

VISION-CAPT

USER & SERVICE MANUAL FOR:

INFINITY ST5, QUANTUM ST5, BIO-PRINT ST4,
E-BOX VX5, DOC-PRINT VX5



Please read me first!

Please read carefully the installation instruction before proceeding to the installation.



FOR INFINITY ST5, QUANTUM ST5 and BIO-PRINT ST5

Please do not connect the USB camera to the computer before installing the Vision-Capt software.

After the software is fully installed, connect the USB camera to the computer. At that time, Windows 8 & 8.1 for Windows 7 will look for the camera driver located in the CD-Rom.

Complete installation procedure are described in this manual. Please refer to the complete details before to proceeding to the installation.



FOR E-BOX VX5:

Complete installation procedure are described in this manual. Please refer to the complete details before to proceeding to the installation.





WARNING : during the use of this material, the non-respect of these instructions can cause very serious burns to the user.

WARNING : Ultra Violet light is dangerous for unprotected eyes and skin, therefore the user must wear UV protective goggles (Ref. LP70) or a face-shield (Ref.MP-80 or MP-800)
SAVE THESE INSTRUCTIONS

AVISO: Durante el uso del instrumento, no seguir las instrucciones puede causar quemaduras graves al usuario.
PRECAUCION : La radiación ultravioleta puede ser peligrosa para los ojos y la piel expuestos sin protección. Para protegerse, es impérativo usar gafas o una máscara.
CONSERVAR CUIDADOSAMENTE ESTAS INSTRUCCIONES.

AVERTISSEMENT : Lors de l'utilisation de cet appareil, le non-respect des instructions peut provoquer de graves brûlures à l'utilisateur.
ATTENTION : Le rayonnement Ultra-Violet est dangereux pour les yeux et la peau exposés sans protection, il est impératif de porter des lunettes (Réf. LP70) ou un masque de protection (Réf. MP-80 ou MP-800).
CONSERVER SOIGNEUSEMENT CES INSTRUCTIONS

AVVERTIMENTO : Durante l'utilizzo di questo apparecchio, il non rispetto delle istruzioni può provocare bruciature gravi all'utilizzatore.

ATTENZIONE : I raggi Ultra Violetti essendo pericolosi per gli occhi e la pelle esposti senza protezione, è obbligatorio portare gli occhiali (Ref. LP 70) oppure una maschera di protezione (Ref. MP-80 o MP-800).
CONSERVARE CON CURA QUESTE ISTRUZIONI.

WARNING: während der Benutzung dieses Gerätes kann die Missachtung der Anleitung schwere Verbrennungen an Personen hervorrufen.
ACHTUNG: Ultraviolettes Licht ist gefährlich für ungeschützte Augen und die Haut. Der Benutzer ist daher angehalten, eine UV-Schutzbrille (Art. LP-70) oder ein Schutzschild (Art. MP-80 oder MP-800) zu tragen.
BEWAHREN SIE DIESE ANLEITUNG SORGFÄLTIG AUF

警告：使用此组件时，若不遵从使用指导将导致严重烧伤！
警告：紫外线对眼和皮肤有害，操作者必须佩戴紫外防护眼镜（货号：LP70）或面罩（货号MP-80 或MP-800）
请保存使用指导！

警告：機器の使用に際して、説明書の指示に従わない場合、使用者が重大な熱傷をこうむる場合があります。
警告：紫外線は裸眼や保護されていない皮膚にとって危険です。使用者はUV保護眼鏡（Ref. LP70）またはフェースシールド（Ref. MP-80またはMP-800）を装着する必要があります。
将来のためにこれらの説明書を保管しておいてください



Thank you

Dear Customer,

On behalf of Vilber Lourmat, we would like to thank you for choosing our imaging system.

In order to learn the capabilities of your imaging system and software, we kindly ask you to read this manual. This manual details how to install and to operate the hardware and the software components.

Vilber Lourmat is dedicated to your satisfaction and we will be pleased to answer any question you may have. We are also very receptive to your suggestions. Many of the new features and enhancements in this system are a direct result of conversations with our customers. Please do not hesitate to contact us to let us know what you would like to see in the next version of this system.

You can contact us at the following addresses:

⇒ Email: info@vilber.com

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Deutschland
T.: 49 (0) 7355 931 380
F.: 49 (0) 7355 931 379

Do not hesitate to visit our website at www.vilber.com



USER & SERVICE MANUAL

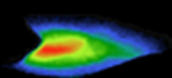
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VISION-CAPT

WARNING, SAFETY, LICENSE AGREEMENT

Please read carefully these instructions before installing and operating
Your imaging system and the VISION-CAPT software



Whenever you find this pictograph, be sure to refer to this Manual.
It indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.



Whenever you find this pictograph, be sure to refer to this Manual.
It indicates a UV radiation situation which, if not avoided, could result in serious injury.

WARNING

The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).

Use of the UV transilluminator acrylic protective screen does not guarantee the user protection from UV radiation. The use of protective goggles, mask, and/or gloves is strongly recommended





This product is safe to use when operated in accordance with the instruction manual. This instrument should not be modified or altered in any way. Modification or alteration of this instrument will void the manufacturer's warranty, void the regulatory certifications and create a potential safety hazard.


The intended purpose of the Imaging system is blot and gel documentation. They are designed for research use in laboratory only. VILBER LOURMAT 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 for any modifications of the instrument not performed by VILBER LOURMAT or by an authorized agent.

All uses opposed to the notification specified in this technical instruction or all misuses affect the goods and bodies security fastened by this device and can damage the instrument.

| | |
|--|--|
| | <p>It is mandatory to connect the Imaging system to an appropriate AC voltage outlet that is properly grounded and protected by a circuit breaker. Connecting to ground constitutes an obligatory protection.</p> <p>It is mandatory to power down the system and to disconnect the AC main from the unit before performing any disassembly or repair the instrument.</p> <p>The system must be unplugged from the AC voltage outlet if it is not intended to use it before a long time.</p> <p>Disconnect the power cord by pulling the plug. Never pull on the cord itself.</p> <p>Ensure that all the ventilation-opening systems are not obstructed. The obstruction of the air admission grids may affect the performance of the system and cause operational failure.</p> <p>To prevent fire or shock hazard, do not expose the unit to rain or moisture.</p> <p>The use of accessories not supplied by VILBER LOURMAT can damage the system or create safety hazard.</p> <p>Do not use the Imaging system in dangerous atmosphere or with dangerous materials for which the Imaging system has not been designed for.</p> |
|--|--|

| | |
|--|--|
|  | <p style="text-align: center;">TRADEMARKS</p> <p>Windows, Excel, Microsoft, and Power Point are trademarks of Microsoft Corporation.</p> <p>Intel Pentium, Intel Core are trademarks of Intel Corporation.</p> <p>FireWire, Mac, and Mac OS X are trademarks of Apple Inc.</p> <p>Coomassie is a trademark of BASF Aktiengesellschaft.</p> <p>Cy is a trademark of GE Healthcare group companies.</p> <p>SYBR Safe, SYBR Green, SYBR Gold, and SYPRO are trademarks of Invitrogen Corporation.</p> <p>Other brands or product names are trademarks of their respective holders.</p> |
|--|--|

| | |
|---|---|
|  | <p>This instrument must be used only by specialized personnel that know the health risks associated with UV radiation and with the reagents that are normally used with this instrument. Use of the UV protective screen doesn't guarantee protection of the user from UV radiation. The use of protective eyeglasses or mask and gloves is highly recommended.</p> |
|---|---|

| | |
|---|--|
|  | <p>The power cable of the camera is expensive and very fragile, because of the thin conducting pin. Before plugging or unplugging the cable, ensure the unit is off and disconnect the Imaging system from the AC voltage outlet.</p> <p>Never pull the camera cable itself. Disconnect the cable only by grasping the plug.</p> |
|---|--|



All the equipment connected to this unit shall be certified according to standard IEC 950, or other IEC/ISO Standards applicable to the equipment.



This instrument must be used only by specialized personnel that know the health risks associated with UV radiation and with the reagents that are normally used with this instrument. Use of the UV protective screen doesn't guarantee protection of the user from UV radiation. The use of protective eyeglasses or mask and gloves is highly recommended.



Do not pour liquids directly on or inside the instrument.

Switch off all the lights immediately after use.

Clean the transilluminator plate after use.

End user license agreement

Please read these instructions before installing and operating
the Vision-Capt Advance software



Please read carefully the following license agreement. This document is a legal agreement between you, and Vilber Lourmat, concerning the use of the enclosed software. This agreement constitutes the complete agreement between you and Vilber Lourmat.

By opening the software package or using the CD, you are consenting to be bound by and are becoming a party to this agreement. If you do not agree To all of the terms of this agreement, do not open the package or use the CD. Promptly return the CD, including the written materials, the binder, and all other equipment/containers to the dealer from whom you purchased them.



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If the Software is permanently installed on the hard disk or other storage device of a desktop or portable computer (other than a network server) and one person uses that computer more than 80% of the time, then that person may also use the Software on a 2nd computer for the purpose of viewing and post-processing images.

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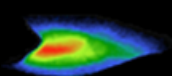
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- This license agreement may be modified only by a written agreement signed by you and us that specifically supersedes this agreement.
- This license agreement is governed by the French laws



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VISION-CAPT

COMPUTER CONFIGURATION

Minimum computer configuration

| | Minimum requirement |
|----------------------|--|
| Type | Desktop computer |
| Processor | Intel Core i3 with Intel chipset – i5 recommended |
| Ram | 4 Gb and above (8 Gb recommended) |
| Hard disk | 200 Gb and above At least 10% free disk space least in order to allow software installation and image storage |
| Monitor / Video card | 1280x1024/ 16 million color mode (24-bit). Upper resolutions supported. Video card with a refresh rate above 60Hz. |
| Operating system | Microsoft Windows 8 & 8.1 (32 or 64-bit) Microsoft Windows 7 SP1 (and upper) (32 or 64-bit) |
| USB Port | At least two USB ports available in the computer rear side |

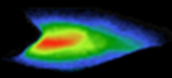


VILBER LOURMAT cannot guaranty the correct working of the computer and the software when the BIOS or Windows energy saving options are active

Windows® is a registered trademark of Microsoft and must be installed before installing the acquisition board and the Vision-Capt software



Do not unplug a USB key drive while the camera is on using the Preview mode or the Exposure mode



VISION-CAPT

SOFTWARE INSTALLATION

Pre-requirement



Please read carefully the installation instruction before proceeding to the installation.

Please do not connect the USB camera to the computer before installing the Vision-Capt software.

After the software is fully installed, connect the USB camera to the computer. At that time, Windows 7 or windows 8 & 8.1 will look for the camera driver located in the CD-Rom.



The imaging system should be **switched off** before any software installation.

Software installation – Preliminary steps



The CD disk provided with your system contains the Capt Advance software and drivers.



Capt Advance runs with Microsoft Windows 7 and Windows 8 & 8.1 (32-bit or 64-bit mode).
Windows® is a registered trademark of Microsoft.



You must have Windows™ administrator permission to install the Capt Advance software



Note: During the driver installation, the Windows installation CD-ROM might be required.
Please, check you have it before starting the Capt Advance software installation

Software installation

Please ensure the system is switched-off before the software installation. Do not switch on the system before the installation is fully completed.

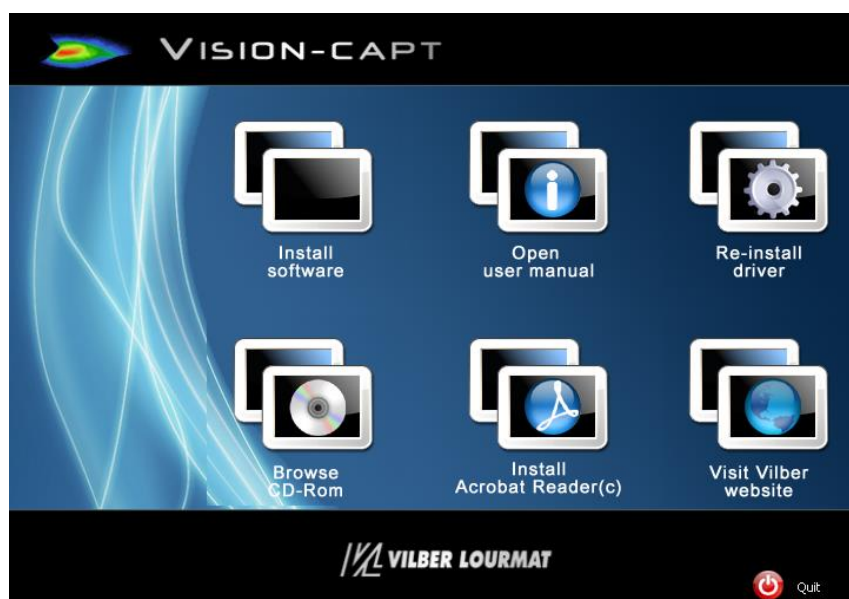
Step 1

⇒ Insert the CD-ROM in the CD-ROM drive

⇒ Ensure that all other application programs are closed. Windows 7 and Windows 8 & 8.1 users should also ensure that they are logged on with administrator privileges.

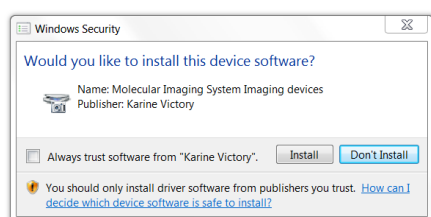
⇒ If the Autorun option is set on your computer, the installation automatically starts. If not, double click on the Autorun.exe file to start the installation of the software.

⇒ Please click on the run autorun.exe icon. The Vision-Capt installation window will appear:



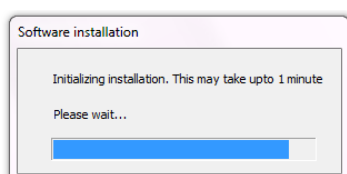
⇒ Please click on the Install software icon.

A pop-up window displays the following Windows installation authorization message:

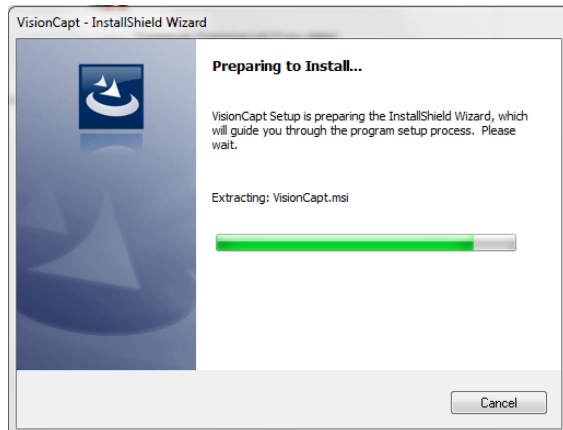


Click on the “Install” button. The setup wizard will then start to initialize. This could take up to 1 minute:

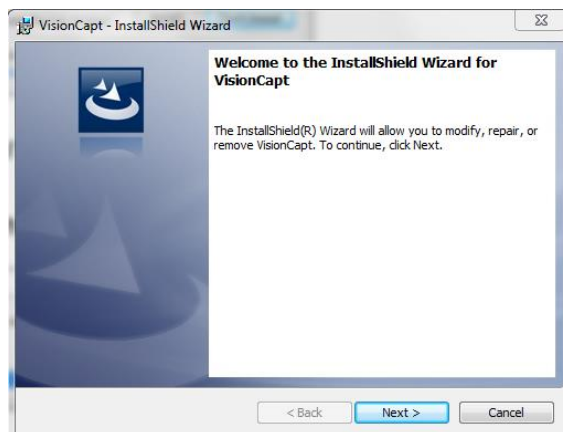
The installation software will start to initialize. This could take up to 1 minute:



The setup wizard will then start the installation process:

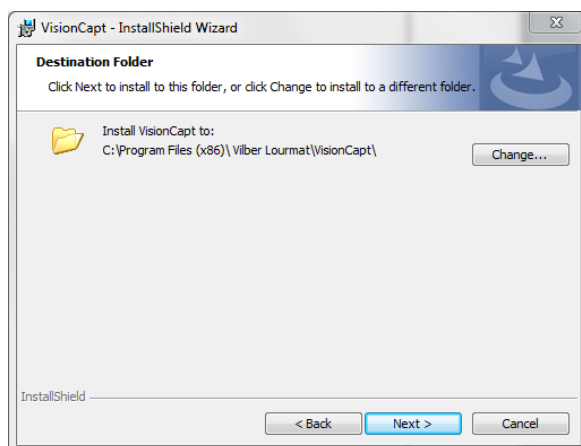


Step 2. ⇒ The welcome screen is displayed, click on NEXT to continue

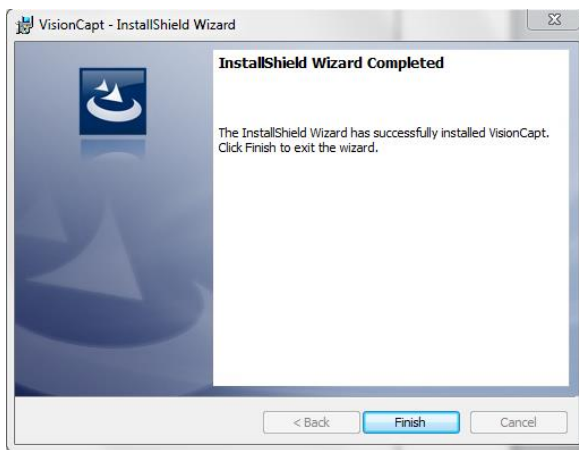
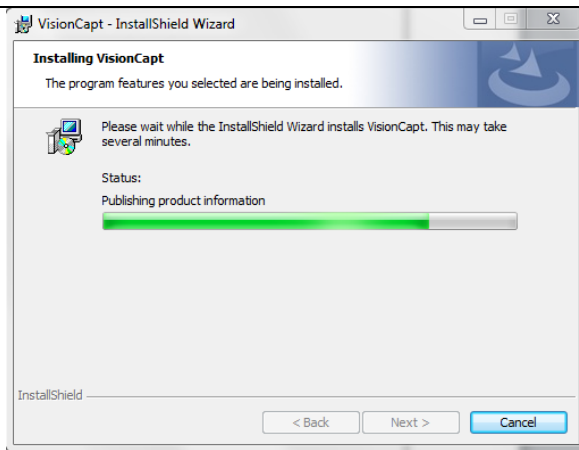


Click on NEXT to continue

⇒ Select the Destination directory ("c:\Program files\Vilber Lourmat\VisionCapt" by default).

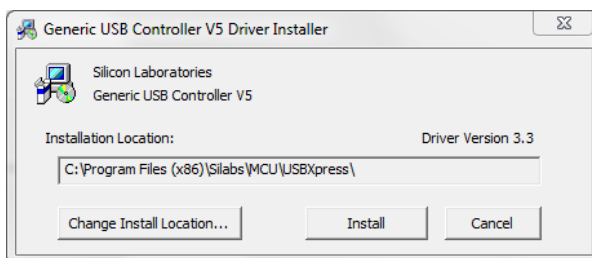


Then click on NEXT. Program files are installed in the specified directory and group created:

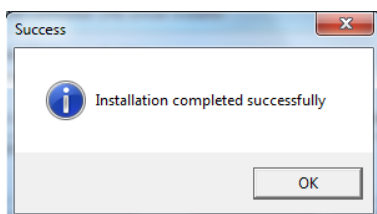


When the software installation is complete, click on Finish. The system will then start the driver installation process:

The setup wizard will then install the USB controller driver.

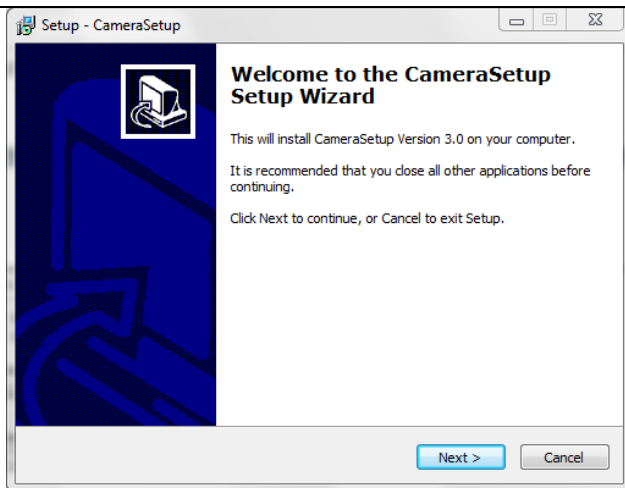


Click on Install to install the system's USB driver.

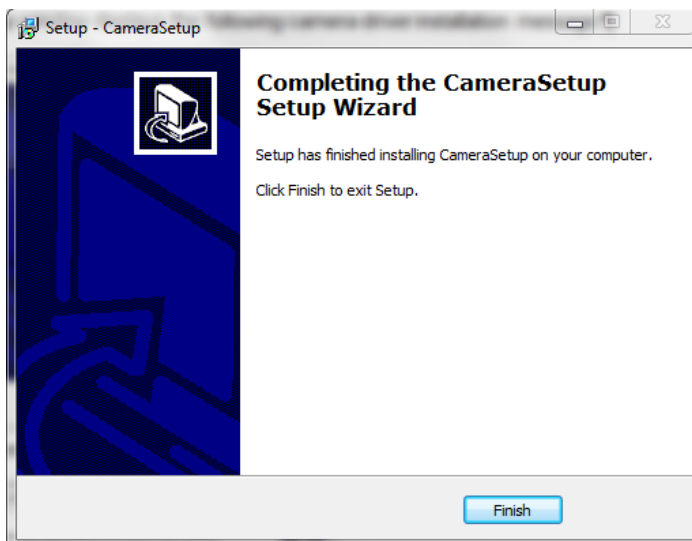
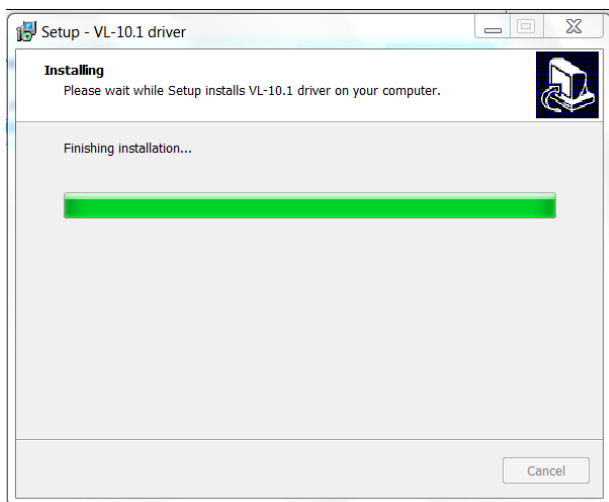


When finished, click on OK.

A pop-up window displays the following camera driver installation message:

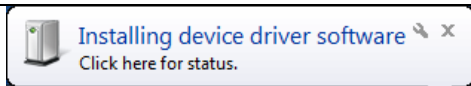


Click Next to continue. The following messages are then successively displayed:




- ⇒ Once the software is installed, the system is updated.
- ⇒ Switch on the imaging system. Keep the Vision-Capt CD-Rom in the CD-Rom drive of your computer.

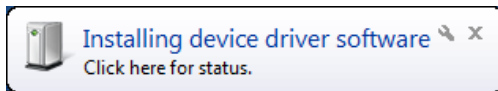
The darkroom driver is then installed by Windows (Xpress and Infinity series only):



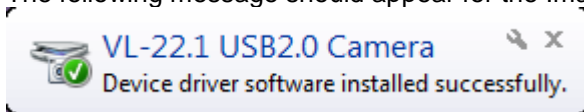
This driver is related to the imaging system darkroom management.

Wait for 10 seconds and double click on the Vision-Capt icon: .

The camera driver is then installed by Windows:



The following message should appear for the Imaging system:



You can now properly use the Vision-Capt software and hardware.

Upgrading the software



WARNING

Before to install a new software version, make sure you have the CD-Rom of the current software version you are using

First, uninstall the previous version of the software using the uninstall shield. To do so, click on the Windows Start button, select the Vilber Lourmat directory and click on UnInstVision-Capt:

Follow the uninstall instruction. Then, open the Windows Explorer and delete the following directory: My document\Vilber Lourmat\VisionCapt:

My Documents ► Vilber Lourmat ► VisionCapt ►

Then, to upgrade the software to this version, proceed as described in the first Installation chapter. Please make sure the system is switched-off when upgrading the software.

Vision-Capt un-install

You may want to de-install the software from your hard disk, the uninstVisionCapt software will do it for you:

- ⇒ Click on "Start" button
- ⇒ Go to "Programs"
- ⇒ Choose Vilber Lourmat and click on uninstVisionCapt

- ⇒ Answer "Yes" to the question and programs are removed
- ⇒ Click on "Ok" to finish de-installation

Darkroom control board driver installation

!

Darkroom connection

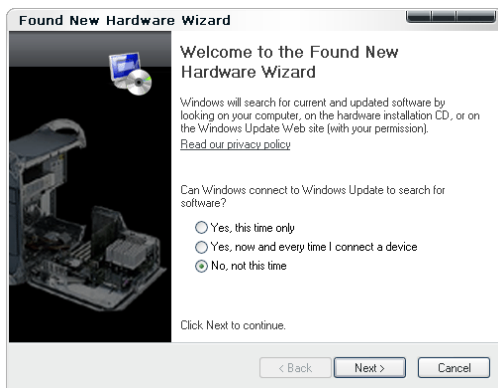
The USB port electrically supplies the motorized lens and the darkroom. To this extent, only the USB zoom should be connected to the computer rear side USB hub.

The USB cable should be connected to the **rear side** USB port of the computer.
In case the electrical supply of the zoom is deficient, we suggest the use of an external USB hub with a separate independent power supply.

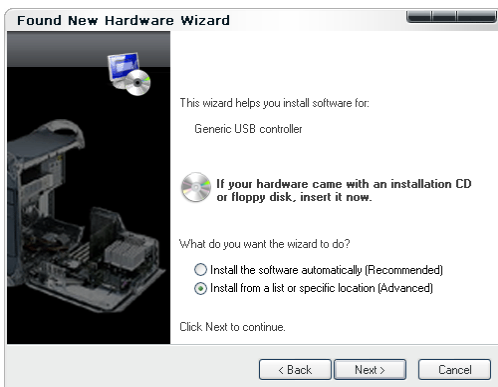
USB motorized zoom driver & filter wheel (except for CN-900).

The motorized zoom USB driver is installed at the same time that the Vision-Capt software. No specific installation is required. If the Vision-Capt software does not detect the motorized zoom lens, we recommend checking first if the zoom is properly connected to the USB port. If the problem is not resolved, we recommend to re-install the motorized zoom control board driver.

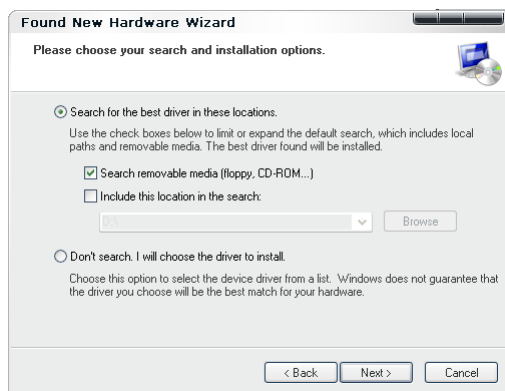
Switching the computer on, Windows® detects a new device and launch the installation wizard:



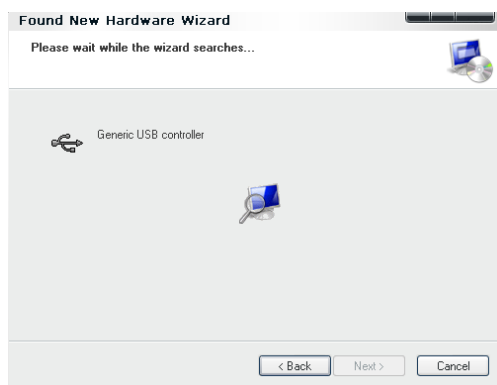
Select “Not this time” and click on Next:



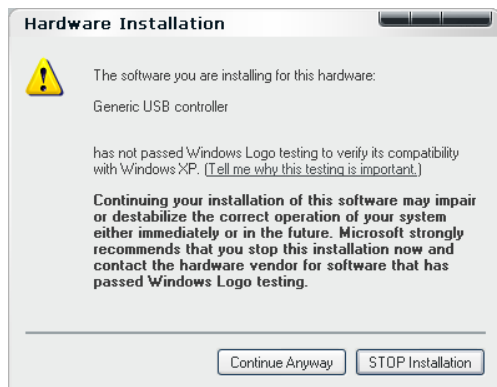
Select install from a “List of specific location” and click on Next:



Select the CD-Rom media drive and click on Next:



A dialog box indicating that this driver has not passed the Windows Logo testing is displayed. Even though our driver works on Windows XP, it is not numerically signed, so click on « Continue anyway » button to continue the installation.

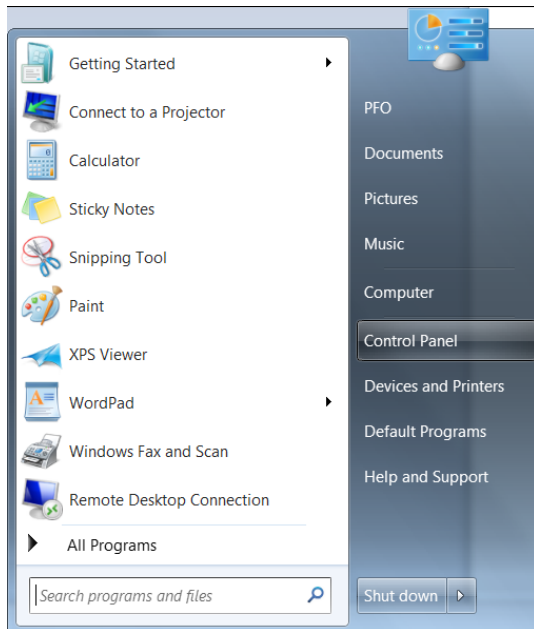


Once the driver is installed, click on « Finish » button to validate the driver installation.

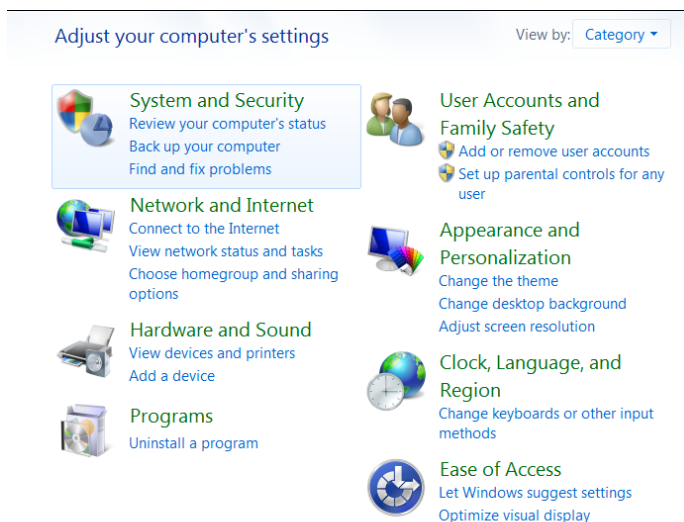
Trouble shooting – Windows device manager

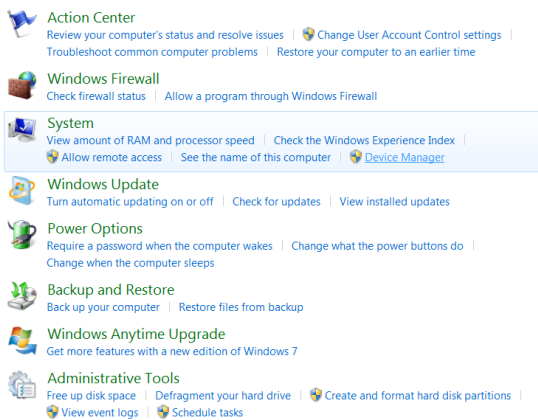
In case of installation issue, we recommend to check the driver status using the Windows Device Manager.

To do so, from the Windows start menu, select “Control Panel”.

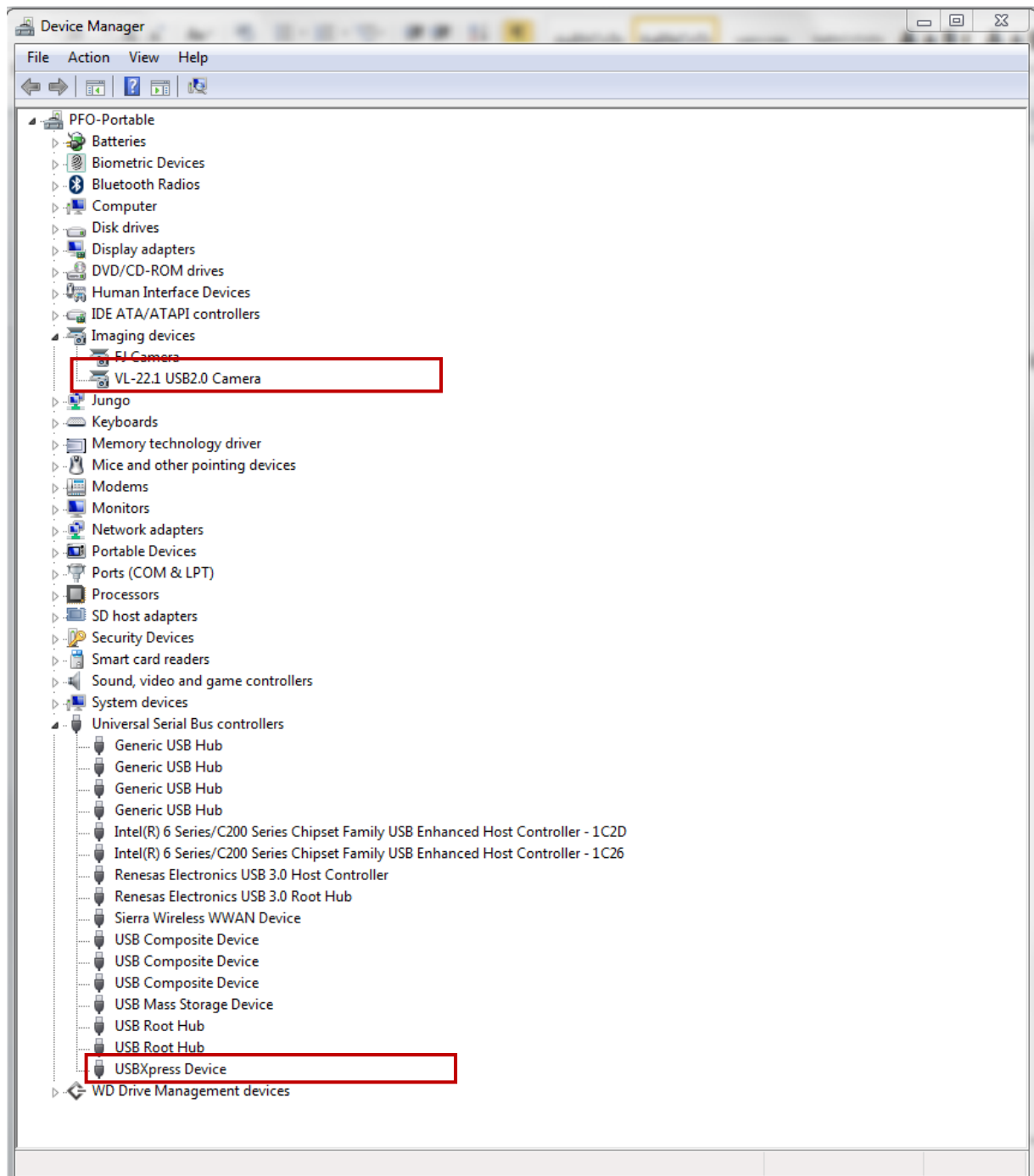


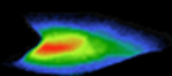
⇒ The software opens the Windows setting options; For Windows 7, select System and security, then system, then Device Manager:





The Device Manager should appear as below for the CN-1300 and Xpress series:





VISION-CAPT

INFINITY ST5, QUANTUM ST5, BIO-PRINT ST4 - HARDWARE

Unpacking the system

Please, open the box carefully and verify the contents:

| | |
|--|---|
| ▪ Darkroom / Camera and camera support | 1 |
| ▪ Power cable | 1 |
| ▪ Instruction manual | 1 |
| ▪ Vision-Capt software CD-Rom inside the instruction manual | 1 |
| ▪ USB cable for Xpress (motorised zoom) or Infinity version only | 1 |

⇒ Remove carefully each component from the box.

⇒ Remove their protective plastic cover.

⇒ Place the darkroom at its permanent location, the door facing forward. The cabinet has to be placed near the computer used for image acquisition.



It is recommended that the darkroom be carried by at least two people – one on each side- holding the instrument from the bottom side. Be sure that the door is properly closed when carrying the instrument.

Do not connect the power cable to a power source until all connections are made. The power source has to be grounded and protected by a circuit breaker.

The system is designed to fit a specific voltage. Please, check the voltage to ensure it corresponds to the system specifications.



Please keep an open area of at least 20 cm at the rear of the cabinet to ensure a proper air circulation for the system. The system should be located in an area free of excessive dust or moisture, strong magnetic fields or ionising radiation. It is also recommended that the ambient temperature be stable and within the range of 15°C to 25°C (20°C recommended) and that the relative humidity not exceed 70%, non-condensing.

Ensure that all of the systems ventilation openings are free of interference. Excessive heat build-up in the instrument may affect performance or cause operational failure.

Do not defeat any instrument interlocks; they are designed to prevent user injury.

It is compulsory to power down the system and disconnect the AC mains from the unit before performing any disassembly or repair to the system.



WARNING

The use of the system involves ultraviolet (UV) illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV light. This instrument is meant to be used only by specialised personnel that know the health risks associated with UV radiation and the chemicals that are normally used with this instrument.



WARNING

The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).



WARNING

The system should be located away from water, solvents, or a corrosive material, on a bench top that is dry and stable. The system should be placed away from interfering electrical signals and magnetic fields. A dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.



You must ensure a compatible Windows® is installed on your computer before any other installation.



Please read carefully the installation instruction before proceeding to the installation.

Please do not connect the USB camera to the computer before installing the Vision-Capt software.

After the software is fully installed, connect the USB camera to the computer. At that time, Windows 8 & 8.1 or Windows 7 will look for the camera driver located in the CD-Rom.

1- Connect all items

1. Install the darkroom by the computer



Illustration 1: the camera/optics on its support

The camera & optics are already installed on its support. This support need to be fixed on the top of the darkroom by the two fixing knob as described in illustration 2.

- 1 – Unscrew knurled knobs.
- 2 – Install camera with its support.
Insert carefully zoom into rubber.
- 3 – Screw knurled the 2 knobs for fixing
- 4 – Lock the Earth wire terminal on the spacer with a knurled knob

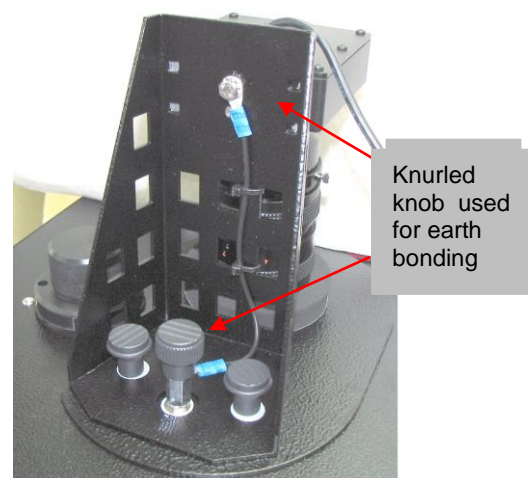
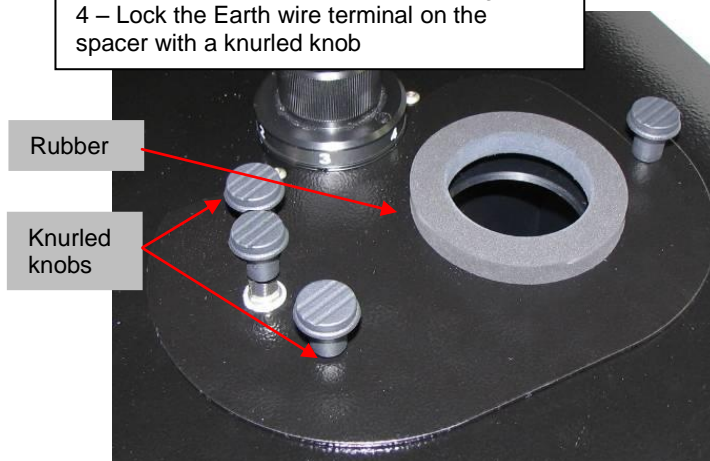


Illustration 2: the camera/optics installed on the top of the darkroom (rear side)



Illustration 3: the camera/optics installed on the top of the darkroom (front side)

Connecting the camera



CAUTION

You must first connect the darkroom and the computer to Earth

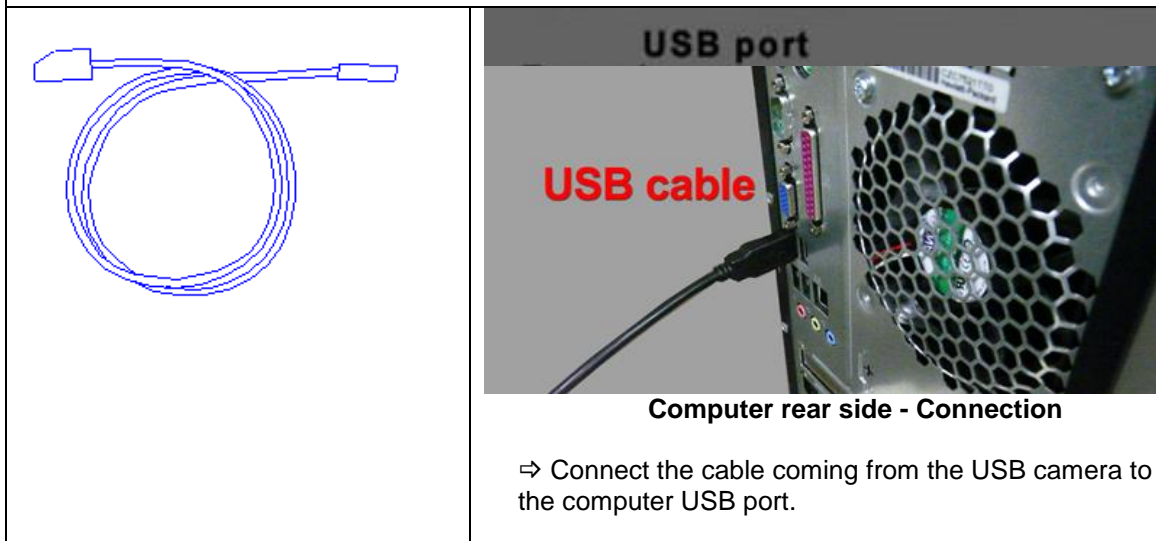
Plug the darkroom into an earthed socket.



Plug the computer and the monitor into an earthed socket.

- 1- Connect the camera USB cable to the computer USB port (rear side).

FIG 1: USB CAMERA CONNECTION



Note: Always connect to a computer rear side USB port.

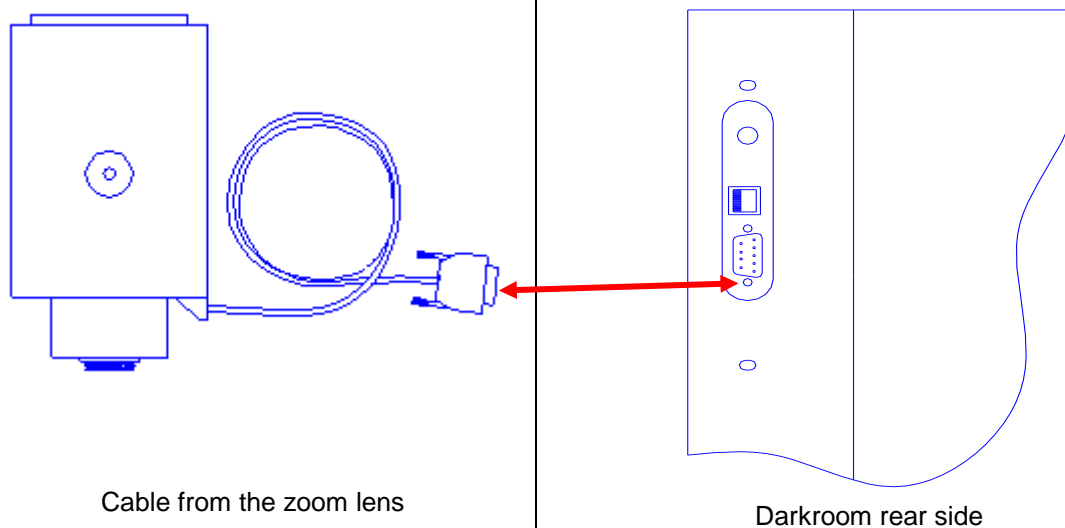
Connecting the darkroom – Infinity ST5 1100 and Xpress motorized zoom series only

Xpress motorized zoom series only

2- Connect the USB cable from the darkroom to the computer USB port.

FIG 1: ZOOM CONNECTION (X-PRESS SERIES ONLY WITH MOTORISED ZOOM LENS)

1 – ZOOM TO THE DARKROOM



Note: Always connect to a computer rear side USB port.



Computer rear side – USB cable connection



Darkroom back side– USB cable connection



Computer rear side – USB cable connection



It is mandatory to connect the system to an appropriate AC voltage outlet that is properly grounded and protected by a circuit breaker. Connecting to ground constitutes an obligatory protection.

Warning while using the darkroom



WARNING

The transilluminator is used for the fluorescence applications.



WARNING

The use of the system involves ultraviolet (UV) illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV light. This instrument is meant for use only by specialised personnel that know the health risks associated with UV radiation and the chemicals that are normally used with this instrument.



WARNING

The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).



Caution:

Switch off the transilluminator when gel is not present on the UV filter. If the filter is too hot, it will damage your electrophoresis gel.



Note:

Wait for at least 20 second in the "High" position before reducing the intensity selector to "Low".

