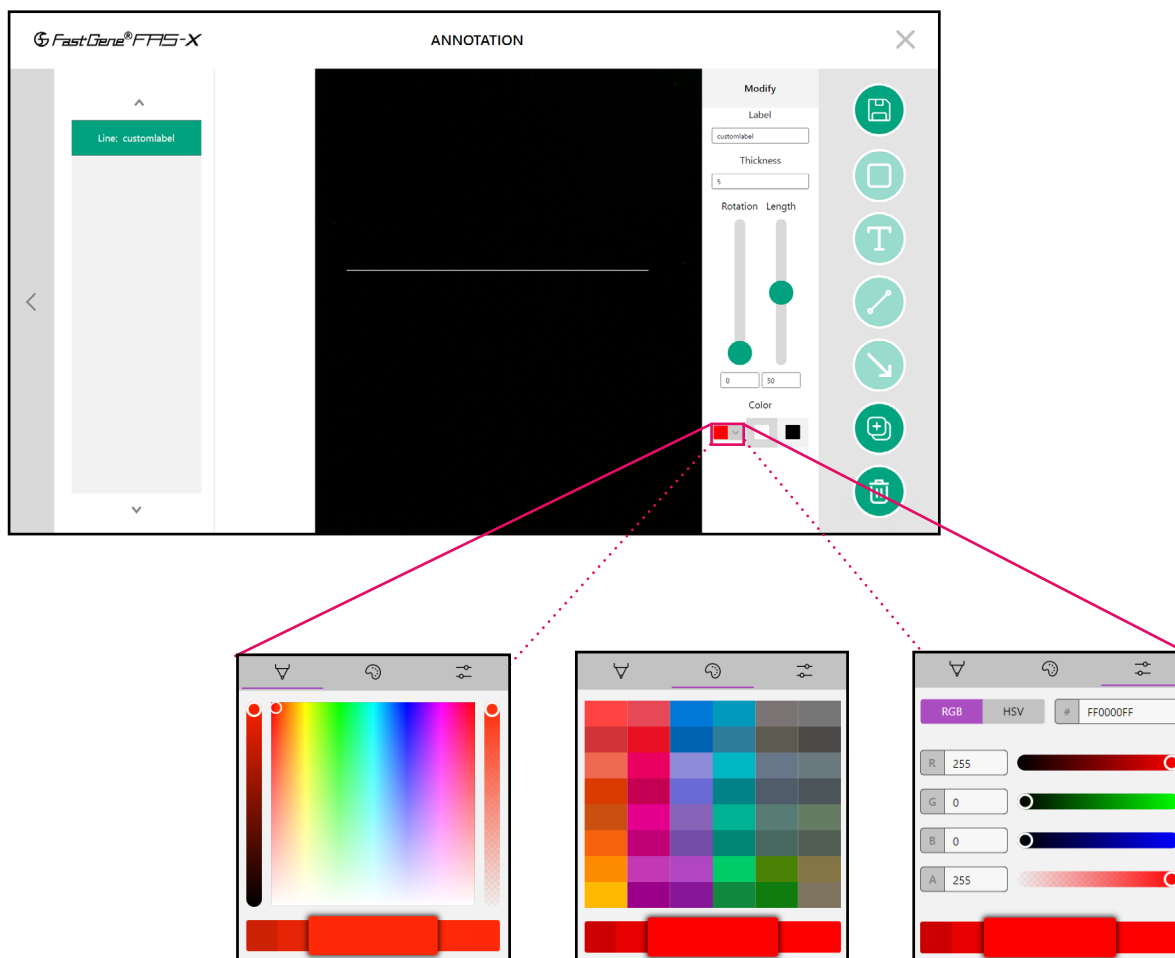
Please note that font size adjustment is a feature available exclusively in the text tool.

6.6.8.3. Line tool



The line tool is designed to let you draw and customize lines on your image. Its features include:

- Labeling and sorting elements, or assigning custom names to each annotation in the left panel;
- Adjusting the thickness of the line;
- Rotating the line using the slider or by entering a specific value;
- Customizing the line's color with a selection of custom options, including black and white for quick access;
- Changing the length of the line to suit your needs.



