



Product

FastGene® FAS-Digi PRO

Cat. No.

GP-07LED

Category

Gel Documentation System



Version 1.3

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Content

General Information	5
SAFETY INFORMATION	5
REGULATORY NOTICE	5
WARRANTY	5
IMPORTANT NOTICE	5
Specification	6
CAMERA	6
CONTROL	6
DARKBOX	6
ILLUMINATOR	6
UNIT	6
Nomenclature	7
Installation guide – Setting up the FAS-Digi PRO	10
ASSEMBLING THE CAMERA HOLDER	10
CONNECTING THE CABLES	13
CONNECTING THE CAMERA TO A PC	14
Installation, Operation and Performance Qualification	20
COMPUTER MINIMAL REQUIREMENTS	22
INSTALLATION QUALIFICATION	22
OPERATION QUALIFICATION	22
PERFORMANCE QUALIFICATION	23
Operating the System	26
LOG IN	26
MAIN MENU	26
SELECTING THE APERTURE	27
SELECTING THE EXPOSURE TIME	27
SELECTING THE SENSITIVITY OF THE SENSOR	27
TAKING IMAGES WITH DIFFERENT EXPOSURE TIMES	27
FOCUSING THE IMAGE	27
CHANGE THE IMAGE SETTINGS	28
PRINTING THE LIVE VIEW	28
DISPLAYING THE RECORDING INFORMATION	28
CAPTURING THE IMAGE	28
Excising DNA bands	29
REMOVING THE FILTER SHIELD FROM THE DOOR	29
ADDING THE FILTER SHIELD TO THE CUTTING POSITION	29
EXCISE THE DNA BAND	29
Taking images using a white light source	30
Contact Details	31



General Information

SAFETY INFORMATION

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

- ▲ Please wear the appropriate personal protective equipment.
- ▲ Please read the safety precautions stated in the Canon 200D operating manual.
- ▲ Using FastGene® Blue/Green LED XL-Transilluminator instrument 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 filter included in the box, when handling the transilluminator while the FastGene® FAS-Digi PRO box is open.
- ▲ Operate the FAS-Digi PRO only if it is connected to a safety socket.
- ▲ Place the unit on a level surface with minimal chance of dropping.

WARRANTY

The FastGene® Blue/Green LED XL-Transilluminator and the FastGene® FAS-Digi PRO 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.

IMPORTANT NOTICE

Please, read the installation instruction carefully before installing the FastGene® Blue/Green LED XL-Transilluminator and the FastGene® FAS-Digi PRO Imaging System. 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 or use the amber shield for your own protection!

Please make sure to connect the instrument only to a protective current!



Specification

Camera

Camera type	Canon 200D, 24 MPixel (Resolution: 6000x4000), APS-C Sensor DIGIC 7 Processor, WiFi enabled
Image Sensor	APS-C sized CMOS Sensor
Resolution/Image Size	6000 x 4000 pixel
Bit Output Format	8-bit
Aperture	F/4-5.6
Lens	18-55 mm zoom Lens, manual
Exposure time	0.00025 to 30 seconds
Filter	FastGene® amber filter attached by magnets

Control

Control Software	NIPPON Genetics Camera Studio, Windows OS 10 or higher
Saved Image Format	TIFF, JPEG
Image storage	Host computer dependent
Interface	Host computer dependent
	Host computer dependent
	Supports Mitsubishi thermal-printer P95D

Darkbox

Access	Front door, 180° opened
Power unit	Power supply for transilluminator and camera
Filter	FastGene® amber filter shield