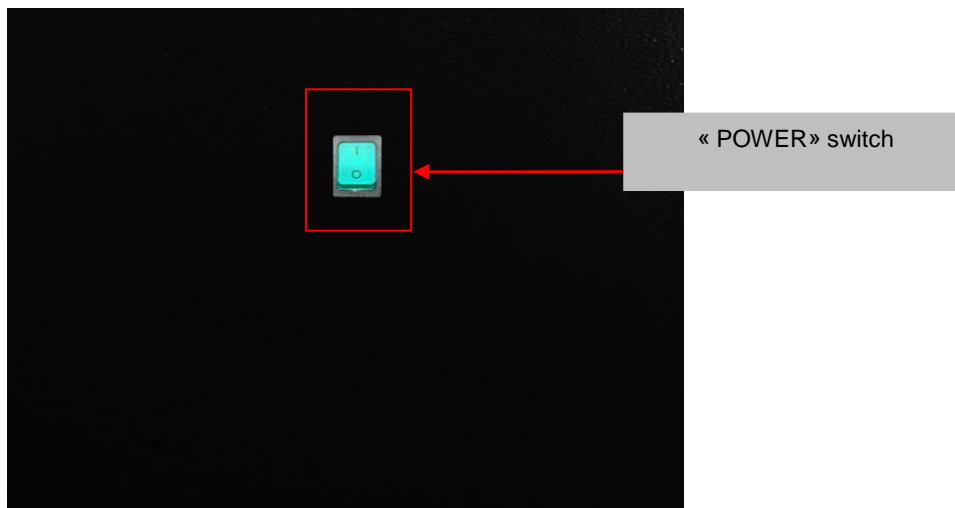


Note:

If one or several tubes are off or used, and in order to keep a better homogeneity, we recommend to change the 6 tubes simultaneously.

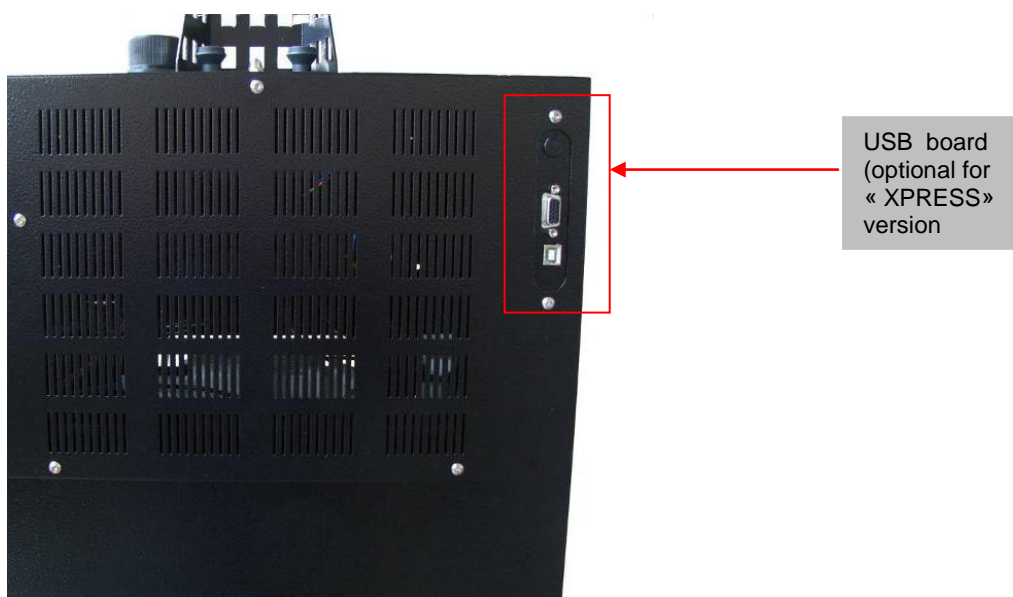
Main switch

The darkroom CN-1100 and CN-1300 main switch is located on the darkroom right hand side:



Darkroom right hand side

⇒ Switch on the main switch before to use the system.



Darkroom back side: power supply and optional USB motorized zoom lens connection

CN-1300 darkroom – Epi UV & WL



⇒ UV epi-illumination

Select the appropriate wavelength: 254 or 365nm. Switch on the epi-UV lamp by pushing the corresponding button to the position "On", the control panel diode will light on. After use, switch off the light by putting the switch to the position "Off".

⇒ White light epi-illumination

Switch on the white light lamp by switching the white light command to the position "On", the control panel diode will light on. After use, switch off the light by putting the switch to the position "Off".

⇒ Transilluminator

Case 1: security on when the door is open

Switch on the door security switch to the "0" position to activate the UV security when the door is opened. Switch on the transilluminator command. The door is opened and the UV transilluminator is off.

Case 2: security off when the door is open

Switch off the door security switch to the "1" position to inactivate the UV security when the door is opened. The security switch's diode will light on. Switch on the transilluminator command. The door is opened and the UV transilluminator is on.

CN-900, CN-1100 & CN-1300 darkroom – Epi WL



⇒ White light epi-illumination

Switch on the white light lamp by switching the white light command to the position "On", the control panel diode will light on. After use, switch off the light by putting the switch to the position "Off".

⇒ Transilluminator (except for CN-900)

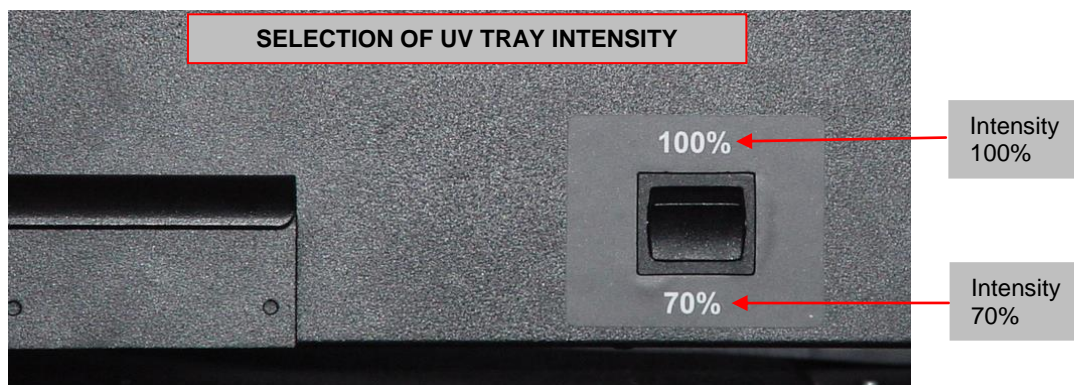
Case 1: security on when the door is open

Switch on the door security switch to the "0" position to activate the UV security when the door is opened. Switch on the transilluminator command. The door is opened and the UV transilluminator is off.

Case 2: security off when the door is open

Switch off the door security switch to the "1" position to inactivate the UV security when the door is opened. The security switch's diode will light on. Switch on the transilluminator command. The door is opened and the UV transilluminator is on.

UV Transilluminator (except for CN-900)



Filter wheel (except for CN-900)

The 6 positions filter wheel is supplied with the F590 M58 interferential filter supplied with the system for ethidium bromide application. The F590 filter is already installed on the first position of the wheel.

To select the filters, turn the black handle and select the position of your choice. The first position is designed for the F590 filter for ethidium bromide application. Install the filter on the hole in front of you. The filter number corresponds to the number indicated on the filter wheel (for instance, number one to 1 to 6). To select a filter hole, turn the black handle in way to have the filter indication of your choice, in front of you.

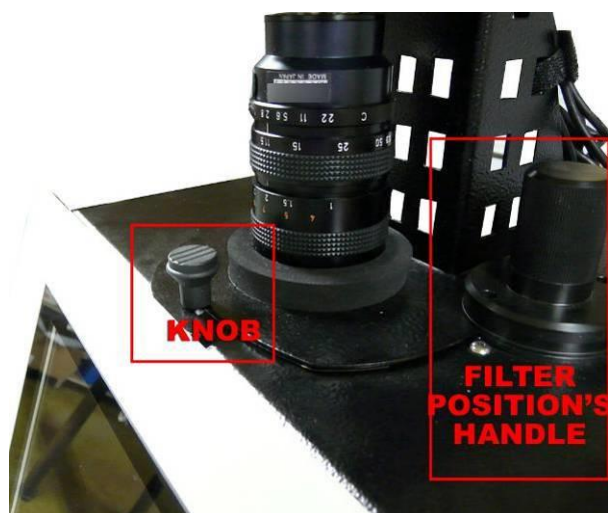


Figure 2 – Top of the darkroom

To install a filter, slightly unscrew the knob and turn the camera holder from the right to the left. Select the filter position using the handle. Screw the filter in its dedicated holder.



Figure 3: Top of the darkroom. The camera holder is positioned to facilitate the filter installation.



WARNING

You have to protect your eyes and your skin. You can open the door, the UV table and UV lamp will continue to work. You must wear all possible UV protection, especially for your eyes, when the transilluminator switch is turned ON. Mask and gloves are recommended to block the UV radiation.

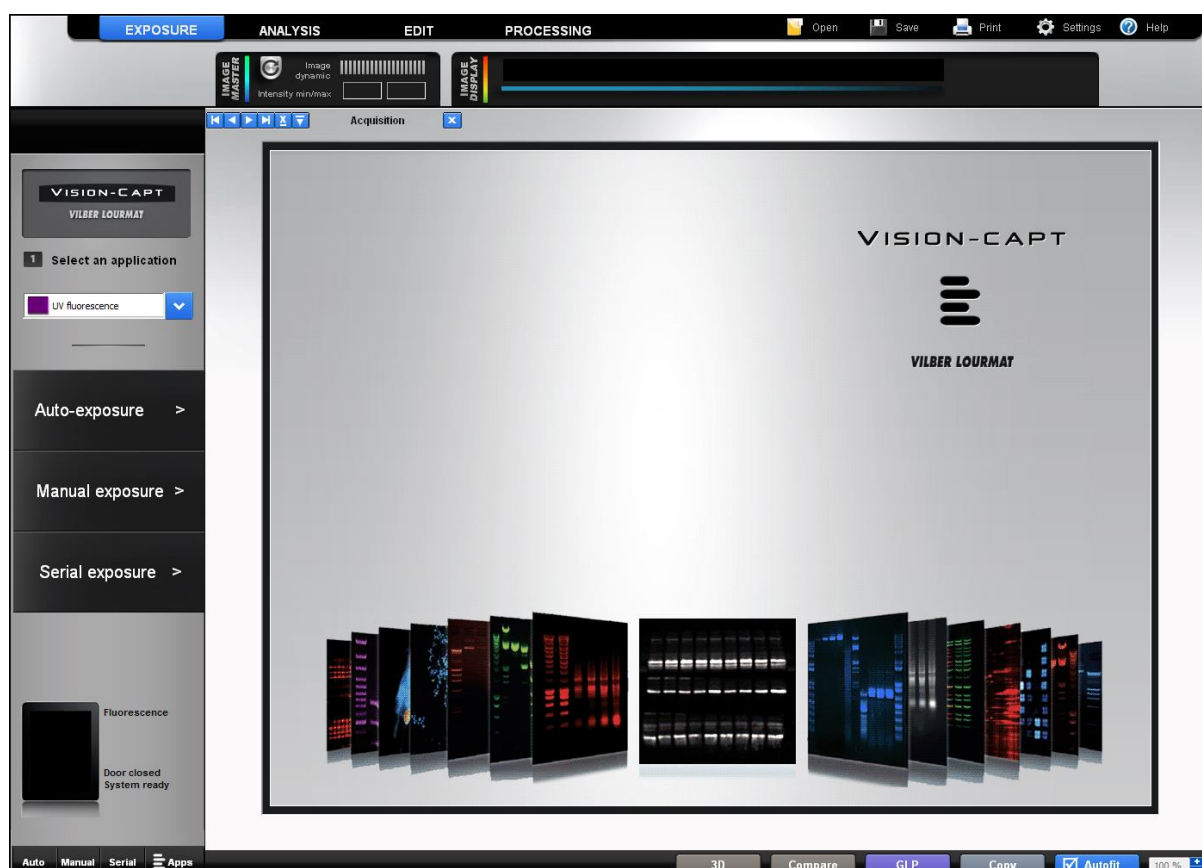
WARNING

The system should be located away from water, solvents, or a corrosive material, on a bench top that is dry and stable. The system should be placed away from interfering electrical signals and magnetic fields. A dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.



Navigating the Vision-Capt software - Access to the Exposure modules

The Capt Advance software opens with the following image window:



The Vision-Capt operating environment is organized into five areas:

The menu bar:



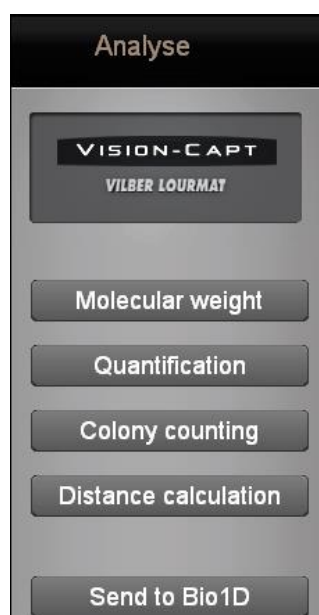
The upper image bar:



The lower image bar:




The folder menu:



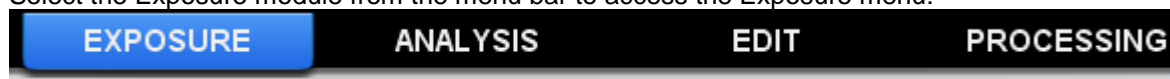
The image window:



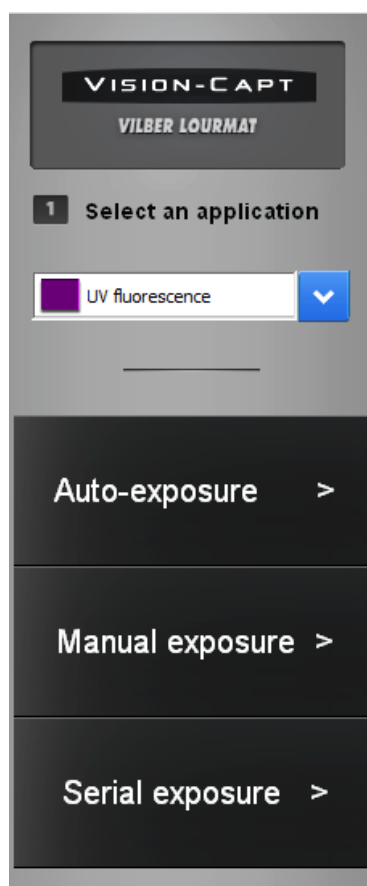
Taking your first picture

This Quick start is intended as a quick reference guide for acquisition. For more detailed information on the individual features reference the appropriate part of this manual.
Power on the computer. After the computer has booted up completely, switch on the imaging system. Wait for 10 seconds and double click on the Vision-Capt icon: . The software opens on the image acquisition window.

Select the Exposure module from the menu bar to access the Exposure menu:



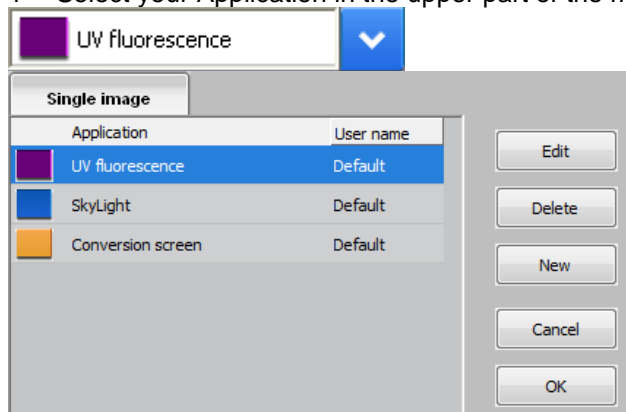
This will open the Exposure function folder:



Select Auto-exposure, Manual exposure or Serial exposure. A new menu window will appear:

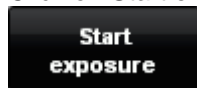


1- Select your Application in the upper part of the menu.



Click on OK to validate your selection.

Click on Start exposure. If necessary, adjust the exposure time. Then click on Stop exposure.



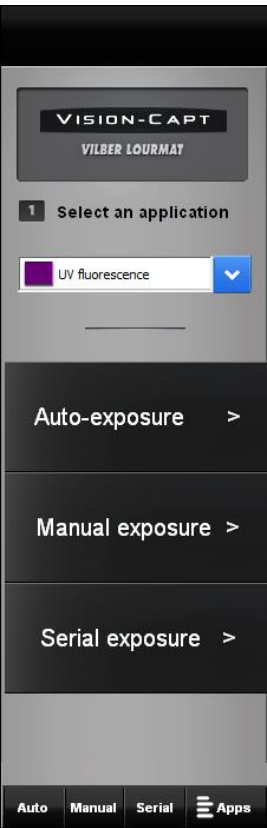
After the exposure is over, save the image

Access to the Exposure modules

Select the Exposure module from the menu bar to access the Exposure menu:



This will open the Exposure function folder:



The Exposure function folders contain the following features:

| | |
|--------------------------|---|
| Auto-exposure > | Define automatically an ideal exposure time |
| Manual exposure > | Set your own exposure time |
| Serial exposure > | Take several images and select the one you prefer |

Auto-exposure >

The VSION-CAPT system can calculate automatically an ideal exposure time (Auto-exposure) taking into account the Application protocol pre-defined parameters. When you select the Auto-Exposure option, the system samples the light levels and uses the values to calculate the final exposure time.

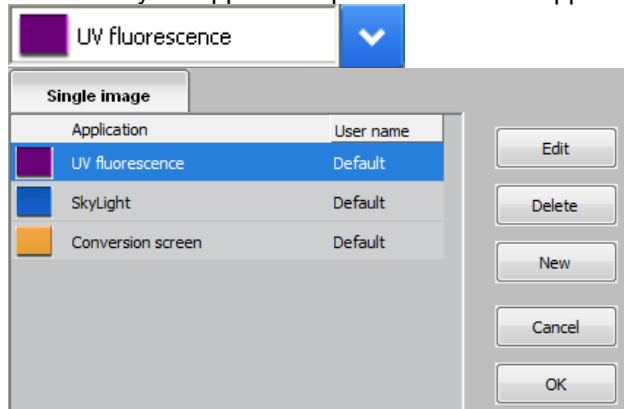
Click on the “Auto-exposure” button. A window displays the following menu:



Start exposure

To proceed:

- 1- Select your application protocol from the application menu

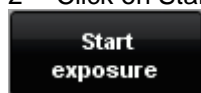


The factory settings include 3 pre-defined Application protocols:

- SkyLight
- UV fluorescence
- Conversion screen

You can also create or select your own Application protocol. Please refer to the Application protocol chapter of this manual to have more details on the way you can create your own Application.

2- Click on Start Exposure.



The system will calculate automatically an ideal exposure time. After validation, the system will expose automatically your sample using the calculated auto exposure time.

Note: The auto-exposure is controlled by a set of parameters described in the Application protocol chapters of this manual.

Note: With long integration time, a delay could be necessary before an image is displayed on the monitor. The acquisition will stop automatically at the end of the exposure time.

Note: When the specified exposure time is reached, the last captured image is displayed. The camera continues to integrate the image on the CCD sensor, updating the display whenever the specified Exposure time is reached. The Stop exposure button stops the exposure process. The last full exposure is displayed.

Preview

You can also preview your sample using the preview function (live mode):



Live mode allows direct visualization of the image. This mode enables you to adjust the aperture and the focus, and to position your sample.

Note: A live image means the image displayed is refreshed every 1/20th of a second. This short exposure time (or frame) is adequate for a variety of white light samples including protein gels and autoradiography. A live image, however, is not sufficient for most samples, which are visualized and photographed over a relatively dim UV light source. A feature called integration compensates the low light situation by allowing the CCD camera to obtain a timed exposure.

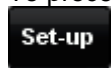
Note: After 2 minutes, the software will automatically stop the live preview.

The stop function captures the last image for further saving, analysis or enhancement. To proceed, click on the stop preview button.

Set-up

The Set-up button gives you access to the main exposure parameters. These parameters could be changed independently from the Application protocol.

To proceed, click on the Set-up button.

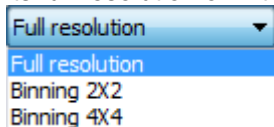


This will open the set-up menu window:



Sensitivity

This option defines the image sensitivity for your image exposure. The Imaging systems offer exquisite resolution and sensitivity to maximize quantifiable data. The system can be used at either its full resolution or with binning. Sensitivity options are as follows:



The full resolution is the native camera image.

For a complete detail of the set-up parameters, please refer to the Application protocol chapter of this manual to have more details on each option.

Manual exposure

Manual exposure >

The exposure time is the acquisition of an image by summing the signal of the camera during the time displayed under integration time button.

The exposure time process will take into account the Application protocol pre-defined parameters.

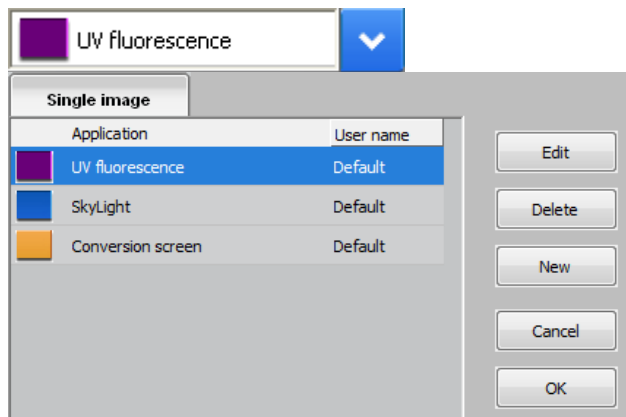
Click on the “Manual exposure” button. A window displays the following menu:



Start exposure

To proceed:

- 1- Select your application protocol from the application menu



The factory settings include 3 pre-defined Application protocols:

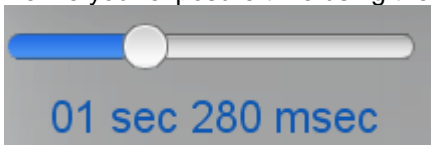
- SkyLight
- UV fluorescence
- Conversion screen

You can also create or select your own Application protocol. Please refer to the Application protocol chapter of this manual to have more details on the way you can create your own Application.

- 2- Click on Start Exposure.

**Start
exposure**

Define your exposure time using the scroll bar for the fluorescence mode:



Note: The integration time increase or decrease by 40 milli-seconds.

Note: With long integration time, a delay could be necessary before an image is displayed on the monitor (up to twice the selected Exposure time).

Note: When the specified exposure time is reached, the last captured image is displayed. The camera continues to integrate the image on the CCD sensor, updating the display whenever the specified Exposure time is reached. The Stop exposure button stops the exposure process. The last full exposure is displayed.

Preview

You can also preview your sample using the preview function (live mode):

Preview

Live mode allows direct visualization of the image. This mode enables you to adjust the aperture and the focus, and to position your sample.

Note: A live image means the image displayed is refreshed every 1/20th of a second. This short exposure time (or frame) is adequate for a variety of white light samples including protein gels and autoradiography. A live image, however, is not sufficient for most samples, which are visualized and photographed over a relatively dim UV light source. A feature called integration compensates the low light situation by allowing the CCD camera to obtain a timed exposure.

Note: After 2 minutes, the software will automatically stop the live preview.

The stop function captures the last image for further saving, analysis or enhancement. To proceed, click on the stop preview button.

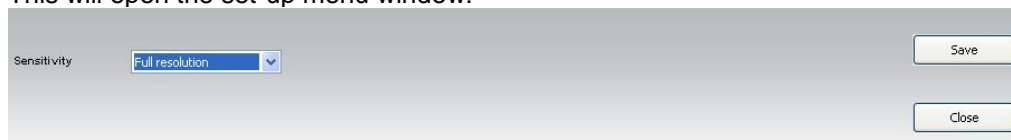
Set-up

The Set-up button gives you access to the main exposure parameters. These parameters could be changed independently from the Application protocol.

To proceed, click on the Set-up button.

Set-up

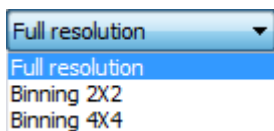
This will open the set-up menu window:



Sensitivity

This option defines the image sensitivity for your image exposure. The Imaging systems offer exquisite resolution and sensitivity to maximize quantifiable data. The system can be used at either its full resolution or with binning.

Sensitivity options are as follows:



The full resolution is the native camera image. For a complete detail of the set-up parameters, please refer to the Application protocol chapter of this manual to have more details on each option.

Serial exposure >

The Serial exposure mode allows repetitive image acquisition with or without image accumulation. You can then select the image you prefer from the series of images.

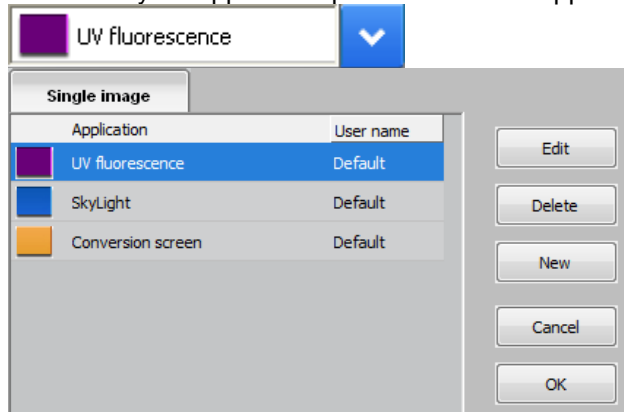
Click on the “Serial exposure” button. A window displays the following menu:



Start exposure

To proceed:

- 1- Select your application protocol from the application menu



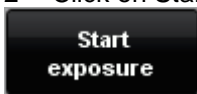
The factory settings include 3 pre-defined Application protocols:

- SkyLight
- UV fluorescence

- Conversion screen

You can also create or select your own Application protocol. Please refer to the Application protocol chapter of this manual to have more details on the way you can create your own Application.

2- Click on Start Exposure.



The Serial exposure mode allows you to acquire a user defined number of image (frame). This set of frame defines a video sequence. Each image has an exposure time. The software will wait a user-defined time elapse prior to acquire the subsequent image.

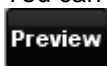
The number of images defines the number of frame of the Serial exposure sequence.

The number of number of images, the exposure time, the time elapse and other Serial exposure parameters are defined in the Application protocol or could be directly accessed from the Set-up menu. For a complete detail of the set-up parameters, please refer to the Application protocol chapter of this manual to have more details on each option.

Note: When the specified exposure time is reached, the last captured image is displayed. The camera continues to integrate the image on the CCD sensor, updating the display whenever the specified Exposure time is reached. The Stop exposure button stops the exposure process. The last full exposure is displayed.

Preview

You can also preview your sample using the preview function (live mode):



Live mode allows direct visualization of the image. This mode enables you to adjust the aperture and the focus, and to position your sample.

Note: A live image means the image displayed is refreshed every 1/20th of a second. This short exposure time (or frame) is adequate for a variety of white light samples including protein gels and autoradiography. A live image, however, is not sufficient for most samples, which are visualized and photographed over a relatively dim UV light source. A feature called integration compensates the low light situation by allowing the CCD camera to obtain a timed exposure.

Note: After 2 minutes, the software will automatically stop the live preview.

The stop function captures the last image for further saving, analysis or enhancement. To proceed, click on the stop preview button.

Set-up

The Set-up button gives you access to the main exposure parameters. These parameters could be changed independently from the Application protocol.

To proceed, click on the Set-up button.



This will open the set-up menu window:

A screenshot of the "Set-up" menu window. It contains several settings: "Sensitivity" set to "Full resolution", "Serial mode" set to "Incremental", "Number of images" set to 5, "Stop when saturation is reached" with an unchecked checkbox, "Increment Time (mn-s-ms)" set to 0, 0, 5, and "First exposure time" set to 0, 0, 5. There are "Save" and "Close" buttons on the right.

For a complete detail of the set-up parameters, please refer to the Application protocol chapter of this manual to have more details on each option.

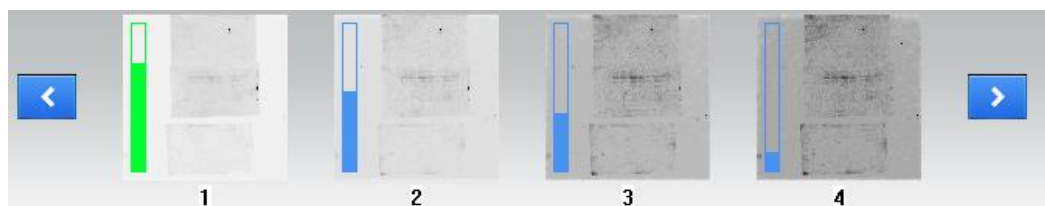
Catalogue function



You can open a previously saved image series using the catalogue function. To proceed, click on Catalogue. This will open the Catalogue menu. Then, Open a catalogue to select the series of image you want to open.

You can either display the summed images or the native images.

Note: The green graph on the top of the image thumbnail indicates the best image from the image series from the dynamic point of view

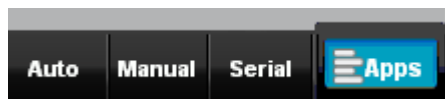


Note: The green graph on the top of the image thumbnail indicates the image dynamic

Apps Studio

The Vision-Capt Apps Studio is a library of applications which contains more than 40 different data sheet for your blot, gel and other bioluminescence samples. The Studio contains the excitation and the emission spectra of the main fluorophores used in modern molecular biology laboratory. It also suggests the best possible system configuration in terms of excitation light source, emission filter and sensitivity level.

You can access the Apps Studio by clicking on the Apps button of the lower part of the image acquisition menus:



This will open the Apps Studio menu:



The applications library is organized into 3 chapters:

- Fluorescence
- Chemiluminescence
- Bioluminescence

Focus point adjustment and motorized zoom controls (X-press series)

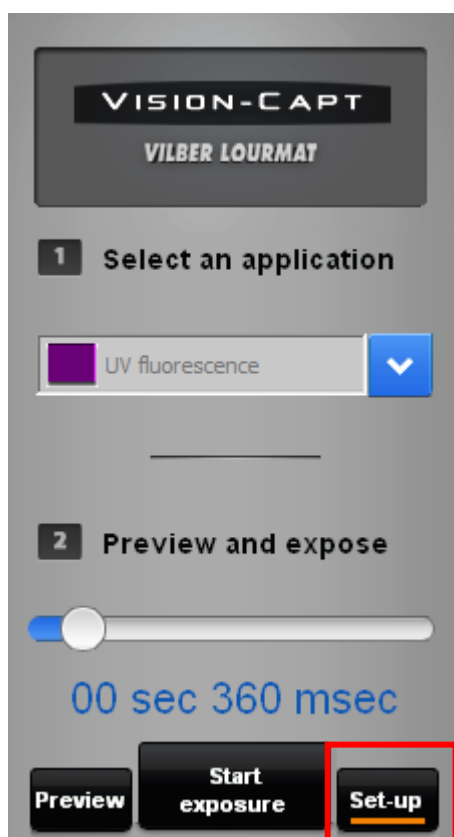
The zoom control dialog box is displayed each time the acquisition menu is active. It helps you to adjust the 3 settings of the zoom lens:

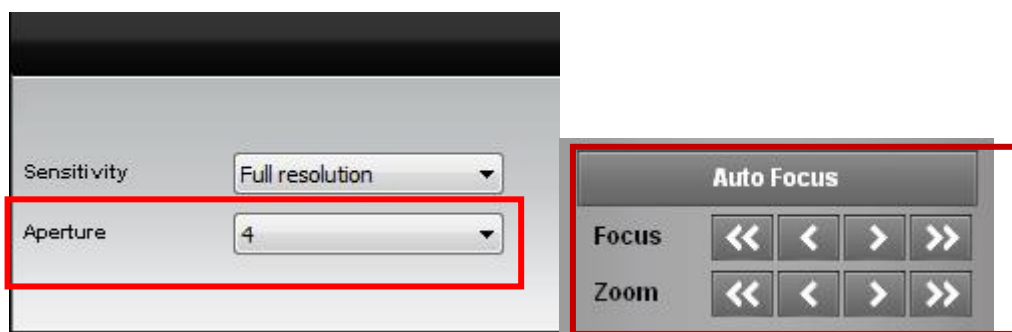
- Aperture. Aperture allows the CCD sensor to receive more or less light. Closing the aperture decreases the amount of light coming to the sensor, thereby making the image darker. To adjust the aperture, click on the Close or Open. The lens automatically moves to the new value.
- Zoom. Zoom allows you to change the size of your sample, on the image. To proceed, click on the In or Out. The zoom automatically moves to the new value. The zoom control will not affect the focus.
- Focus. Focus is needed to adjust the sharpness of the image. Turning the ring clockwise or counter clockwise changes the focal point of the lens. To proceed, click on the Far or Near button to access the Focus adjustment. Each time you press on one of those buttons the zoom moves of one step the focus settings. It is not necessary to keep the button pressed, press as many times as necessary to get a fine focus adjustment.



Note: "<<" and ">>" are for fast adjustment and "<" and ">" are for step-by-step adjustment.

Note: The aperture function is available in the set-up menu:





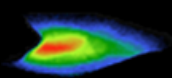
All cameras require a focus point adjustment. In order to proceed, you have to zoom to the maximum on a straight forward image (a printed paper, a business card ...). Then, focus till you obtain a very sharp image on the screen. This procedure can be done with epi-illumination light and a printed paper. The focus point adjustment varies with the focal distance.

- Autofocus. Autofocus is a feature that enables focus automatically by a single click on a written sample, instead of requiring the user to adjust focus through the Focus plus and minus controls.



Note: In order to proceed, you have to zoom to the maximum on a straight forward image (a printed paper, a business card ...). The zoom should ensure the sample covers almost the full image window. The aperture should not be wide opened.

Note: autofocus feature is centred on the heart of the image. The grey window which appear when autofocus is disregarded by the autofocus function.



VISION-CAPT

E-BOX VX5, DOC-PRINT VX5 - HARDWARE

Unpacking the system

Please, open the box carefully and verify the contents:

| | |
|---|---|
| ▪ Darkroom / Camera and camera support | 1 |
| ▪ Power cable | 1 |
| ▪ Instruction manual | 1 |
| ▪ Vision-Capt software CD-Rom inside the instruction manual | 1 |

⇒ Remove carefully each component from the box.

⇒ Remove their protective plastic cover.

⇒ Place the darkroom at its permanent location, the door facing forward. The cabinet has to be placed near the computer used for image acquisition.



It is recommended that the darkroom be carried by at least two people – one on each side- holding the instrument from the bottom side. Be sure that the door is properly closed when carrying the instrument.

Do not connect the power cable to a power source until all connections are made. The power source has to be grounded and protected by a circuit breaker.

The system is designed to fit a specific voltage. Please, check the voltage to ensure it corresponds to the system specifications.



Please keep an open area of at least 20 cm at the rear of the cabinet to ensure a proper air circulation for the system. The system should be located in an area free of excessive dust or moisture, strong magnetic fields or ionising radiation. It is also recommended that the ambient temperature be stable and within the range of 15°C to 25°C (20°C recommended) and that the relative humidity not exceed 70%, non-condensing.

Ensure that all of the systems ventilation openings are free of interference. Excessive heat build-up in the instrument may effect performance or cause operational failure.

Do not defeat any instrument interlocks; they are designed to prevent user injury

It is compulsory to power down the system and disconnect the AC mains from the unit before performing any disassembly or repair to the system.



WARNING

The use of the system involves ultraviolet (UV) illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV light. This instrument is meant for use only by specialised personnel that know the health risks associated with UV radiation and the chemicals that are normally used with this instrument.



WARNING

The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).



WARNING

The system should be located away from water, solvents, or a corrosive material, on a bench top that is dry and stable. The system should be placed away from interfering electrical signals and magnetic fields. A dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.



You must ensure a compatible Windows® is installed on your computer before any other installation.

Installing the E-Box VX5

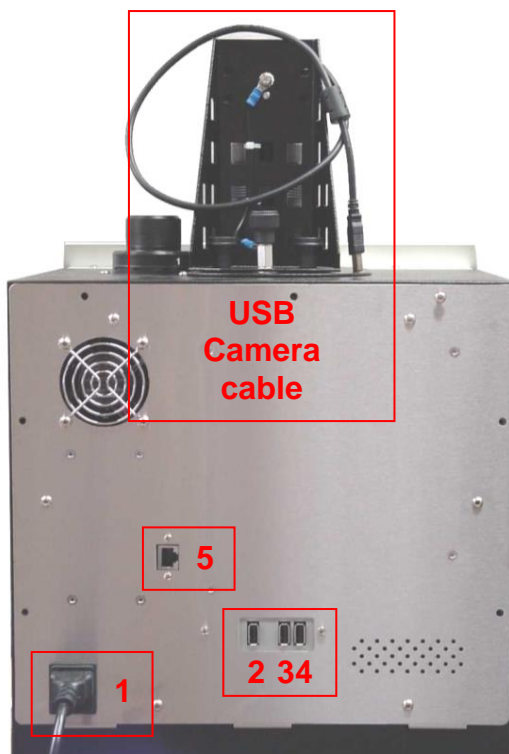


Please read carefully the installation instruction before proceeding to the installation.

Place the E-Box VX5 on a level-working surface.



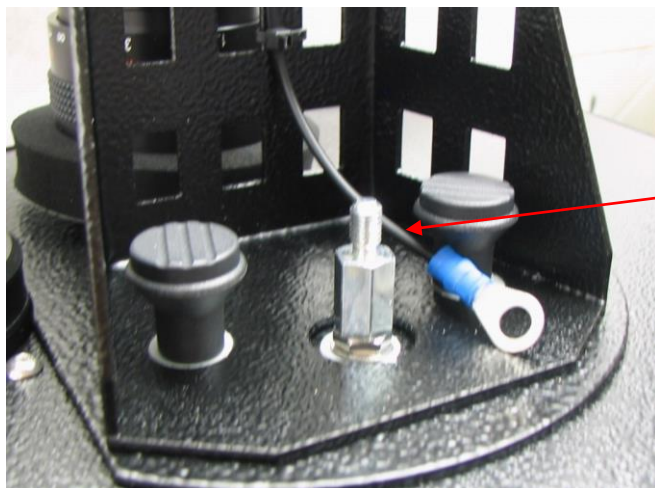
E-Box rear side drawing:



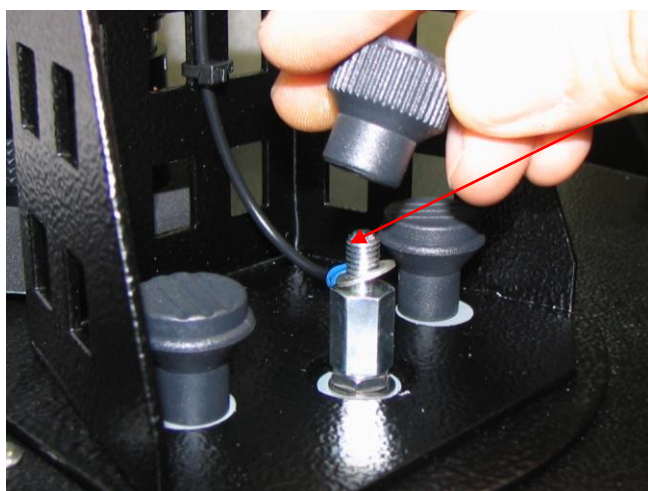
Port 1: Power supply
Port 2: Camera cable USB port
Port 3: available USB port
Port 4: available USB port
Port5: Lan network port

⇒ Connect the “USB Camera cable” from the camera to the rear side USB port n°2 of the E-Box VX5 darkroom, as shown in figure 1.

Camera earth wire connection:



Remove the knurled nut already installed on the darkroom.



Place the terminal on the spacer as shown on picture.

Then, screw the knurled nut on the spacer to lock the terminal.



The USB port of the right hand side of the instrument is particularly design to hold your USB key drive for image saving.



Warning while using the darkroom



WARNING

The transilluminator is used for the fluorescence applications.



WARNING

The use of the system involves ultraviolet (UV) illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV light. This instrument is meant for use only by specialised personnel that know the health risks associated with UV radiation and the chemicals that are normally used with this instrument.



WARNING

The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).



Caution:

Switch off the transilluminator when gel is not present on the UV filter. If the filter is too hot, it will damage your electrophoresis gel.



Note:

Wait for at least 20 second in the "High" position before reducing the intensity selector to "Low".

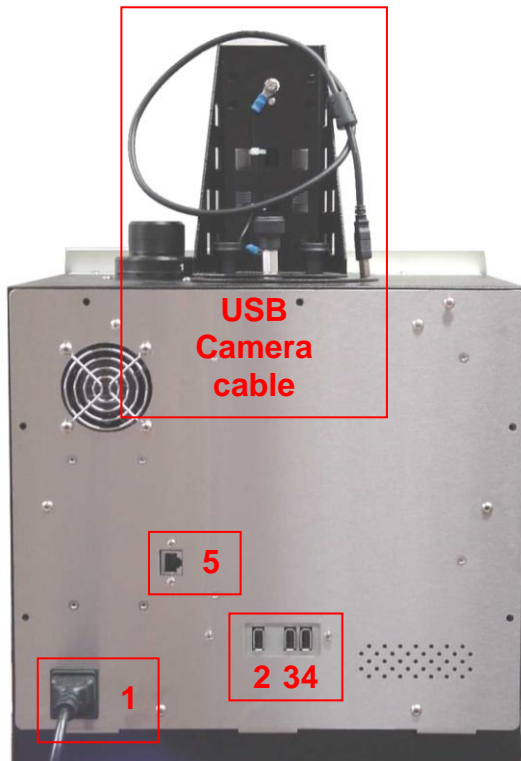


Note:

If one or several tubes are off or used, and in order to keep a better homogeneity, we recommend to change the 6 tubes simultaneously.

Using the E-Box darkroom

The E-Box VX5 power supply socket is located on the darkroom rear side:



Port 1: Power supply

⇒ Connect the “Power supply cable” from the rear side of the darkroom to an earth electrical outlet, as shown in figure 1.



It is mandatory to connect the system to an appropriate AC voltage outlet that is properly grounded and protected by a circuit breaker. Connecting to ground constitutes an obligatory protection.

Filter wheel

The 4 positions filter wheel is supplied with the F590 M58 interferential filter supplied with the system for ethidium bromide application. The F590 filter is already installed on the first position of the wheel.

To select the filters, turn the black handle and select the position of your choice. The first position is designed for the F590 filter for ethidium bromide application. Install the filter on the hole in front of you. The filter number corresponds to the number indicated on the filter wheel (for instance, number one to 1 to 5). To select a filter hole, turn the black handle in way to have the filter indication of your choice, in front of you.

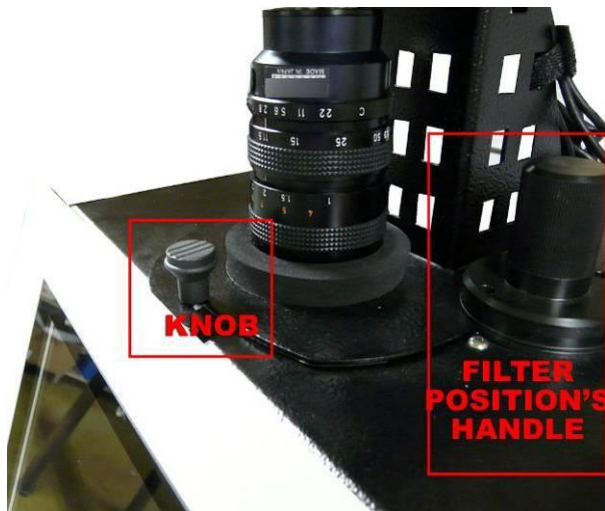






Figure 2 – Top of the darkroom

To install a filter, slightly unscrew the knob and turn the camera holder from the right to the left. Select the filter position using the handle. Screw the filter in its dedicated holder.



Figure 3: Top of the darkroom. The camera holder is positioned to facilitate the filter installation.

Control panel

| | |
|--|--|
|     | <div data-bbox="406 331 1348 607"><p style="text-align: center;">WARNING</p><p>The use of the E-Box VX5 system may involve ultraviolet (UV) illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV light. This instrument is meant for use only by specialized personnel that know the health risks associated with UV radiation and the chemicals that are normally used with this instrument.</p></div> <div data-bbox="406 779 1348 1032"><p style="text-align: center;">WARNING</p><p>The operator should wear appropriate safety glasses or a protective mask and gloves. UV radiation can be dangerous for unprotected eyes and skin; therefore we recommend the user to wear UV protective goggles (LP-70) or face-shield (MP-80 or MP-800).</p></div> |
|--|--|

The control panel includes the followings options:

- Switch on/off the image acquisition processing unit
- Switch on/off the white light (WL)
- Switch on/off the UV security switch (⚠)
- Switch on/off the UV transilluminator (UV)



Figure 4 – Control panel options



⇒ **White light lamps (“WL”)**

Switch on the white light lamp by switching the white light command “WL”. The switch diode will light on. After use, switch off the light by pressing the switch once again.

White light only works if system is powered ON.



Figure 5 – White light switch

⇒ **Transilluminator**



The transilluminator is within the darkroom. Open the door to access the transilluminator.



Case 1: security on. When the door is open UV is automatically switched off

Switch off the UV security. No light indicator is indicated on the UV security switch. Switch on the transilluminator command. The transilluminator switch is enlightened in blue color. The door is opened and the UV transilluminator is off.



Case 2: security off. When the door is open, UV transilluminator is on
Switch on the UV security. The security switch is enlightened in red color. Switch on the transilluminator command. The transilluminator switch is enlightened in blue color. The door is opened and the UV transilluminator is on.



Figure 6 – UV security and UV light switches



WARNING

You have to protect your eyes and your skin. You can open the door, the UV table and UV lamp will continue to work. You must wear all possible UV protection, especially for your eyes, when the transilluminator switch is turned ON. Mask and gloves are recommended to block the UV radiation.



WARNING

The system should be located away from water, solvents, or a corrosive material, on a bench top that is dry and stable. The system should be placed away from interfering electrical signals and magnetic fields. A dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.

Installing the Doc-Print VX5

Place the DOC-PRINT VX5 on a level-working surface.