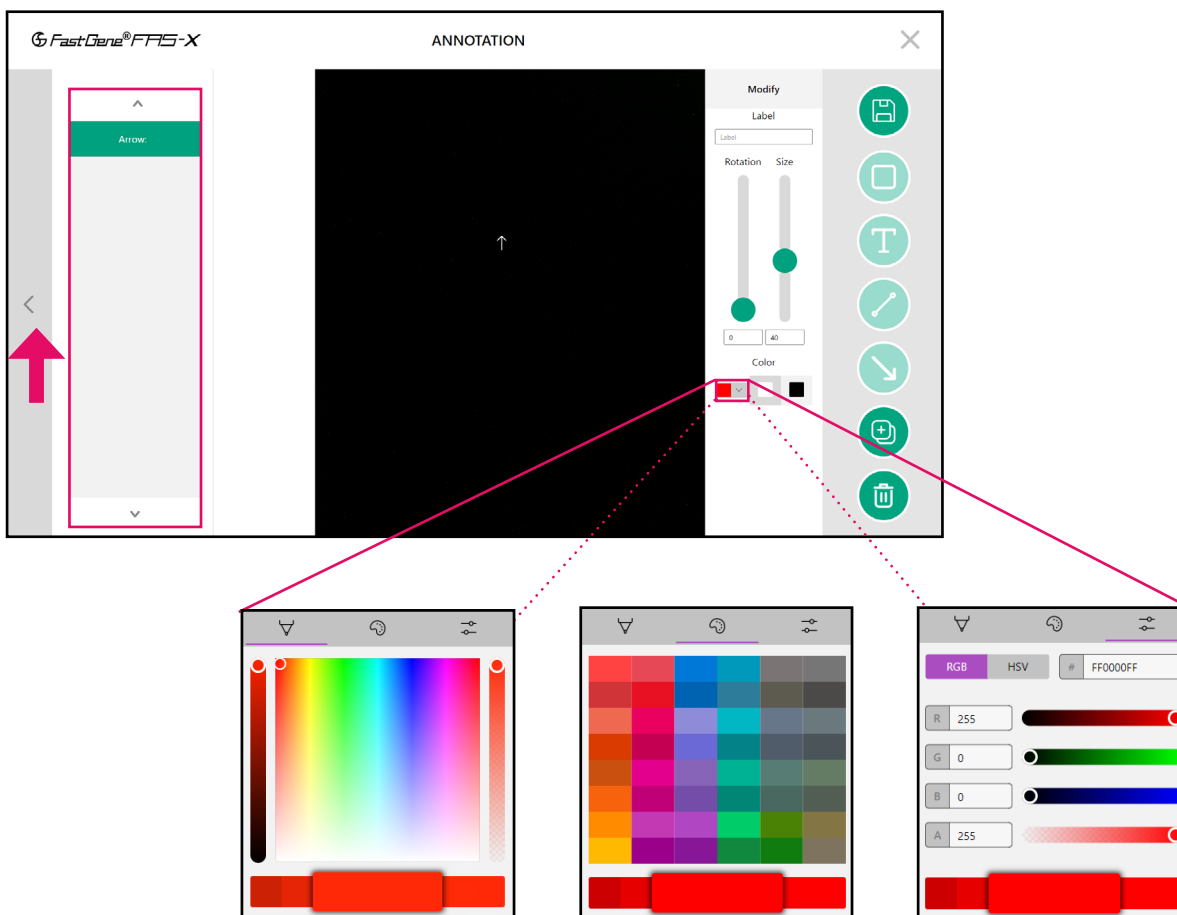
Please note that length adjustment is a feature available exclusively in the line tool.

6.6.8.4. Arrow tool



The arrow tool is designed to add arrows to your image. It offers the following features:

- Labeling and sorting elements, or assigning custom names to each annotation in the left panel;
- Adjusting the thickness of the arrow;
- Rotating the arrow using the slider or by entering a specific value;
- Customizing the arrow's color with a selection of custom options, including black and white for quick access;
- Adjusting the size of the arrow.



Please note that arrow size adjustment is a feature available exclusively in the arrow tool.

After adding element(s) to the image, you can access the element overview by tapping the dark grey area with the arrow on the left side (indicated by arrow in the image above). All added elements will appear in this list panel, with the currently selected element highlighted in green (indicated by the rectangle in the image above). You can duplicate or delete the selected element using the two buttons

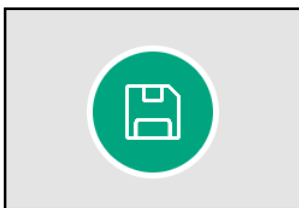
located on the right panel below (see images below):



Duplicate element

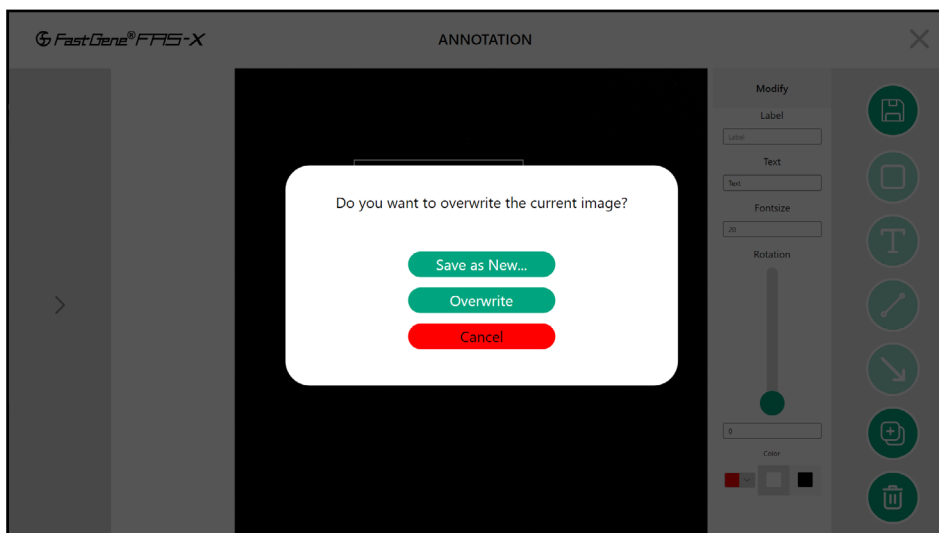
Delete element

Once you complete the annotation process, you can save the image by clicking the save button located at the top right corner of the panel.