Illuminator

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

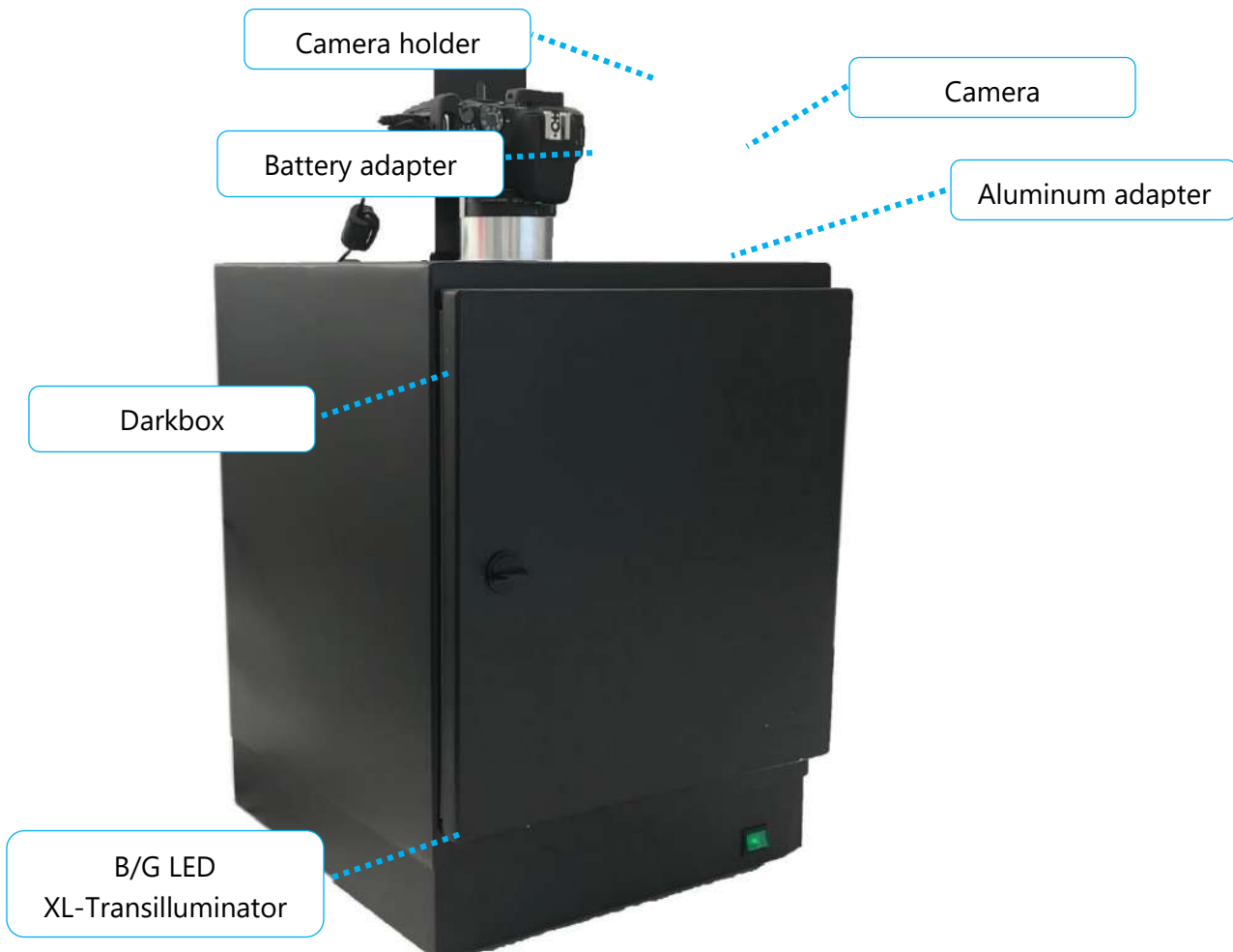
Unit

Material	Painted aluminum metal
Rated Voltage	100-240 V~, 50/60 Hz
Dimension (H x L x W)	52 x 33.5 x 32.5 cm
Weight	14 kg



Nomenclature

- Blue/Green LED XL-Transilluminator
- Darkbox
- Amber goggles
- FastGene[®] amber filter shield attached with magnets (stored in the door)
- Camera holder
- USB-Stick with Software
- Cables:
 - a. Battery adapter for the camera
 - b. USB-Cable to connect the camera to the PC
 - c. Power cable 1: From a power socket to the darkbox
 - d. Power cable 2: From the darkbox to the Blue/Green LED XL-Transilluminator
- Camera:
 - a. Attached to the aluminum adapter (Please do not remove the aluminum adapter)
 - b. FastGene[®] amber filter attached by magnets to the lens



Part I

Installation



Installation guide – Setting up the FAS-Digi PRO

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

Assembling the camera holder

The camera holder prevents the camera from turning when rotating the zoom ring using the aluminum adapter and is fixed by two screws to the darkbox and one tripod screw to the camera. The position of the camera holder must be adjusted according to the camera:

1. Place the camera with its aluminum adapter in its final position, by adding it to the hole in the top part of the darkbox.
2. Add the Battery adapter to the camera. Please note that only one direction is possible.