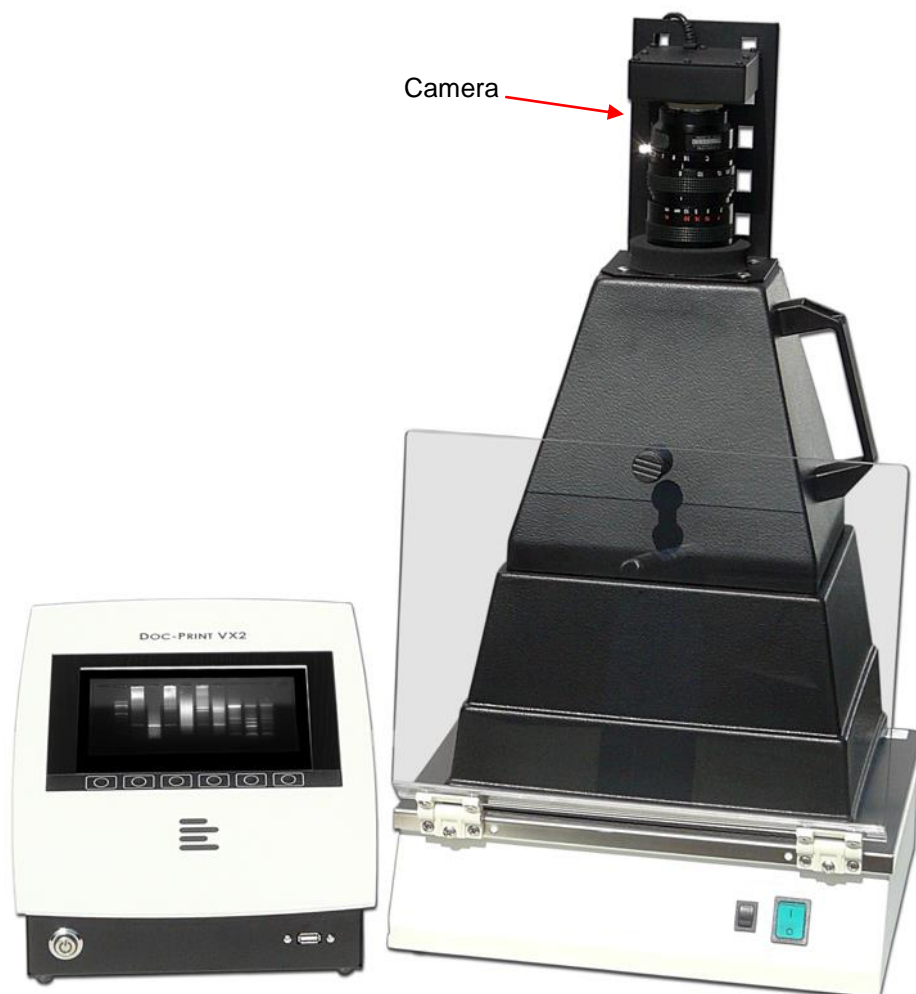


Figure 1

Stand-by

Port 4

Port 4: The USB port is particularly designed to hold your USB key drive for image saving



DOC-PRINT rear side drawing:

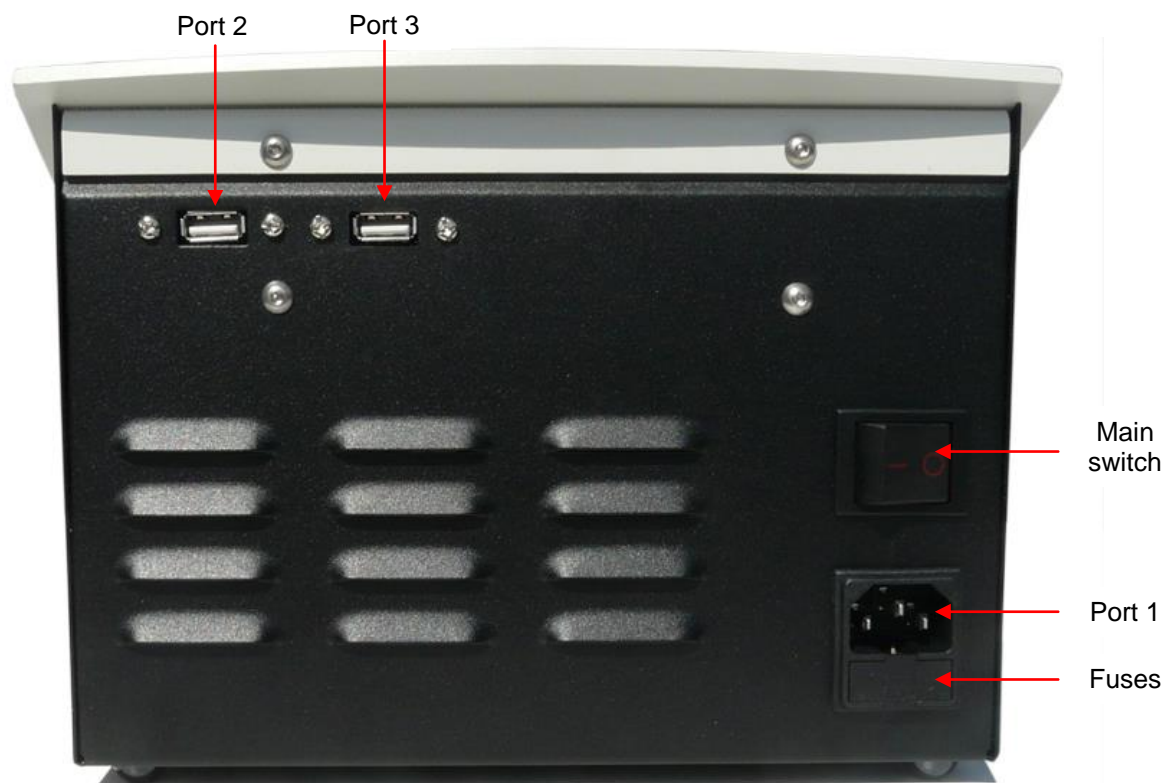


Figure 3

Port 1: Power supply and main switch
Port 2: Camera cable USB port
Port 3: Printer cable USB port
Port 4: Available USB port (figure 1)

⇒ Connect the “USB Camera cable” from the camera to the rear side USB port n°2 of the DOC-PRINT VX5 box, as shown in figure 3.

⇒ Connect the “Power supply cable” from the rear side of the system to an earth electrical outlet, as shown in figure 3.

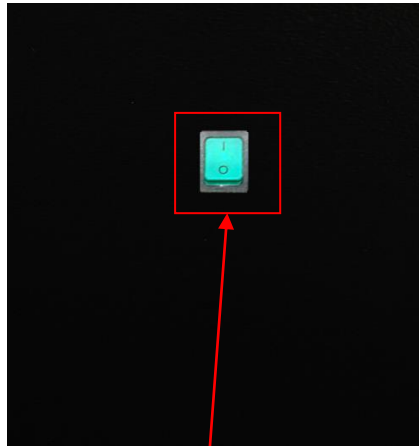


It is mandatory to connect the system to an appropriate AC voltage outlet that is properly grounded and protected by a circuit breaker. Connecting to ground constitutes an obligatory protection.

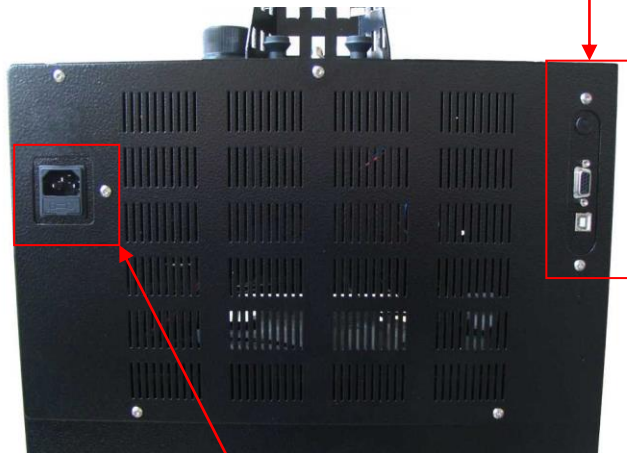
Case of the Doc-Print 1100

The darkroom CN1100 main switch is located on the darkroom rear side:

The darkroom CN1100 main switch is located on the darkroom right side:



Main switch on right side



Port 1: Power supply

⇒ Switch on the main switch before to use the system.

⇒ White light epi-illumination

Switch on the white light lamp by switching the white light command to the position [I], the control panel diode will light on. After use, switch off the light by putting the switch to the position [0]. After use, put the switch to the position [0]

⇒ Transilluminator

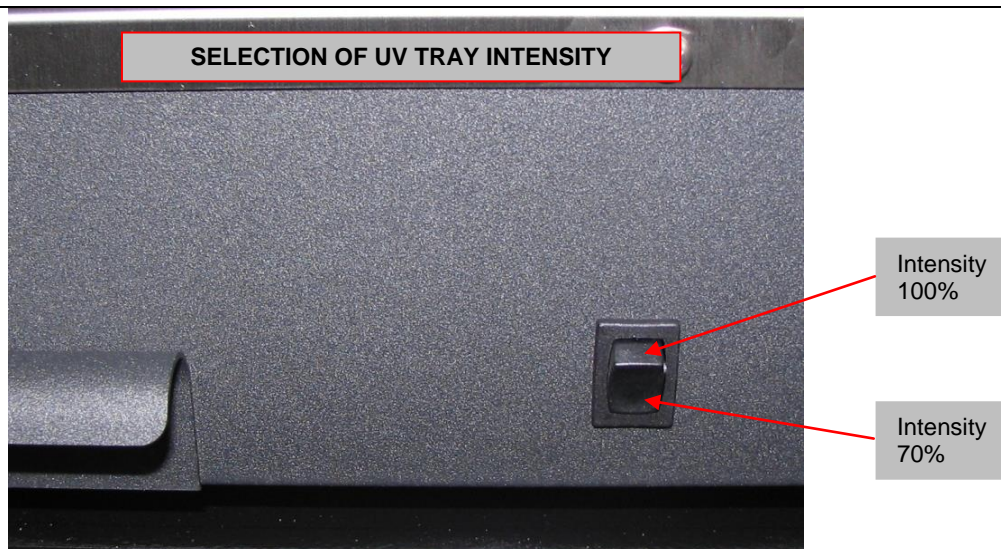
Case 1: security on when the door is open

Switch on the door security switch to the "0" position to activate the UV security when the door is opened. Switch on the transilluminator command. The door is opened and the UV transilluminator is off.

Case 2: security off when the door is open

Switch off the door security switch to the "1" position to inactivate the UV security when the door is opened. The security switch's diode will light on. Switch on the transilluminator command. The door is opened and the UV transilluminator is on.





Filter wheel

The 6 positions filter wheel is supplied with the F590 M58 interferential filter supplied with the system for ethidium bromide application. The F590 filter is already installed on the first position of the wheel.

To select the filters, turn the black handle and select the position of your choice. The first position is designed for the F590 filter for ethidium bromide application. Install the filter on the hole in front of you. The filter number corresponds to the number indicated on the filter wheel (for instance, number one to 1 to 6). To select a filter hole, turn the black handle in way to have the filter indication of your choice, in front of you.

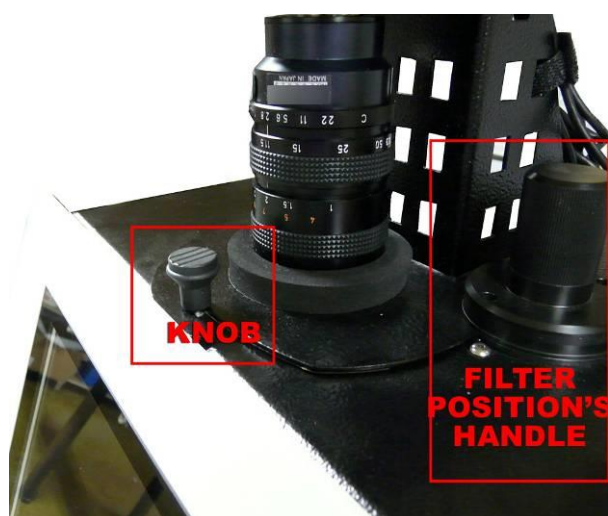


Figure 2 – Top of the darkroom

To install a filter, slightly unscrew the knob and turn the camera holder from the right to the left. Select the filter position using the handle. Screw the filter in its dedicated holder.



Figure 3: Top of the darkroom. The camera holder is positioned to facilitate the filter installation.



WARNING

You have to protect your eyes and your skin. You can open the door, the UV table and UV lamp will continue to work. You must wear all possible UV protection, especially for your eyes, when the transilluminator switch is turned ON. Mask and gloves are recommended to block the UV radiation.

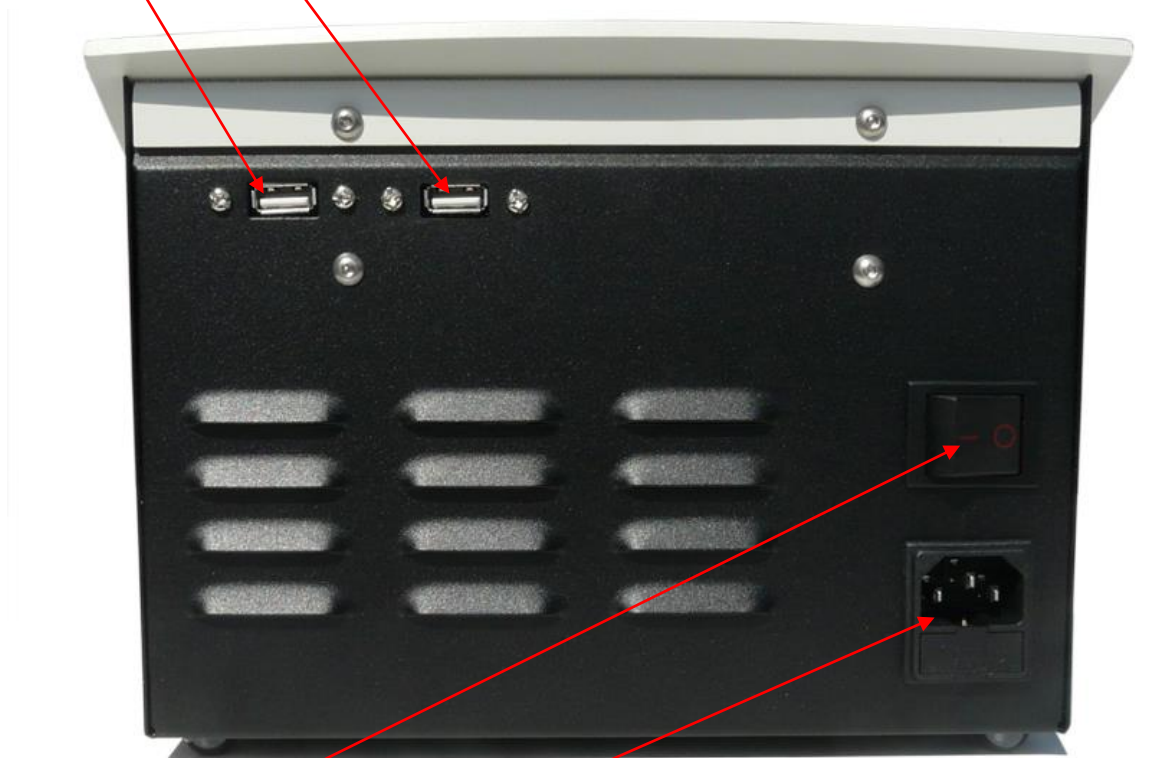
WARNING

The system should be located away from water, solvents, or a corrosive material, on a bench top that is dry and stable. The system should be placed away from interfering electrical signals and magnetic fields. A dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.

Doc-Print VX5 main switch

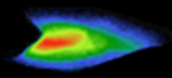
The DOC-PRINT VX5 main switch is located at rear side:

USB camera and printer connections



Port 1: Main switch and Power supply connection

⇒ Switch on the main switch before to use the system.



VISION-CAPT

E-BOX VX5, DOC-PRINT VX5 – IMAGE ACQUISITION

E-Box VX5 operating environment

Power the E-Box VX5 using the on/off switch of the control panel.



After boot-up, the E-Box firmware will automatically start, and the following screen will appear:



Doc-Print VX5 operating environment

Power the DOC-PRINT VX5 using the ON/OFF switch of the control panel.




After boot-up, the DOC-PRINT firmware will automatically start, and the following screen will appear:



Taking your first picture


⇒ Switch on the E-Box or the Doc-Print

⇒ Switch on the white light


⇒ Click on  to position your sample and to adjust the zoom, the aperture and the focus

⇒ Switch off the white light and switch on the UV light

⇒ Click on  or  keys to adjust the exposure time

⇒ Freeze your image with the  key

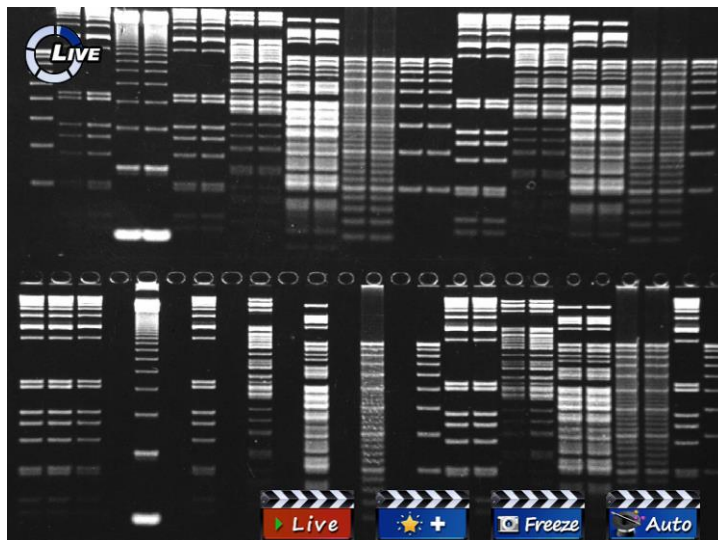
⇒ Switch off the UV light

⇒ Save your image with the  key

⇒ Print your image with the  key



1. Live mode allows direct visualization of the image. This mode enables you to adjust the zoom, the focus and the aperture and to position your sample.



Note: A live image means the image displayed is refreshed every 1/30th of a second. This short exposure time (or frame) is adequate for a variety of white light samples including protein gels and autoradiography.

However, a live image is not sufficient for most samples, which are visualized and photographed over a relatively dim UV light source. A feature called exposure compensates the low light situation by allowing the CCD camera to obtain a timed exposure.

Note: After 2 minutes, the firmware will automatically stop the live preview.

Click on Live a second time or on Freeze to captures the last image.

Exposure time



The emission light signal coming from the gel could be relatively dim. A feature called exposure time compensates this low light situation. This allows the CCD camera to collect the incoming light over a greater period of time.

The exposure time is the acquisition of an image by summing the signal of the camera during the time displayed under integration time button.

When the specified exposure time is reached, the image is displayed on the video monitor. The CCD continues to integrate the image and the displayed image is refreshed each time the set exposure time is reached.

You can modify the exposure time using the following keys:



to increase the exposure time



to decrease the exposure time

Note: Exposure time is the integration of the image on the CCD sensor over a period of time. The effect is similar to exposure time for a standard camera.

Note: The maximum exposure time is 2 minutes.

Note: The Live mode corresponds to an exposure time of 1/30 second.

Note: The selected exposure time is displayed on the monitor while acquiring the image.

Note: When the specified exposure time is reached, the last captured image is displayed. The camera continues to integrate the image on the CCD sensor, updating the display whenever the specified exposure time is reached. The Freeze button stops the exposure process. The last full exposure is displayed.

Click on Freeze to stop the exposure time and to capture the last image.

The exposure time is displayed in the control bar of the monitor, as shown in the illustration below:

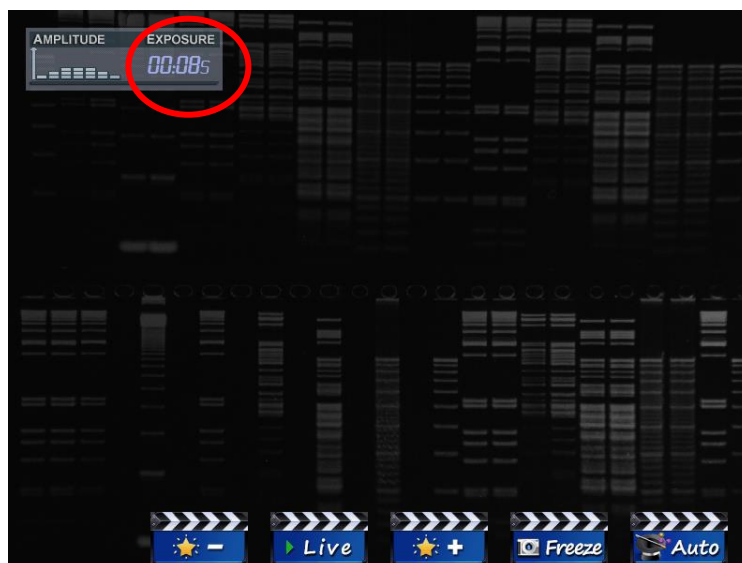


Image dynamic:

The image dynamic is crucial for quantitative accuracy. It should be the largest possible within the gray scale of the system.

- ⇒ 4096 gray levels for 12-bit imaging
- ⇒ 256 gray levels for 8-bit imaging

The gray scale is the total number of levels between white and black. The image dynamic range within this scale. Adjustments are necessary to obtain an image with the broadest dynamic. With most of the gels, a real time image has a limited dynamic. In this case, the exposure time enhances the image dynamic.

In order to obtain an optimum image, you can control the image dynamic by adjusting the exposure time. The image dynamic is displayed in the "Amplitude" bar graph as shown in the illustration below:

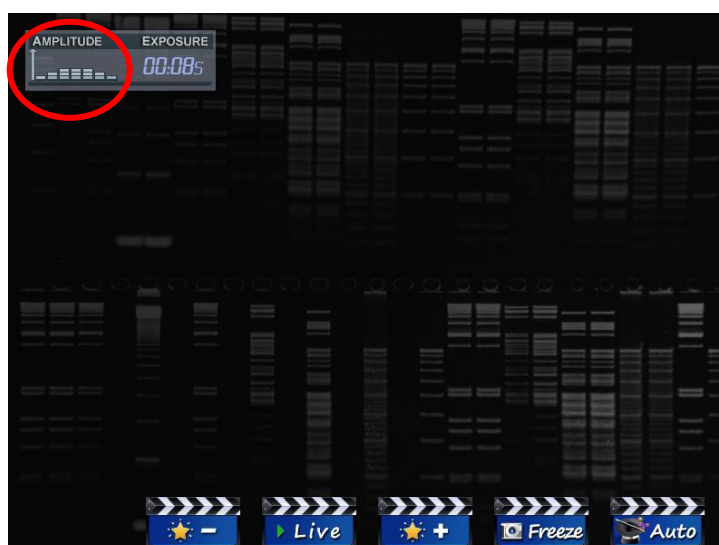
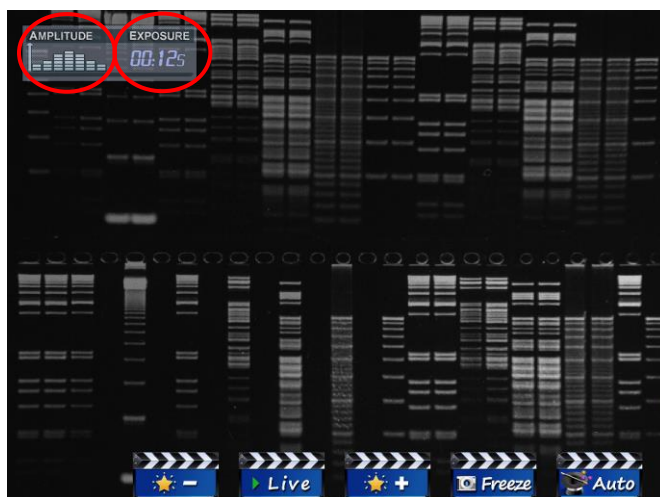
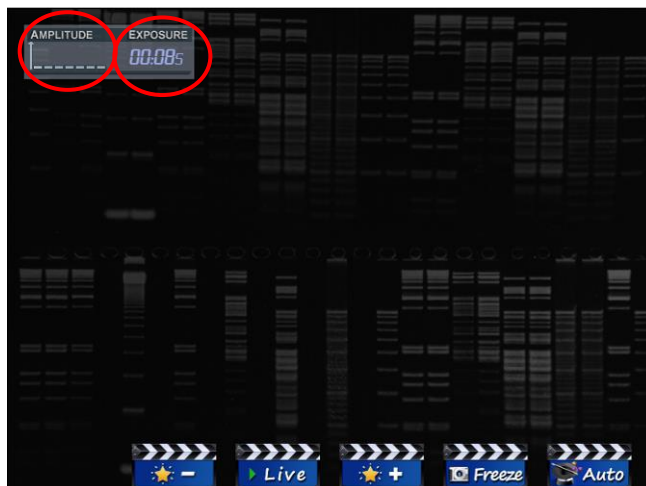


Illustration of the use of the Dynamic bar graph:




**Increasing the exposure time enhances
the image dynamic**

Freeze

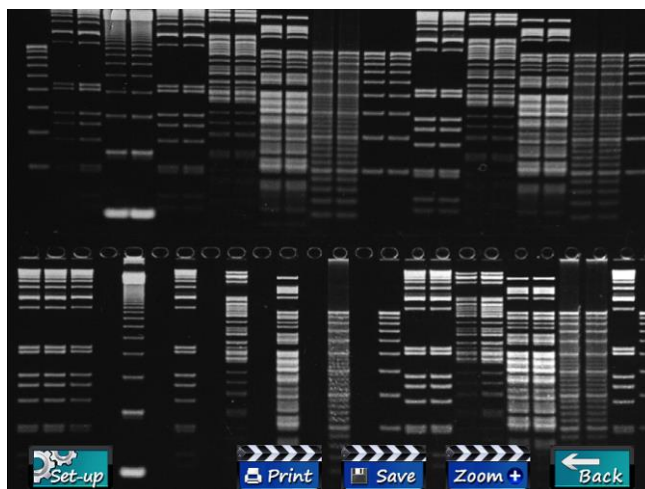


The freeze key stops the exposure process and captures the last image for further saving or printing.

To proceed, click on the Freeze key () to stop the image acquisition. The monitor displays the last full exposure.

Note: By pressing the Live key or the exposure time keys, the image is released from the freeze status.

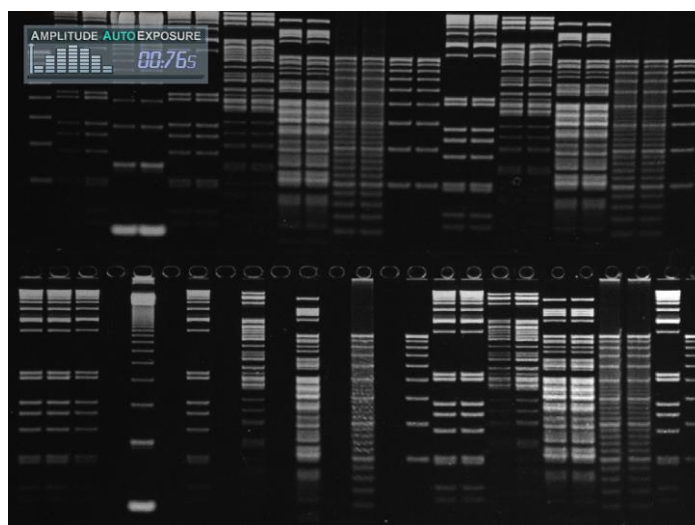
The following screen will appear after the image is frozen:



Auto

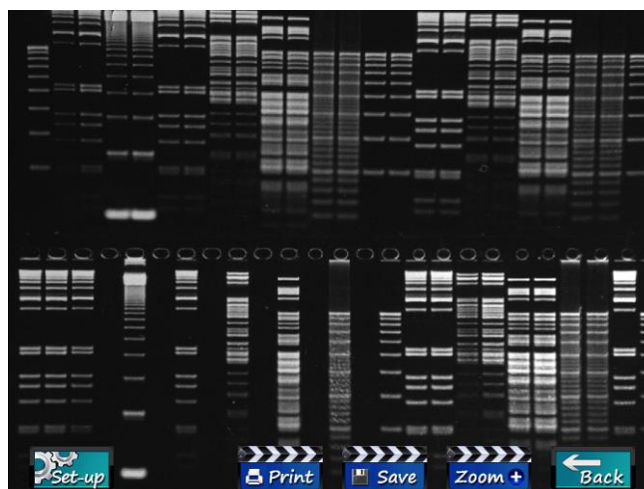


The E-Box VX5 system can calculate the necessary exposure time (Auto-exposure) for a standard gel. When you select the Auto-Exposure option, the system samples the light levels and uses the values to calculate the final exposure time.



Note: With long integration time, a delay could be necessary before an image is displayed on the monitor. The acquisition will stop automatically at the end of the exposure time.


At the end of the auto-exposure process, the image is automatically frozen. The following screen will appear:

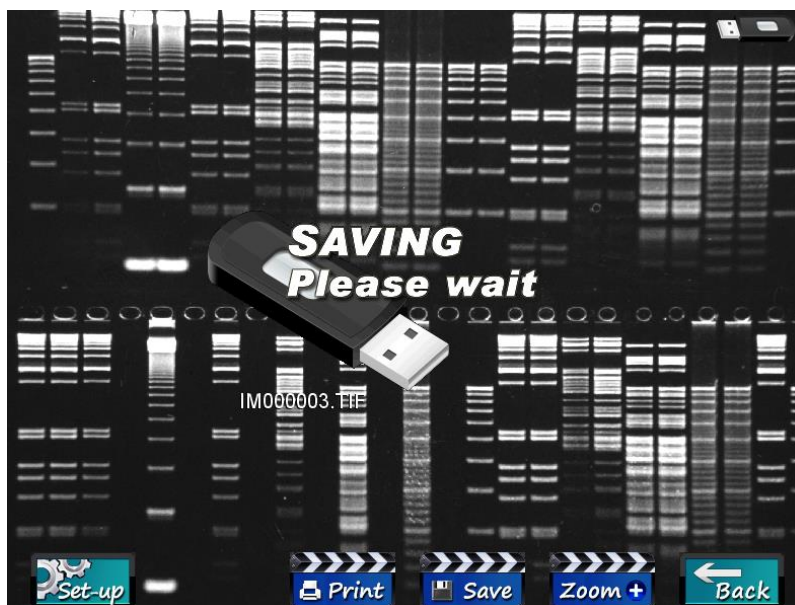


Save



Clicking on Save will start the saving of the captured image. The image is saved on the USB® key drive, according to the default image format.

To proceed, click on the “Save” () key.



The E-Box has an internal memory, interrelated with the USB external saving drive. When pressing the “Save” key, the image is saved at the same time both on the internal memory and on the USB key drive.

The internal memory can contain 50 images. When the internal memory is full, the oldest image file is erased (first in / first out principle).

You can access the internal memory through the network.

Note: The image file is named by the system. The default image name has 8 characters. The first 2 are IM. The last 6 are a number ascending from 000001 to 999999.

Note: The default file name is incremented by one each time an image is saved.

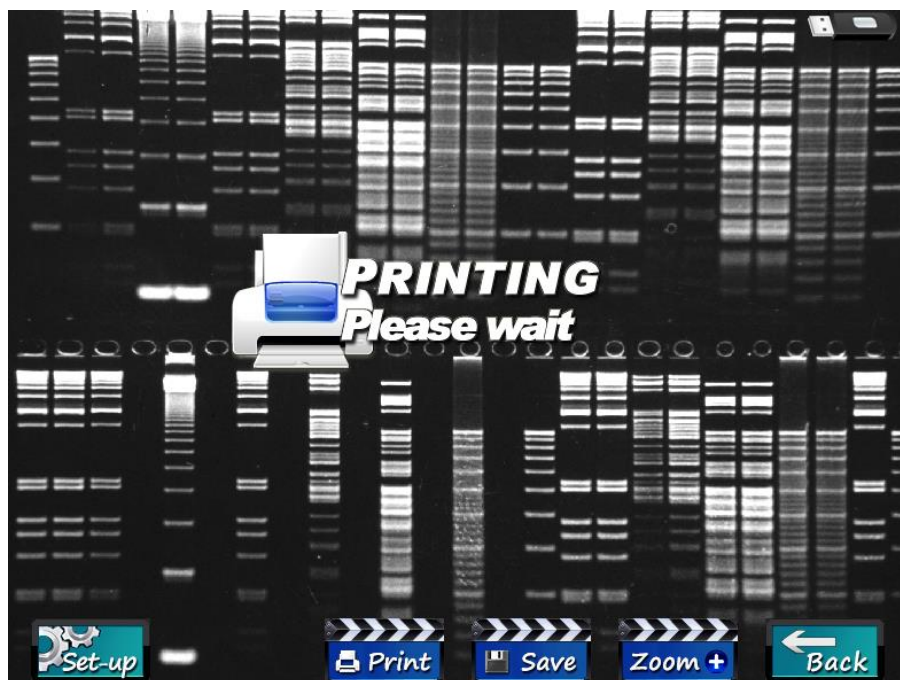
Note: The file extension varies according to the image file format:

- ⇒ For TIFF, the extension is TIF
- ⇒ For BMP file, the extension is BMP;
- ⇒ For JPEG, the extension is JPG



To print, press the "Print" key (.

The image is printed on the default printer, if defined.

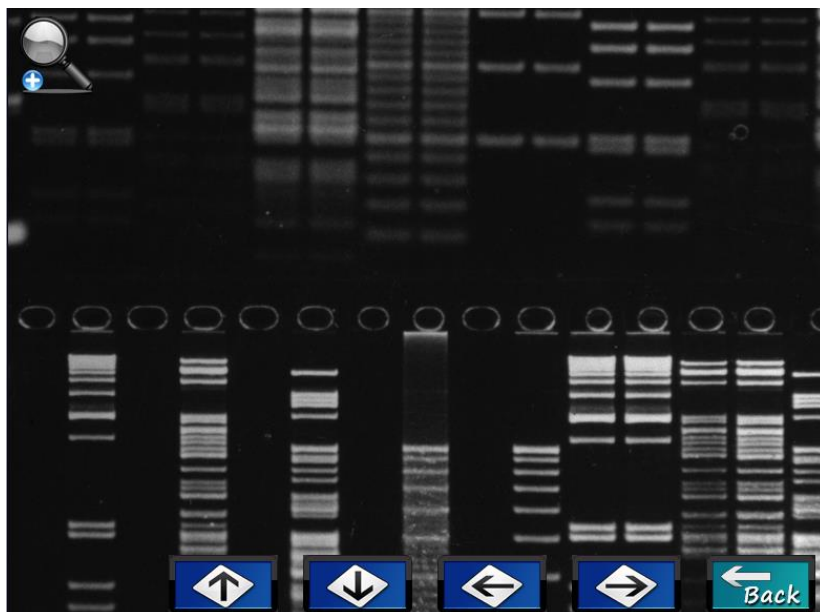


Note: a printer message can appear on the display in the case of lack of ink or paper. In such case the message should disappear after few seconds. If not, please press any touch from the panel and the message will disappear after few seconds.

Zoom +



You can zoom in the image when pressing the Zoom + key.
Then, with the up/down/left/right arrows, you can navigate with the image:

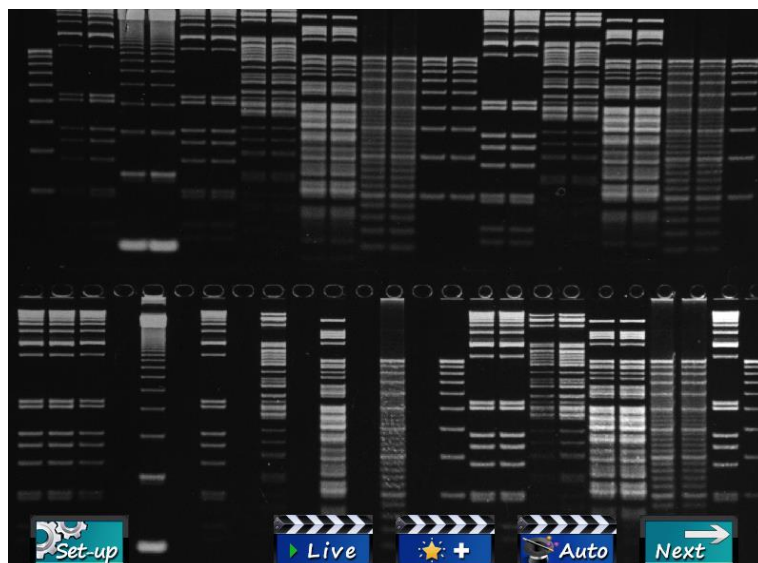


The zoom view displays the "Amplitude" bar graph as well as the minimum and maximum grey level for the image:

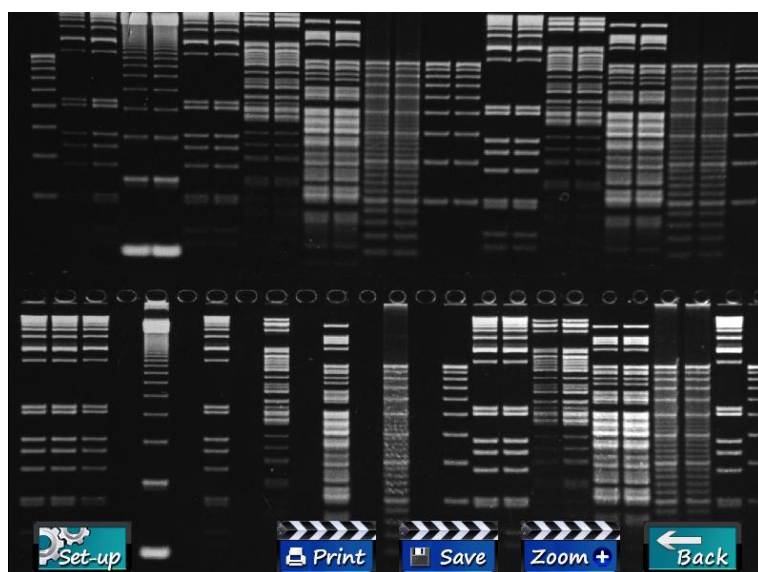
Press the Back key to return to the previous menu.



The Next and Back keys help you to navigate within the menu:



From the Next button, you access the Print, Save and Zoom keys.



From the back button, you access the Live, Exposure and Auto keys.

Focus point adjustment

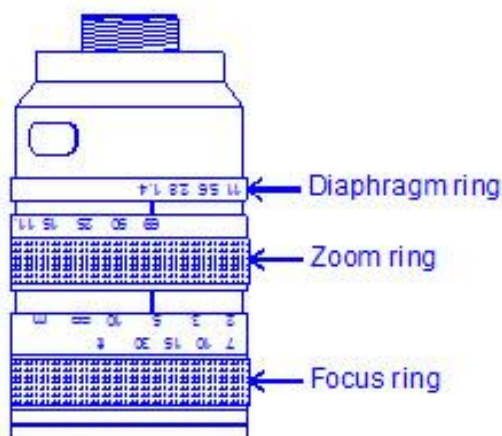


All cameras require a focus point adjustment. In order to proceed, you have to zoom to the maximum on a straight forward image (a printed paper, a business card ...). Then, focus till you obtain a very sharp image on the screen. This procedure can be done with epi-illumination light and a printed paper. The focus point adjustment varies with the focal distance.

You may need to adjust the 3 settings of the zoom lens:

- Aperture. Aperture allows the CCD sensor to receive more or less light. Closing the aperture decreases the amount of light coming to the sensor, thereby making the image darker.
- Zoom. Zoom allows you to change the size of your sample, on the image. To proceed, click on the In or Out. The zoom automatically moves to the new value. The zoom control will not affect the focus.
- Focus. Focus is needed to adjust the sharpness of the image. Turning the ring clockwise or counter clockwise changes the focal point of the lens.

Zoom 11.5x69



In order to properly adjust the focus, please proceed as follows :

- 1/ Adjust the diaphragm ring on aperture 4
 - 2/ Adjust the zoom ring on position "69"
 - 3/ Put a sharp written paper on the transilluminator (transilluminator has to be off)
 - 4/ Open slightly the darkroom door to obtain a bright image on the display
 - 5/ Adjust the focus ring in order to obtain a sharp image.
- At this stage, the image must be sharp whatever the zoom ring position is. Do not change the focus ring position anymore as far as you do not modify the focal distance.

The lower the f-stop number, the brighter the image will be. For enhanced gel imaging, we suggest to position the diaphragm ring around aperture "4".



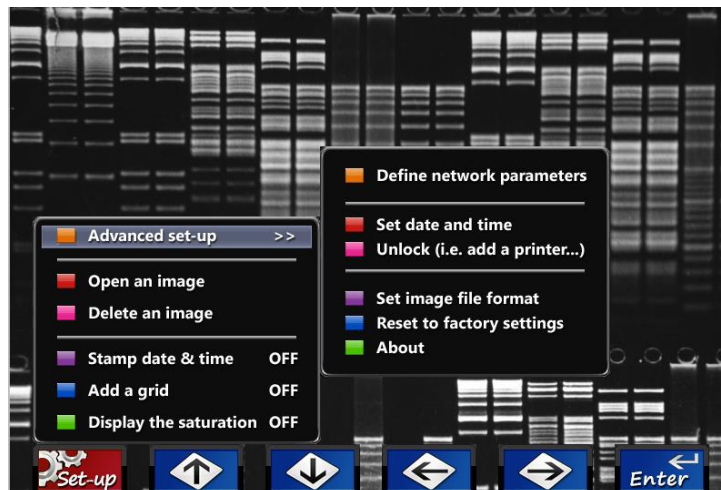
You can access a set-up menu from which you will be able to manage the following functions:

- ⇒ Display the saturation
- ⇒ Add a grid
- ⇒ Stamp the date & time
- ⇒ Open or delete an image
- ⇒ Define the network parameters
- ⇒ Modify the date and time
- ⇒ Unlock the system and add a device such as a printer
- ⇒ Modify the file format (i.e.: Tiff, BMP, Jpeg)
- ⇒ Reset the system to the factory settings
- ⇒ Check the system status and version



To access the Set-up menu, press the Set-up menu key ().

All the functions of the set-up menu are described in details in the Setup Menu chapter of this manual.



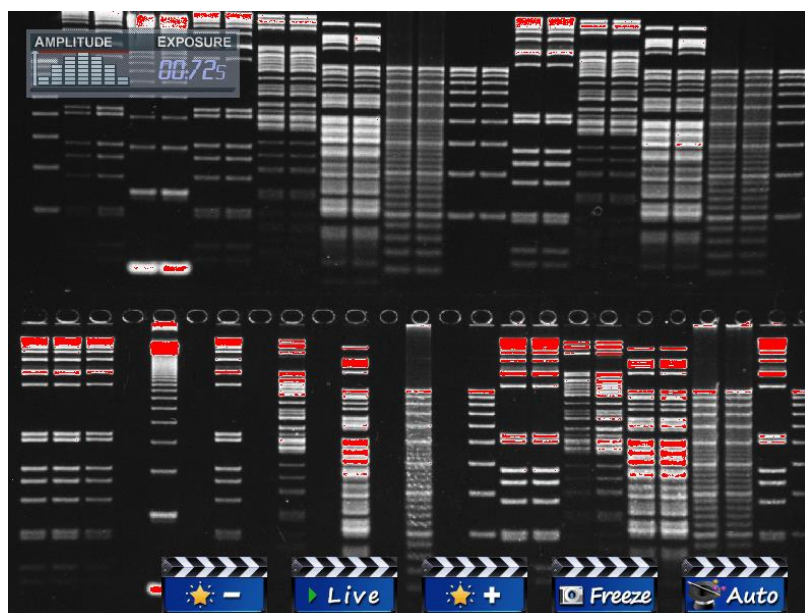
Display the saturation

■ Display the saturation

Saturation occurs if the amount of light collected by the camera exceeds its capacity. In such case, the image is over-exposed and the integration time should be reduced.

A saturated image is inappropriate for image quantification with image analysis software. The saturation option allows you to visualize the saturated pixels in order to avoid flattening the peaks.

To proceed, press the saturation key. The saturated pixels appear in red on the display.



Note: A saturated image creates quantification error when studied by image analysis software.

Note: To un-activate the saturation option press the saturation key one more time.

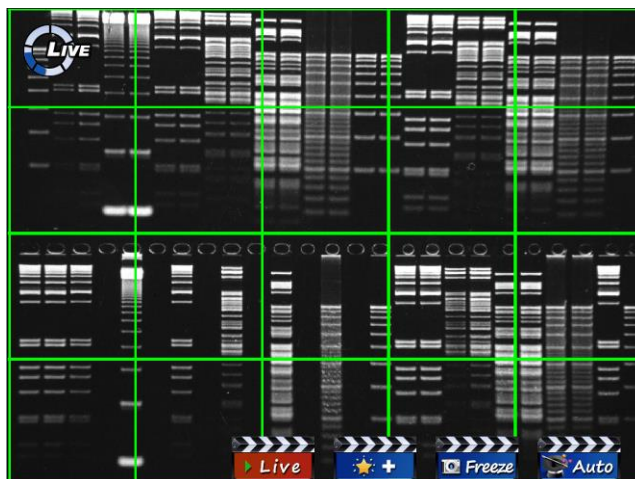
Note: The image saturation is also indicated by a red line in the Amplitude graph.



Add a grid

Add a grid

With the grid option, you can display a grid on the screen to adjust your gel according to horizontal and vertical axis. To proceed, press the Add a grid key. The grid appears as below with the Live and Exposure modes:



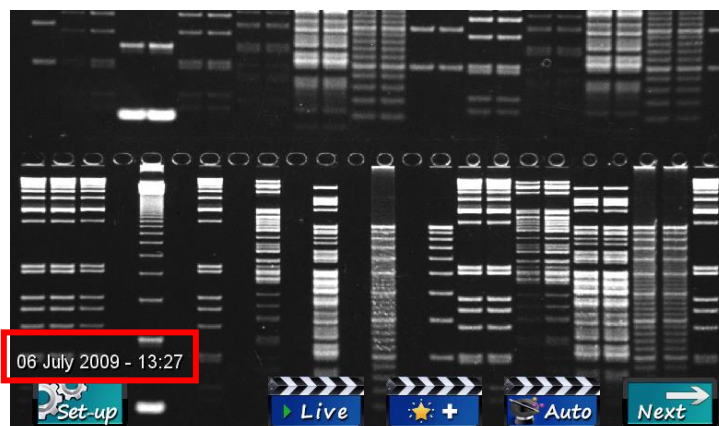
Note: The grid option is only available with the Live mode and Exposure mode.