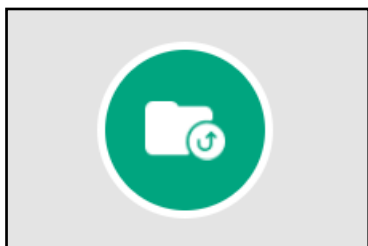


Save

The software will prompt you to choose whether to save the annotated image as a new file or overwrite the existing one.

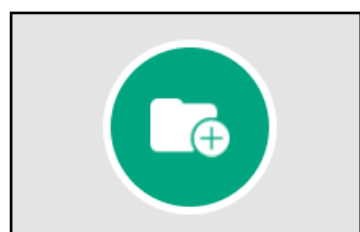


6.6.9. Back to the parent folder



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

6.6.10. Create new folder

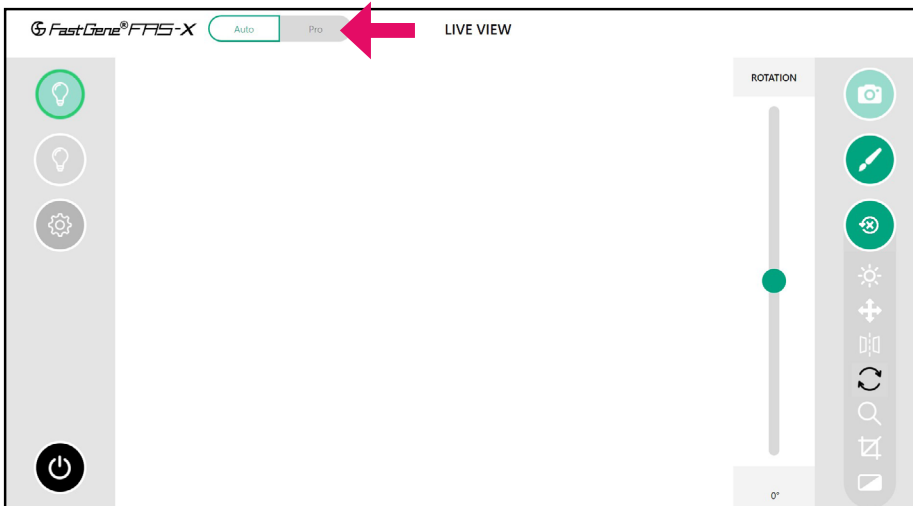


Create new folder(s).

6.7. Operation in Auto and Pro mode

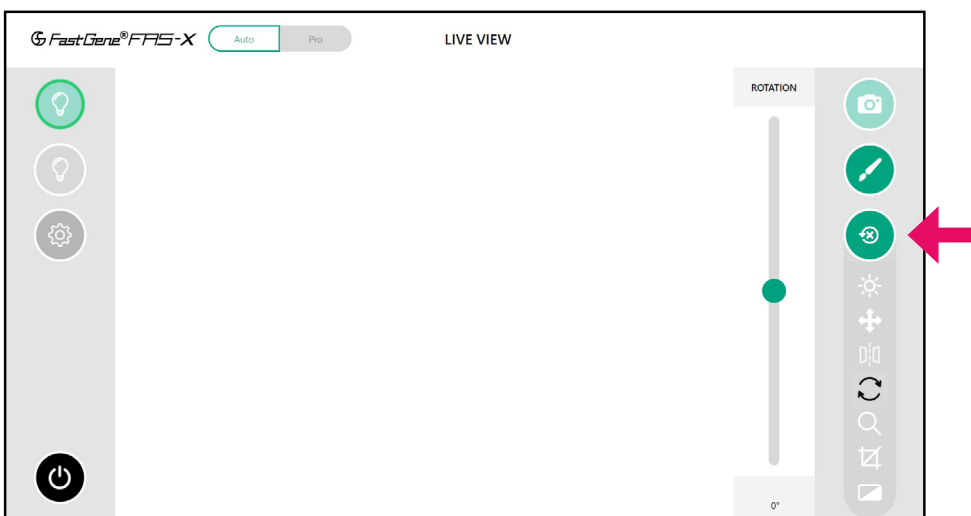
6.7.1. Switching between Auto and Pro mode

The Auto mode has predefined values for the exposure and zoom tools making it simpler to operate compared to the Pro mode which allows for specific customizations. To operate in Pro mode, switch from Auto to Pro mode in the top left corner.