3. Close the battery compartment completely. Please put the cable in the cable channel. Please note: the camera will not turn on if the battery compartment is not completely closed.

Cable channel





- Align the camera, so that the image of the position is straight. The control buttons should be facing toward the door of the darkbox.
- Loose the tripod screw from the camera. Please be careful not to lose the spacer. The spacer is added between the camera and the camera holder.

Tripod screw



Spacer



- Fix the camera holder on the camera using the tripod screw in the following order: Screw→Spacer→Camera holder→Spacer→Camera.



- Align the camera holder holes with the 2 small holes in the darkbox





8. Use the screws fixed on the box. You will need a 6mm head for the nut and a hexagon socket screw (a.k.a. Allen) key.



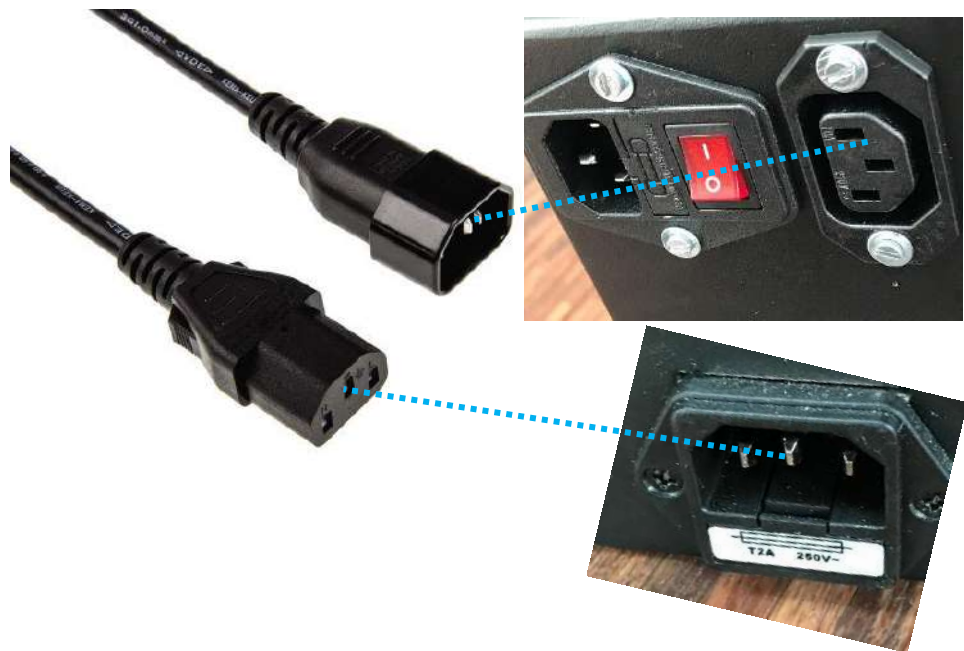
The darkbox connected with the camera is now ready and can be placed on top of the transilluminator. The next step will explain how to connect the cables.