Note: You can remove the grid option by deselecting this option.

Stamp date and time

Stamp date & time


You can activate or un-activate the display of the status bar and of the date and time bar. To proceed, press the Insert date and time key (Stamp date & time).

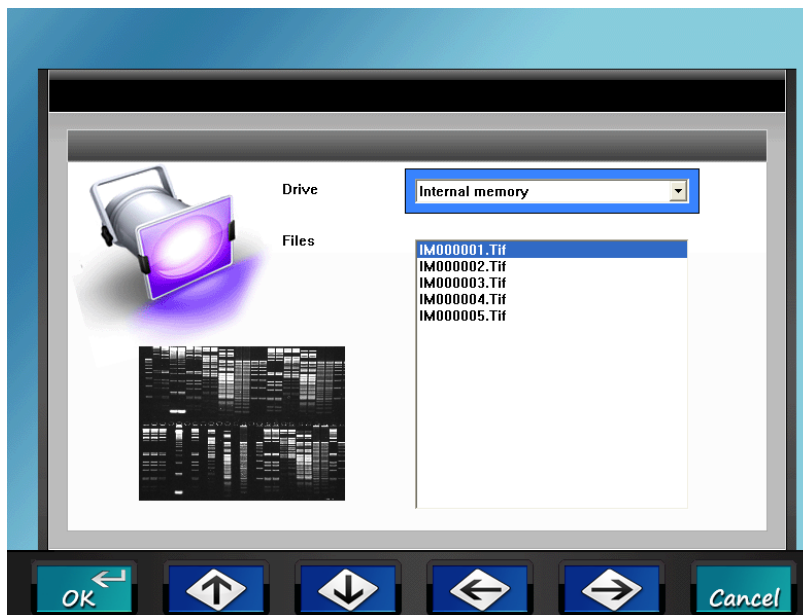


Note: The image is printed according to the Display option. If the date and time bar is displayed, the image will be printed with the date and the time stamped on the print.

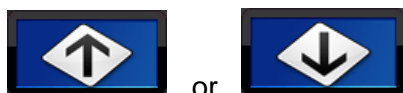
Open an image

Open an image

You can open an image from the internal memory or from your USB key drive for further printing. To process, press Open an image ( Open an image). A pop-up window displays the list of drive and the list of images for the selected drive:



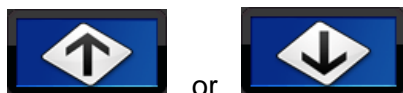
Select the drive by using the up and down keys:



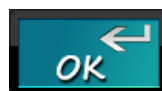
Then, select the Files option using the left and right keys:



Select a specific file by using the up and down keys:



Validate using the OK key:



Note: By pressing the Cancel key, you could return to the image acquisition mode.

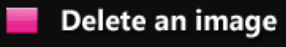
Note: An image thumbnail is displayed when a file is selected.

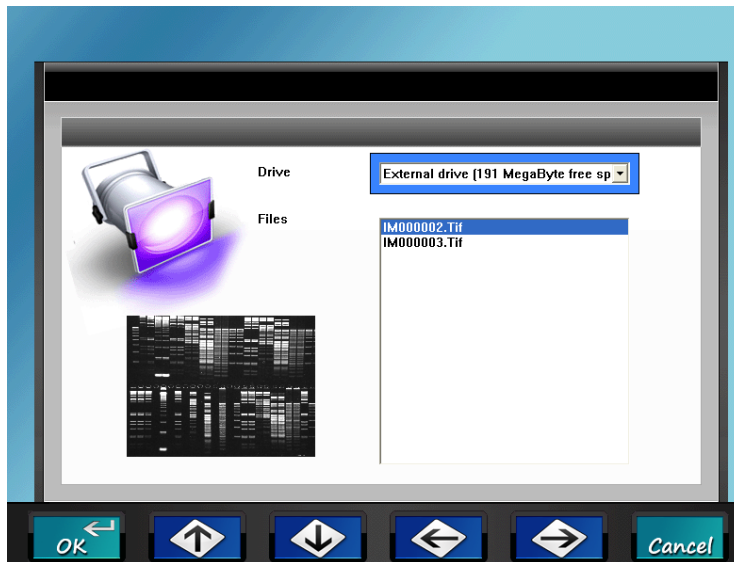
Note: Only the images of the default image format are displayed.

Delete an image

Delete an image

You can delete an image from your USB key drive for further printing.

To process, press Delete an image (). A pop-up window displays the list of drive and the list of images for the selected drive:



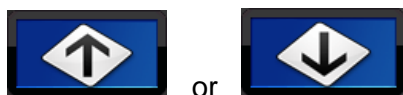
Select the drive by using the up and down keys:



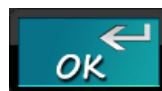
Then, select the Files option using the left and right keys:



Select a specific file by using the up and down keys:



Validate using the OK key:



Note: By pressing the Cancel key, you could return to the image acquisition mode.

Note: An image thumbnail is displayed when a file is selected.

Note: Only the images of the default image format are displayed.


Define network parameters – E-Box VX5 only

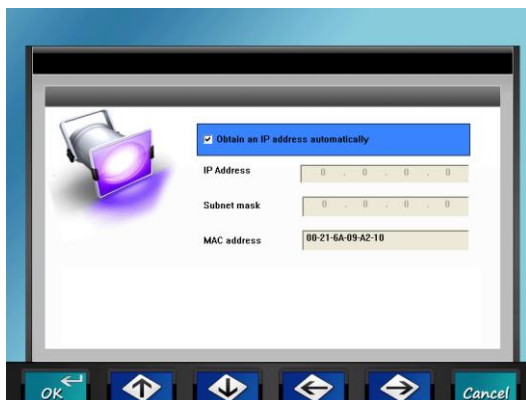


You can connect your E-Box to the local area network of your laboratory and download your gel image from the comfort of your office.

Note: The E-Box can not be considered as a regular computer workstation, and is not designed for installation of additional software such as Anti-Virus software, FireWall, etc...

The E-Box has a unique IP address which allows you to connect the system to your laboratory network for downloading. The image acquisition is performed in your laboratory and the image is saved in the internal memory of the E-Box. Then, from your office, you can easily download the image using your E-Capt software.

To do so, you need to set an IP address and a subnet address for your system. You can set the network configuration the Option folder of the Set-up menu. To access the Network configuration function, press the Set-up menu key ( **Define network parameters**).



1- Local area connection with network cable

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

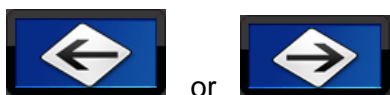
For automatic IP address, select the following option:

☒ Obtain an IP address automatically

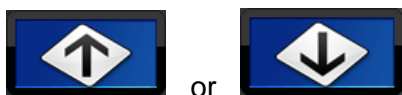
For specific IP settings, select the following option:

| | |
|-------------|---------------|
| IP Address | 0 . 0 . 0 . 0 |
| Subnet mask | 0 . 0 . 0 . 0 |

Select the IP Address and the Subnet Mask by using the up and down keys:



Then, select the option using the left and right keys:



Validate using the OK key:



2- Wireless network

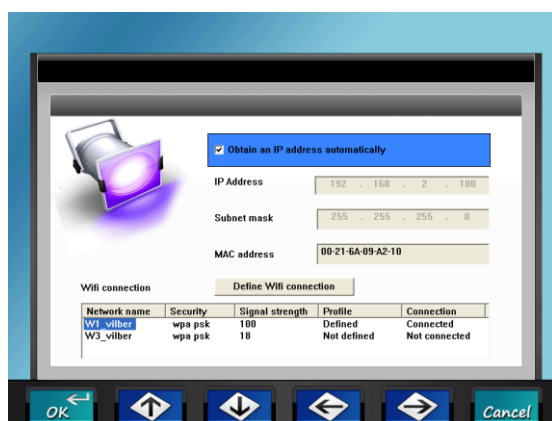
In order to connect to a Wireless network, you need to upload your wireless network definition using the E-Capt software.

E-Capt need to be installed within a computer connected to the same wireless network to the one you intend to connect the E-Box VX5. The E-Capt software will produce a WifiProfile XML document containing the authentication key information. Please save this XML file on a USB key drive. This E-Capt procedure is described in the "E-Box IP address parameters in the E-Capt software".

Note: The WifProfile.xml file will also retrieve the WPA or WEP identification key

Plug the USB key drive containing the WifiProfile file in the USB port of the E-Box. The Define Wifi Connection button will appear on the display:

Define Wifi connection



Then, select the Define Wifi Connection button using the left and right keys:



The E-Box VX5 is then connected to the wireless network.

Wifi connection

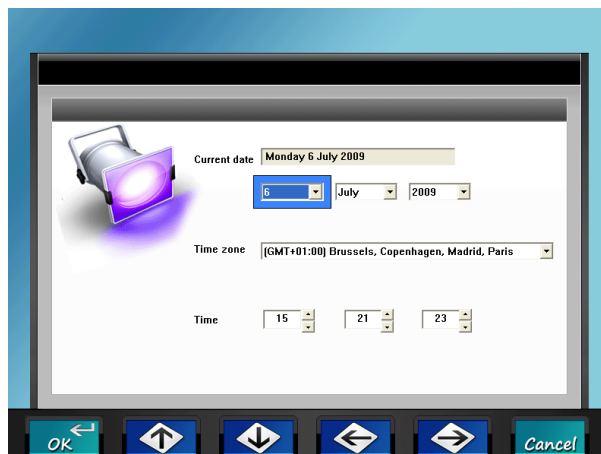
| Network name | Security | Signal strength | Profile | Connection |
|--------------|----------|-----------------|-------------|---------------|
| W1_vilber | wpa psk | 100 | Defined | Connected |
| W3_vilber | wpa psk | 18 | Not defined | Not connected |

Set date and time

Set date and time E-Box VX5 has a clock that records the date and time at which you take each picture. The information is recorded in the image property of the Good Laboratory Practice (GLP) file. You can set the date and time from the Option folder of the Set-up menu.

Set date and time

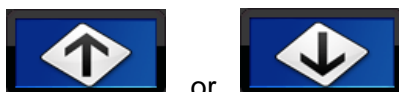
The following display will appear:



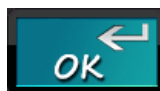
Select the date, the time zone and the time by using the left and right keys:



Then, select the appropriate option using the up and down keys:



Validate using the OK key:



Unlock (i.e. Add a printer)

The E-Box VX5 system is write-protected to prevent the installation of any non-approved programs or files such as malware or virus.

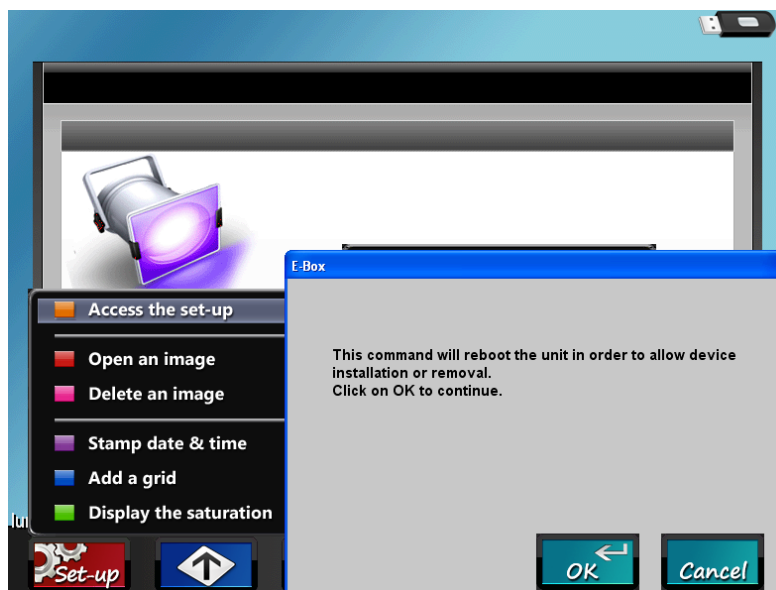
Thanks to the write-protected function, all files that are not write-protected are removed with a restart of the system. In other words, a simple reboot will remove any malware or virus that would have been able to infect the E-Box system.

The Add a device function is designed to unlock the system to allow the installation of additional drivers (such as printer drivers or wireless network device).

With the Add a device function, the write-protection is disabled after the system is restarted. At that time, you can install the needed drivers. Upon reboot, the system will have the new drivers installed, and will be write-protected again.

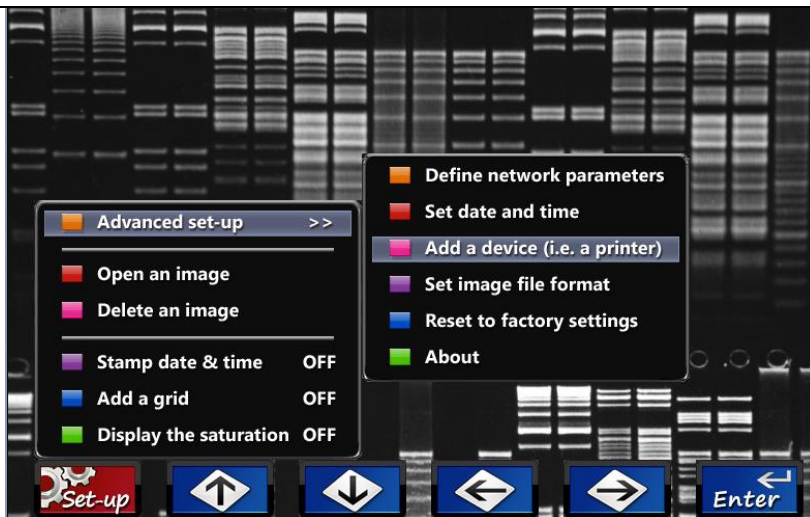
Before to add a device, it is compulsory to scan for virus the USB key drive which will contain the driver to be installed in the E-Box system.

When the system is locked, the following display will appear:

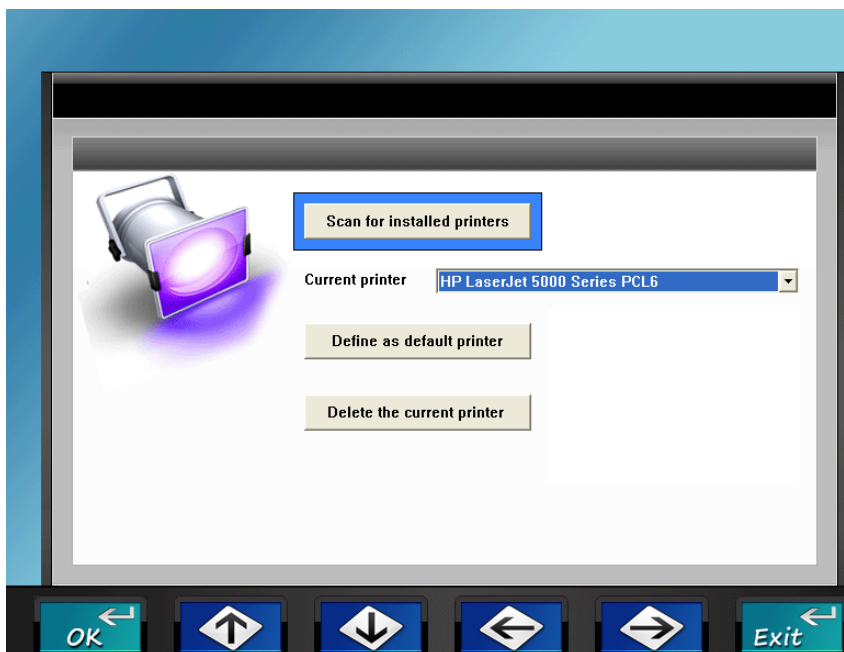


Validate using the OK key:  or select Cancel. By validating, the system will reboot to allow device installation or removal.

Upon reboot, select the Add a device option.



The Add a device display the following window:



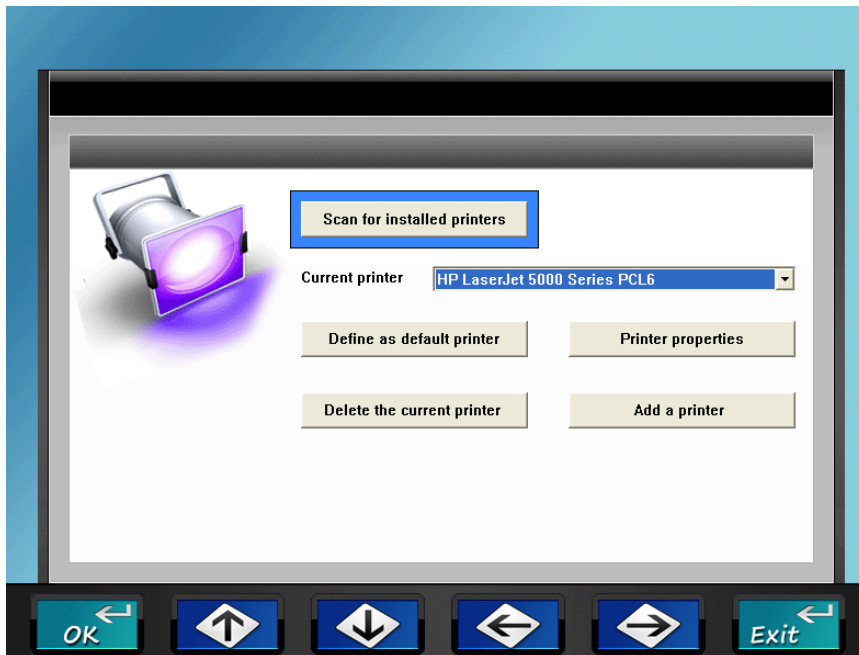
“Scan for installed printers” will retrieve the list of installed printer drivers.

The “Current printer” option lists the installed printers.

The “Define as default printer” set the selected printer as the default printer. This means images will be printed with this default printer.

How to add a printer (new printer driver installation)

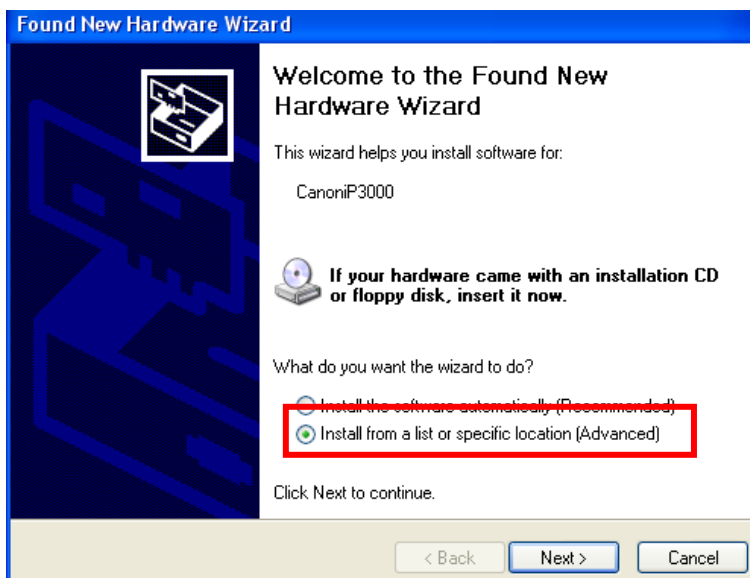
To add a printer, you need to connect a USB keyboard and a USB mouse. The “Add a device” will then display the following window:



Install the USB Printer Driver on a USB key drive.

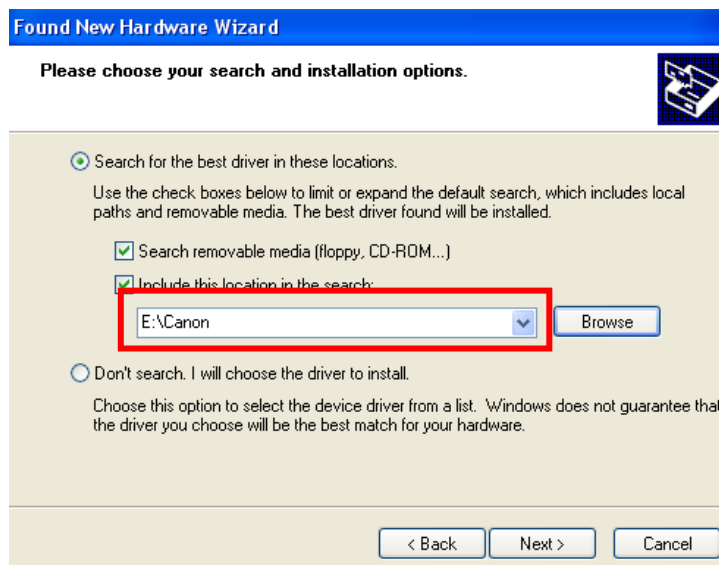
Plug in the USB printer, switch on the printer and wait for the Windows Add a Printer Wizard.

The following window will be displayed:

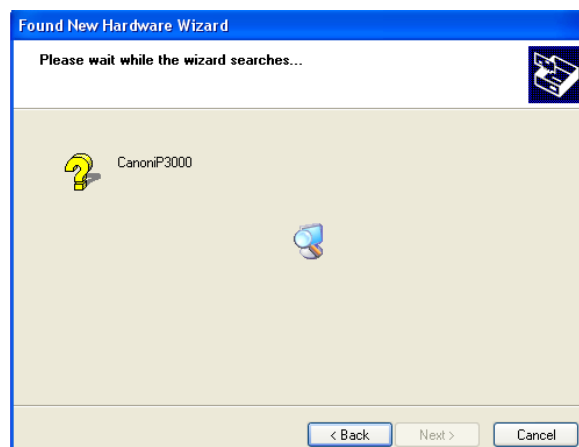


Select “Install from a list or specific location (Advanced)”
Then, click on Next.

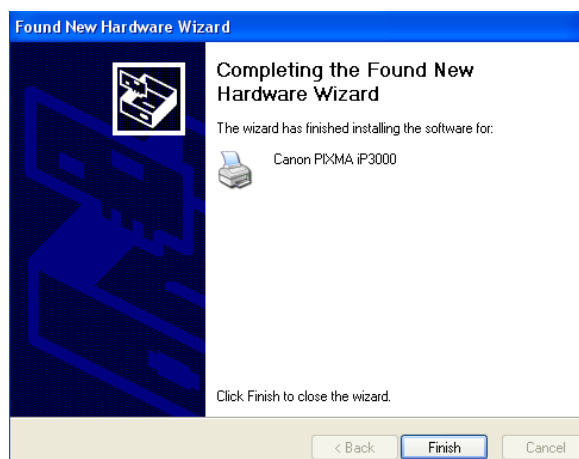
The following window will be displayed:



Select the USB key drive which contain the printer driver.
Then, click on Next.
The following window will be displayed:



Then, the following window will be displayed:



Click on finish. The printer is then installed. Please switch off the E-Box VX5 system and re-start.

Set image file format

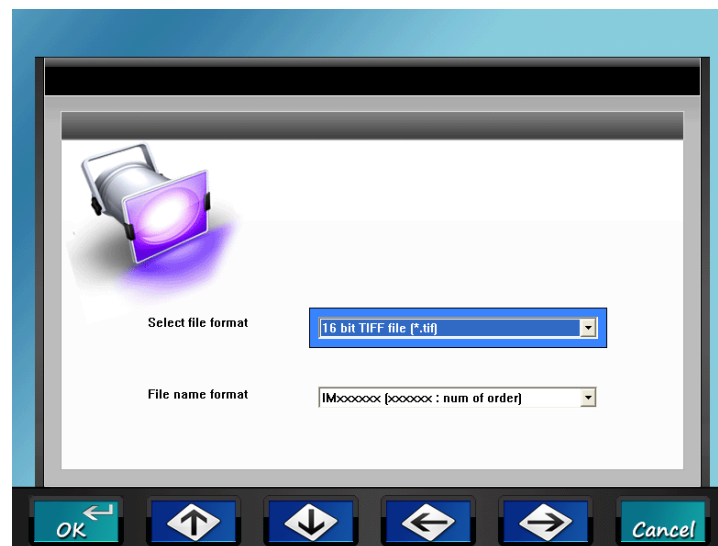
E-Box supports 4 different image formats:

- ⇒ TIFF-16-bit. The TIFF 16-bit encapsulated the 12-bit image format which has 4096 gray levels.
- ⇒ TIFF-8-bit. The TIFF 8-bit format has 256 gray levels.
- ⇒ BMP. The BMP format is 8-bit (256 gray levels).
- ⇒ JPEG. The JPEG format is compressed (1/10) and 8-bit (256 gray levels).

E-Box supports two file name formats.

- ⇒ By default, the name is IM00000x. The name will be incremented by one each time an image is saved.
- ⇒ The image could also be named according to the time and hour it has been taken.

You can select an image file format and the image format using the “Set image file format” function.



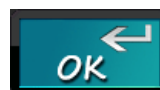
Select the file format and the file name format by using the left and right keys:



Then, select the appropriate option using the up and down keys:



Validate using the OK key:

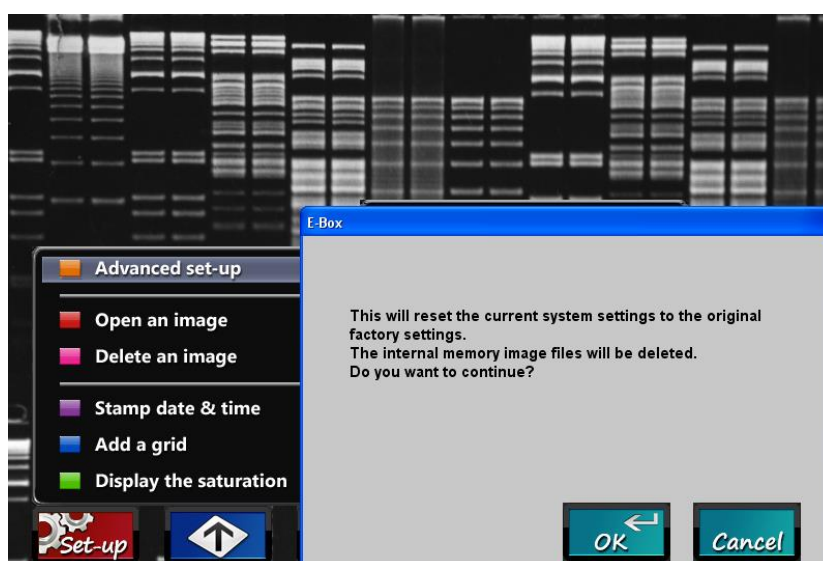


Reset

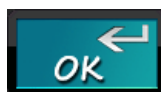
You can reset the E-Box system and restore the factory settings:

- ⇒ The image number is reset to IM000001
- ⇒ The internal memory images files is deleted
- ⇒ The default file format will be Tif-12-bit
- ⇒ The default IP address will be: 192.168.1.10 or Auto IP address
- ⇒ The default subnet mask address will be: 255.255.255.0 or Auto IP address

To access the Reset function, press the Set-up menu key and select the Reset function.



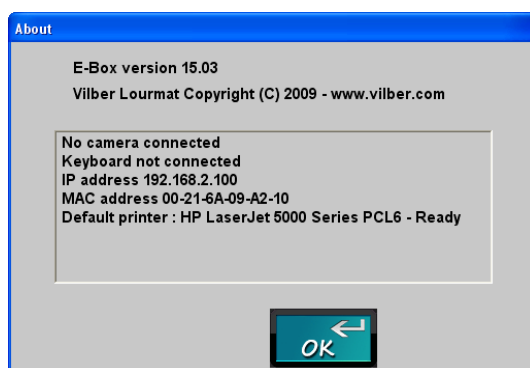
Validate using the OK key:



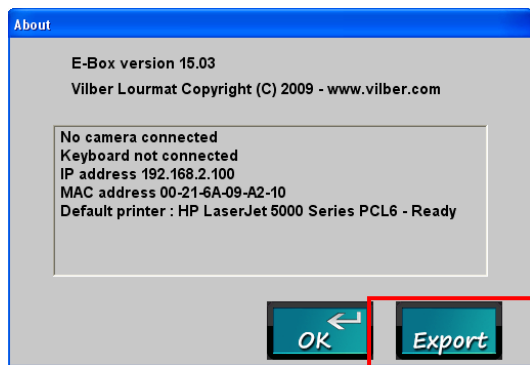
The About folder summarizes the information concerning your E-Box and its set-up. It gives you access to the following information:

- ⇒ Systems name & version
- ⇒ IP address / Mac address
- ⇒ Camera state
- ⇒ Printer state

To access About menu, press the Set-up menu key and select the About option:



If a USB key drive is connected, you can export the E-Box information to the USB key by creating a text file when pressing the Export key:



If suggested by Vilber, the E-Box firmware can be updated using a special program and a zip file provided by Vilber.

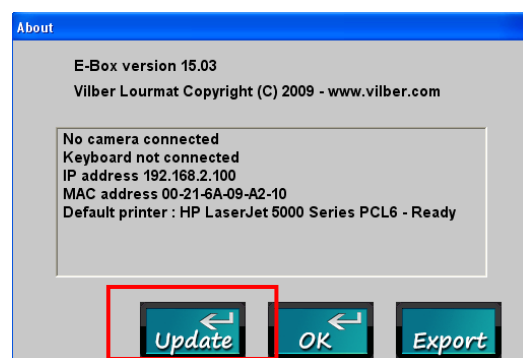
This program and this zip file need to be copied on a USB key drive. Insert the drive in the E-Box and access the About function through the Set-Up.

The About folder summarizes the information concerning your E-Box and its set-up. It gives you access to the following information:

- ⇒ Systems name & version
- ⇒ IP address / Mac address
- ⇒ Camera state
- ⇒ Printer state

To access About menu, press the Set-up menu key and select the About option:

The following menu will appear:



Select the update key. The system will reboot automatically. This procedure last few minutes. Please do not try to access the system during the updating time.

USB device precaution



DO NOT PLUG OR UNPLUG A USB KEY DRIVE WHILE THE CAMERA IS ON USING THE LIVE MODE OR THE EXPOSURE MODE

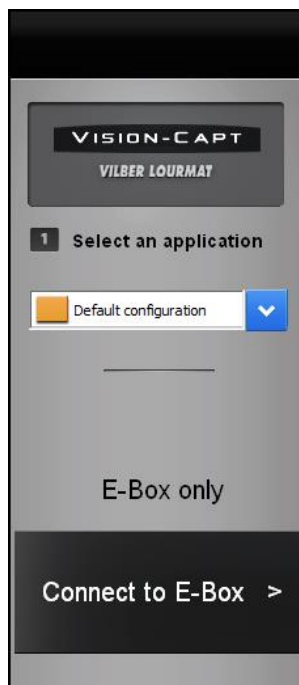
NOTE: A USB WIRELESS LAN DEVICE HAVING A HIGH ENERGY CONSUMPTION, WE DO NOT RECOMMEND TO USE SUCH DEVICE.

Access to the Exposure module for the Vision-Capt / E-Box VX5 network connection

Select the Exposure module from the menu bar to access the Exposure menu:



This will open the Exposure function folder:



The Exposure function folder contains the following feature:

Connect to E-Box >

Connect your computer to the E-Box through the local area network (LAN) on which is connected your E-Box system and download your images.

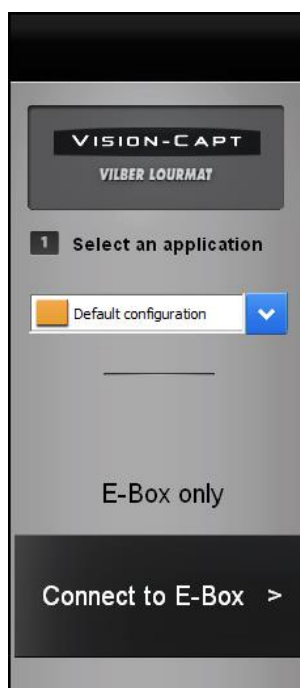
Connect to E-Box from the Vision-Capt software

The Vision-Capt software helps you to download your image from the E-Box system.

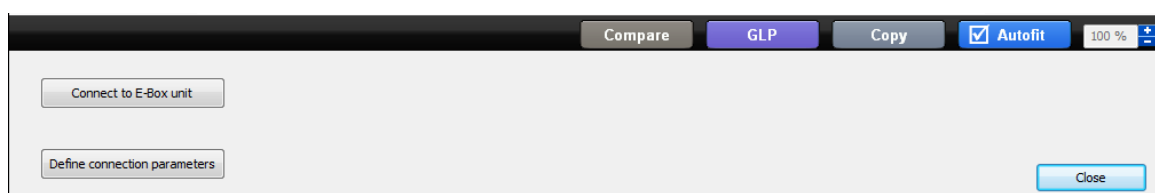
You can connect your E-Box to the local area network of your laboratory and download your gel image from the comfort of your office.

The E-Box has a unique IP address which allows you to connect the system to your laboratory network for downloading. The image acquisition is performed in your laboratory and the image is saved in the internal memory of the E-Box. Then, from your office, you can easily download the image using your Vision-Capt software.

You access the Connect to E-Box function thanks to the Exposure menu:



Then, click on the Connect to E-Box button to access the function options:



To do so, you need first to set an IP address and a subnet address for your E-Box VX5 system.

Connection parameters

Vision-Capt provides connectivity between your computer and the E-Box through the local area network (LAN) on which is connected your E-Box system. A LAN is a communication network connecting a group of computers, printers, and other devices located within a relatively limited area (for example a laboratory). A LAN allows any connected device to interact with any other on the local network. For instance, any computer connected on the LAN could download an image.

Transmission Control Protocol/Internet Protocol (TCP/IP) is the most popular network protocol, and the basis for the Internet. In Windows operating system, TCP/IP is automatically installed.

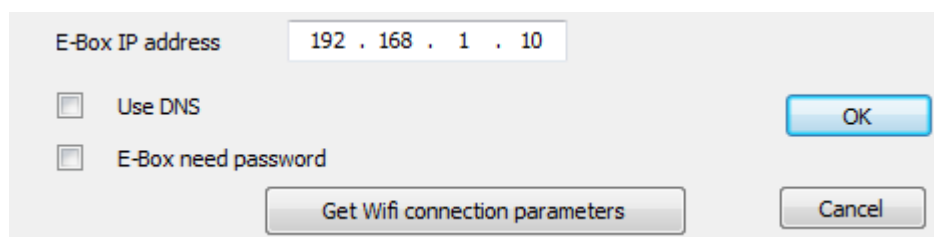
On a TCP/IP network, you must provide IP addresses to clients. This means, you need to provide an address to make sure your computer is already properly connected to your LAN and that an IP address is assigned to the E-Box.

The remote “connect to the E-Box” from your computer must be configured to permit users to request the specific E-Box IP address. Connections are created and configured thanks to the E-Capt IP address.

For remote access to the E-Box from your computer, you need to define the E-Capt IP address in the setup. To proceed, click on Define connection parameters:

Define connection parameters

A pop-up window displays the following menu:



E-Box VX5 IP address

By default, we recommend to select DNS (automatic IP address assignment from your network):

☒ Use DNS

If this option is not working properly, unselect the DNS option:

☐ Use DNS

Fill-in the E-Box IP address with the IP address defined in the E-Box VX5 system.

E-Box IP address 192 . 168 . 1 . 10

Then, validate by clicking on OK.

Wireless network parameters for the E-Box VX5 - Windows XP

If E-Box is connected to your wireless network, you need to retrieve the wireless network parameters using the Vision-Capt software installed in a computer connected to this wireless network.

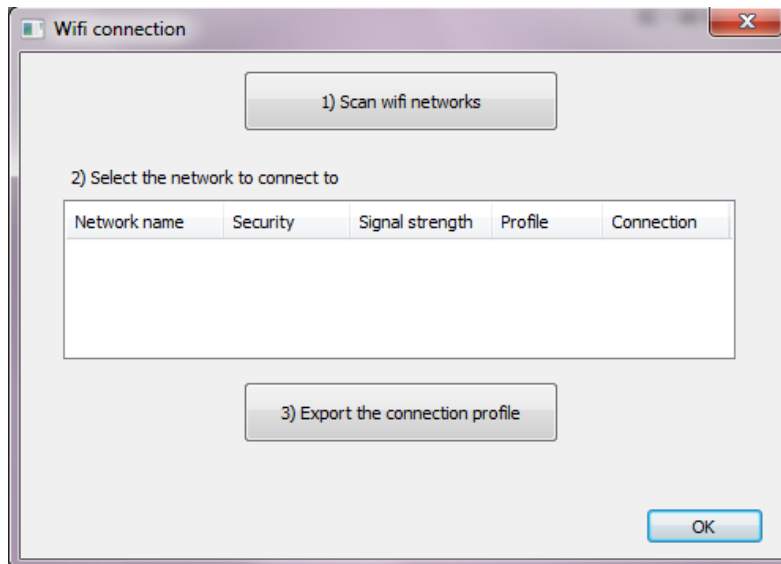
The Vision-Capt software will produce a WifiProfile XML document containing the authentication key information. This file has to be saved into a USB key drive for further file input into the E-Box VX5 system.

| Name | Size | Type | Date Modified |
|-------------|------|--------------|------------------|
| WifiProfile | 1 KB | XML Document | 11/06/2009 09:41 |

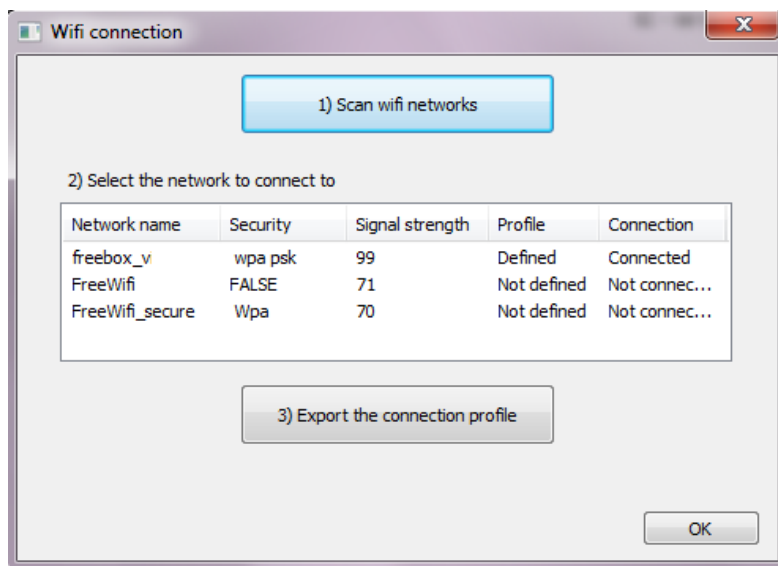
Get Wifi connection parameters

To proceed, click on

A pop-up window displays the following menu:



- 1- Scan the wifi networks by pressing the scan button
- 2- Select your network from the list:



- 3- Export the xml file to your USB key

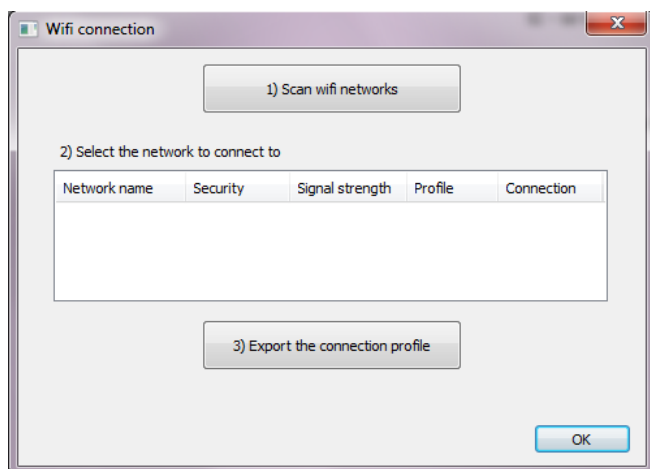
To import the xml file into the E-Box VX5 system, please refer to the "Define Network Parameter" chapter of this manual.

Wireless network parameters for the E-Box VX5 - Windows 7

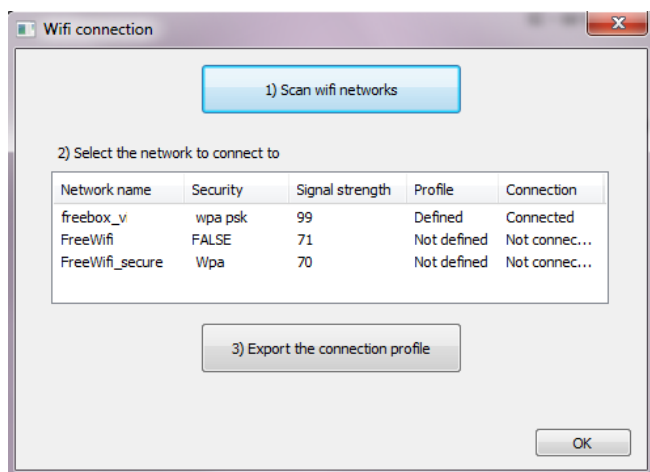
If E-Box is connected to your wireless network, you need to retrieve the wireless network parameters using the Vision-Capt software installed in a computer connected to this wireless network.

Get Wifi connection parameters

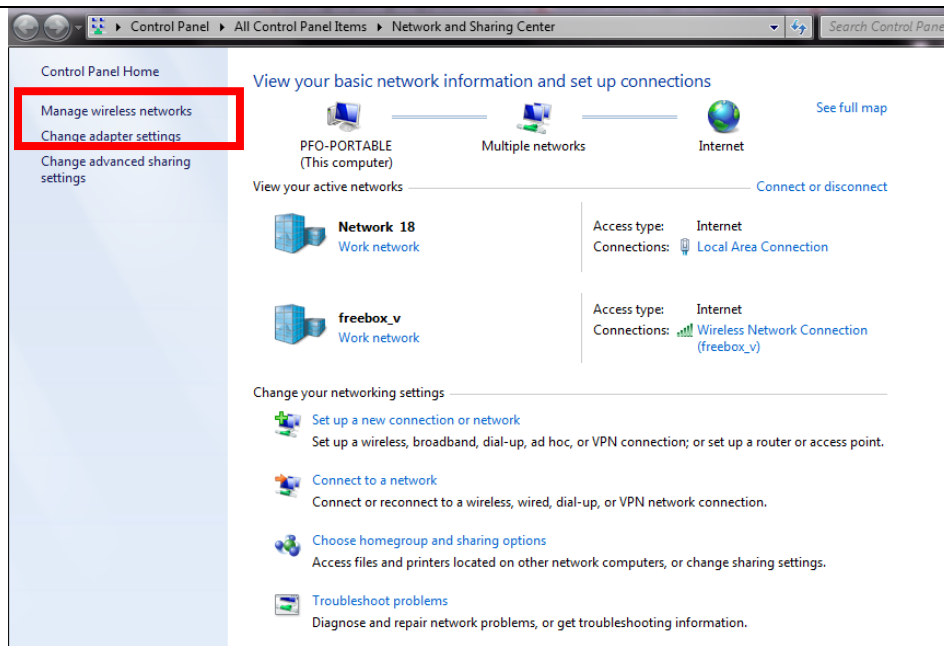
A pop-up window displays the following menu:



- 1- Scan the wifi networks by pressing the scan button
- 2- Select your network from the list:








- 3- Export the xml file to your USB key
- Windows open the following menu:



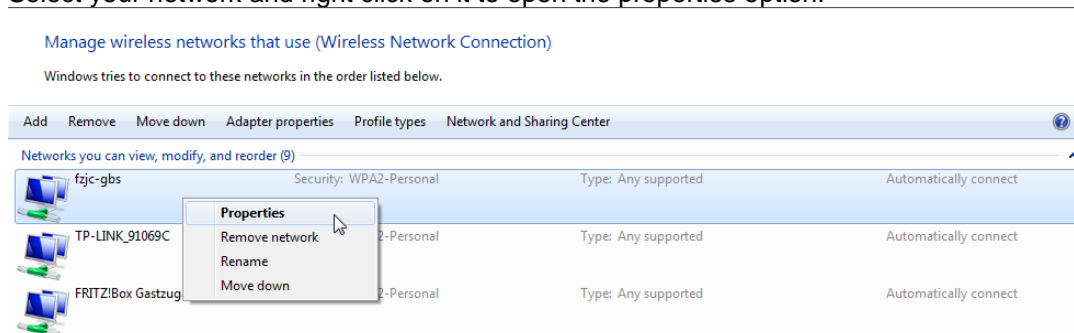
Select Manage wireless network

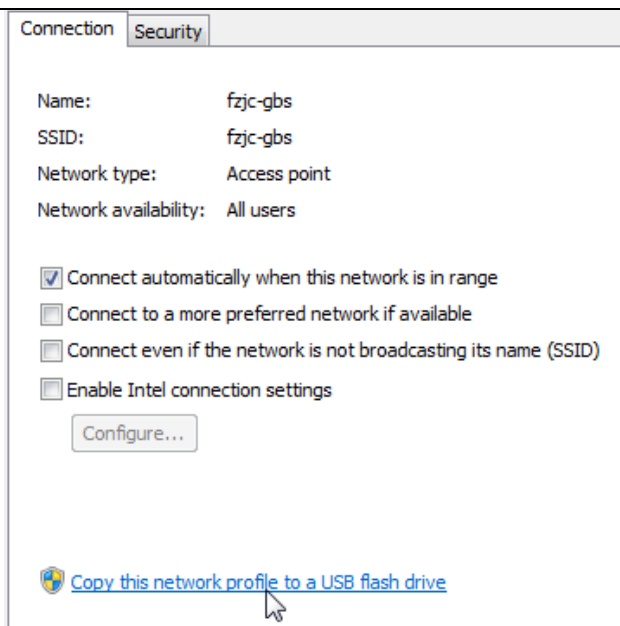
Manage wireless networks that use (Wireless Network Connection)

Windows tries to connect to these networks in the order listed below.

| Add | Adapter properties | Profile types | Network and Sharing Center |
|---|----------------------|-------------------------|----------------------------|
| Networks you can view, modify, and reorder (10) | | | |
|  | fzjc-gbs | Security: WPA2-Personal | Type: Any supported |
|  | TP-LINK_91069C | Security: WPA2-Personal | Type: Any supported |
|  | FRITZ!Box Gastzugang | Security: WPA2-Personal | Type: Any supported |
|  | tr_og | Security: WPA-Personal | Type: Any supported |
|  | GF-FALCON-GOLD-1 | Security: WPA-Personal | Type: Any supported |

Select your network and right click on it to open the properties option:





Then, plug a USB key in your computer and select “Copy this network profile to a USB flash drive.