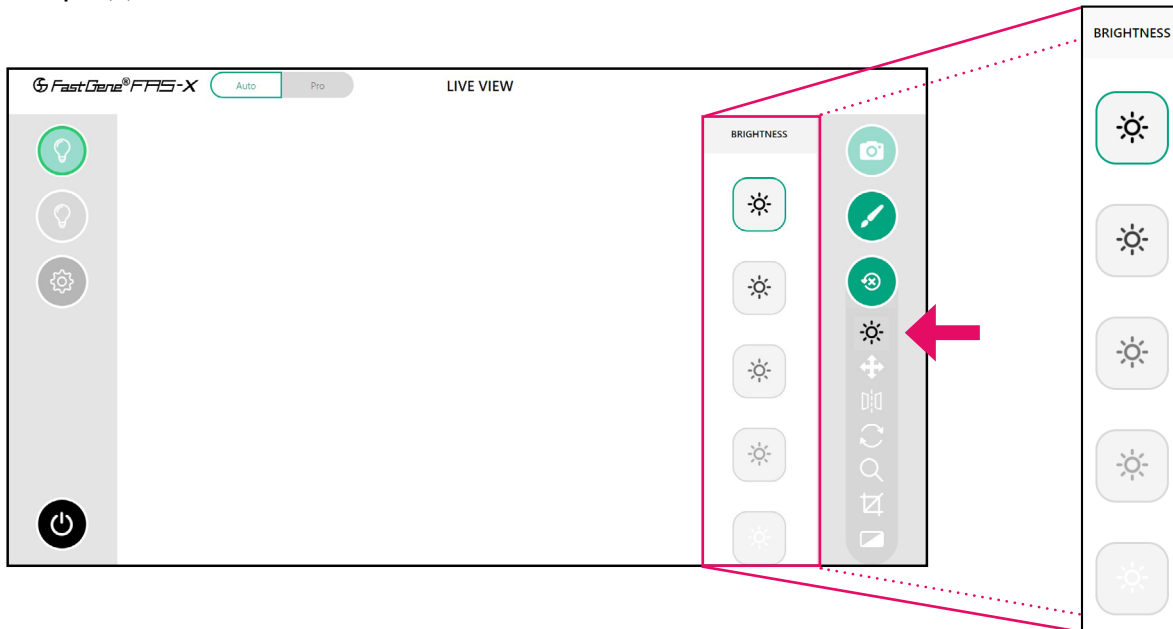
6.7.2. Tool Reset

The tools that will be described in the following sections can be reset with the central reset button. It will only become active after selecting one of the tools.



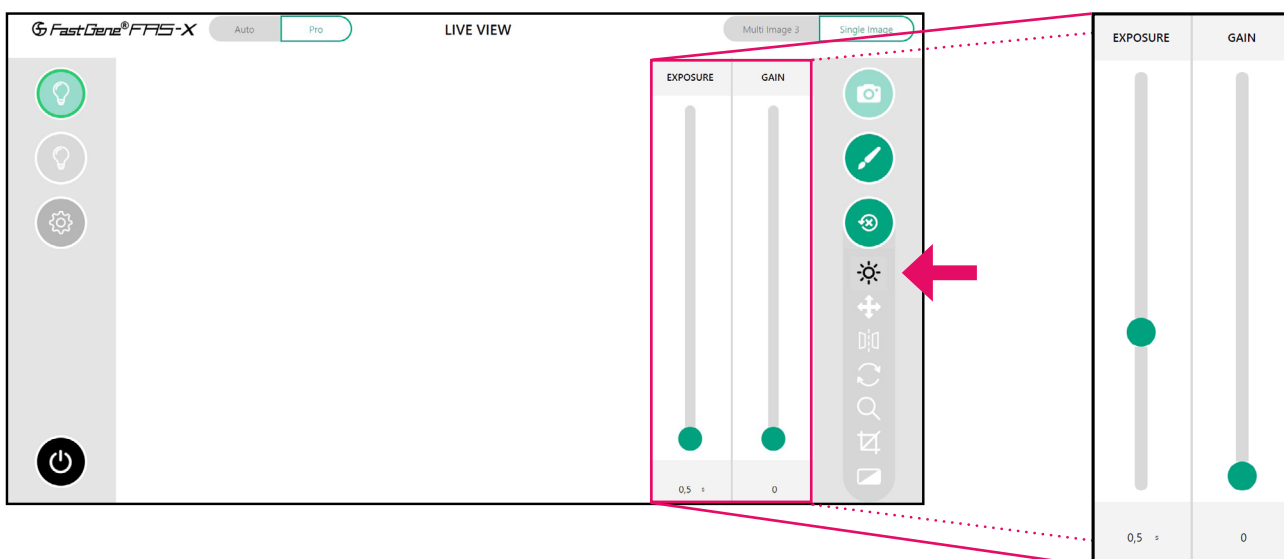
6.7.3. Exposure adjustment function

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



The strongest sun symbol represents the longer exposure time, while the weakest sun represents the shortest exposure time. **Note that the same sun symbol will have different exposure times for white LED and Blue/Green LED.**