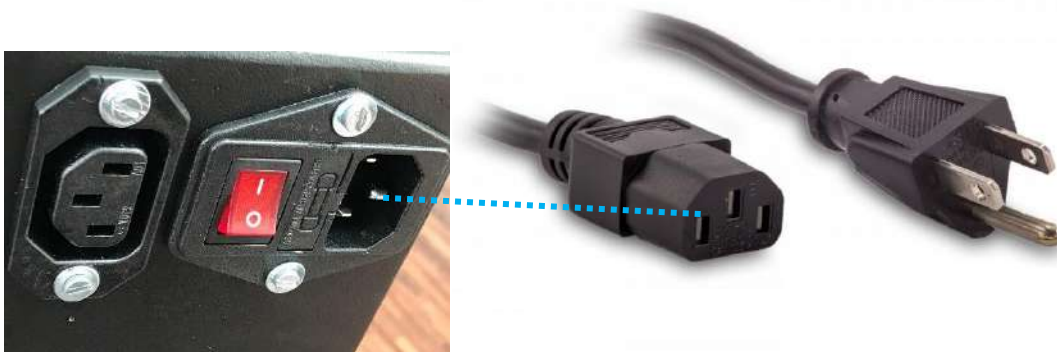
Connecting the cables

The FAS-Digi PRO was designed to have only one power supply. The transilluminator and the camera receive their electrical power from the darkbox. Please connect the cables using the following order:

9. Connect the B/G LED XL-Transilluminator to the darkbox using the male to female power plug:



10. Add the power lead to the power socket and to the darkbox.



11. Switch on the red switch on the back part of the darkbox.



The FAS-Digi PRO is now powered up. The transilluminator should switch on, as soon as the switch in the front is used. The next step explains how the camera is connected to a PC.

Connecting the camera to a PC

The FAS-Digi PRO is powered up and can be used without a software. Here, we will explain how to connect the FAS-Digi PRO gel documentation system to a Windows 10 PC and to use the NIPPON Genetics Camera Studio software.

Preparation:

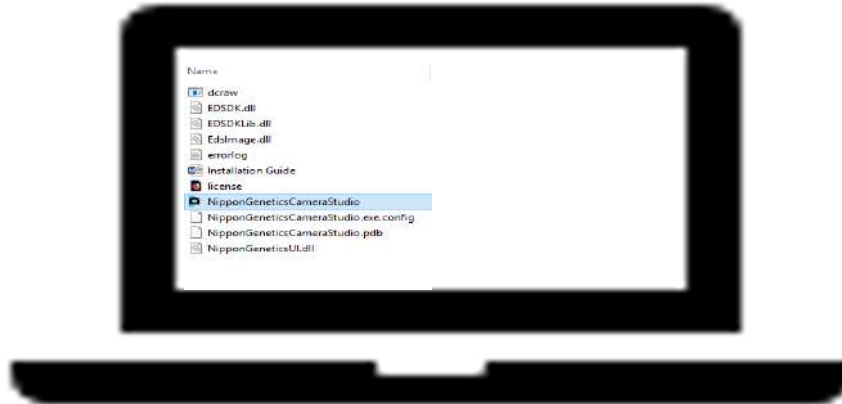
- Check that the autofocus and the image stabilization are turned off.
- Copy the FAS-Digi PRO folder to the desktop of a Microsoft Windows 10 PC.
- Connect the camera to the PC using the USB cable found in the camera box. The USB port is on the left side of the camera.
- Set the camera to manual mode by turning the mode dial to M.
- Switch the camera on.



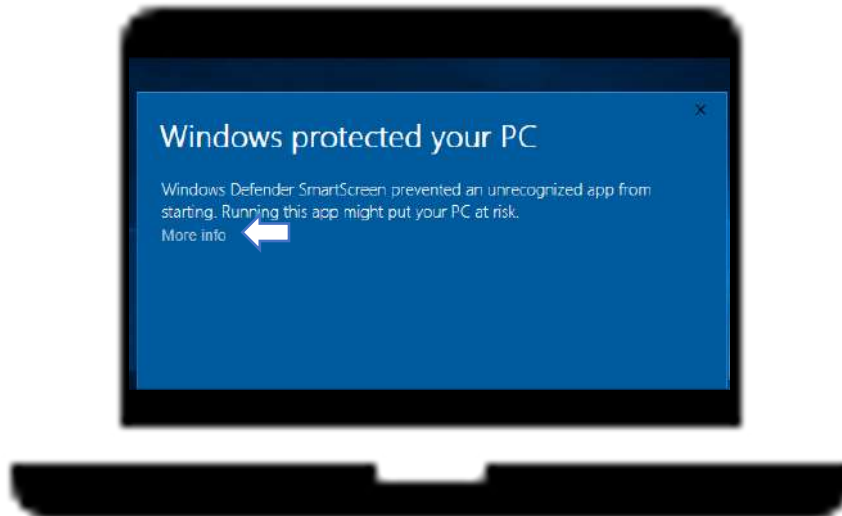


Starting the software

1. Start the NIPPON Genetics Camera Studio software:



Please note if a blue SmartScreen appears: select More info and chose the option run anyway.