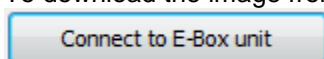
To import the network profile file into the E-Box VX5 system, please refer to the “Define Network Parameter” chapter of this manual.

E-Box need password

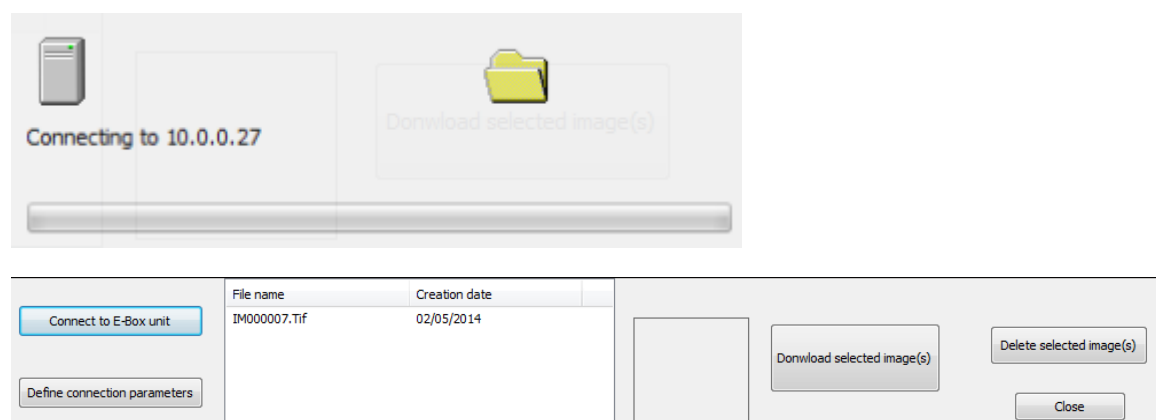
This option is not used with the E-Box VX5. The older E-Box system required a password for the ftp access. If you are using an old version of the E-Box system, please select E-Box need password for your ftp access. The password is then e-box.

Connect to the E-Box:

To download the image from the E-Box, click on Connect to the E-Box unit button:



A pop-up windows prompt you the system is connecting to the E-Box:



The list of the E-Box images appears in the table:

| File name | Creation date |
|--------------|---------------|
| IM000004.Jpg | 13/03/2013 |
| IM000005.Jpg | 13/03/2013 |
| IM000001.Tif | 13/03/2013 |
| IM000002.Tif | 13/03/2013 |
| IM000003.Tif | 13/03/2013 |
| IM000006.Tif | 13/03/2013 |



Download selected image(s)

Select your image. A image thumbnail appear. Click on Download selected image(s) to download your image and open it in the Vision-Capt software.

Note: You can also delete an image from the list using the Delete selected image(s) button.

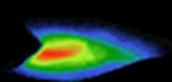
Retrieve an image directly from your internet browser

DNS is selected:

If the E-Box is connected in the same IP domain as your computer, you can download your image directly from your internet browser by using the following address: <ftp://images>

DNS is not selected and you use a defined IP address

If the E-Box is connected in the same IP domain as your computer, you can download your image directly from your internet browser by using the following address: ftp://YOUR_DEFINED_IP_ADDRESS, for instance ftp://10.0.0.27

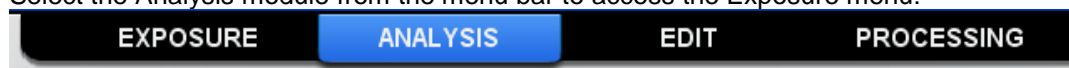


VISION-CAPT

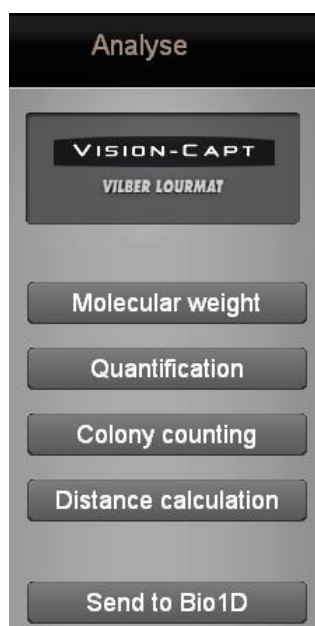
VISION-CAPT ANALYSIS MENU

Access to the analysis modules

Select the Analysis module from the menu bar to access the Exposure menu:



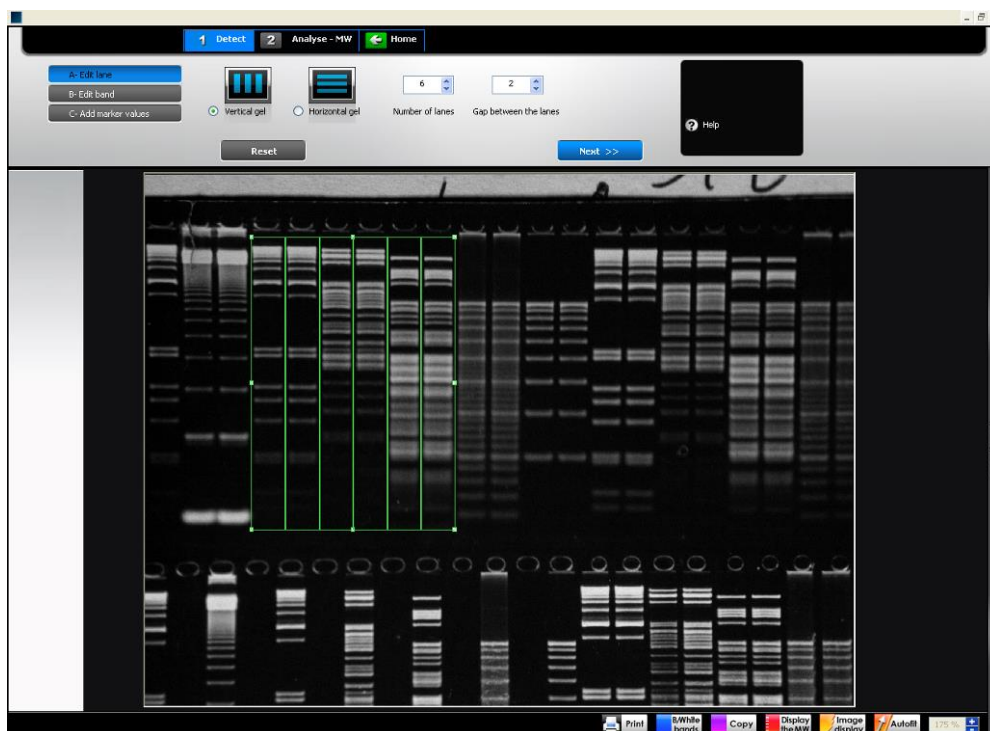
This will open the analysis function folder:



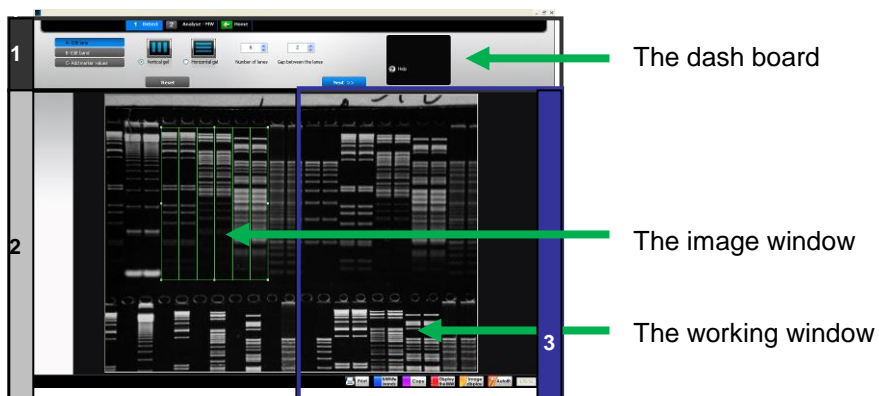
| | |
|--|---|
| | Select the Molecular weight icon to open the molecular weight analysis (MW) module |
| | Select the Colony counting icon to open the colony counting (CC) analysis module |
| | Select the Optical density - 1D icon to open the optical density (OD) analysis module based on a 1D detection |
| | Select the Distance calculation module to measure the distance in between a front line and an ending line |

Analysis module operating environment

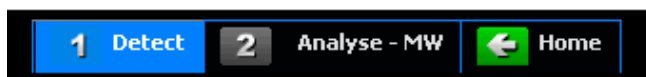
The analysis module opens on the following window:



The Capt Advance operating environment is organized into three areas:



The **dash board** is different for each analysis module. For molecular weight, it contains the following tabs:



1. Detect
2. Analyse molecular weight (MW)
3. Home

For Colony Counting, the dash board contains 3 different tabs:



1. Automatic counting
2. Manual counting
3. Home

For distance calculation, the **dash board** contains three different tabs:

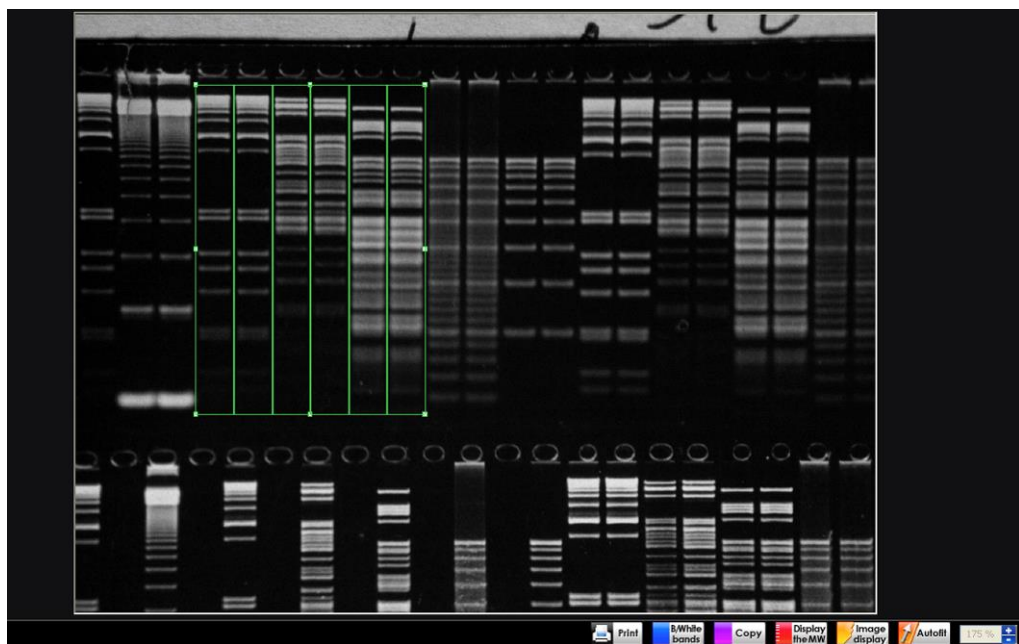


1. Detect
2. Analyse
3. Home

For the Quantification analysis module, the dash board contains three different tabs:

1. Window definition
2. Spot quantification
3. Home

The **image window** displays the active image:



It also contains the image toolbar:



⇒ Print the image



⇒ Set the band parameters (white bands / black background ; black bands/ white background)



⇒ Copy to clipboard



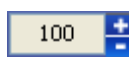
⇒ Display the molecular weight on the image



⇒ Change the image display parameters

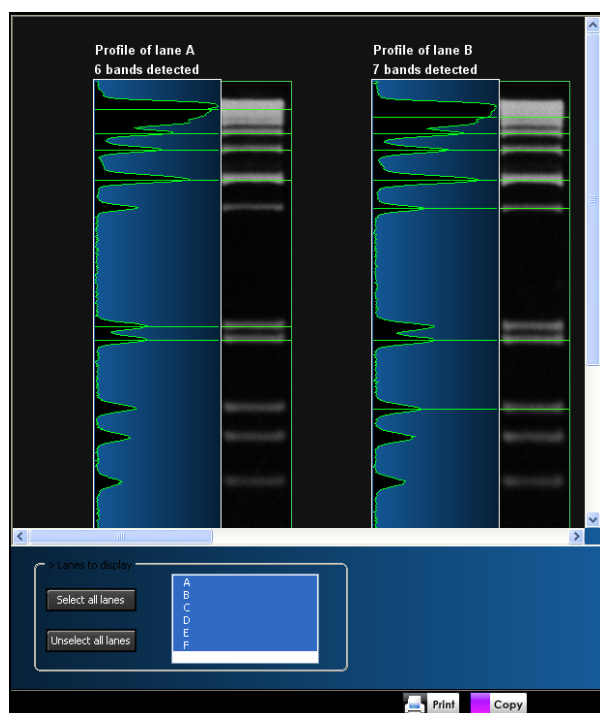


⇒ Autoscale



⇒ Zoom in or out the image

The **working window** displays the graphs and tables related to the active analysis:



It also contains the working window image toolbar:



⇒ Print the image



⇒ Copy to clipboard

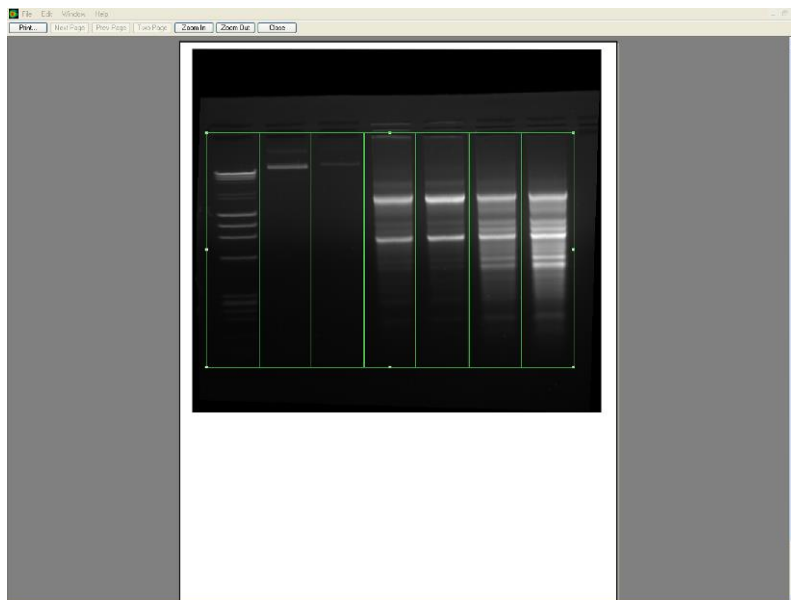


⇒ Export the table to Microsoft Excel

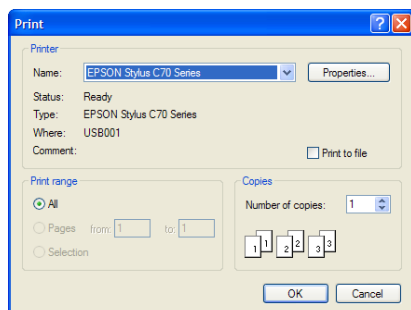


Print

Click on the “Print” icon to print the image, the table or the graphs. A pop-up window displays the Print preview: The Print preview displays a preview of the image, as it will be printed.



Click on Print to validate the preview. A pop-up window displays the following menu:



- ⇒ Select a printer
- ⇒ Click on Properties to modify the default setting of the printer, if necessary
- ⇒ Select the number of copies
- ⇒ Click on OK to validate your options

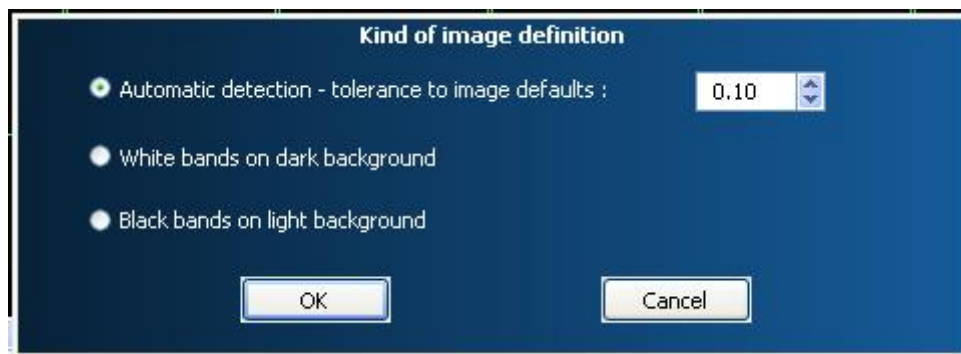
Note: You can also access the Print menu from the Menu bar (File\Print).



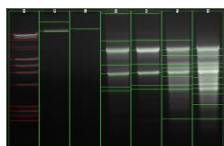
Black / White bands

This function set the bands parameters (white bands / black background / black bands, white background).

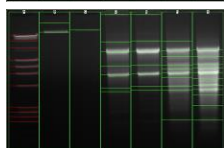
1. To proceed, click on the Black/White bands icon. A pop-up window displays the following menu:



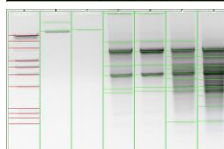
You can select the following options:



⇒ Automatic detection. Capt software will automatically detect the bands color scheme according to the defined percentage of tolerance



⇒ White bands on dark background for images with white signals and black background



⇒ Black bands on light background for images with black signals and clear background



Copy to clipboard

This function copies an image, a table or a graph onto the clipboard for insertion into another program. This option is identical to the Windows® [Ctrl C] command.

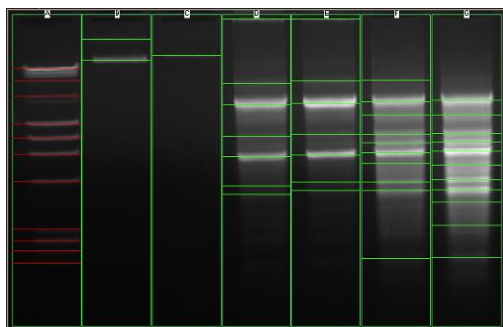
1. To proceed, click on the Copy to clipboard icon. The image, the table or the graph is now ready to be pasted into another application.

2. Open the application that you want to paste the image into, and select from the available pasting options ([Ctrl V] command for Windows® software).

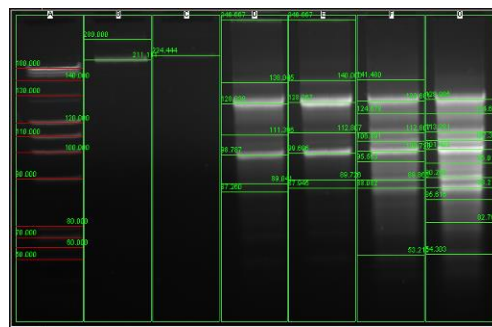


Display the molecular weight

1. Click on the “display the molecular weight” to display the calculated molecular weight on top of the image.



Default display

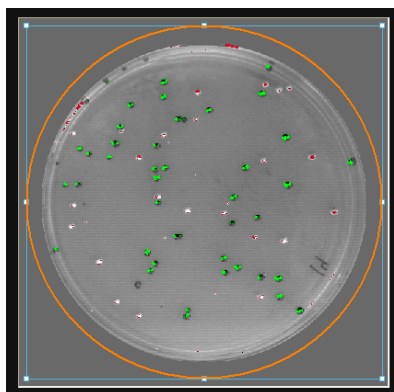


Molecular weight displayed on the image

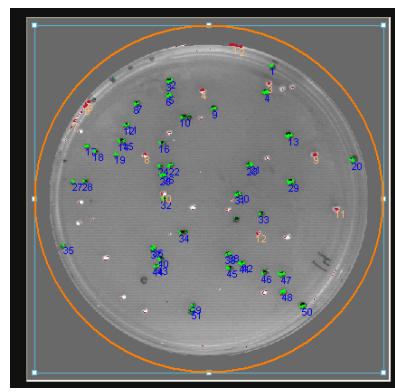


Display the colony number (Colony counting analysis module)

1. Click on the “display the molecular weight” to display the calculated molecular weight on top of the image.



Default display



Colonies count displayed on the image



Image display

1. Click on the “Image display” to displays the Image Master data as well as the Image Display set-up.

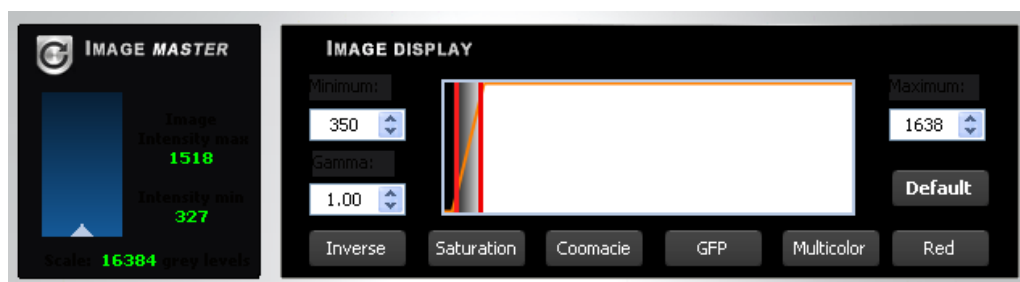




Image Master data

The Image Master data refers to the dynamic range of grey levels in between the minimum and the maximum pixel intensities obtained in an image.

Image depth is expressed as gradation level. In an image, the density range between white and black is divided into a number of gradation levels. For instance, a 12-bit image has 4096 gradation levels. The image dynamic refers to the number of grey levels in between the minimum levels obtained and the maximum level obtained on a specific image.

The Image Master data informs you of the obtained dynamic on your image compared to the potential image depth.



| | |
|-----------------------------------|--------------------------------------|
| Minimum: | Maximum: |
| <input type="text" value="363"/> | <input type="text" value="16235"/> |
| Gamma: | <input type="text" value="Default"/> |
| <input type="text" value="1.00"/> | |

Optimum display (for 12, 14 and 16-bit image file)

The optimum display window is helpful to modify the greyscale selection to enhance the image display.

Some images has a 12, 14 or 16-bit format and Windows® can only display 8-bit images (256 grey levels). Due to this limitation, the Capt Advance software handles two images: A “memory” image corresponding to the 12, 14 or 16-bit format (4 096, 16 384 or 65 536 grey levels)

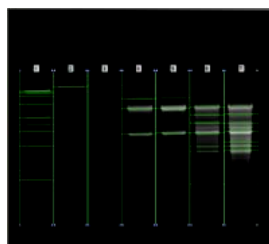
A “display image” corresponding to the image displayed on the screen (256 grey levels)

The easiest way to calculate the “display image” would be to translate the full grey scale each time an image is acquired: the x grey levels values of the “memory” image corresponds to 256 values in the displayed image. In that case, it won't be possible to visualize faint spots on a dark image.

Capt Advance offers the possibility to select the grey level range to translate for the display image calculation. All the grey levels under the “Min value” defined will be converted to 0 (Black) in the displayed image. All the grey levels upper the “Max Value” defined will be set to 255 (White) in the displayed image. The grey levels between those two limits will be converted in an intermediate grey level value following a linear rule.

For both values, you can:

- Edit the value in the corresponding field
- Select the value by dragging and dropping the arrow
- Click on the “optimum display” button: Capt Advance will then calculate the ideal values to be selected according to the parameters defined



Default optimum display



Optimum display enhancement
The image appears brighter. The faint bands are more visible.

Note: The optimum display has no impact on the analysis. Only the display of the image is modified.

Inverse

Saturation

Coomacie

GFP

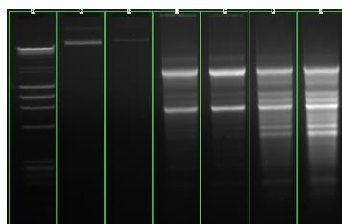
Multicolor

Red

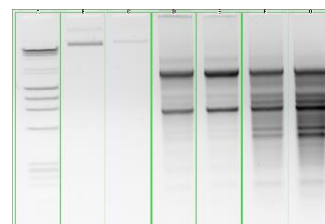
Inverse or display pseudo color

Inverse

Click on the "Inverse" icon to inverse the grey level of the image. This makes a negative image



Before

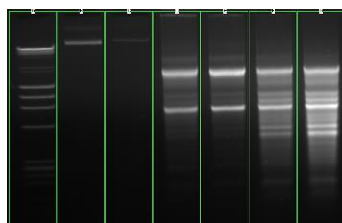


After

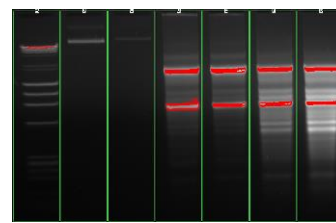
Saturation

A saturated image is inappropriate for image quantification with image analysis software. The saturation option allows you to visualize in red, pixels that have the maximum grey level (4095 for a 12-bit image or 16 383 for a 14-bit image or 65536 for a 16-bit image) in order to avoid to flatten the peaks.

Select the saturation option and the saturated pixels are displayed in red:



Saturated pixels not displayed

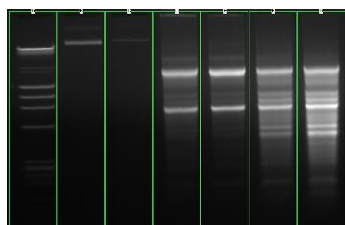


Saturated pixels displayed in red

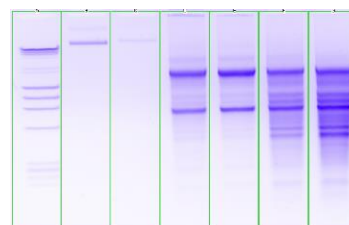
Note: A saturated image creates quantification error when studied by image analysis software. Gel-doc systems have to indicate to the user if the image is saturated and if it is then necessary to modify the integration time.

The pseudo colors can display different types or levels of fluorescence in an image. It replaces the original grey levels of the image by another palette color. The Capt software has several predefined palette designs. Select your palette design from the followings:

Coomassie

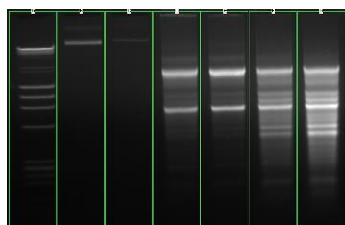


Original image

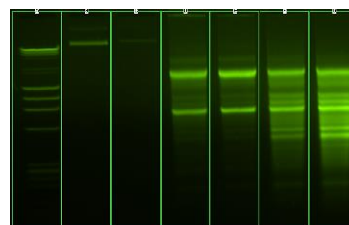


Coomassie painted image

GFP

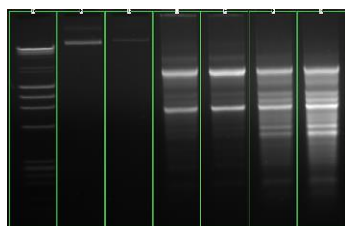


Original image

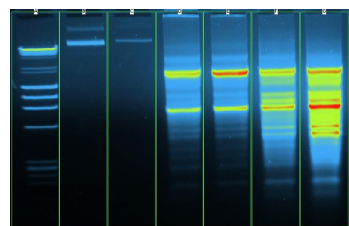


GFP painted image

Multicolor

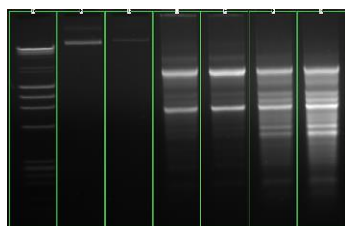


Original image

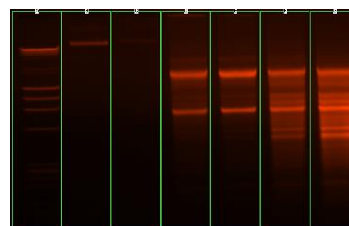


Multicolored painted image

Red



Original image

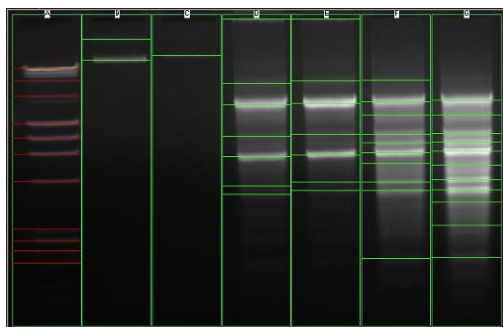


Red painted image

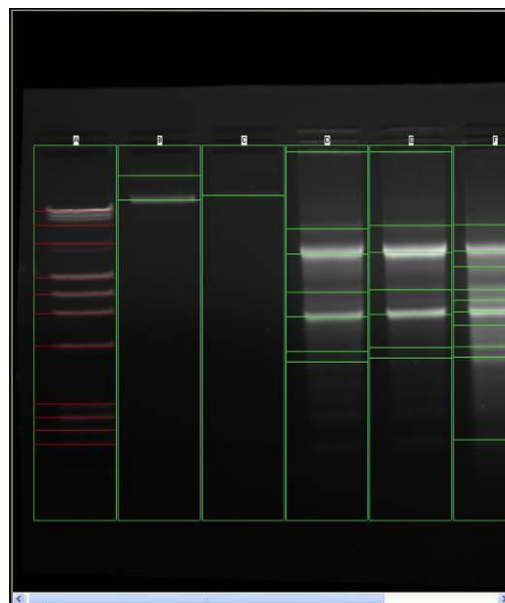


Autofit

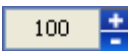
1. Click on the “Autofit” to resize the image to fit the size of the monitor. The Autofit feature proportions the display of the image to the screen resolution



Auto-scale (no scroll bar)

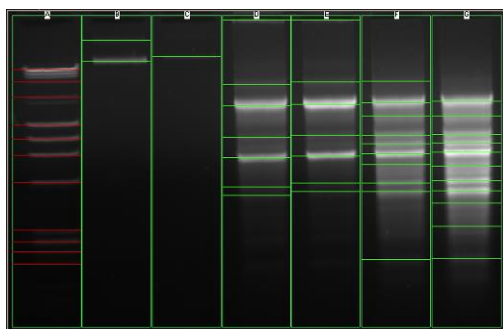


No auto-scale (scroll bar)

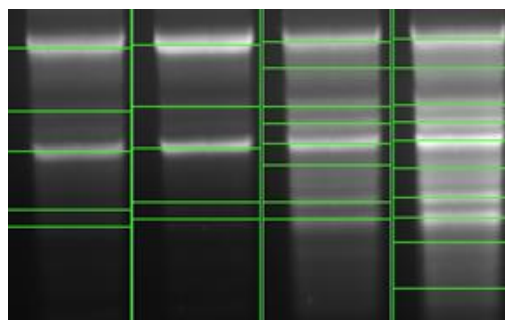


Zoom

1. Click on the “+” or “-” to zoom in or out the image



Auto-scale (no zoom)



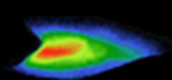
Zoom 150%



Excel

This function transfers the results table to Microsoft Excel™.

1. To proceed, click on the Send to Excel™ icon. The Excel software is automatically opened by the Fusion-Capt Advance and the table is transferred to Excel™.



VISION-CAPT

MOLECULAR WEIGHT ANALYSIS MODULE

Objectives and output

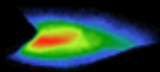
The Capt Advance Molecular Weight module features the calculation of electrophoretic distances according to markers or standards:

- in molecular weight (unit: KiloDalton)
- in fragment sizes (unit: Kilobases)

A regression method is used to calculate the molecular weight/size of the unknown bands. The software will use the molecular weight values of the marker (standard) bands to calculate the standard curve. This standard curve is then used to calculate the values of the unknown bands.

At the end of the process, you can have the following outputs:

- Molecular weight marker's profile and migration curve
- Molecular weight values

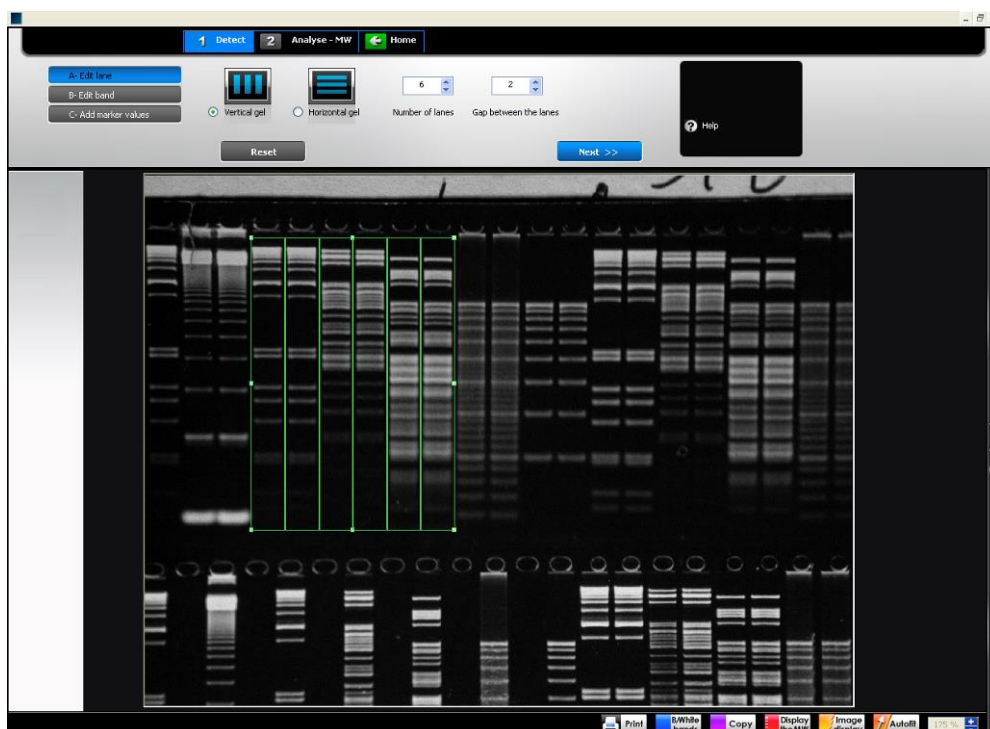


1 - DETECT

A – Edit lane

1 Detect

The molecular weight module opens on the Edit lane dashboard of the Detect process:



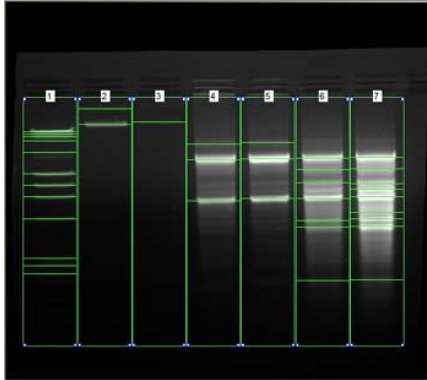
The dashboard details the lane edition parameters:



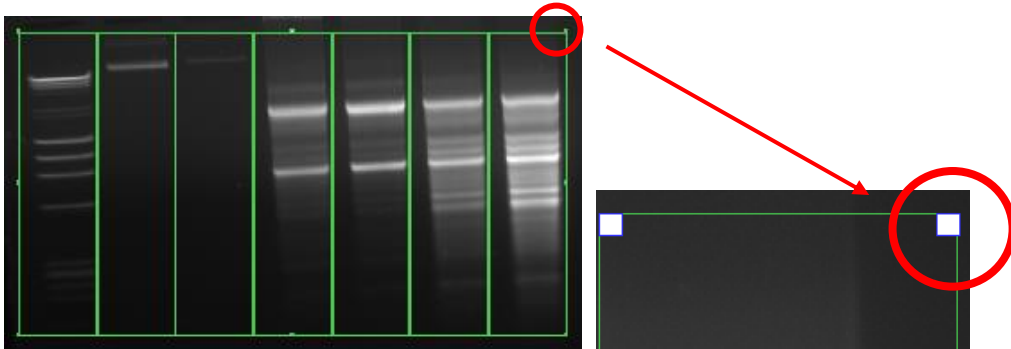
- ⇒ Lane direction
- ⇒ Number of lanes
- ⇒ Gap between the lanes

AREA OF INTEREST

On the image, click and drag to define the analysis area and to overlap the lanes. You can easily adjust the size of the area by clicking on the tags surrounding the area and drag the selected border to the requested size.

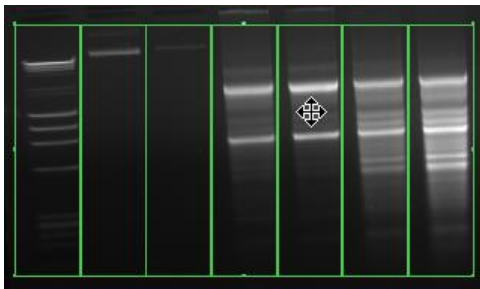


The lanes are defined by green lines, overlaid on the gel image. The gel area is surrounded by square anchors:



To resize the entire lane frame, drag an anchor point in or out. The opposite anchor point will remain fixed while the frame expands or contracts. The frame will expand or contract from the center.

To move the entire frame to a new position, position the mouse on the frame to obtain a cross cursor:



Click and drag the cursor to move the entire frame.

Note: it is not necessary to include the well line in the area of interest window. The calculation of molecular weight does not require this reference line.

LANE DIRECTION

Select the direction of the lanes from:

⇒ Horizontal

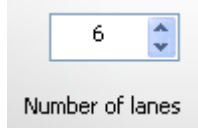
⇒ Or vertical



The lane direction is automatically modified on the image.

NUMBER OF LANES

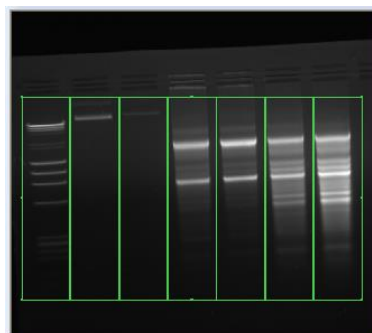
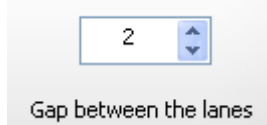
Select the number of lanes:



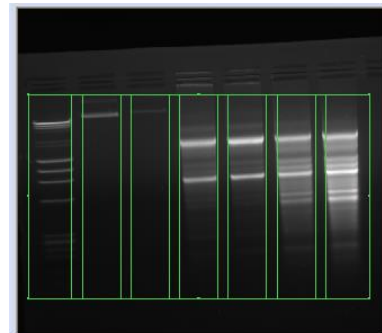
The number of lane is automatically modified on the image.

GAP BETWEEN THE LANES

Define the gap between the lanes:



Short gap



Large gap

The gap between the lanes is automatically modified on the image.

RESET

The "Reset" button restores the default lane detection parameters.



NEXT

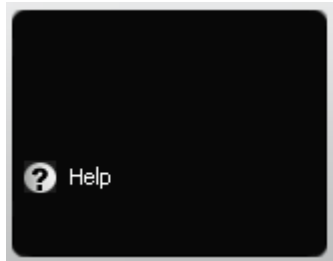
The “Next” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|---------------|
| A- Edit lane |  | B – Edit band |
|--------------|---|---------------|

OPTION FOLDER

The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



B – Edit band

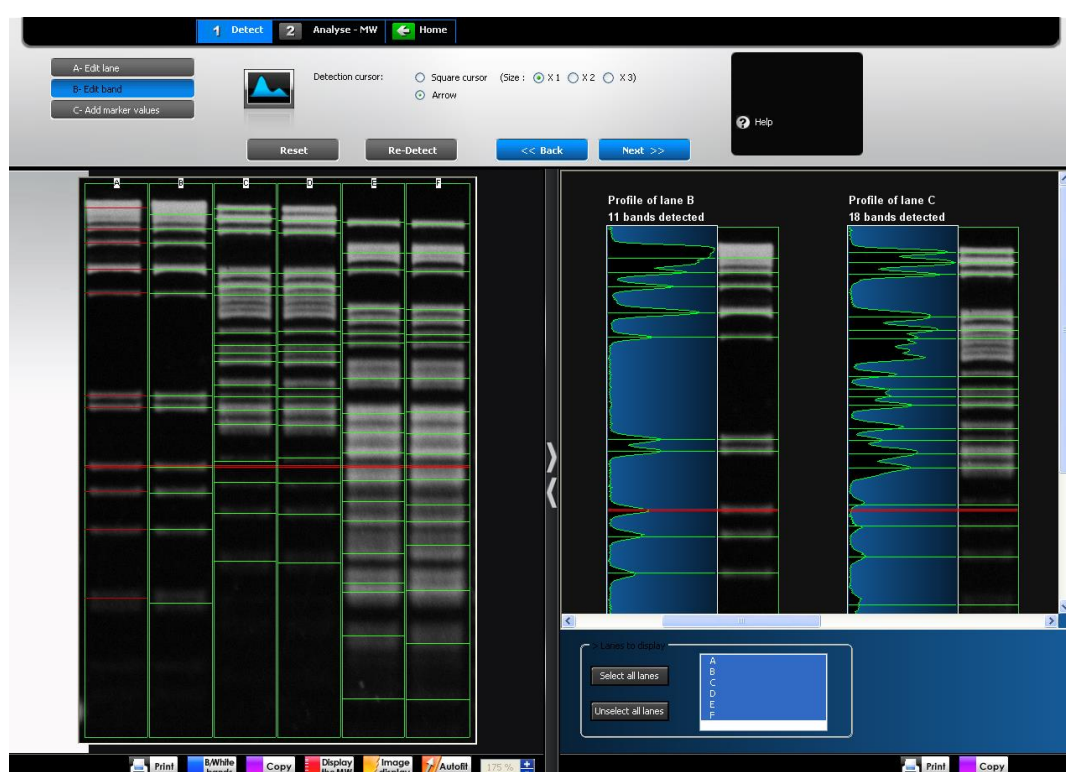
1 Detect

The Edit band process follows the lane definition:

The edit band process automatically identifies all the bands for the defined lanes. You can also manually mark the bands on the image or on the lane's profile. All bands will be automatically detected when you first access the band detection process, based on default parameters.

The bands are marked by green lines, overlaid on the gel image.

Note: you can either access the lane definition menu by clicking on the next button of the lane definition or directly on the band detection tab.



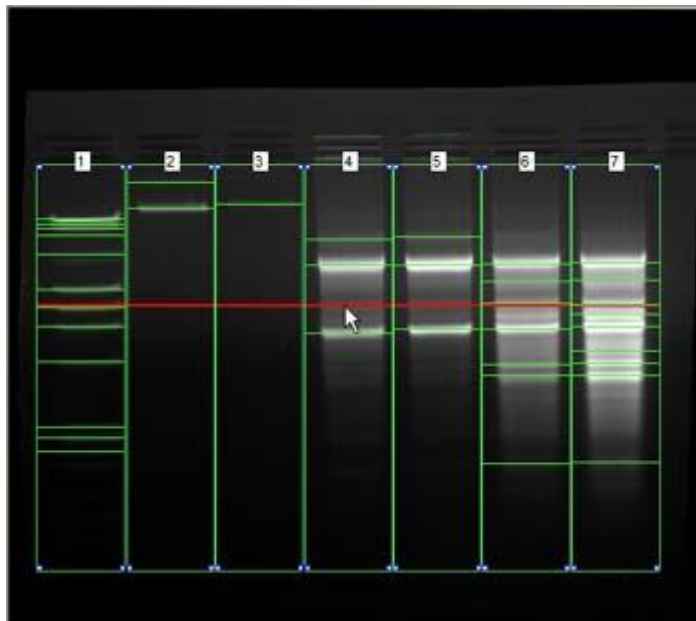
The dashboard details the edit band parameters:



- ⇒ Profile lane
- ⇒ Arrow or square cursor detection

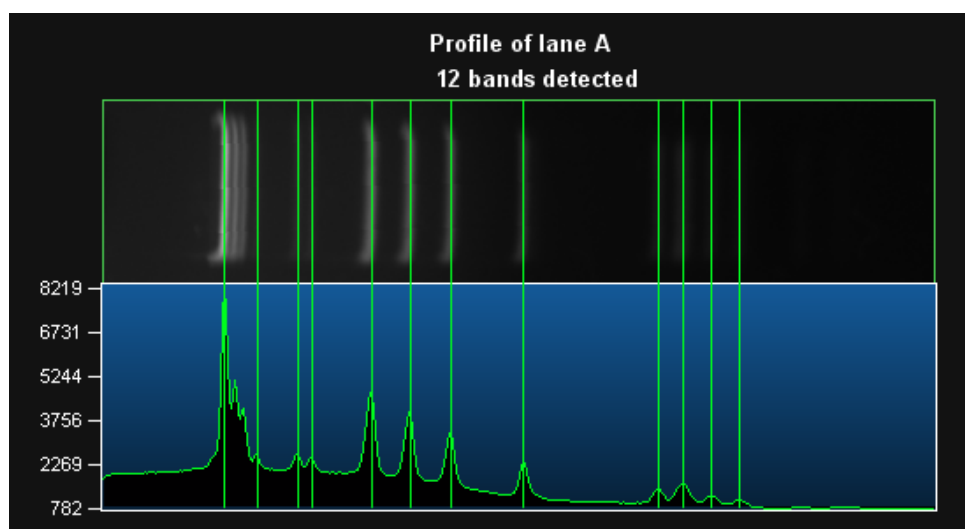
BAND DETECTION ON THE IMAGE

You can add or remove bands by clicking directly on the image. Place the cursor at the chosen location and click. The band is immediately added or removed. The red line allows you to check band alignment between lanes.

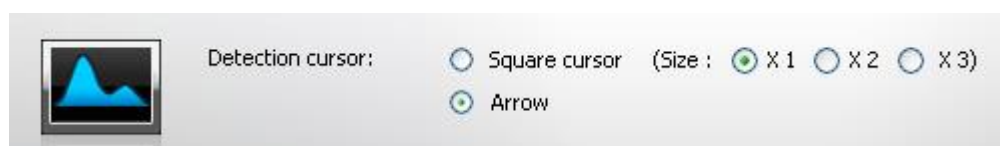


BAND DETECTION ON THE PROFILE

The profile is calculated based on the average intensity of each row of pixels across the specified width of the lane. A lane profile provides a visualisation of the intensity of the bands. Bands are represented by peaks.



You can add or remove bands by clicking directly on the profile. To proceed, select the cursor type:



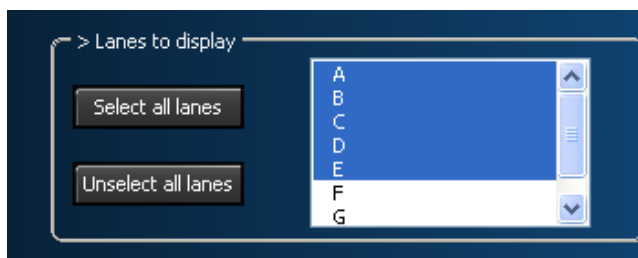
⇒ The linear cursor has the shape of an arrow (↔)

⇒ The rectangular cursor has the shape of a square (□)

Place the cursor at the chosen profile location and click. The detection line is automatically added or removed.