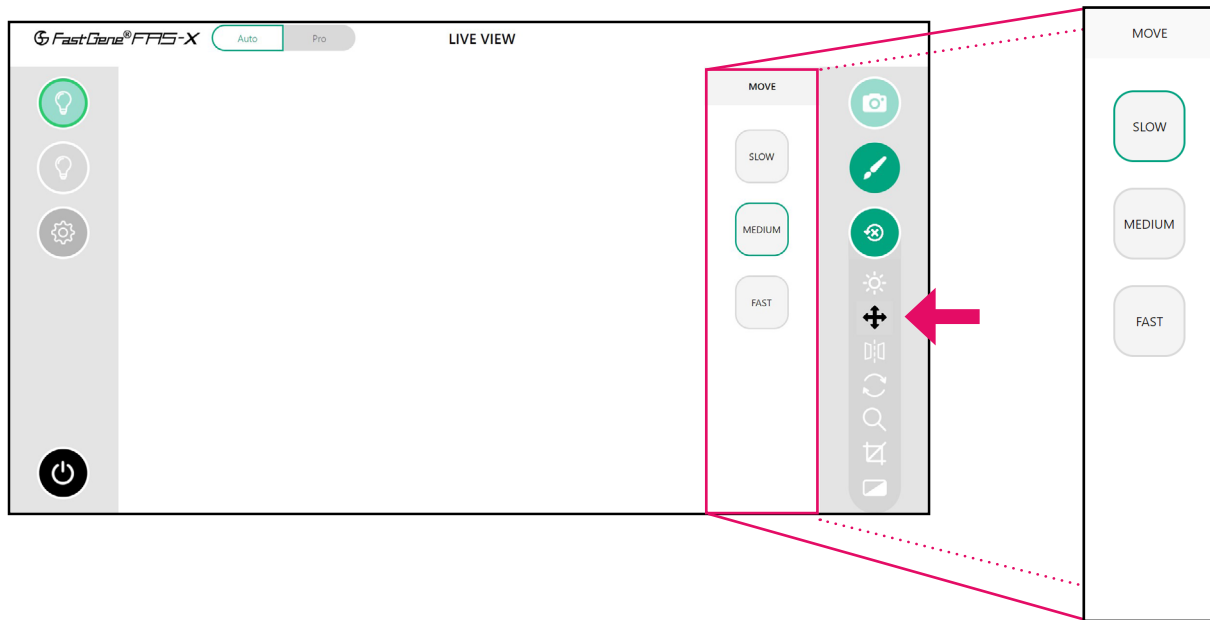
In the Pro mode, the exposure time of the sensor is shown in seconds.



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

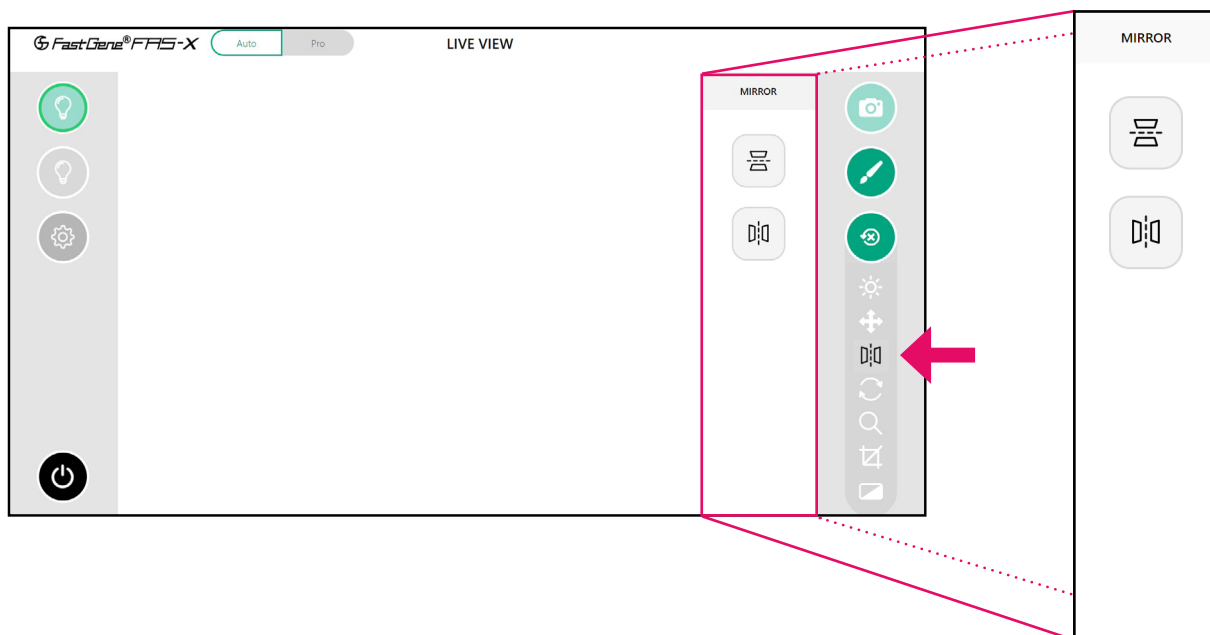
6.7.4. Move function

Use the *Move* function (same for Auto and Pro mode) to position the bands of interest in the centre of the display after zooming in. Here it is possible to choose the movement speed adequate to your needs.