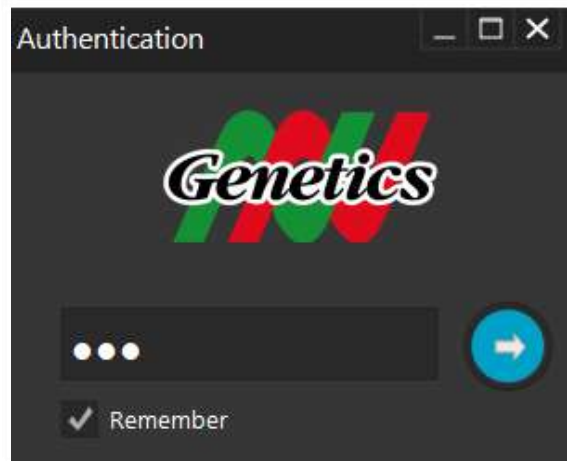
This blue SmartScreen will only appear when the NIPPON Genetics Camera Studio is launched for the first time.



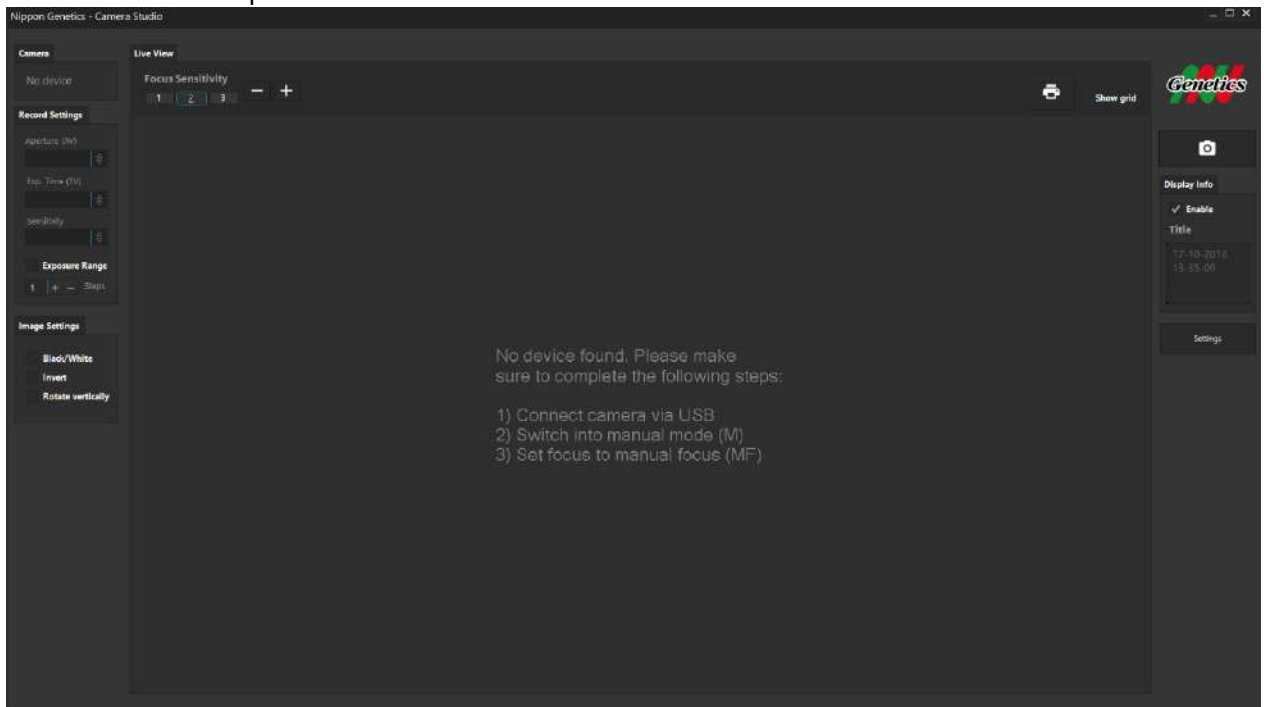
2. Log in

The NIPPON Genetics Camera Studio Software is password protected to avoid unauthorized people to have access to the gel documentation system. The password to enter the software is