Note: For arrow cursor, the band is added at the cursor position.
For rectangular cursor, the band is added at the highest position within cursor bounds.

VISUALISATION OF THE PROFILES



In the profile parameter window, you can select the lanes' profile to be displayed. To do so, just click on the profile name to select or unselect the profiles.

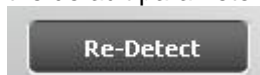
RESET

You can reset the detection by clicking on the "Reset" button. The detection lines will then be removed.



RE-DETECT

You can re-detect the bands by clicking the "Re-detect" button. The detection is based on the default parameters.



NEXT

The "Next" button validates your parameter and opens the following analysis step.



BACK

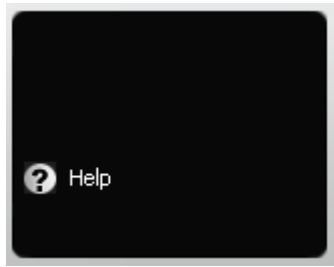
The "Back" button validates your parameter and opens the following analysis step.



OPTION FOLDER

The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



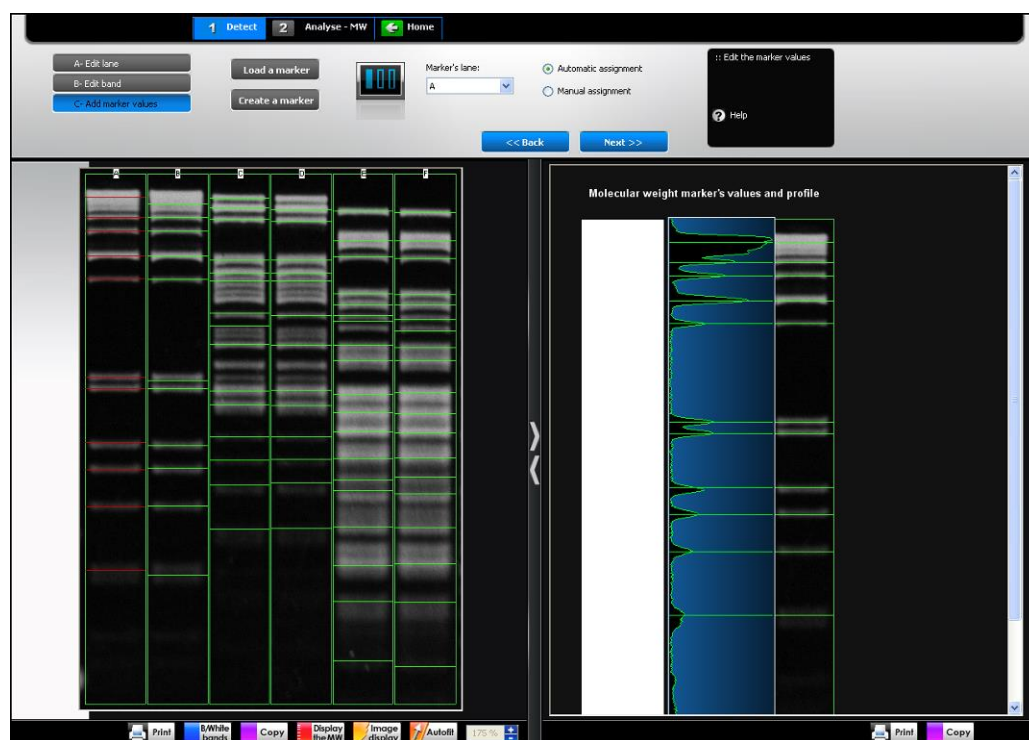
C – Add marker values

1

Detect

The marker values process follows the band detection. This function allows the assignment of the molecular weight marker's values to the bands of the marker lane.

Note: you can either access marker value menu by clicking on the next button of the band detection or directly on marker value tab.



The dashboard details the marker values parameters:



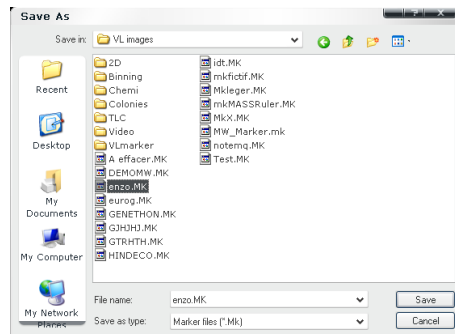
- ⇒ Load a marker
- ⇒ Create a marker
- ⇒ Select the marker's lane
- ⇒ Assign automatically a marker
- ⇒ Assign manually a marker

LOAD A MARKER

1. Click on the “Load a marker” button to open a marker value file.



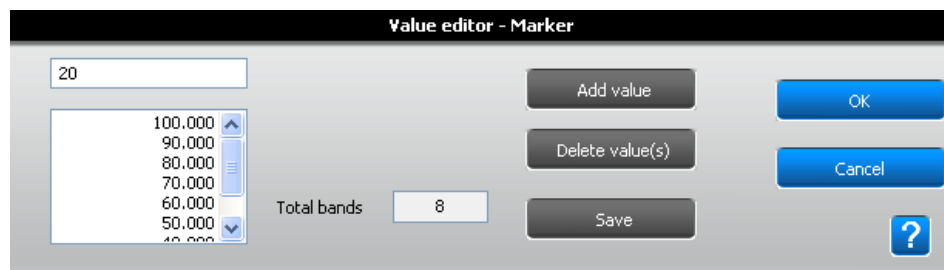
A pop-up window displays the following menu:



- ⇒ Browse to specify the marker directory
- ⇒ Double click on the file name you want to load

CREATE A MARKER

1. Click on the “Create a marker” button to create marker’s values.



Type your values, band to band, in a descending order. The OK button validates your data.

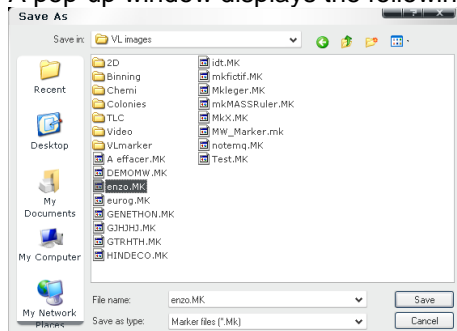
Note: A minimum of four values is necessary to validate the data.

Note: if an automatic calculation with immediate application of the standard values is carried out, it is not necessary to enter all the bands given by the manufacturer's specifications, but only those which are commonly found on the lanes of the gel.

You can save your molecular weights data and create your own marker library; To proceed, click on the “Save “ button:



A pop-up window displays the following menu:



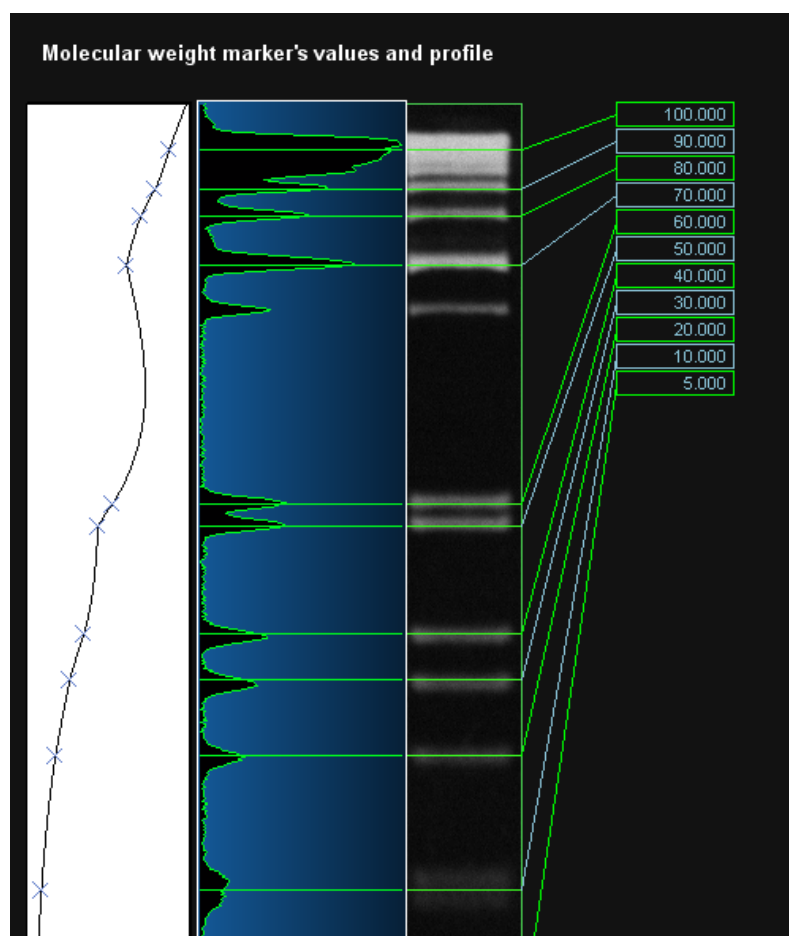
- ⇒ Browse to specify the directory
- ⇒ Type the file name and click on Save.

SELECT THE MARKER'S LANE

Select the lane corresponding to the molecular weight marker:



The migration curve is automatically displayed next to the lane's profile:



The migration curve allows to check the detection of value application errors, distortion errors, bad separation between the bands, or the quality of the standard itself.

Note: To delete the wrong data, you can either place the cursor arrow on the wrong value itself and click on it, or go for the manual assignment.

Note: The displayed migration curve is of the cubic spline type and must then include a minimum of 4 values.

Note: The minimum MW indicates the minimum molecular weight, which can be calculated, based on the marker's value assignment.

Note: The maximum MW indicates the maximum molecular weight, which can be calculated, based on the marker's value assignment.

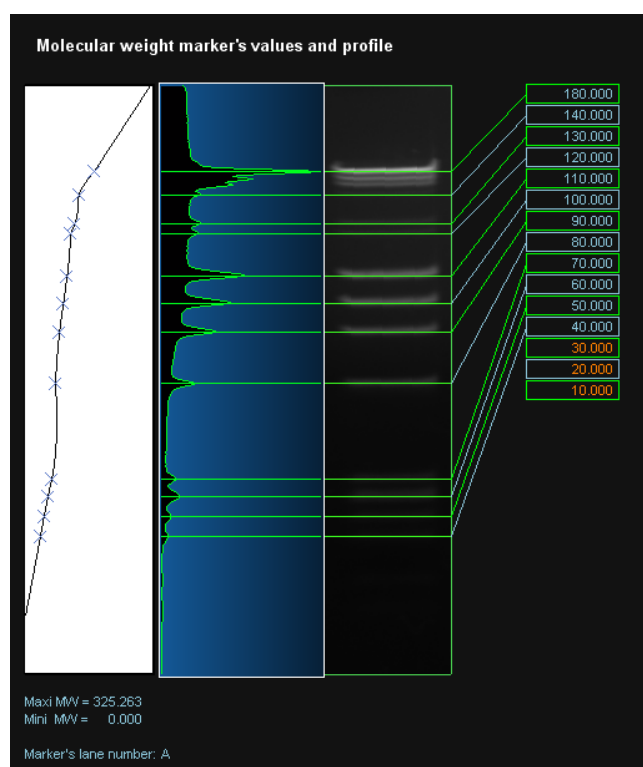
ASSIGN THE MARKER VALUES TO THE BAND

Assign manually the marker values to the lane by selecting the appropriate option:

☒ Automatic assignment

☐ Manual assignment

For manual assignment, click first on the molecular weight's value to be assigned. The value is highlighted in red. Then, click on the corresponding lane. The value is assigned to the lane:



NEXT

The "Next" button validates your parameter and opens the following analysis step.

| | | |
|-----------------------|-------------------------------|-------------------------------|
| C – Add marker values | Next >> | 2- Analyse - MW A- results |
|-----------------------|-------------------------------|-------------------------------|

BACK

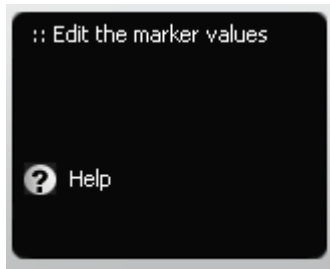
The “Back” button validates your parameter and opens the following analysis step.

| | | |
|-------------------|---|-------------------|
| C – Marker values |  | B- Band detection |
|-------------------|---|-------------------|

OPTION FOLDER

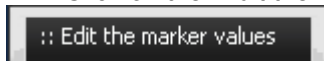
The option folder gathers the following functions:

⇒ Help

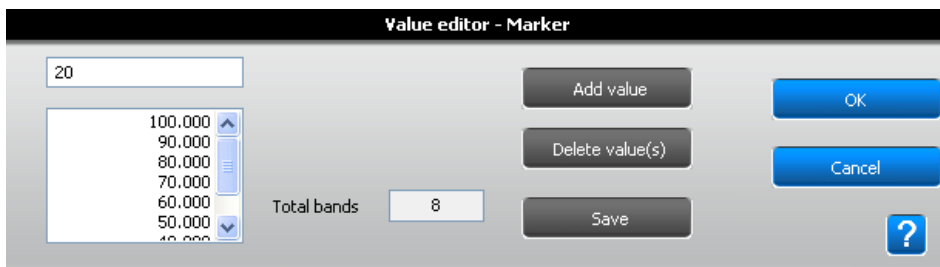


EDIT THE MARKER VALUES

1. Click on the “Edit the marker values” button.



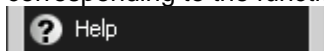
2. A pop-up window displays the following menu on which you can modify the marker values:

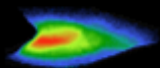


You can add, remove, and save your marker values;

HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function





2- ANALYSE – MOLECULAR WEIGHT

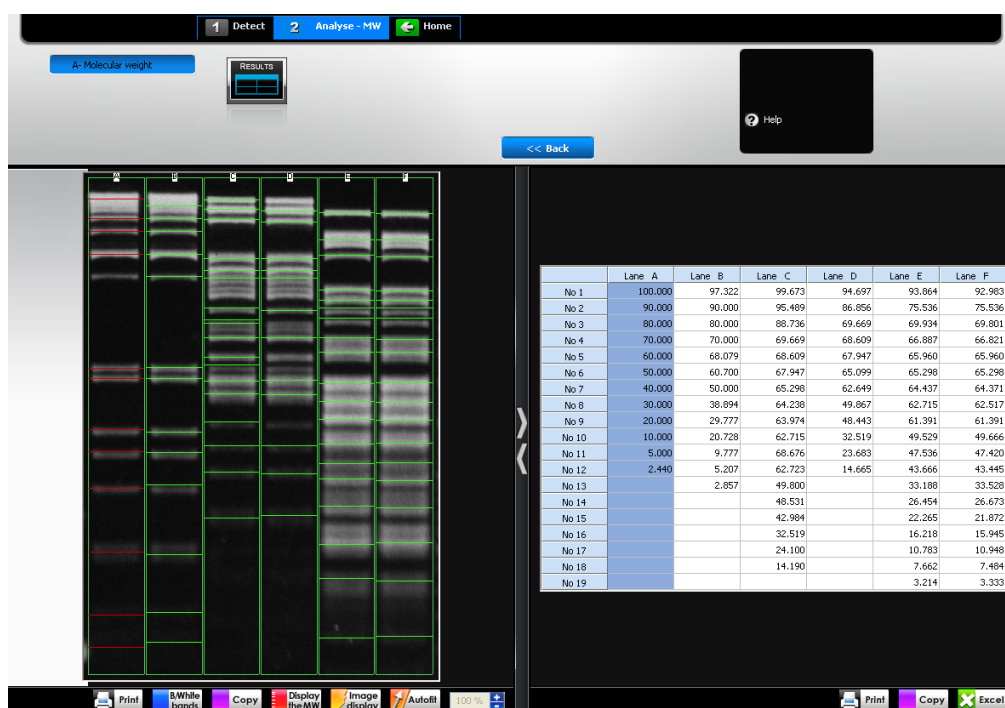
A – Molecular weight results

2

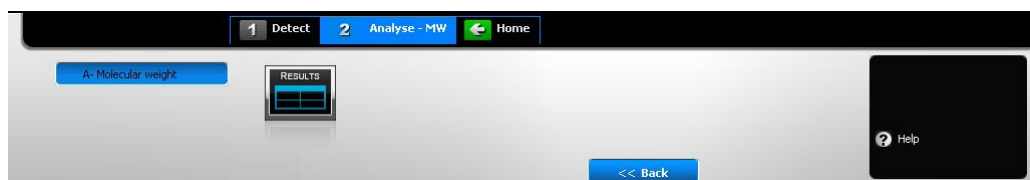
Analyse - MW

The molecular weight results process follows the marker's value assignment.

Note: you can either access the molecular weight results by clicking on the next button of the marker's value assignment or directly by clicking on the Molecular weight tab of the 2-Analyse-MW folder.



The dashboard details the molecular weight results parameters:



BACK

The “Back” button validates your parameter and opens the following analysis step.

2- Analyse – MW
A-Molecular weight

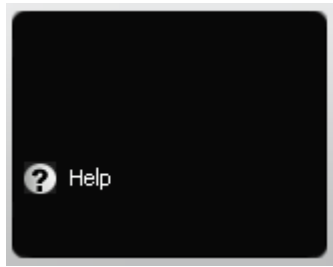
<< Back

1- Detect
C- Marker values

OPTION FOLDER

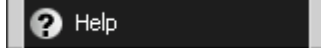
The option folder gathers the following functions:

⇒ Help



HELP MENU

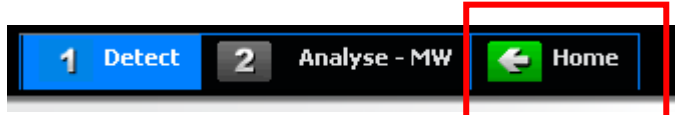
Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function

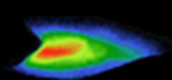


Return to the Capt acquisition module



To return to the Capt acquisition module, select Home Exit from the dash menu.





VISION-CAPT

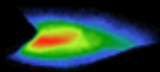
COLONY COUNTING ANALYSIS MODULE

Objectives and output

The Capt Advance Colony counting module features the calculation of the number of colonies and their characteristics (Automatic colony counting) or the manual counting of colonies with the mouse (Manual colony counting).

At the end of the process, you can have the following outputs:

- Number of colonies of type I (detected as green)
- Number of colonies of type II (detected as red)



AUTOMATIC COUNTING

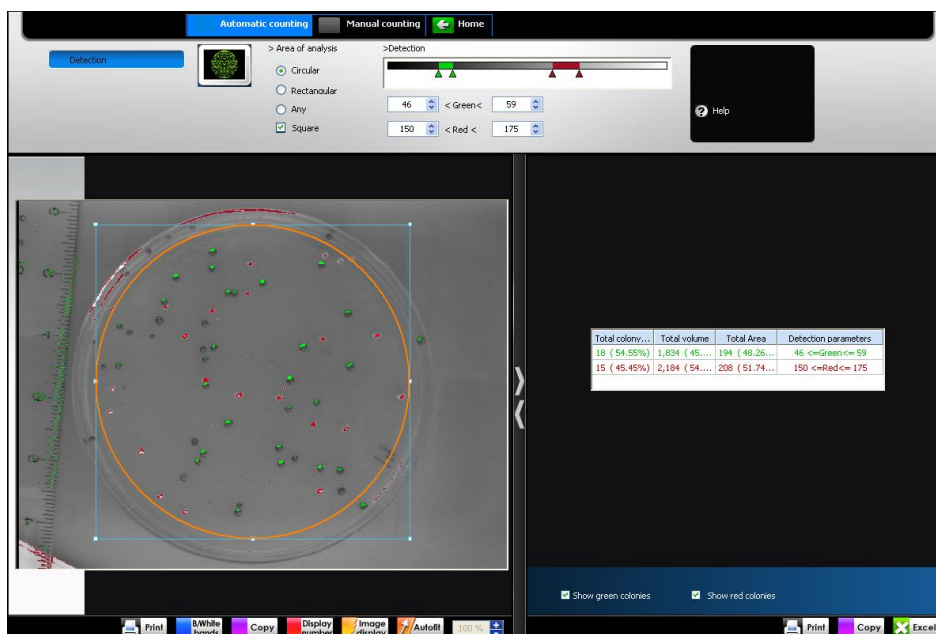
Detection



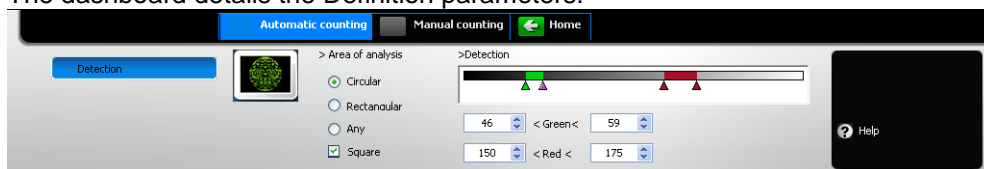
The detection process automatically identifies all the colonies for a defined area of analysis lanes. The colonies will be automatically detected when you first access the automatic counting.

Two types of colonies can be detected:

- Type A called green type, overlaid on green on the image.
- Type B, called red type, overlaid on red on the image.



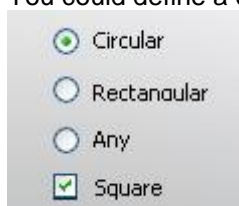
The dashboard details the Definition parameters:



- ⇒ Define the area of analysis
- ⇒ Adjust the detection parameters

DEFINE THE AREA OF ANALYSIS

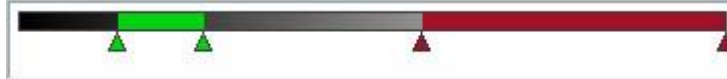
You could define a circular, a rectangular or a free form area of analysis:



To define a free form, click on the first point of the area on the image. Move the cursor to define one edge of the area. Validate this edge by clicking once. Then, repeats this procedure as many times as necessary.
Select the "Square" option to obtain a circle instead of an ellipse or a square instead of a rectangle.

ADJUST THE DETECTION PARAMETERS

The detection parameters are summarised in the following bar graph:



The green and red areas represent the grey level range used to determine both kinds of colonies.

Click on the colored triangle and drag them to a new place to modify the detection range. A preview of the detection is displayed on the image.

Note: you could also type the grey level range in the detailed green and red parameters:

| | | |
|-----|-----------|-----|
| 35 | < Green < | 66 |
| 145 | < Red < | 255 |

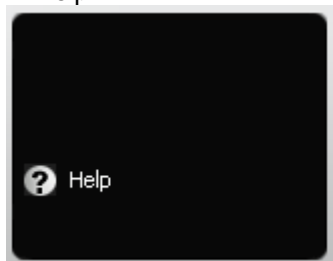
RESULT TABLE

In the result parameter window, you can select the type of colony (both, only red, only green).

OPTION FOLDER

The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the "Help" button. You automatically access the user manual at the chapter corresponding to the function

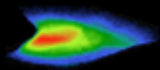


Return to the Capt acquisition module



To return to the Capt acquisition module, select Home Exit from the dash menu.



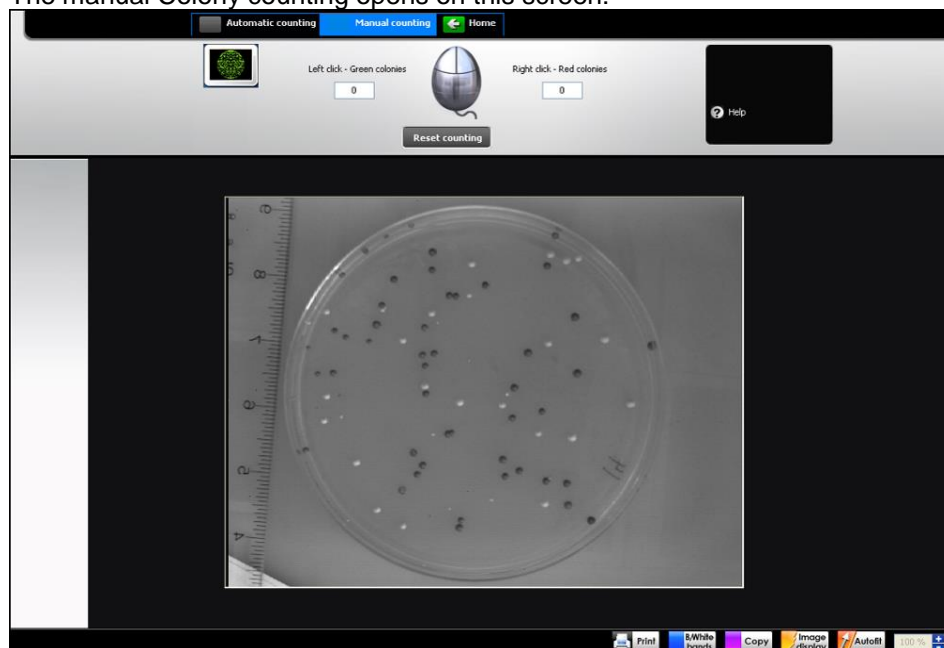


MANUAL COUNTING

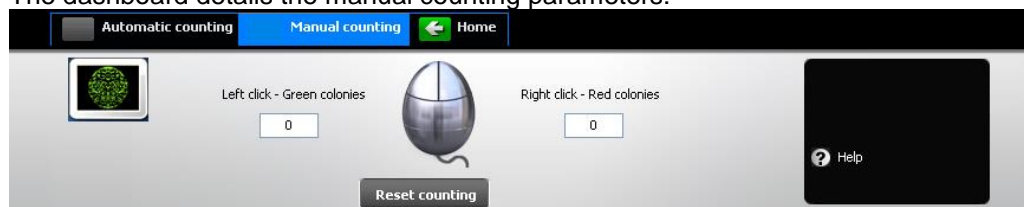
Manual counting



The manual Colony counting opens on this screen:



The dashboard details the manual counting parameters:



- ⇒ Left click for green type colonies
- ⇒ Right click for red type colonies
- ⇒ Reset counting

LEFT CLICK FOR GREEN TYPE COLONIES

Click on the left mouse button to count a green type colony. The colony is then added to the green type counter:

47

Note: you can cancel a counted colony by clicking once again with the left mouse button.

RIGHT CLICK FOR RED TYPE COLONIES

Click on the right mouse button to count a red type colony. The colony is then added to the red type counter:

24

Note: you can cancel a counted colony by clicking once again with the right mouse button.

RESET COUNTING

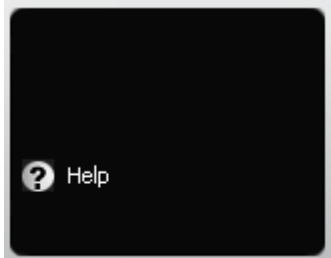
The "Reset" button restores the counters to zero.

A rectangular button with a grey gradient and the text "Reset counting" in white.

OPTION FOLDER

The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the "Help" button. You automatically access the user manual at the chapter corresponding to the function

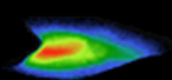


Return to the Capt acquisition module



To return to the Capt acquisition module, select Home Exit from the dash menu.





VISION-CAPT

DISTANCE CALCULATION MODULE

Objectives and output



The Capt Advance Distance module features the calculation of electrophoretic distances according to markers or standards:

- in R.F. values (values between 0 and 1)
- in isoelectric points (pH units)

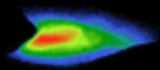
This function allows the assignment of RF values to the detected bands. To do so, an origin line and a front line must be defined. Usually the origin is set to value 0 and the front to 1, but the Capt Advance allows you to set your own values for origin and front lines.

At the end of the process, you can have the following outputs:

- Profile and migration curve
- Calculated distance in between a front line and an end line.

The distance calculation process follows the band detection:

Note: you can access the distance menu by clicking directly on the distance tab.

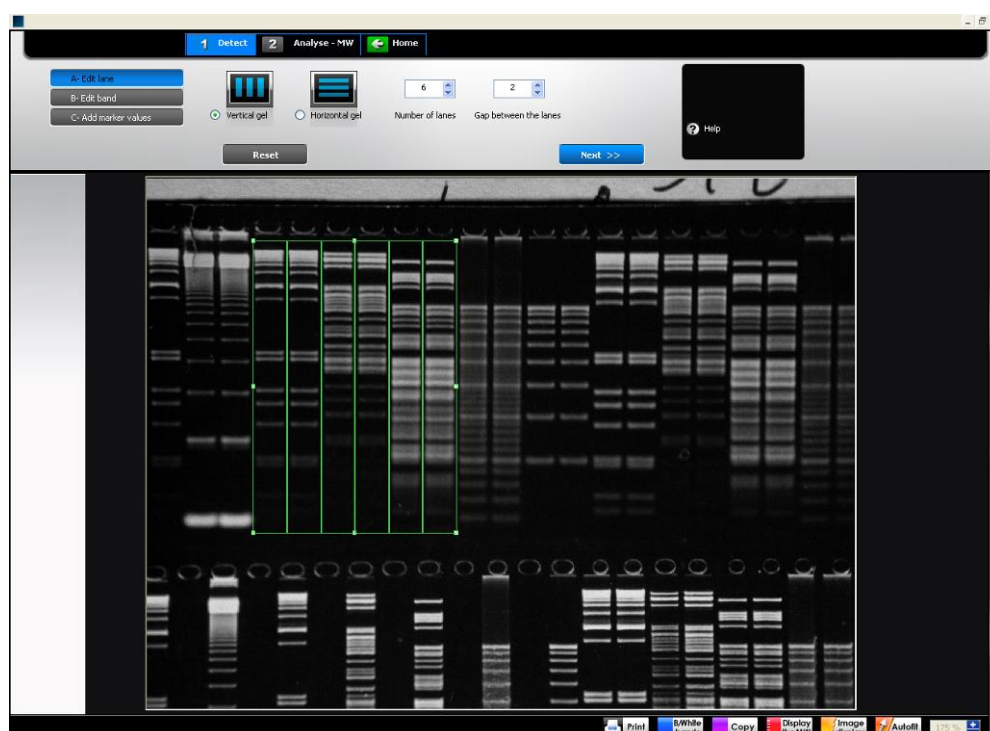


1- DETECT

A – Edit lane

1 Detect

The distance module opens on the Edit lane dashboard of the Detect process:



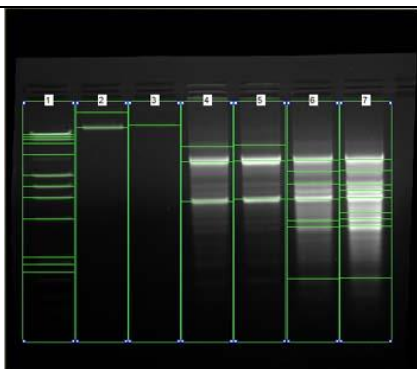
The dashboard details the lane edition parameters:



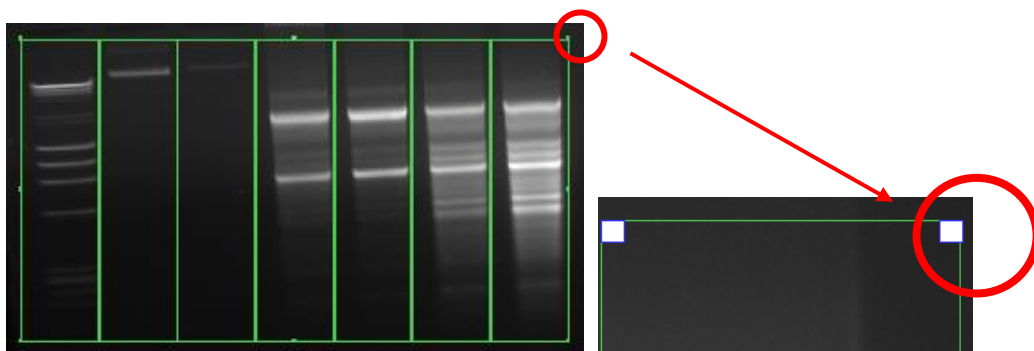
- ⇒ Lane direction
- ⇒ Number of lanes
- ⇒ Gap between the lanes

AREA OF INTEREST

On the image, click and drag to define the analysis area and to overlap the lanes. You can easily adjust the size of the area by clicking on the tags surrounding the area and drag the selected border to the requested size.

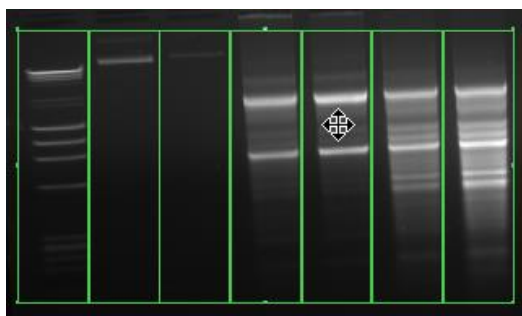


The lanes are defined by green lines, overlaid on the gel image. The gel area is surrounded by square anchors:



To resize the entire lane frame, drag an anchor point in or out. The opposite anchor point will remain fixed while the frame expands or contracts. The frame will expand or contract from the center.

To move the entire frame to a new position, position the mouse on the frame to obtain a cross cursor:



Click and drag the cursor to move the entire frame.

Note: it is not necessary to include the well line in the area of interest window. The calculation of molecular weight does not require this reference line.

LANE DIRECTION

Select the direction of the lanes from:



- ⇒ Horizontal
- ⇒ Or vertical



The lane direction is automatically modified on the image.

NUMBER OF LANES

Select the number of lanes:



 

Number of lanes

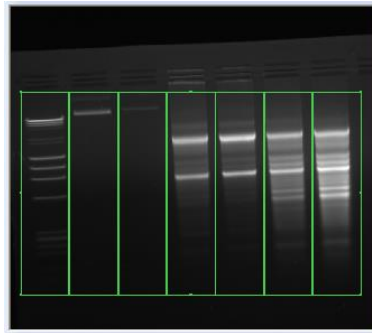
The number of lane is automatically modified on the image.

GAP BETWEEN THE LANES

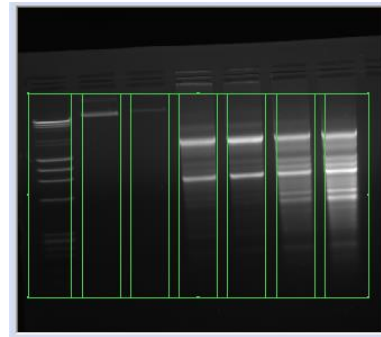
Define the gap between the lanes:

Gap between the lanes



Short gap



Large gap

The gap between the lanes is automatically modified on the image.

RESET

The “Reset” button restores the default lane detection parameters.



NEXT

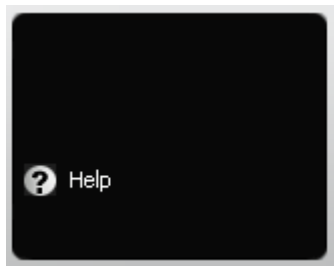
The “Next” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|---------------|
| A- Edit lane |  | B – Edit band |
|--------------|---|---------------|

OPTION FOLDER

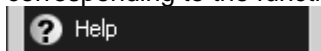
The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



B – Edit band

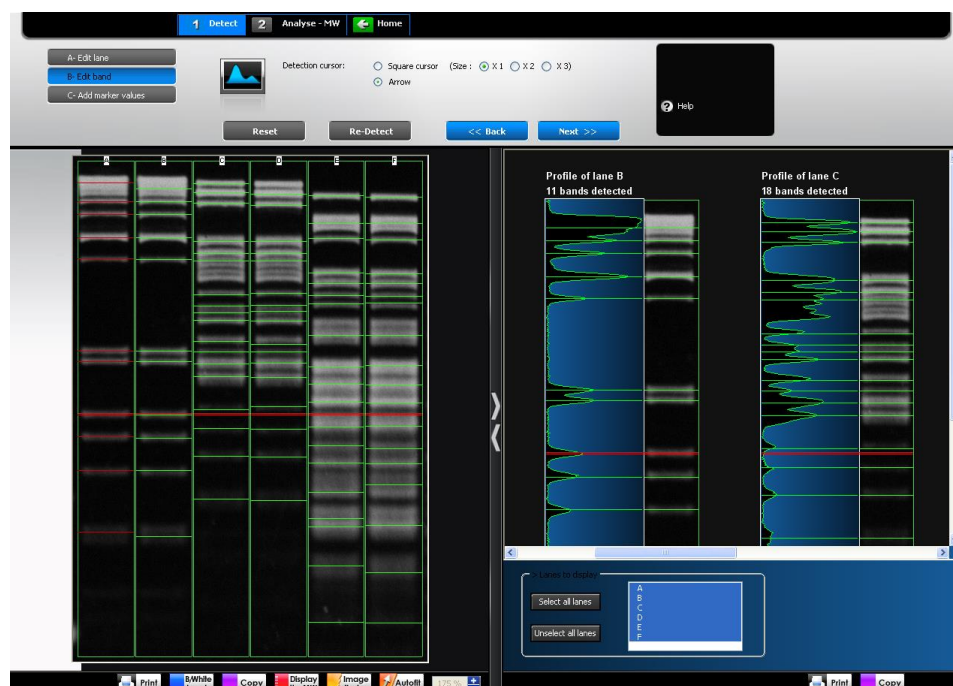
1 Detect

The Edit band process follows the lane definition:

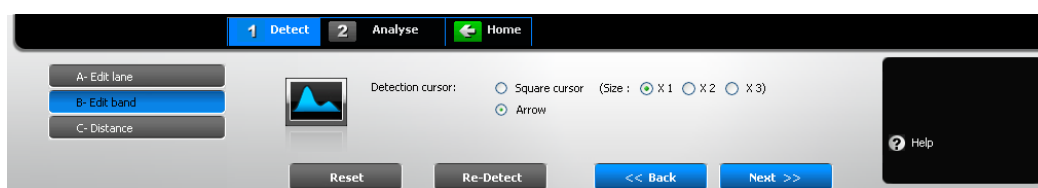
The edit band process automatically identifies all the bands for the defined lanes. You can also manually mark the bands on the image or on the lane's profile. All bands will be automatically detected when you first access the band detection process, based on default parameters.

The bands are marked by green lines, overlaid on the gel image.

Note: you can either access the lane definition menu by clicking on the next button of the lane definition or directly on the band detection tab.



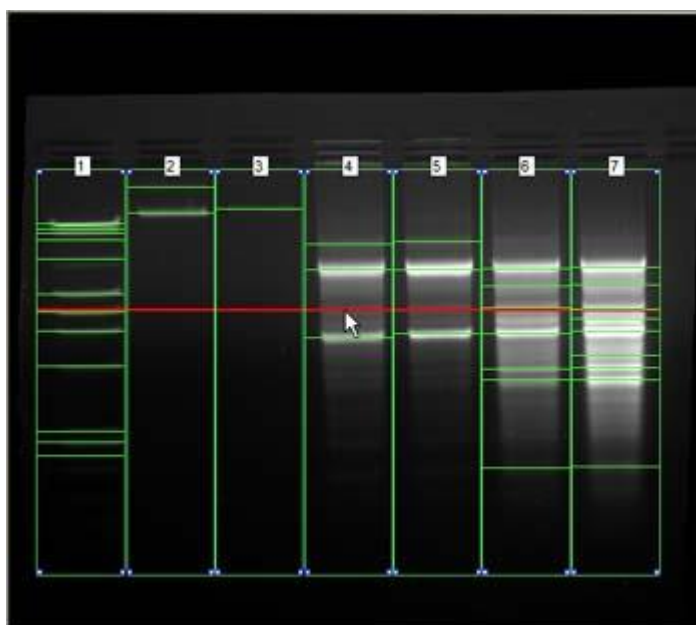
The dashboard details the edit band parameters:



- ⇒ Profile lane
- ⇒ Arrow or square cursor detection

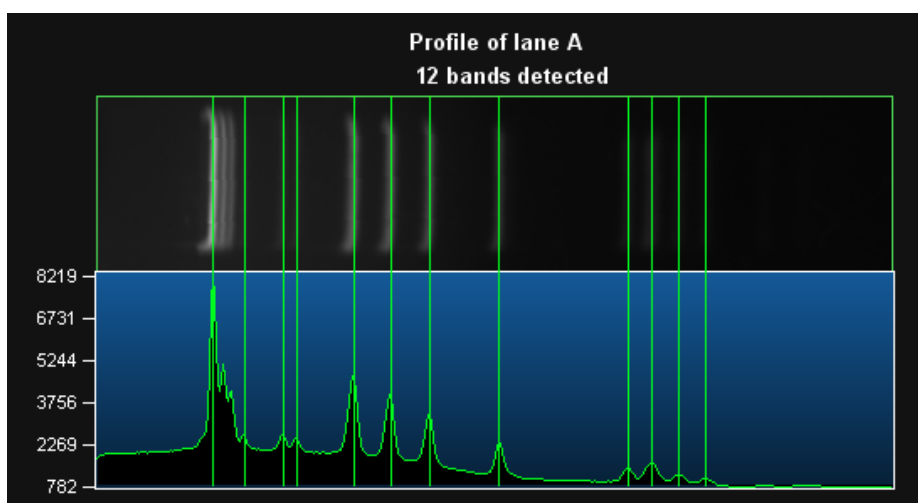
BAND DETECTION ON THE IMAGE

You can add or remove bands by clicking directly on the image. Place the cursor at the chosen location and click. The band is immediately added or removed. The red line allows you to check band alignment between lanes.

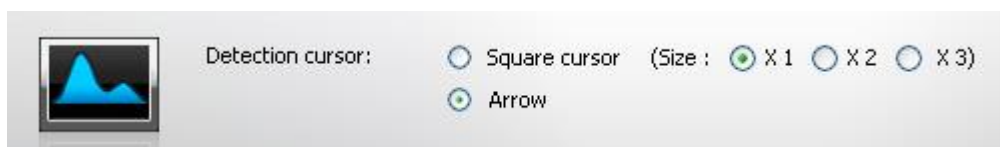


BAND DETECTION ON THE PROFILE

The profile is calculated based on the average intensity of each row of pixels across the specified width of the lane. A lane profile provides a visualisation of the intensity of the bands. Bands are represented by peaks.



You can add or remove bands by clicking directly on the profile. To proceed, select the cursor type:



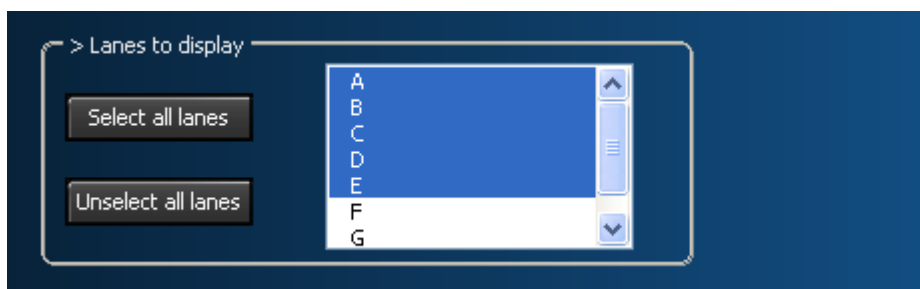
The linear cursor has the shape of an arrow (↔)

The rectangular cursor has the shape of a square (□)

Place the cursor at the chosen profile location and click. The detection line is automatically added or removed.

Note: For arrow cursor, the band is added at the cursor position.
For rectangular cursor, the band is added at the highest position within cursor bounds.

VISUALISATION OF THE PROFILES



In the profile parameter window, you can select the lanes' profile to be displayed. To do so, just click on the profile name to select or unselect the profiles.

You can also define the way the profiles are displayed:

- Only the profile
- Only the image
- Both the profile and the image
- In an horizontal way
- In a vertical way
- Stacked the profiles of the selected lanes

RESET

You can reset the detection by clicking on the "Reset" button. The detection lines will then be removed.




RE-DETECT

You can re-detect the bands by clicking the "Re-detect" button. The detection is based on the default parameters.



NEXT

The “Next” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|--------------|
| B- Edit band |  | C – Distance |
|--------------|---|--------------|

BACK

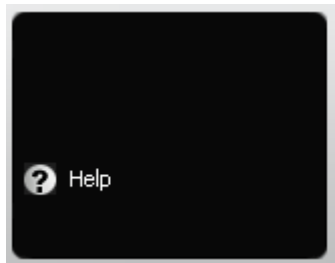
The “Back” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|---------------------|
| B- Edit band |  | A - Lane definition |
|--------------|---|---------------------|

OPTION FOLDER

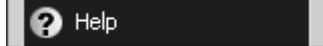
The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



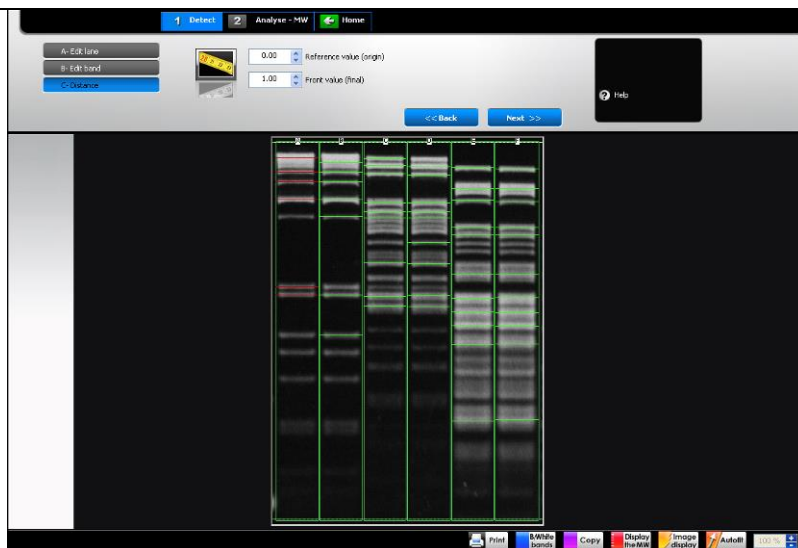
C – Distance

1 Detect

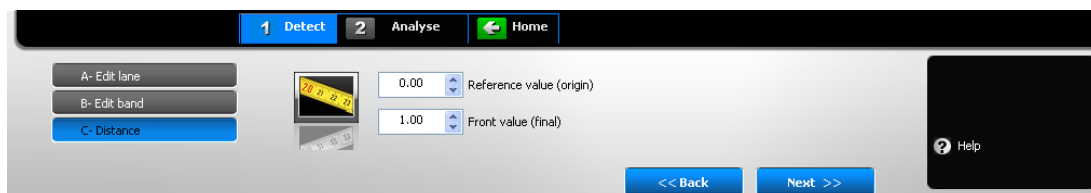
The Distance process follows the band detection.