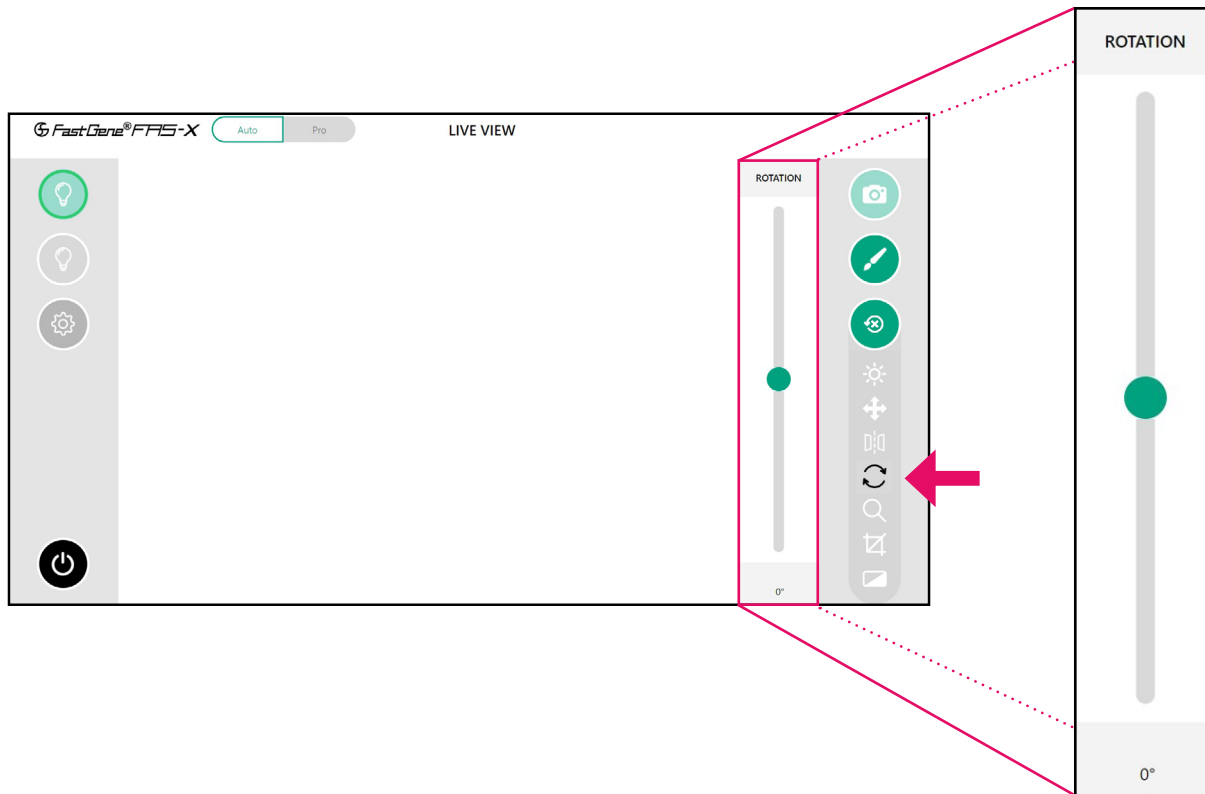
6.7.5. Mirror function

The *Mirror* function (same for Auto and Pro mode) allows you to flip the image horizontally or vertically. Additionally, you have the option to reset the mirroring.



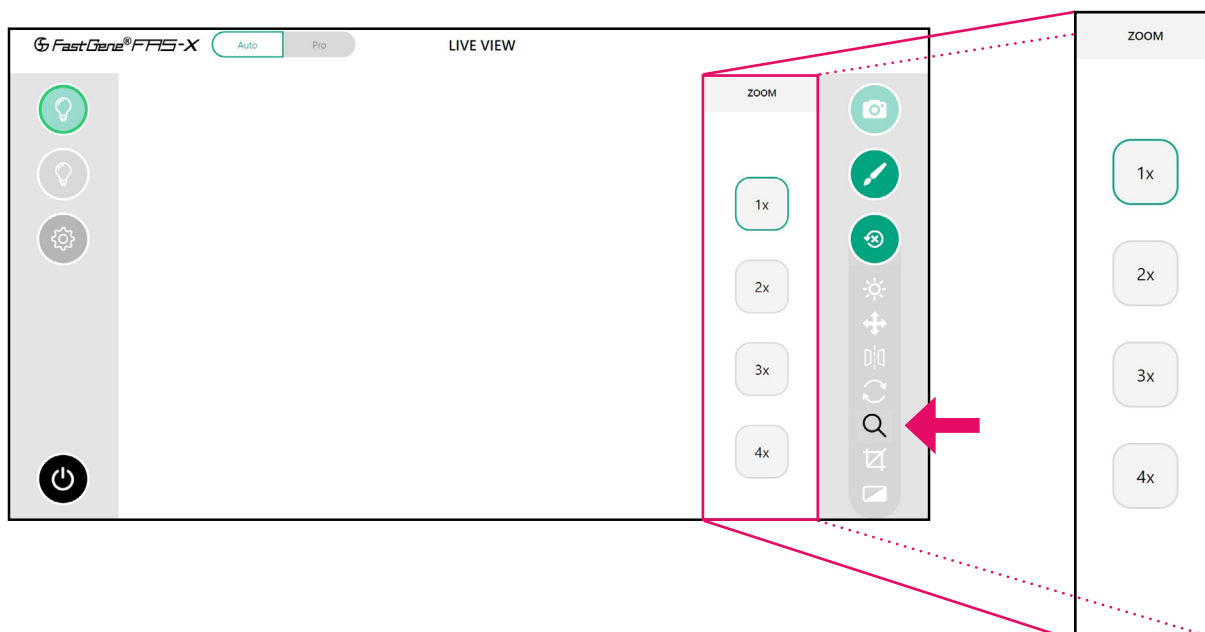
6.7.6. Rotation function

The rotation function (same for Auto and Pro mode) allows you to rotate the image using the slider or by entering a value. You can also use a two-finger gesture to rotate the image (counter-) clockwise.