NgE



3. The software will open.



You completed the installation of the FAS-Digi PRO. Please continue with the IQ/OQ/PQ protocol.

WELL DONE!

Part II

IQ — OQ — PQ



Installation, Operation and Performance Qualification

FAS-Digi PRO GP-07LED

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 to specifications. 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-Digi PRO device and software.

_____	_____	_____
Customer Name	Signature	Date
_____	_____	_____
Reviewer Name	Signature	Date



List of Serial Numbers:

Serial No. darkbox _____ Date _____
Serial No. camera _____
Serial No. transilluminator _____

List of components:

- Camera
 - Camera body
 - Lens
 - Aluminum adapter attached to the lens
 - FastGene® amber filter attached with a magnet at the lens
 - Manual of the camera
 - USB cable
- Darkbox
 - Camera holder
 - 2 fixation screws on top of the darkbox
 - Tripod screw with two spacers
 - Battery adapter
 - FastGene® amber filter shield attached with magnets in the door
- Cable
 - Power cable 1 (see part I - installation)
 - Power cable 2 (see part I - installation)
- Amber goggle
- USB Stick with NGCS software 1.0
- Blue/Green LED XL-Transilluminator
- This document (Installation; IQ, OQ, PQ; Manual)



Computer minimal requirements

Description	Minimum Requirement	Confirmed ?
Computer	PC	
Operating system	Windows 7, Windows 10	
USB 2.0	2 ports	

Installation Qualification

IQ Check List		FC	Customer	Note
Are all components included		<input type="checkbox"/>	<input type="checkbox"/>	
No obvious defects on casing		<input type="checkbox"/>	<input type="checkbox"/>	
Check door, if it is moving easily		<input type="checkbox"/>	<input type="checkbox"/>	
Is the FastGene® amber filter shield attached in the door		<input type="checkbox"/>	<input type="checkbox"/>	
Check B/G table for defects		<input type="checkbox"/>	<input type="checkbox"/>	
Check camera on defects		<input type="checkbox"/>	<input type="checkbox"/>	
Check if aluminium adapter is fixed tightly to the lens		<input type="checkbox"/>	<input type="checkbox"/>	
Is the FastGene® amber filter attached to the lens and is the magnet working		<input type="checkbox"/>	<input type="checkbox"/>	
USB with NGCS software		<input type="checkbox"/>	<input type="checkbox"/>	
Set up the GP-07LED like described in the installation part		<input type="checkbox"/>	<input type="checkbox"/>	
Examination signature		Verification signature		

Operation Qualification

OQ Check List		FC	Customer	Note
Turn the switch on at the back of the box, the camera and the illuminator and check if all components are working		<input type="checkbox"/>	<input type="checkbox"/>	
Connect the FAS-Digi Pro with the computer and start the software from the USB Stick		<input type="checkbox"/>	<input type="checkbox"/>	
Turn off the transilluminator and set the following parameters for the camera: Lens: 18mm Aperture: 4.0 Exposure time: 5" Sensitivity: ISO3200		<input type="checkbox"/>	<input type="checkbox"/>	
Take a picture		<input type="checkbox"/>	<input type="checkbox"/>	
Check that no light is detectable (Black image)		<input type="checkbox"/>	<input type="checkbox"/>	
Examination signature		Verification signature		