This function allows the assignment of RF values to the detected bands. To do so, an origin line and a front line must be defined. Usually the origin is set to value 0 and the front to 1, but the Capt Advance allows you to set your own values for origin and front lines.

Note: you can either access marker value menu by clicking on the next button of the band detection or directly on marker value tab.



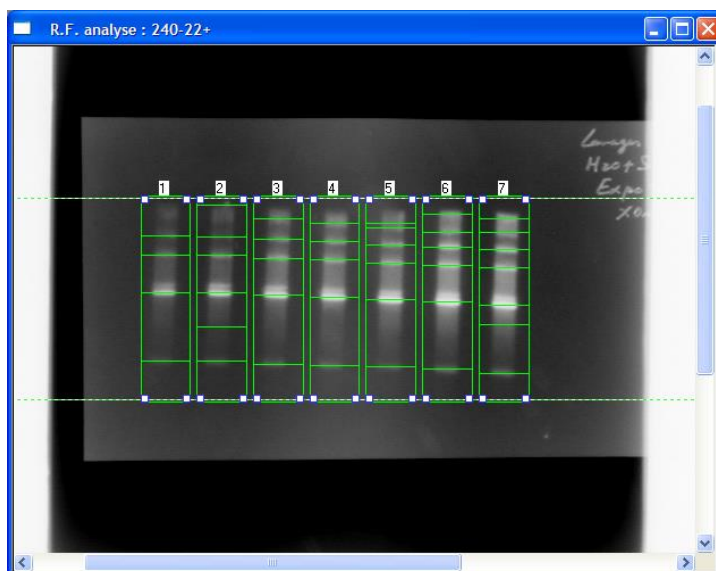
The dashboard details the marker values parameters:



- ⇒ Define the reference value
- ⇒ Define the front value

DEFINE THE REFERENCE AND THE FRONT VALUES

An origin and a front line are displayed on the image:



Click on the first line, keep pressed the left mouse button, and move it to the location for the origin line. Then, release the button.

Click on the second line and move it to the location for the migration front. Then, release the button. The R.F. values are assigned to the bands.

Select the value for the origin and the value the end.




0.00 Reference value (origin)

1.00 Front value (final)

NEXT

The “Next” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|--------------------------|
| C – Distance |  | 2- Analyse A- results |
|--------------|---|--------------------------|

BACK

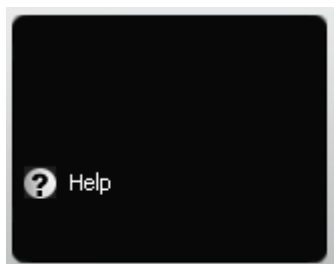
The “Back” button validates your parameter and opens the following analysis step.

| | | |
|--------------|---|-------------------|
| C - Distance |  | B- Band detection |
|--------------|---|-------------------|

OPTION FOLDER

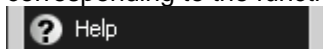
The option folder gathers the following functions:

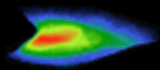
⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function





2- ANALYSE – DISTANCE

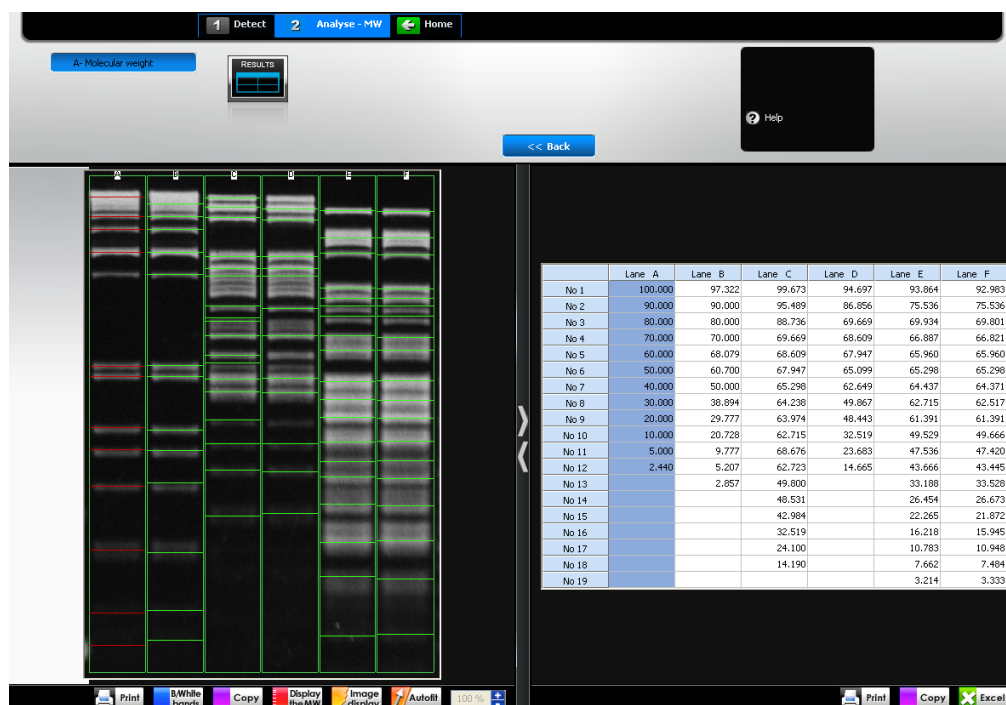
A – Distance results

2

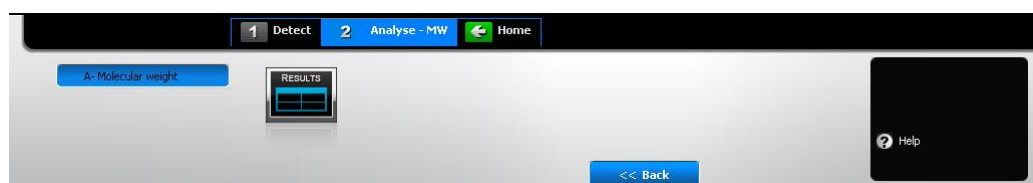
Analyse

The Distance results process follows the marker's value assignment.

Note: you can either access the molecular weight results by clicking on the next button of the marker's value assignment or directly by clicking on the Molecular weight tab of the 2-Analyse-MW folder.



The dashboard details the molecular weight results parameters:



BACK

The "Back" button validates your parameter and opens the following analysis step.

2- Analyse – MW
A-Molecular weight

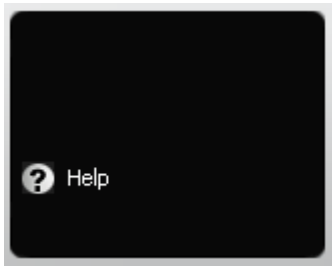
<< Back

1- Detect
C- Distance

OPTION FOLDER

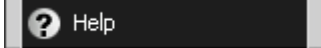
The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function

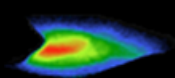


Return to the Capt acquisition module



To return to the Capt acquisition module, select Home Exit from the dash menu.





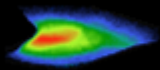
VISION-CAPT

OPTICAL DENSITY 1D ANALYSIS MODULE

Objectives and output

The Capt Advance Optical density /1D module features the quantification of spot in volume, percentage.

At the end of the process, you can have the following outputs:
- Lane's volume and concentration



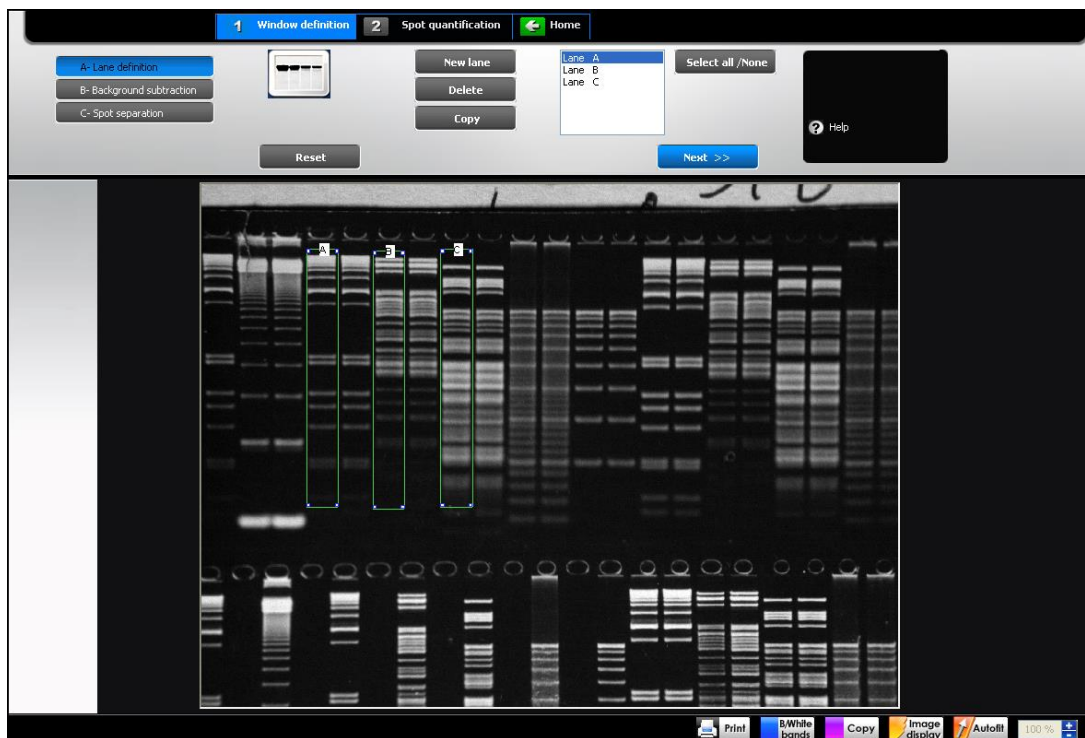
1- WINDOW DEFINITION

A – Lane definition

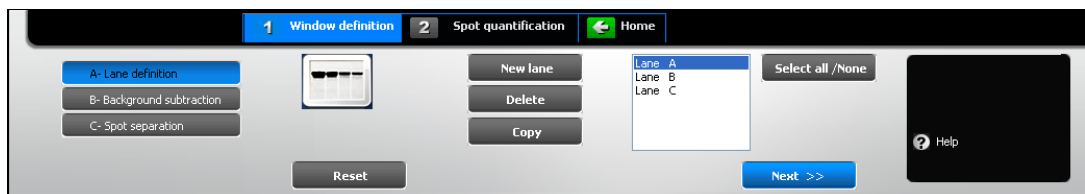
1

Window definition

The Optical Density / 1D module opens on the Lane definition dashboard of the Window definition process:



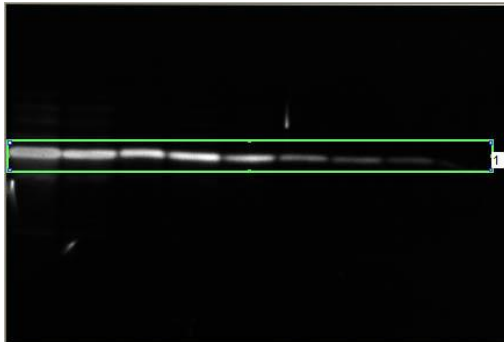
The dashboard details the lane definition parameters:



- ⇒ New lane
- ⇒ Delete
- ⇒ Copy
- ⇒ Select / unselect all lanes

DEFINE A NEW LANE

On the image, click on the top left corner of the lane, then drag to define the size of the analysis area. You can easily adjust the size of the area by clicking on the tags surrounding the area and drag the selected border to the requested size.

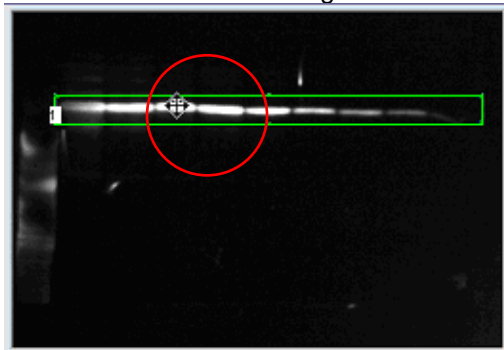


The lane is defined by green lines, overlaid on the image. The area is surrounded by square anchors:



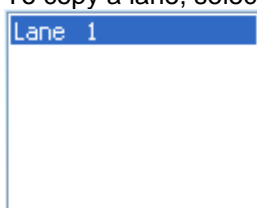
To resize the entire lane frame, drag an anchor point in or out. The opposite anchor point will remain fixed while the frame expands or contracts. The frame will expand or contract from the centre.

To move the entire frame to a new position, position the mouse on the frame to obtain a cross cursor: Click and drag the cursor to move the entire frame.

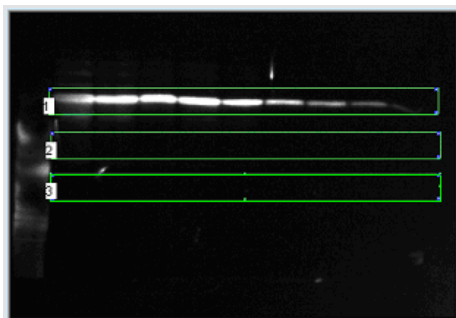


COPY A LANE

To copy a lane, select the lane in the lane list:



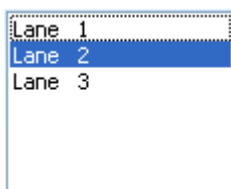
Click on the Copy button. The lane is then duplicated:



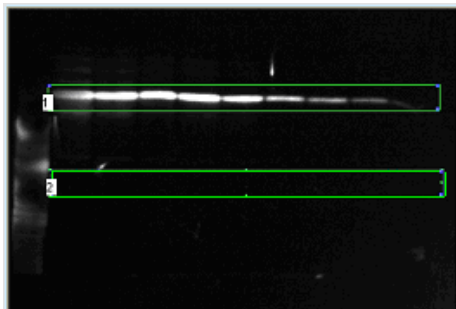
The number of lanes is automatically modified in the lane list.
You can move the lane frame to a new position. In order to do so, position the mouse on the. Click and drag the cursor to move the frame.

DELETE A LANE

To delete a lane, select the lane in the lane list:



Click on the Delete button. The lane is then deleted.



The number of lanes is automatically modified in the lane list.
You can move the lane frame to a new position. In order to do so, position the mouse on the. Click and drag the cursor to move the frame.

NEXT

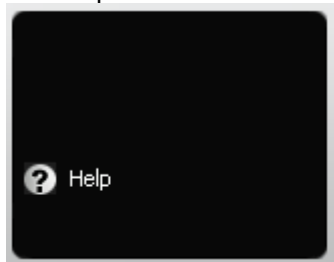
The “Next” button validates your parameter and opens the following analysis step.



OPTION FOLDER

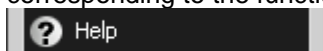
The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



B – Background subtraction

1

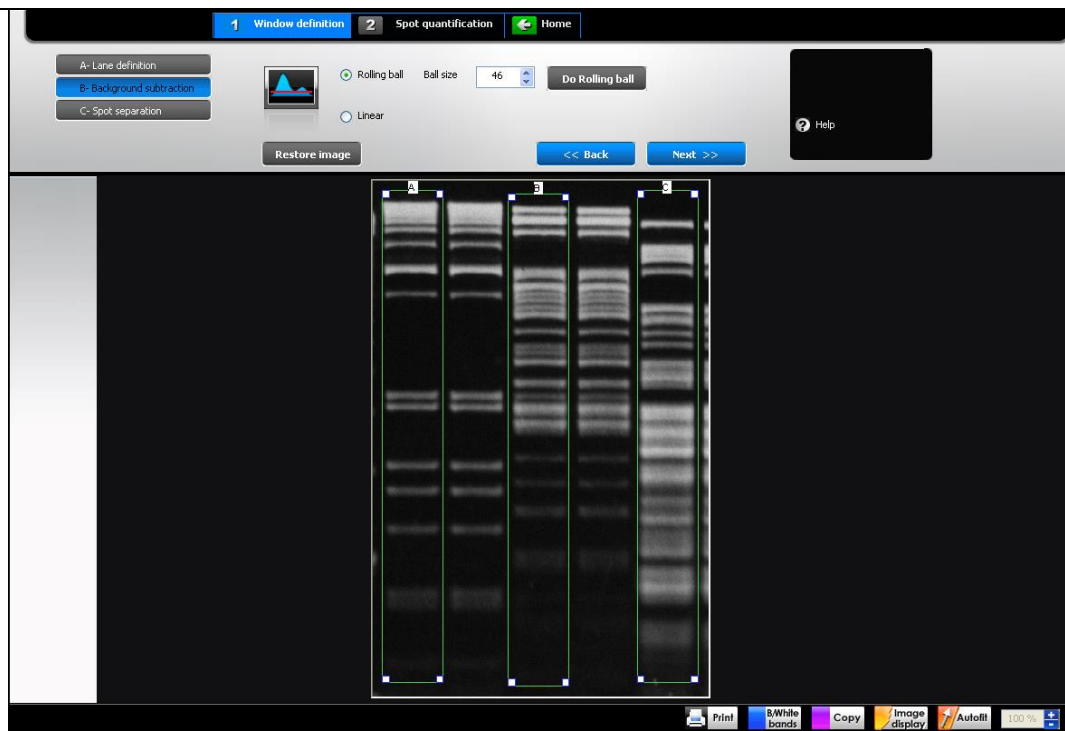
Windows
definition

The background subtraction process follows the lane definition.

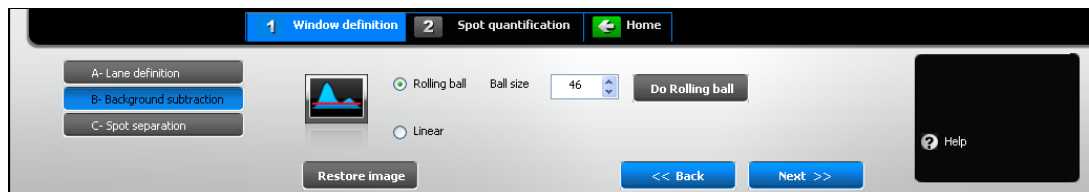
Image background interferes with quantification and data analysis such. Background could results from gel opacity, random signal noise, opacity of the carrier medium (film, gel matrix, or blot matrix) or film fogging.

As image background interferes with quantification and data analysis, we recommend performing a background subtraction before any peak volume quantification. Capt advance has several approaches for subtracting background intensity from gel images. You can either subtract background for the whole image or for individual lanes.

Note: As background subtraction permanently changes the image, this is not possible to save the image with a processed background subtraction. However, the process can be saved by saving the complete analysis through the Save analysis process.

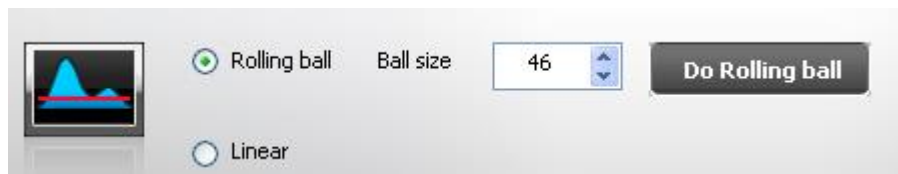


The dashboard details the noise subtraction parameters:



Capt Advance has several functions to minimise image background.

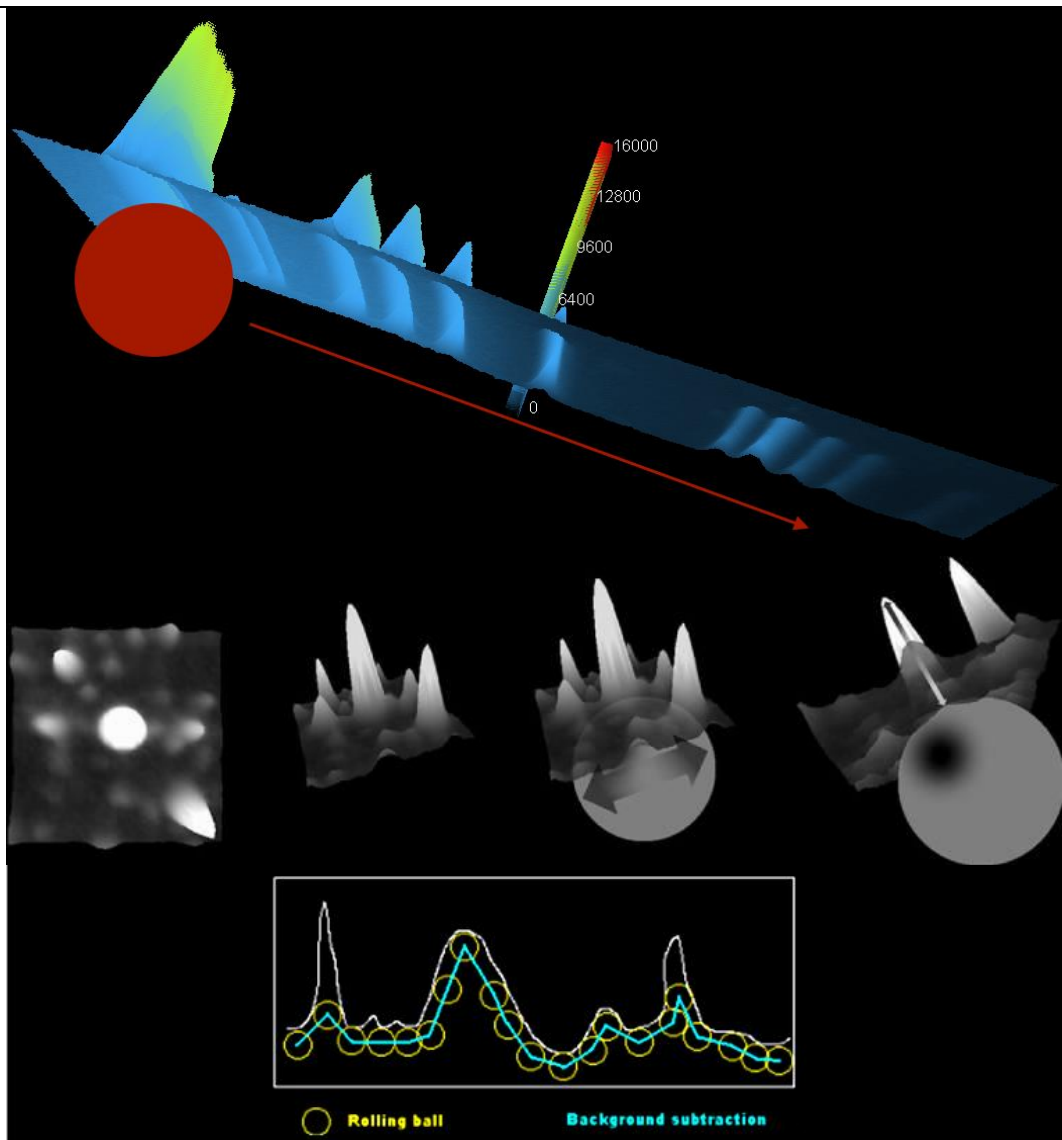
- ⇒ The rolling ball approach
- ⇒ The linear approach



ROLLING BALL

The rolling ball method is named for a hypothetical ball that rolls along underneath the lane profile, removing the intensity levels along the length of the lane.

The rolling ball subtraction method removes background levels along the length of the lanes according to the size of a virtual ball. The ball is rolled under each profile of the image so its movement varies along the image. The ball follows the profile trace, touching fewer points along the trace and removing the lower part of the points which defined the subtracted background.



The centre of gravity of the ball describes a curve:

- ⇒ This curve represents the noise to be subtracted.
- ⇒ The curve depends on the size of the ball and on the size of the peaks.

The size of the ball affect the position and movements of the centre of gravity and thus it determined how much background will be subtracted. A smaller disk will more closely follow the profile trace, removing more background. A disk radius that is too large will result in poor background removal. A disk radius that is too small may subtract actual data.

The Capt Advance calculates automatically the ideal parameter for background subtraction. This could be manually modified by adjusting the spot size:

Ball size

To process the rolling ball background subtraction, click on the “Do rolling ball” button:

Do Rolling ball

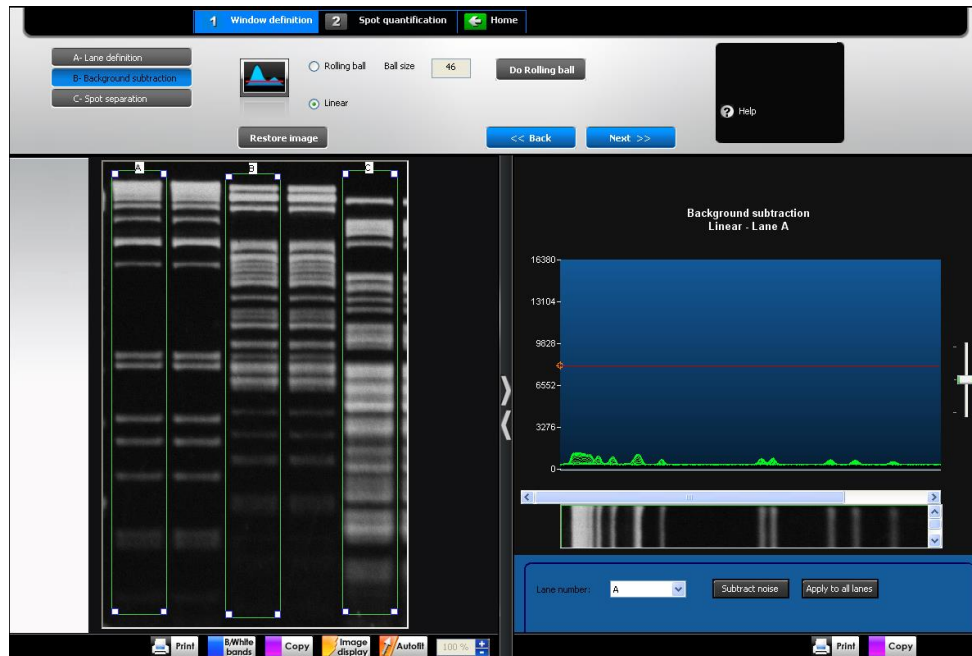
The changes will be automatically applied to the image.

Note: few seconds could be necessary to perform the background subtraction.

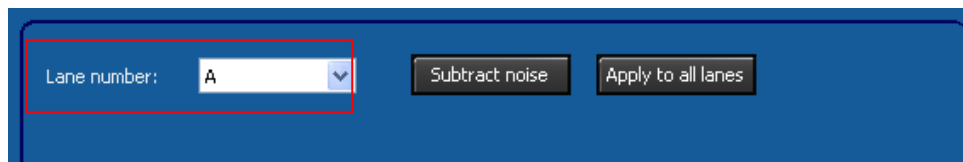
LINEAR APPROACH

The linear approach is a lane-based background subtraction. It allows to manually define the level of noise to be subtracted on the lane profile. This option gives you the opportunity to set different background subtraction levels for each lane.

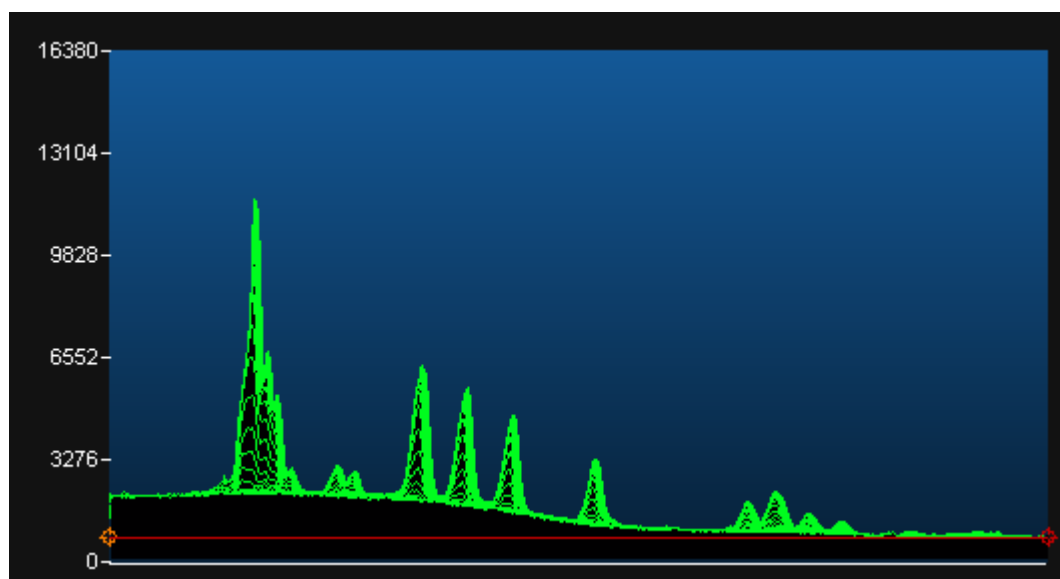
Click on the “Linear ” button:
It opens the lane profile window:



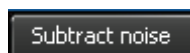
In the profile parameters window, select the lane to perform the linear approach:



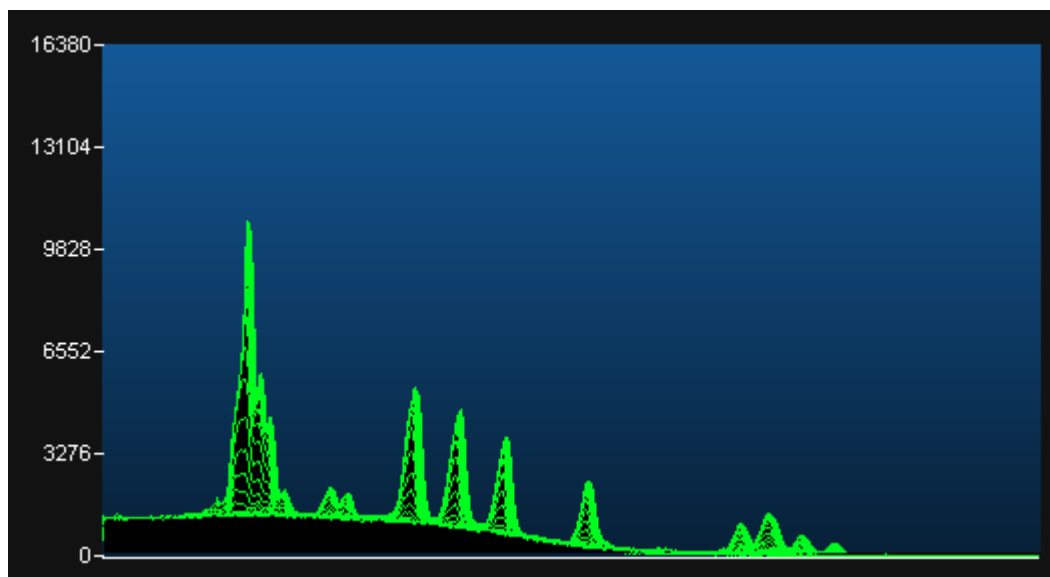
On the profile, click to define the background linear level you want to remove:



Then, click on Subtract noise:



The changes will be automatically applied to the image and to the profile:



The linear approach is a lane-based background subtraction. You can set the same subtraction level for all lanes or specify an individual subtraction level for the selected lane. Any changes you make will be automatically applied to the image.

To apply the same subtraction level for all lanes, click on the “Apply to all lanes” button:

Apply to all lanes

NEXT

The “Next” button validates your parameter and opens the following analysis step.

| | | |
|-----------------------------|-------------------------------|--------------------|
| 1B – Background subtraction | Next >> | 1C-Spot separation |
|-----------------------------|-------------------------------|--------------------|

BACK

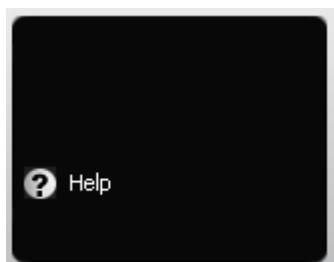
The “Back” button validates your parameter and opens the following analysis step.

| | | |
|-----------------------------|-------------------------------|----------------------|
| 1B – Background subtraction | << Back | 1A - Lane definition |
|-----------------------------|-------------------------------|----------------------|

OPTION FOLDER

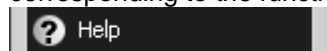
The option folder gathers the following functions:

⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function



C –Spot separation

1

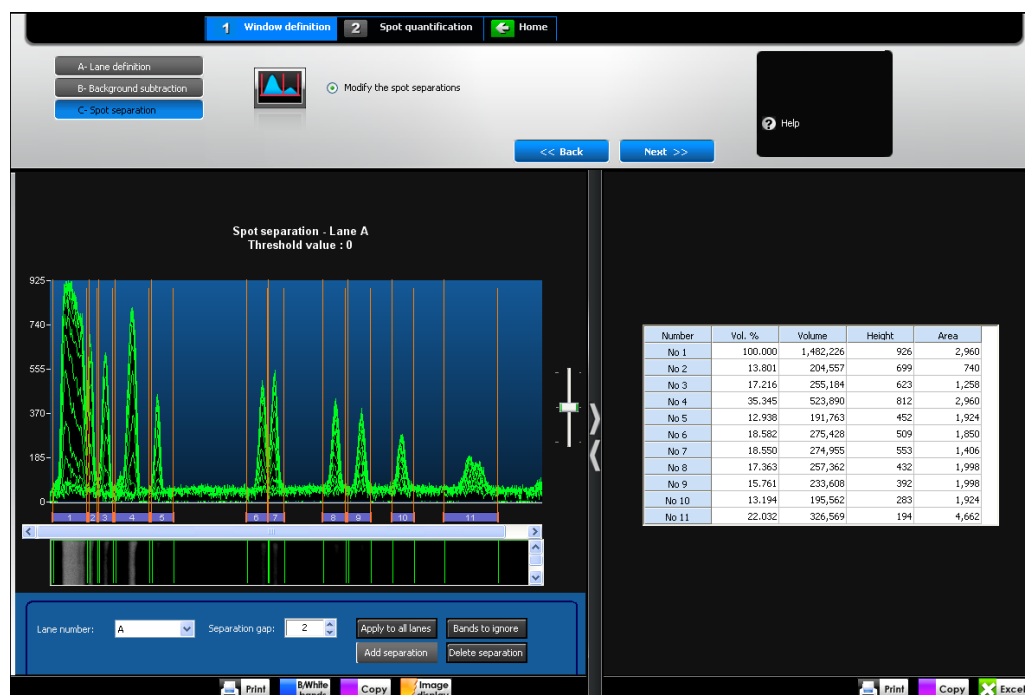
In order to measure the volume of a particular spot, you need:

- ⇒ To define the boundary around the spot;
- ⇒ To compare the intensity data inside the boundary with the data of other spots or of a standard.

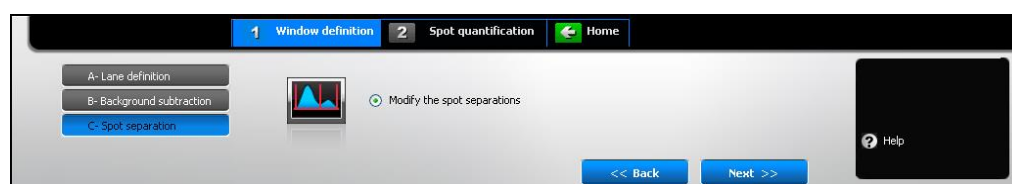
A volume is the sum of the pixel intensity inside a defined boundary. The purpose of the spot separation is to define this boundary.

The spot separation process follows the background subtraction.

Note: you can either access the spot separation function by clicking on the next button of the background subtraction or directly by clicking on the spot separation of the Window definition folder.



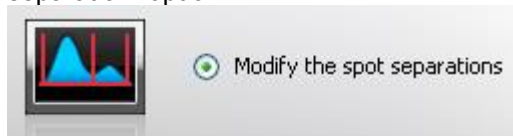
The dashboard details the spot separation parameters:



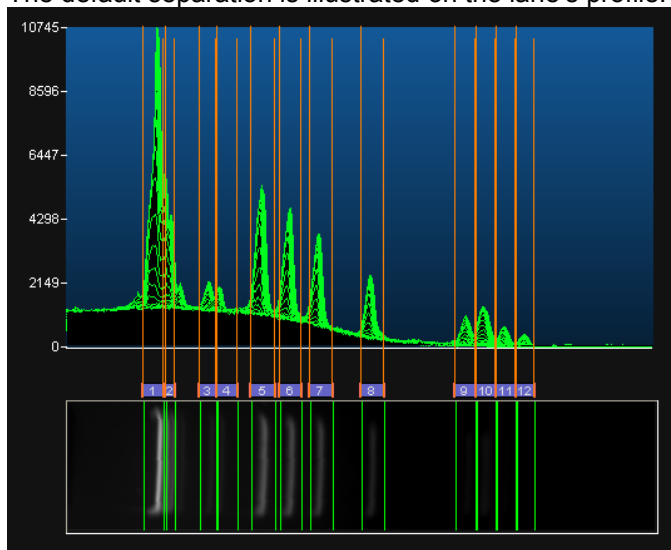
- ⇒ Modify the spot separation
- ⇒ Define a threshold

MODIFY THE SPOT SEPARATION

Capt Advance proposes by default an automatic predefined spot separation based on the band detection. You can modify the default spot separation by selecting the “Modify the spot separation” option.



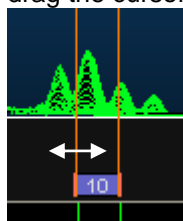
The default separation is illustrated on the lane's profile:



The brackets illustrate the bands boundaries:



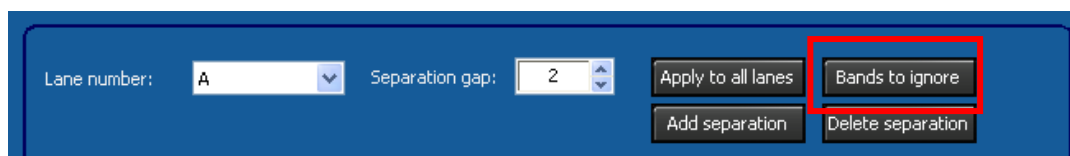
You can easily reposition a band's boundaries. In order to do so, click on the bracket and drag the cursor:



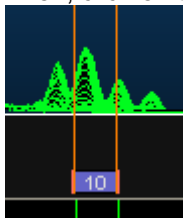
Drag the cursor until the area of the band that you want to define has been completely enclosed.

Note: When you release the mouse button, the band's volume is automatically recalculated to take into account the new area of interest.

To ignore a band, select “Bands to ignore” from the profile’s parameter menu:



Then, click on the band you want to ignore:

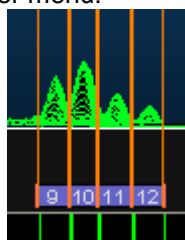


The band is then highlighted in grey and discarded from the result table:

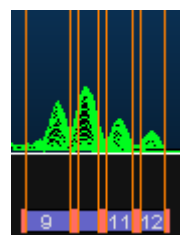
Note: you can ignore more than one band at a time.

Note: to stop the process, click again on the “Bands to ignore” button.

To increase the gap in between the lane, select the “Separation gap” option from the profile’s parameter menu:

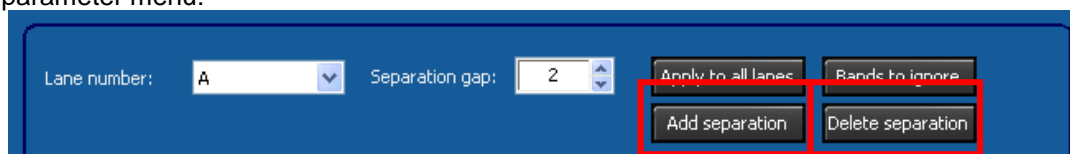


Limited separation gap

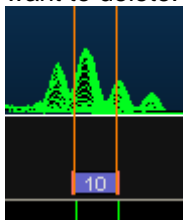


Extended separation gap

To ignore add a separation or delete a separation, select “Bands to ignore” from the profile’s parameter menu:



Then, click on the band where you want to add a separation or on a current separation you want to delete:



NEXT

The “Next” button validates your parameter and opens the following analysis step.

| | | |
|---------------------|---|---------------------------|
| 1C- Spot separation |  | 2A- Quantity of reference |
|---------------------|---|---------------------------|

BACK

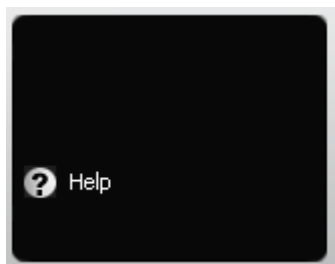
The “Back” button validates your parameter and opens the following analysis step.

| | | |
|---------------------|---|------------------------------|
| 1C- Spot separation |  | 1 B – Background subtraction |
|---------------------|---|------------------------------|

OPTION FOLDER

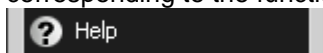
The option folder gathers the following functions:

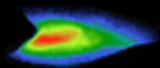
⇒ Help



HELP MENU

Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function





2- ANALYSE – SPOT QUANTIFICATION

Principles of quantification

2

Spot

quantification

You can use the Volume tools to quantitate bands, spots, arrays, and other image data

The images taken by the Vilber's imaging systems are displayed by your computer screen in the form of grey scale images. Our systems convert the light signals from your gel or membrane samples into digital data.

A digital image is a finite set of pixels. The digital image contains a fixed number of rows and columns of pixels. Pixels are the smallest individual element in an image, holding quantized values that represent the light intensity at any specific point. The light intensity is graded into a grey scale. The word pixel is based on a contraction of pix ("pictures") and el (for "element").

Volume is use in the band or spot quantification process. The volume is the sum of all the pixels intensities included in the defined area (window + separation). To measure the quantity of a particular band or spot, you need to define a band or a spot area.

Quantification is based on the image in pixels whose intensity is coded on a scale.

- The scale has 256 grey levels for a 8-bit image
- The scale has 4 096 grey levels for a 12-bit image
- The scale has 16 384 grey levels for a 14-bit image
- The scale has 65 536 grey levels for a 16-bit image

The quantity (or density) of a spot is calculated from its volume. This is made of the sum of all pixel intensities composing the spot

In other words, the spot quantity then depends on:

- The number of pixels inside the area of the spot
- The intensities of these points

$$V = \sum n_i I_i$$

Image analysis allows comparison in between concentrated intense spots and weaker but more diffused bands.

Results are given in volumes that may be recalculated according to an OD of reference or a concentration master-curve.

To measure the amount of a particular spot, you need to define the boundary around the spot and compare the intensity data inside the boundary with the data of other spots or of a standard.

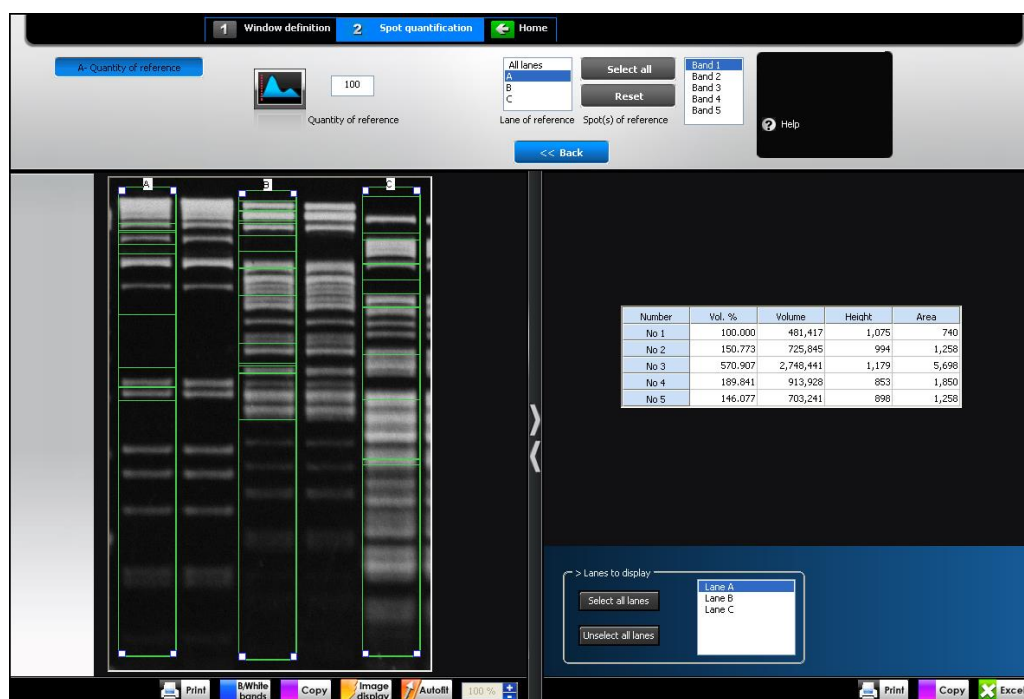
A –Quantity of reference

2 Spot quantification

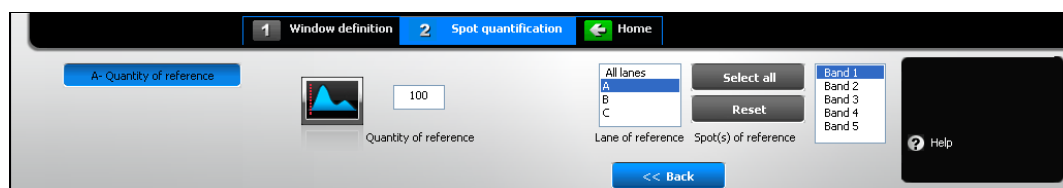
A volume is the total signal intensity inside a defined boundary drawn on a lane. The purpose of the volume of reference is to use volumes of known concentration to calculate the unknown concentrations.

The volume of reference process follows the spot separation.

Note: you can either access the volume of reference function by clicking on the next button of the background subtraction or directly by clicking on the volume of reference of the 2-Spot Quantification folder.