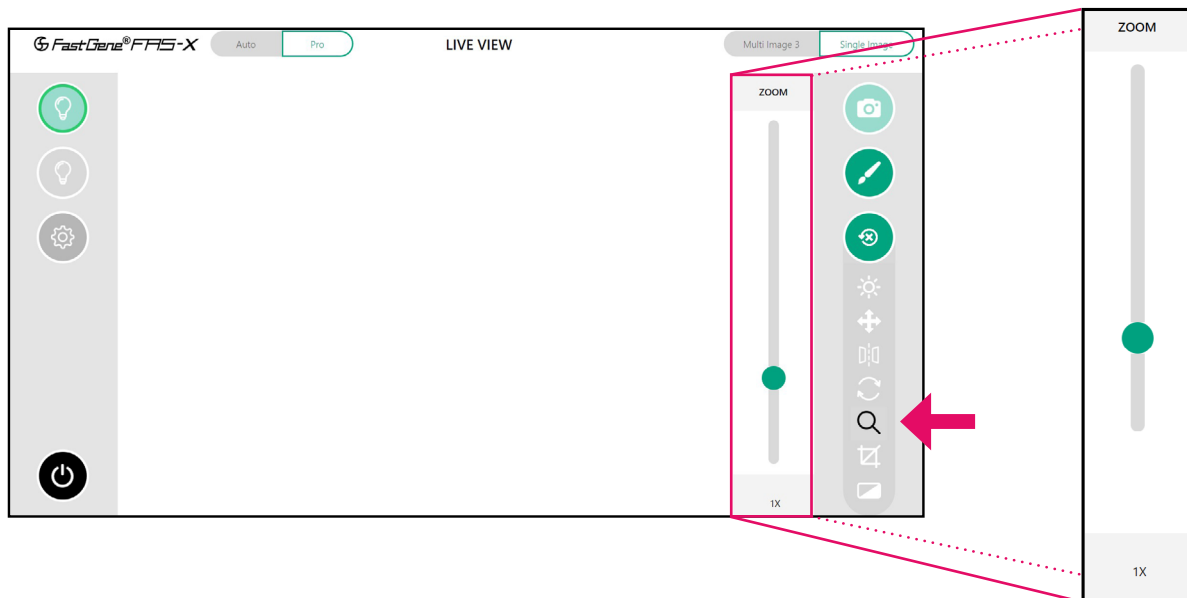


6.7.7. Zoom adjustment function

In the Auto mode, there are three different zoom levels: 1x (default), 2x, 3x and 4x. You can also using a two-finger gesture zoom in and out of an image in both the Auto and Pro mode.

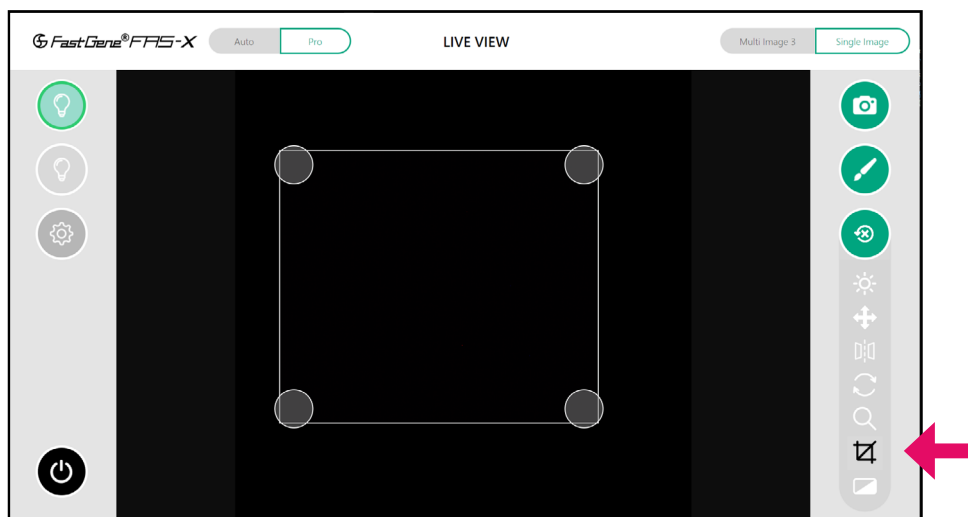


Unlike Auto mode, which offers pre-defined zoom levels, Pro mode allows you to digitally zoom in and out using the button to slide up and down, or type in a value.