Performance Qualification

PQ Check List		FC	Customer	Note
Place a gel on the illuminator		<input type="checkbox"/>	<input type="checkbox"/>	
Using the NGCS software	Take a picture	<input type="checkbox"/>	<input type="checkbox"/>	
	Check title and print option (if printer is available)	<input type="checkbox"/>	<input type="checkbox"/>	
	Change zoom	<input type="checkbox"/>	<input type="checkbox"/>	
	Change aperture	<input type="checkbox"/>	<input type="checkbox"/>	
	Change exposure time	<input type="checkbox"/>	<input type="checkbox"/>	
	Change sensitivity of sensor	<input type="checkbox"/>	<input type="checkbox"/>	
	Focus the image with the three options	<input type="checkbox"/>	<input type="checkbox"/>	
	Activate black and white function	<input type="checkbox"/>	<input type="checkbox"/>	
	Activate invert function	<input type="checkbox"/>	<input type="checkbox"/>	
	Activate rotate vertically function	<input type="checkbox"/>	<input type="checkbox"/>	
	Activate exposure range and save one of the three pictures	<input type="checkbox"/>	<input type="checkbox"/>	
Examination signature		Verification signature		

Part III

Manual



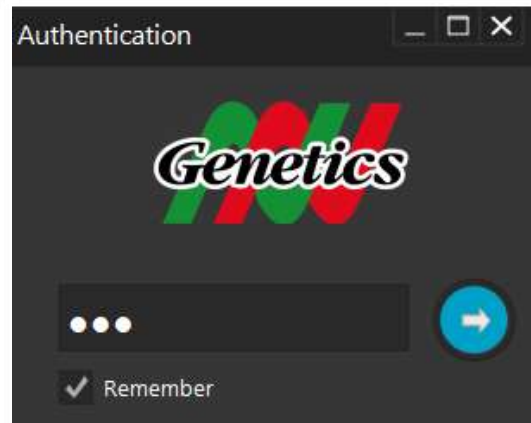
Operating the System

The FAS-Digi PRO is operated through the NIPPON Genetics Camera Studio Software:

Log in

The NIPPON Genetics Camera Studio Software is password protected to avoid unauthorized people to have access to the gel documentation system. The password to enter the software is

NgE



Main Menu

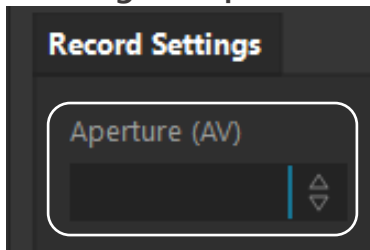
The NIPPON Genetics Camera Studio Software can control all necessary parameters to take an image with the FAS-Digi PRO.



All the following operations can be performed or accessed via the main menu:

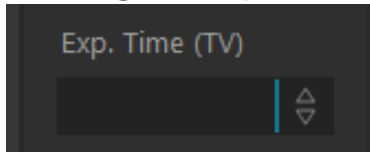


Selecting the aperture



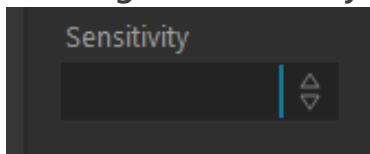
Opening of the iris: controls the amount of light to the sensor and regulates the depth of field. The value can be changed by using the dropdown menu or the mouse wheel.

Selecting the exposure time



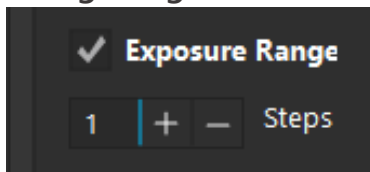
The exposure of the sensor to light in seconds. Minimal exposure time is 1/4000 up to 30 seconds.

Selecting the sensitivity of the sensor



Regulates the sensitivity of the sensor (ISO value). Maximal value is ISO 25625. The lower the sensitivity, the longer the exposure time will be. The higher the sensitivity, the higher the background noise will be.

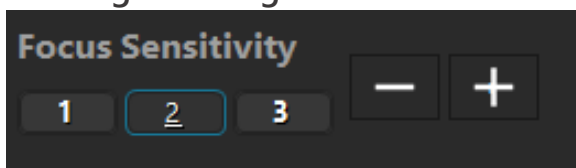
Taking images with different exposure times



Activate the Exposure Range function!