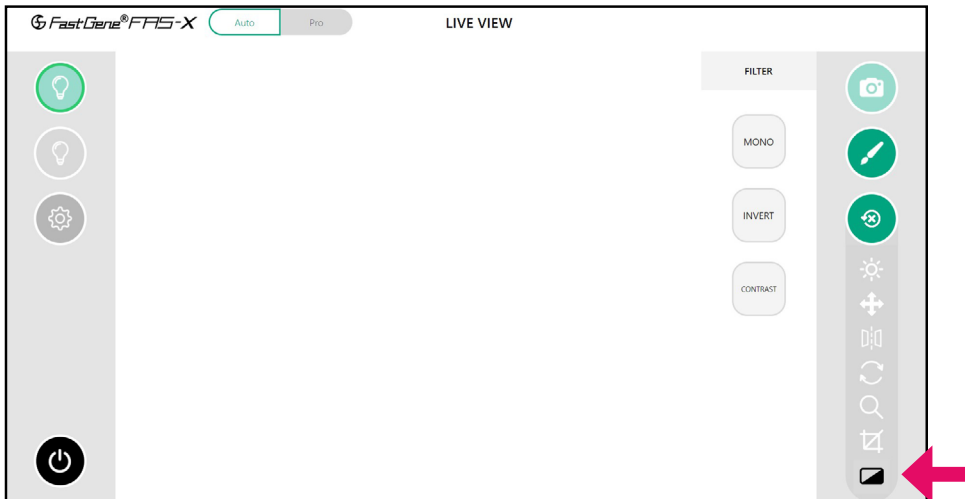
6.7.8. Crop function

The crop function (same for Auto and Pro mode) allows you to save a defined area of an image. Simply drag the handles (round circles) to the desired area and save the image. The tool has also pre-defined ratios for image areas which can be easily moved by holding and moving the area with one finger.



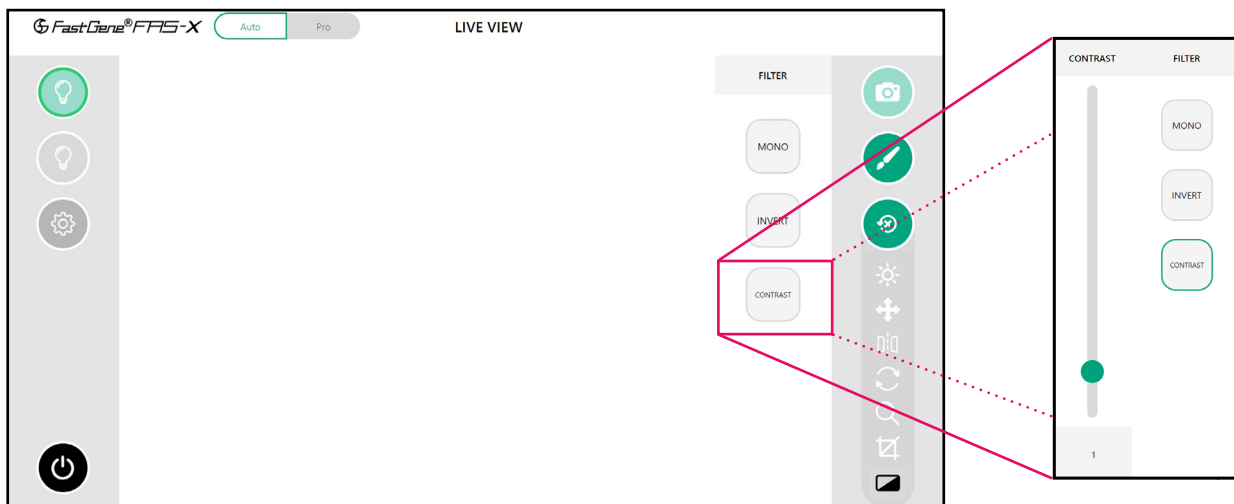
6.7.9. Filter function

The *Filter* function (same for Auto and Pro mode) allows you to customize the image with the *Mono*, *Invert*, and *Contrast* options.



It is possible to change the image from color to grey with the *Mono* option.

The *Invert* option reverses the colors or tones in an image, switching light areas to dark and vice versa. The *Contrast* option allows you to adjust the difference between the light and dark areas of your gel image using the slider or simply by typing the numbers.



6.7.10. Multi-image recording function

The functionality of Pro mode extends to multi-image recording (3 or 5 images) with different exposure times. This allows you to scan and easily select the perfect exposure. The steps of the exposure times can be set in the settings menu (see page 25).



7. Excision of DNA bands

1. Open the drawer to access the transilluminator.
2. Please wear the amber goggles (Cat. No. GPG) or use the Amber Board (Cat. No. FAS-DGOF3) 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 page 49).
4. With the aid of a scalpel or the FastGene® Agarose Gel Band Cutter (Cat. No. FG-830), excise the DNA band of interest.

8. Heat protection mode

The Blue/Green light transilluminator will switch off after 30 minutes of continuous use to protect the transilluminator from overheating.

- Blue/Green light indicator (see image below): the green circle timer counts down 30 minutes and changes from green to yellow and afterwards to red as time decreases.



- Heat protection mode indicator (see image below): five minutes before heat protection mode, the user will be informed about the heat protection mode. Afterwards, the transilluminator goes into heat protection mode for 15 minutes. During these 15 minutes the Blue/Green light is not usable. The timer shows the remaining time until the Blue/Green light is usable again. The circle gets bigger and changes color with decreasing time.





9. Contact details

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

Please contact our support: support@nippongenetics.eu

NIPPON Genetics EUROPE GmbH

Mariaweilerstraße 28a 52349 Düren, Germany

Telephone: +49 2421 55 496 0

Fax: +49 2421 55 496 11