Three images will be captured. Adjusting the difference in exposure value between the single shots using the - +. Three images will be displayed. Select the image with the best light exposure and click on **"Choose"**. The file can be saved as JPEG or TIFF.

Focusing the image



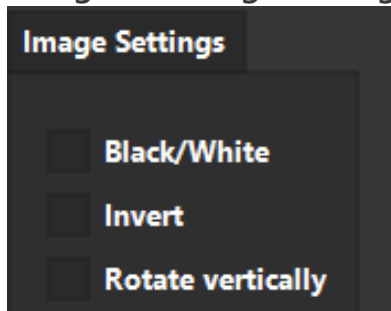
FOCUS SENSITIVITY

Adjusting the intensity by which the focus is changed. 1 is for very sensitive, fine adjustments. 3 is for large steps.

Click on -+ or use the mouse wheel on the screen to change the focal plane.



Change the image settings



BLACK/WHITE

Changes the image from a coloured one to grey values.

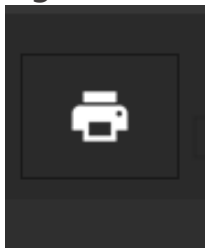
INVERT

Reverses the grey values turning white into black, and black into white.

ROTATE VERTICALLY

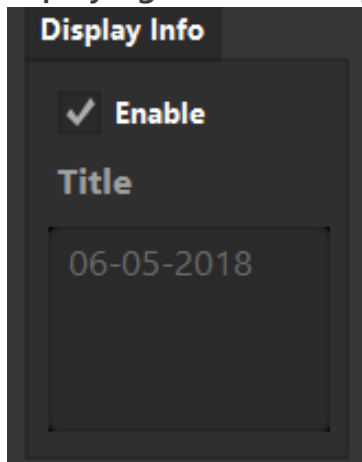
Mirrors the image vertically. Used if the gel is not in the right position.

Printing the live view



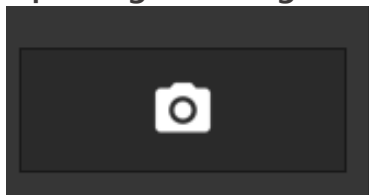
If you want to print the live view image without having to save data to the storage. The printer menu from windows 10 will appear. Please select your desired printer.

Displaying the recording information



Shows the aperture, exposure and ISO values on the image. Additionally, a title is shown. The standard title is the date. To change the title write your text in the box below.

Capturing the image



The image is recorded in the camera RAW mode and converted into a TIFF image. The image is formed by 3 x 8 bit values, resulting in a 24 bit image with a resolution of 24 MPixel and is saved on the harddrive of the computer or on a network location chosen by the user.



Excising DNA bands

Removing the filter shield from the door



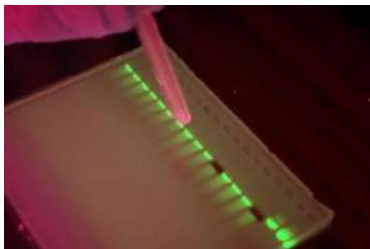
Remove the filter shield from the door and turn it around. The magnets should be facing you.

Adding the filter shield to the cutting position



Attach the filter shield to the magnets inside the box.

Excise the DNA band



Turn on the transilluminator. Now look through the filter shield and excise the DNA band using a scalpel or our FastGene® Agarose Gel Band Cutter (FG-830)



Taking images using a white light source

Taking images of protein gels



Recording images of protein gels or petri dishes are possible by adding a white light source and removing the FastGene® amber filter from the lens. The procedure is shown in the next steps

Exposing the filter



Extend the lens barrel by zooming out. The lens is now exposed and the filter is ready to be removed. The filter is held in place using a magnetic filter holder. After removing the filter, add the white light source (e.g. our white light transilluminator FG-07)

Removing the filter



After zooming out, you can remove the amber filter from the lens, by using 2 fingers, as shown in the left image. The amber filter should now be stored in a safe, clean storage space and be added as soon as the image is taken. To add the filter to the lens, just hold the amber filter close to the lens and the magnet will pull the amber filter to the correct position.



Contact Details

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