The dashboard details the quantity of reference parameters:



- ⇒ The quantity of reference
- ⇒ The lane of reference
- ⇒ The spot(s) of reference

QUANTITY OF REFERENCE

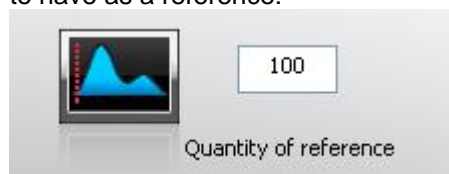
The calculation of the unknown concentrations is based:

- ⇒ On the calculated volumes
- ⇒ On the known concentration. The known concentration is the quantity of reference.

The quantity of reference could correspond to one or several spots.

The purpose of the quantity of reference is to define the known concentration:

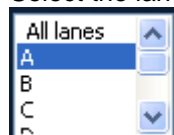
In the "Quantity of reference" edit field, type the quantity of known concentration you want to have as a reference:



LANE OF REFERENCE

The lane of reference defines the lane of the known concentration.

Select the lane of reference from the list:



If a single lane is selected, only the volumes of this reference lane will be used to calculate the relationship between the volume and the quantity. The other concentrations are calculated based on the concentration/volume relationship of this specific lane.

| | Lane 1 | | Lane 3 | | Lane 4 | |
|--------|--------|---------|---------|----------|--------|---------|
| Number | % | Volume | % | Volume | % | Volume |
| No 1 | 44.708 | 6635518 | 178.291 | 26461728 | 49.658 | 7370205 |
| No 2 | 25.475 | 3780895 | 64.424 | 9561786 | 47.652 | 7072517 |
| No 3 | 14.264 | 2117062 | 9.885 | 1467075 | | 0 |
| No 4 | 9.304 | 1380926 | | | | 0 |
| No 5 | 3.574 | 530507 | | | | 0 |
| No 6 | 1.840 | 273100 | | | | 0 |
| No 7 | 0.835 | 123860 | | | | |
| No 8 | | 0 | | | | |
| No 9 | | 0 | | | | |

Illustration 1: 100% / lane 1 / all bands. Total concentration lane 1= 100%

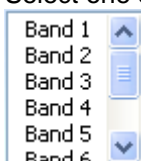
If "All lanes" is selected, for each lane a new relationship between volume and quantity will be recalculated, according to the band's lane selected. For instance, the defined parameters are 100% for all band all lanes; the results table could be as follows. Lane by lane, the total band concentration is 100%:

| | Lane 1 | | Lane 3 | | Lane 4 | |
|--------|--------|---------|--------|----------|--------|---------|
| Number | % | Volume | % | Volume | % | Volume |
| No 1 | 44.708 | 6635518 | 70.582 | 26461728 | 51.031 | 7370205 |
| No 2 | 25.475 | 3780895 | 25.504 | 9561786 | 48.969 | 7072517 |
| No 3 | 14.264 | 2117062 | 3.913 | 1467075 | | 0 |
| No 4 | 9.304 | 1380926 | | | | 0 |
| No 5 | 3.574 | 530507 | | | | 0 |
| No 6 | 1.840 | 273100 | | | | 0 |
| No 7 | 0.835 | 123860 | | | | |
| No 8 | | 0 | | | | |
| No 9 | | 0 | | | | |

Illustration 2: 100% / all lanes / all bands. Total concentration all lanes= 100%

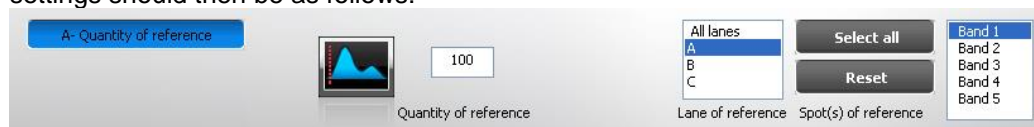
SPOT(S) OF REFERENCE

The quantity of reference could correspond to one or several spots of the selected lane. Select one or several spots of the lane of reference from the list:



EXAMPLE

Let's consider the known concentration is 100% contains in all the spots of lane A. The settings should then be as follows:



The results table indicates the following for lane 3A:

| Number | Vol. % | Volume | Height | Area |
|--------|---------|-----------|--------|-------|
| No 1 | 100.000 | 481,417 | 1,075 | 740 |
| No 2 | 150.773 | 725,845 | 994 | 1,258 |
| No 3 | 570.907 | 2,748,441 | 1,179 | 5,698 |
| No 4 | 189.841 | 913,928 | 853 | 1,850 |
| No 5 | 146.077 | 703,241 | 898 | 1,258 |

RESULT TABLE

In the result parameter window, you can select the lanes and the values to be displayed in the results tables:

- ⇒ Concentration
- ⇒ Volume



Note: You can select or unselect the lanes to display in the results table.

Note: To reposition the 1D profile window, position your cursor at the top of the box. The cursor appearance will change to a multidirectional arrow symbol. You can then drag the box to a new position.

BACK

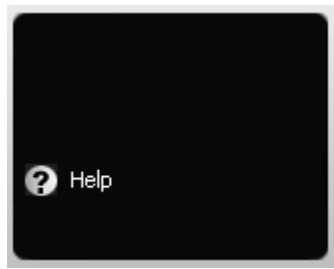
The "Back" button validates your parameter and opens the following analysis step.

| | | |
|----------------------|---------|----------------------------|
| 1C – Spot separation | << Back | 2A – Quantity of reference |
|----------------------|---------|----------------------------|

OPTION FOLDER

The option folder gathers the following functions:

⇒ Help



HELP MENU

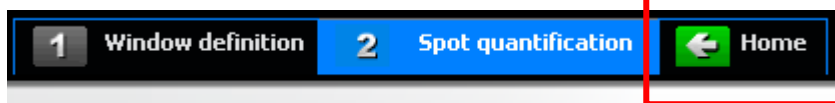
Click on the “Help” button. You automatically access the user manual at the chapter corresponding to the function

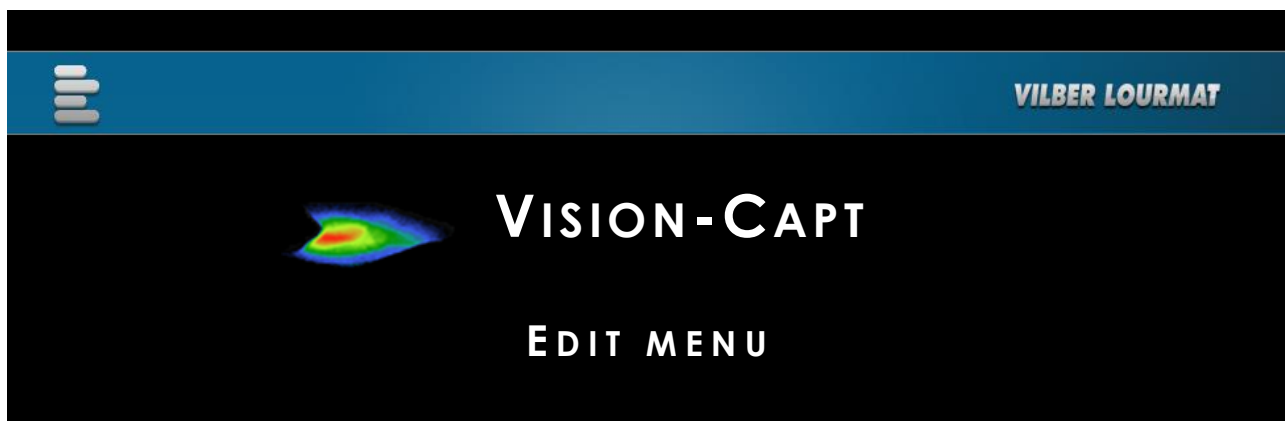


Return to the Capt acquisition module



To return to the Capt acquisition module, select Home Exit from the dash menu.





Access to the Edit module






Select the Edit function from the menu bar to access the Edit menu:

EXPOSURE **ANALYSIS** **EDIT** **PROCESSING**

This will open the Edit function folder:



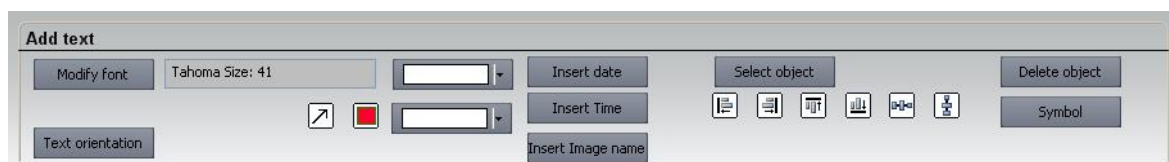
The Edit function folders contain the following features:

| | |
|---|---|
|  | You can annotate your image with text and arrows. |
|  | You can cut out a portion of an image. |
|  | You can rotate your image clockwise in 90° increments or mirror it vertically or horizontally. |
|  | You can define and apply a color palette to your image, allowing you to apply specific RGB values to monochrome images. |
|  | You can step by step reset the Edit function you applied to your image. |

Text



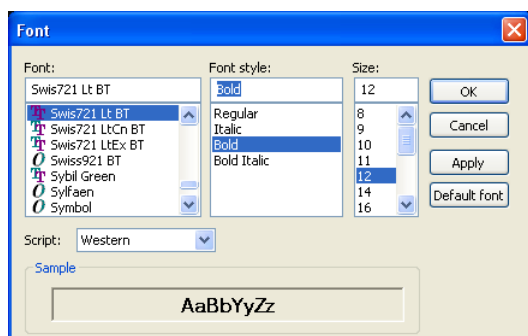
Click on the “Text” button. A window displays the following menu:



You can annotate your image with text and arrows.

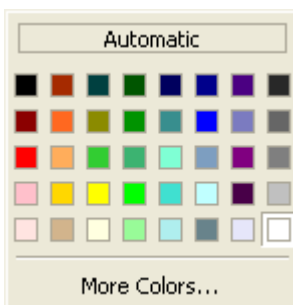
Text

Left click at the point where you want to insert the text. The Text window appears. Enter the text. You can define the appearance of the text. Select the Modify font to modify the font, the font style and the text size.



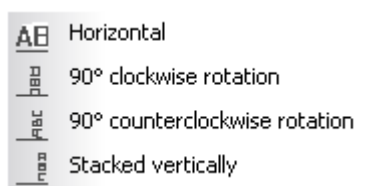
You can modify the font color by selecting the color option:





You can select the text orientation by clicking on the corresponding button:

Text orientation



Object insertion

You can use an arrow or a rectangle to emphasize a particular area in an image. To proceed, click on the following icon:

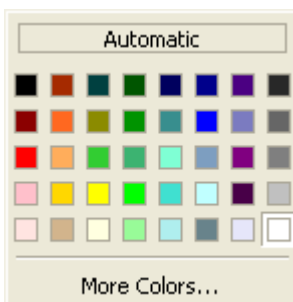
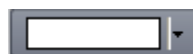


to draw an arrow



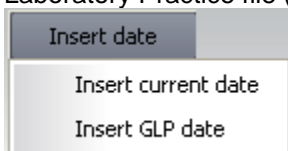
to draw a rectangle

You can modify the object color by selecting the color option:

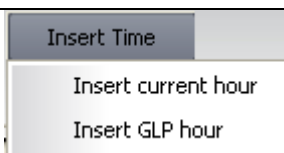


You can insert symbol by clicking on the Symbol button. You can also add the following items to the image:

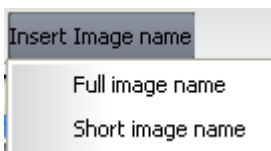
- Date. Add the current date or the GLP date to the image. The current date is the date set on the computer you are using. The GLP date is the image acquisition date as recorded in the Good Laboratory Practice file (GLP).



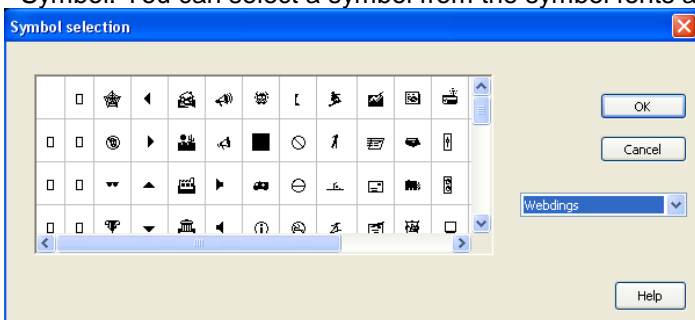
- Time. Add the current time or the GLP time to the image. This current time is the time set on the computer you are using. The GLP time is the image acquisition date as recorded in the Good Laboratory Practice file (GLP).



- Image name. Add the image title to the image. The full image name is the file name and location of the opened image. The short image name is the file name of the opened image.




- Symbol. You can select a symbol from the symbol fonts and insert it on your image



Text or objects position

Select the objects that you want to align:

Use the "Select objects" button to select multiple objects of your choice and drag a dotted box over the objects using the  on the image

Use the "Select all objects" button to select all the text objects from your document


Note: the selected objects are surrounded by an orange frame:




Note: the master object is surrounded by a bold orange frame:





Then align the text objects according to your desired layout:


Align left 

Align right 

Align top 

Align bottom 

Arrange horizontally objects equal distances from each other . Select at least three text objects you want to arrange and then click on Distribute Horizontally

Arrange vertically objects equal distances from each other . Select at least three text objects you want to arrange and then click on Distribute Vertically

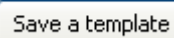
Note: text objects are aligned or arranged according to the master object position.

Delete object

Note: you can delete an object by selecting the object and clicking on :

Template

The text can be saved as a template and re-used for further analysis to facilitate routine text addition.



The template automates a task or set of tasks that you perform repeatedly or on a regular basis. It stores all the text comments. You can save the template created on one image and / or load the template on another image.

The benefits of the template file are as follows:

- ⇒ Time saving
- ⇒ Reproduction of image analysis parameters
- ⇒ Templates are modifiable, allowing the user to maintain an original template while modifying it for a slightly different result, with minimal effort

To close the text editor function, click on



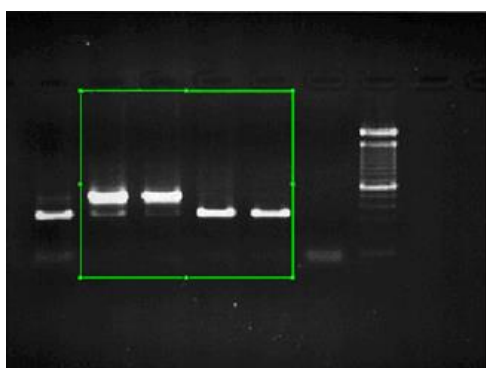
Crop

Crop

You can cut out a portion of an image. Click on the “Crop” button. A window displays the following menu:



- 1- A default area is displayed. Click on the tags surrounding the area to modify its size. Drag and drop the area to modify its position.



Note: To erase a previously defined area, click once again on the function.

- 2- Click on the “Preview” to crop the image:






Note: You can undo the cropping by clicking on “Undo”

Note: Exit the Cropping function by clicking on “Ok” to validate the selection or “Cancel” to discard it and return to the original image.

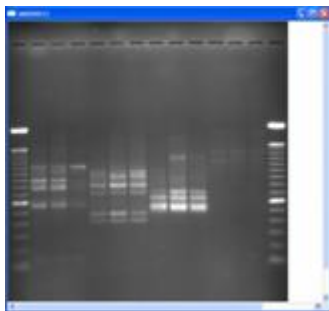
Rotation

Rotation

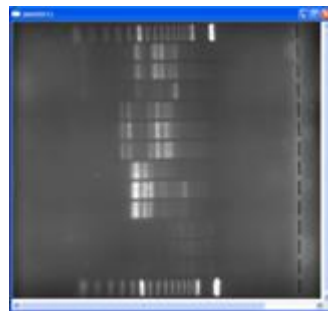
You can rotate your image clockwise in 90° increments or mirror it vertically or horizontally. Click on the “Rotation” button. A window displays the following menu:

-  Rotate 90° left
-  Rotate 90° right
-  Horizontal mirror
-  Vertical mirror
-  Rotate by angle

Click on the “**Rotate**” icon to rotate right the image. The image is rotated clockwise in 90° increments



Before



After

Click on the “**Horizontal mirror**” icon to flip the image from top to bottom.



Before



After

Click on the “**Vertical mirror**” icon to flip the image from right to left.



Before



After

Click on the “Rotate by angle” icon to rotate the image in increments other than 90°. Click on the rotation icon. A pop-up window display the following menu:

Rotate the image

Type the new value in the edit field or move the indicator on the image

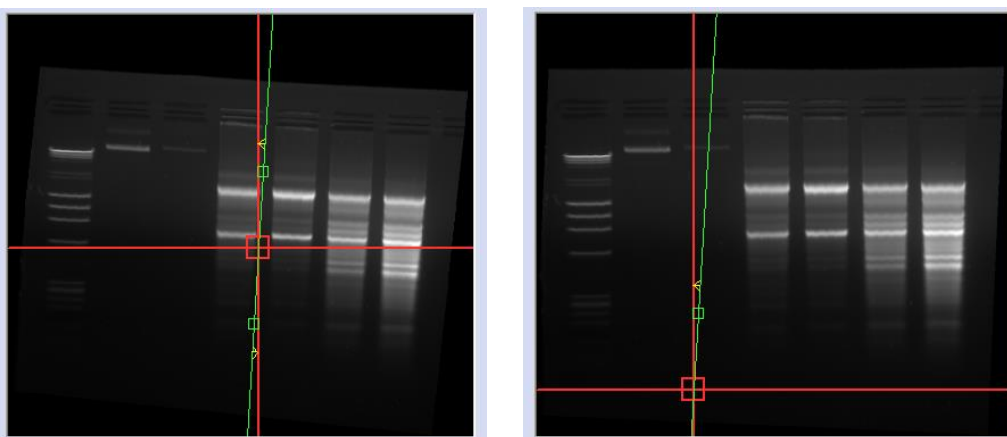
Lane direction
☐ Vertical ☒ Horizontal

Defined angle: 15.00

Preview Undo Cancel OK

You can also define the angle of rotation in degrees. To complete the rotation, click on the Rotate button. Click on the Undo button to come back as previously.

Thanks to the axis, which appears on the image, you can also directly rotate the image using this overlay. To perform the rotation, position the cursor on the green square and drag in the yellow arrow direction. As you drag, the arrow will rotate and the angle in the box will change. Adjust the green lane to be as parallel as possible as the lanes. To complete the rotation, click on the Rotate button.



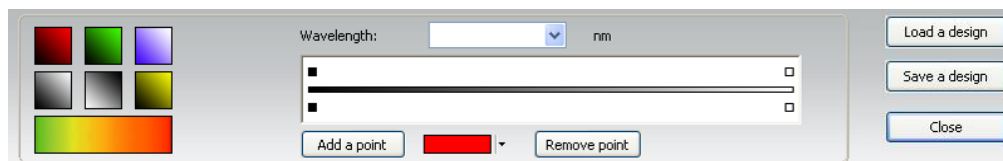
Adjust the green line to be as parallel as possible from the lane. Then, click on Rotate.

Pseudo color

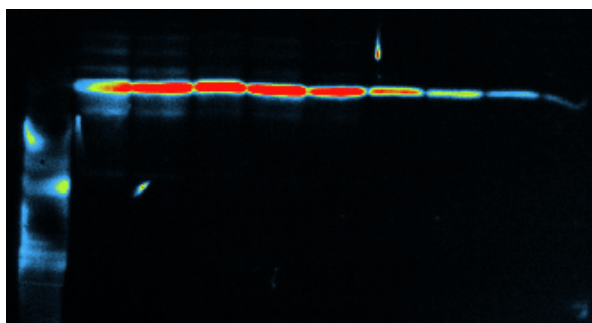
Pseudo color

You can define and apply a color palette to your image, allowing you to apply specific RGB values to monochrome images. The pseudo colors can display different types or levels of fluorescence in an image. It replaces the original grey levels of the image by another palette color.

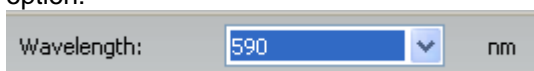
To proceed, click on the Pseudo-color button. A window displays the following menu:



There are seven pre-defined color options: Red, Green, and Blue, Greyscale, Inverted greyscale, Yellow and Multicolor. Click on the pre-defined option icon. The image is then displayed with the default pseudo-colors settings. For instance, the image could be as follows with the Multicolor option:

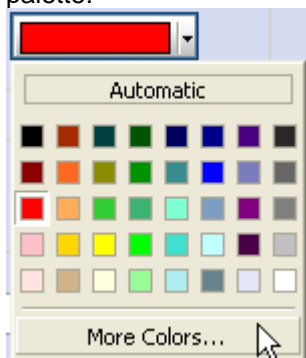


You can apply a specific wavelength value to monochrome images by selecting the Wavelength option:



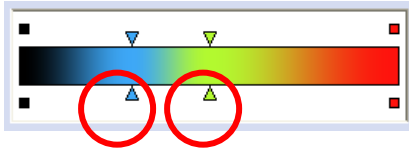
You can define custom palettes using the Add a point option:

Click on Add a point to add a color on the pseudo colors list. Select the color from the Add a point palette:



For the bicolor selection, click on the arrow to define the value of the color you want to modify. While keeping the mouse button pressed, move the arrow to its new value. Release the mouse button when value is satisfactory, the image is automatically updated. You can repeat these

operations as many times as necessary for all pseudo colors.



If needed, select the point to remove and click on Remove point to remove a color from the pseudo colors list.

User defined palette design

You can also save and load your own palette design. Define the set of colors you want to apply and click on Save to save the palette design. Click on Load to open your palette design.



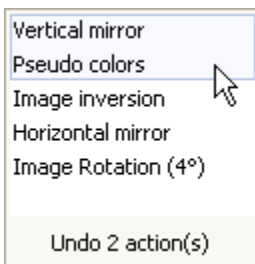
Reset



You can step by step reset the Edit function you applied to your image

The reset function undoes the last image enhancement modification you made. The reset option allows several levels of edits. In other words, you can undo step by step the preceding edit.

To reset an action, click on the reset icon. The list of the last editing actions is displayed:

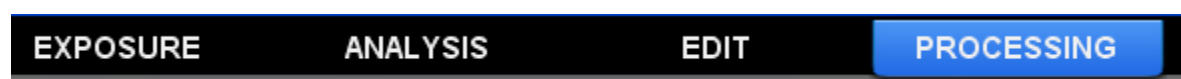


Select from this list, the actions you want to undo. The Undo applies automatically on the image.



Access to the Processing module






Select the Processing function from the menu bar to access the Processing menu:



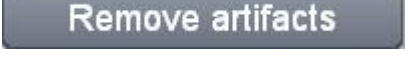


This will open the Processing function folder:



The Processing function folders contain the following features:

| Multiple image processing | |
|---|---|
|  | Gather a blot image and its marker image into a new composite image. |
|  | Copy and paste a marker from the marker image into the signal image |
|  | Combine two or three different fluorescent channels into a new colored composite image. |
|  | Combine a colored overlaid image and a monochrome image into a new colored composite image. |
|  | Subtract an image from another image |

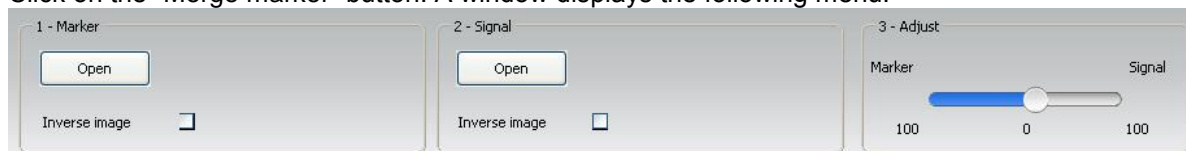
| Single image processing | |
|---|--|
|  | Separates foreground objects from their background clutter. |
|  | Correct for uneven illumination intensity for both the background and the signal |
|  | Remove dust or small defect from an image |

Merge marker

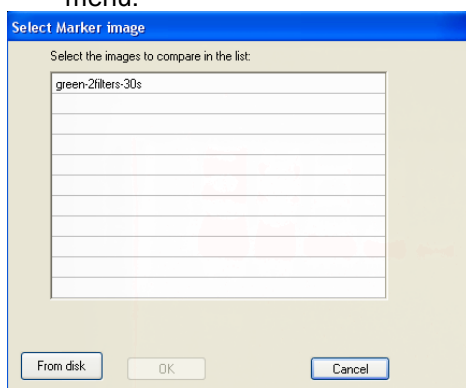


The Merge marker feature allows to gather a blot image and its marker image into a new composite image. Merge marker is frequently used for colorimetric markers run together with chemiluminescent samples.

Click on the “Merge marker” button. A window displays the following menu:

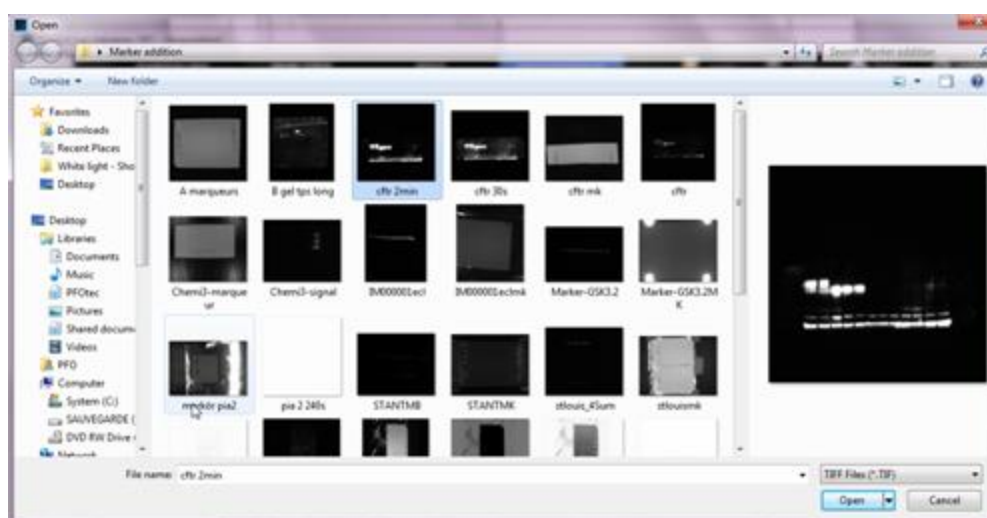


1- Select the Marker image by clicking on “Select image”. A pop-up window displays the following menu:



A list displays the image already opened.

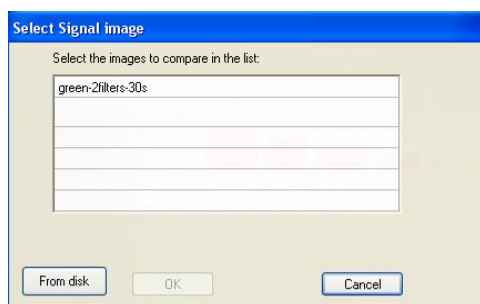
You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:



- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

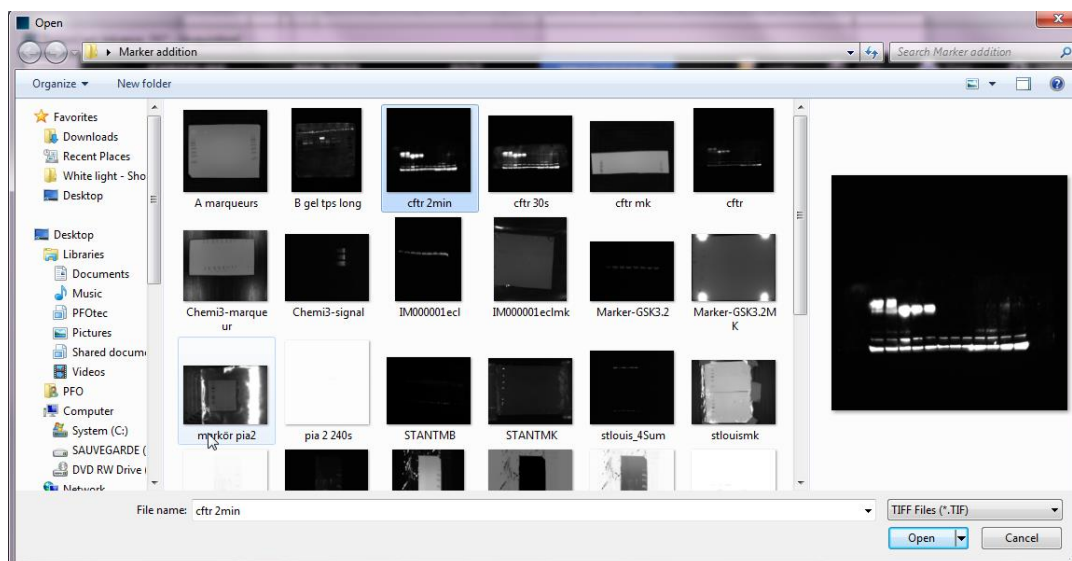
Note: only two positive or two negative images can be added. Thus, it could be necessary to inverse the image one or the image two for having satisfactory results.

- 2- Then, select the signal image by clicking on “Select image” from the Second image paragraph. A pop-up window displays the following menu:



A list displays the image already opened.

You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:



- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

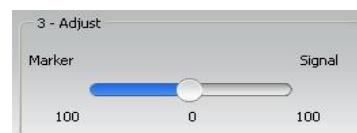
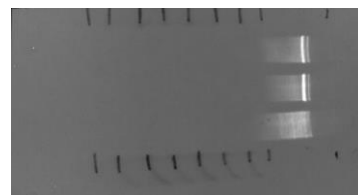
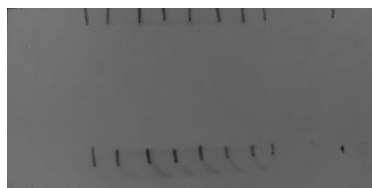
A new composite image appears in the main windows, gathering the marker and the signal images.

- 3- Adjust the weight you want to give to each image

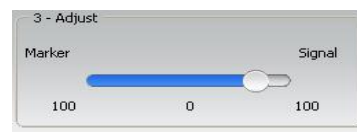
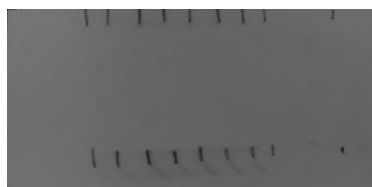
You can adjust the proportion of the marker and of the signals images in the composite image.

Example:

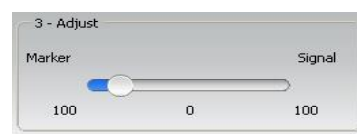
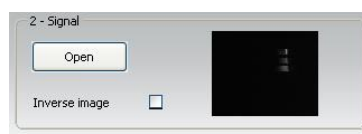
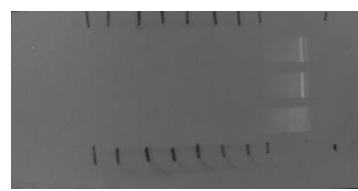
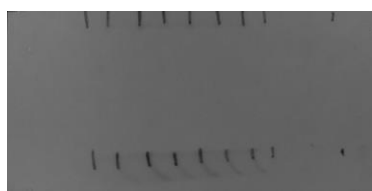
Case 1: weight of 50% for each mage



Case 2: weight of 75% for he Signal image



Case 3: weight of 75% for he Marker image



To close the function, click on

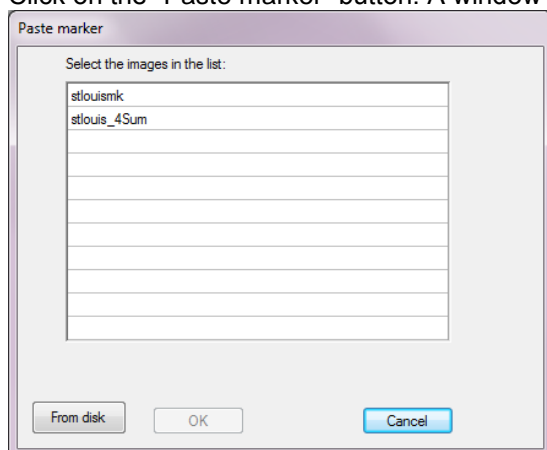
Close

Paste marker



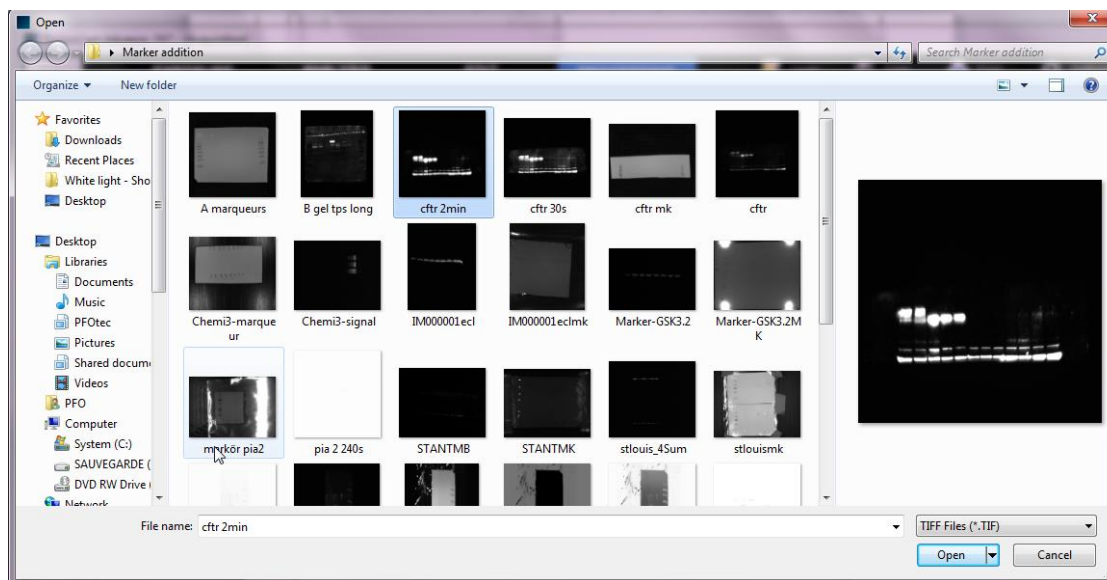
The paste marker feature allows to copy and paste a marker from the marker image into the signal image. Paste marker is frequently used for colorimetric markers run together with chemiluminescent samples. This process will not affect the quantitation of the spots of the signal image.

Click on the “Paste marker” button. A window displays the following menu:



A list displays the image already opened.

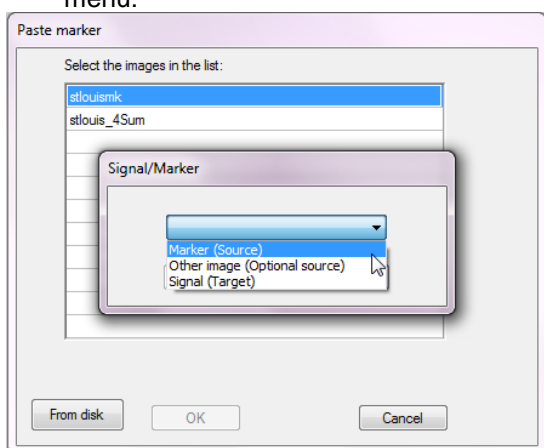
You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:



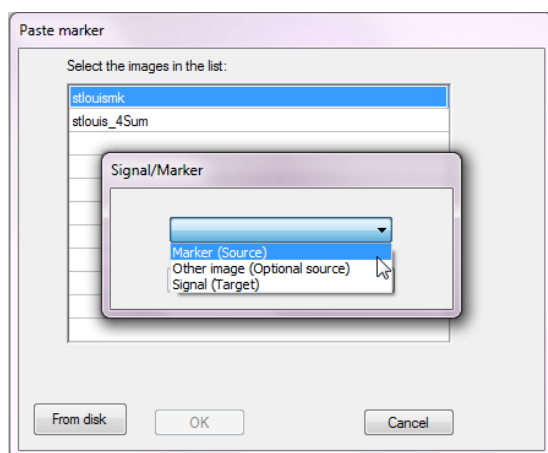
- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

Note: only two positive or two negative images can be added. Thus, it could be necessary to inverse the image one or the image two for having satisfactory results.

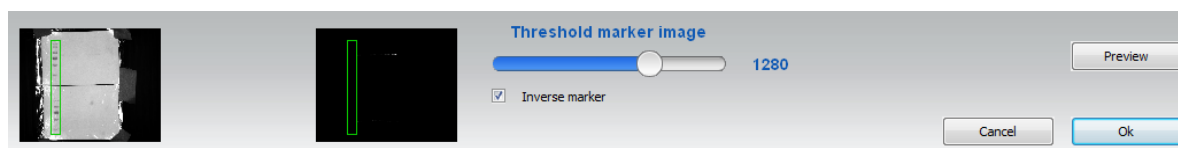
- 1- Select the Marker image by clicking on “Select image”. A pop-up window displays the following menu:



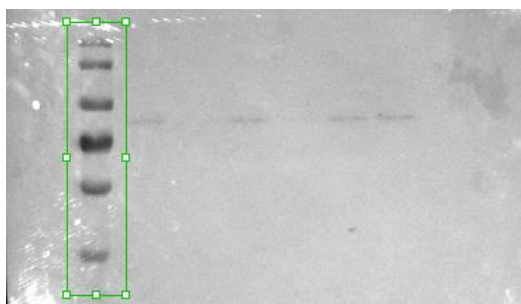
- 2- Then, select the signal image by clicking on “Select image” from the Second image paragraph. A pop-up window displays the following menu:



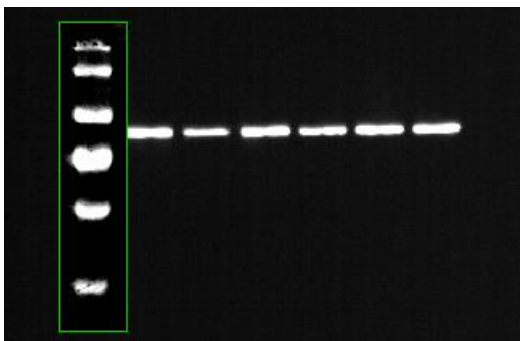
Click on the “OK” button. A window displays the following menu:



A default area is displayed. Click on the tags surrounding the area paste. Drag and drop the area to modify its position

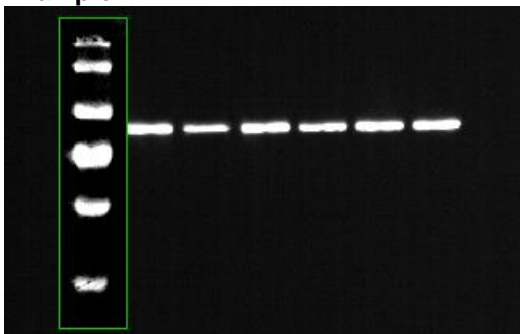


Click on the “Preview” to paste the marker lane. The marker lane is now paste inside the signal image.



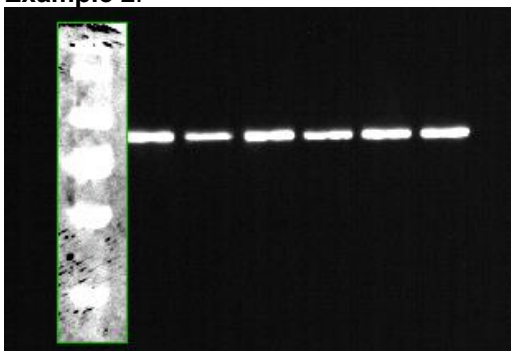
You can adjust the threshold you want to apply to the marker lane so that the background level of the marker lane will be at the same level as the one of the signal image.

Example 1:



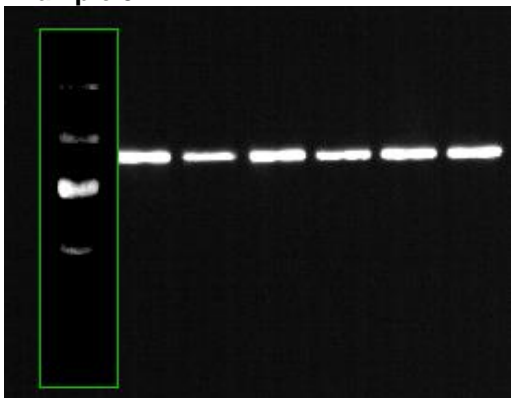
The marker lane background is at the same level as the one of the signal.

Example 2:



The marker lane background is at an upper level as the one of the signal.

Example 3:

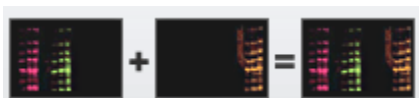


The marker lane background is at a lower level as the one of the signal.

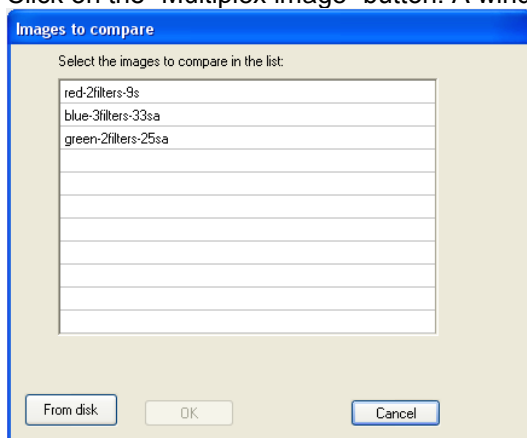
Multiplex images

Multiplex images

The multiplexing feature allows to combine two or three different fluorescent channels into a new colored composite image. The multiplexing option is used primarily in fluorescence imaging when specimens have been stained with more than one dye or in chemiluminescence when you want to add in color a marker lane to your signal sample image.

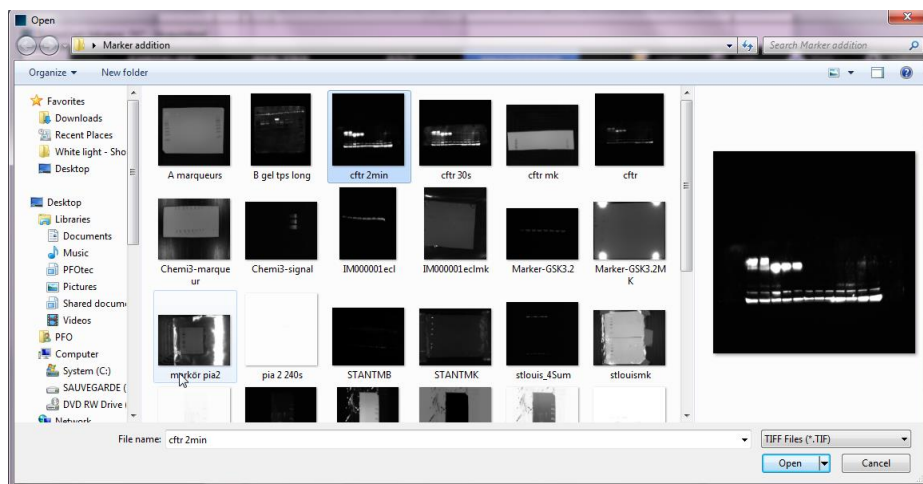


Click on the “Multiplex image” button. A window displays the following menu:



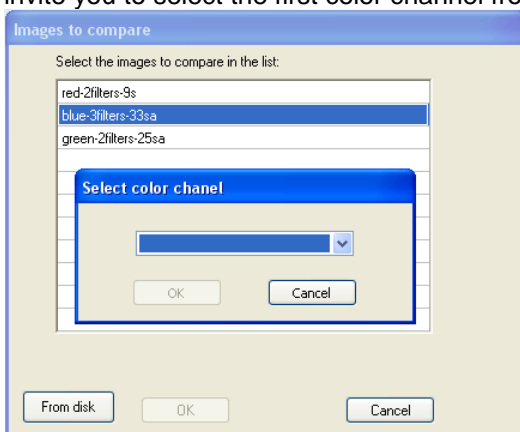
A list displays the image already opened.

You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:

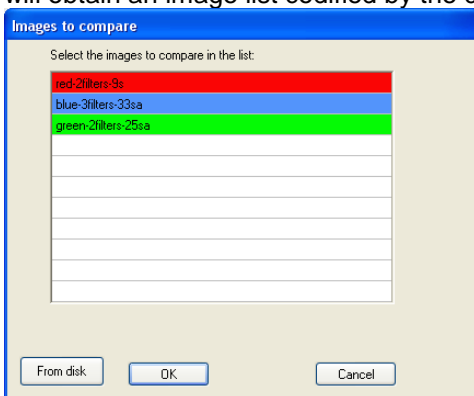


- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

When all the multiplexing images are gathered in the list, click on the first image. A pop-up window invite you to select the first color channel from blue, green, red:



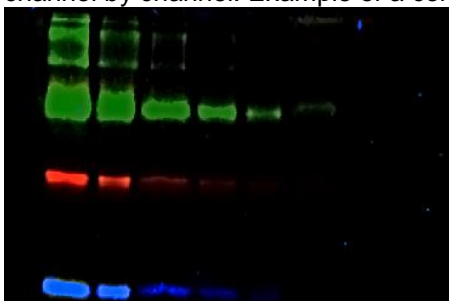
When the first channel is selected, proceed in the same way for the one or two others channels. You will obtain an image list codified by the color channel.



Click on the “OK” button. A window displays the following menu:



A new color composite image appears in the main windows, gathering the multiplexing images, channel by channel. Example of a composite image elaborates from 3 different channels:

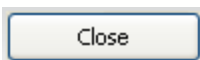


You can adjust the displays of the composite image. To proceed, click on the thumbnails you want to modify. The Display Adjustment graph for the channel you selected will appear in the menu:



Use the Display Adjustments to optimize the display to enhance the features of interest in the image. Adjust the display by moving the slider, or by typing a number in the value box.

To close the function, click on

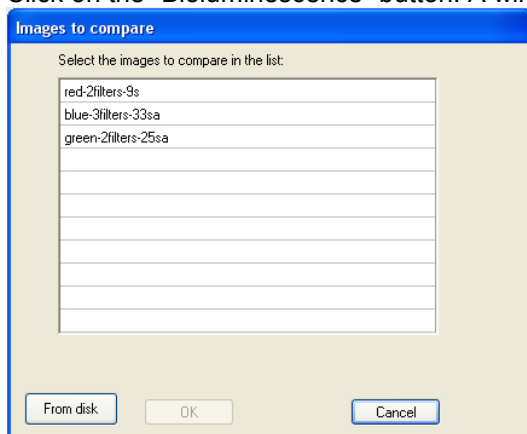


Bioluminescence

The bioluminescence feature allows to combine a colored overlaid image and a monochrome image into a new colored composite image.

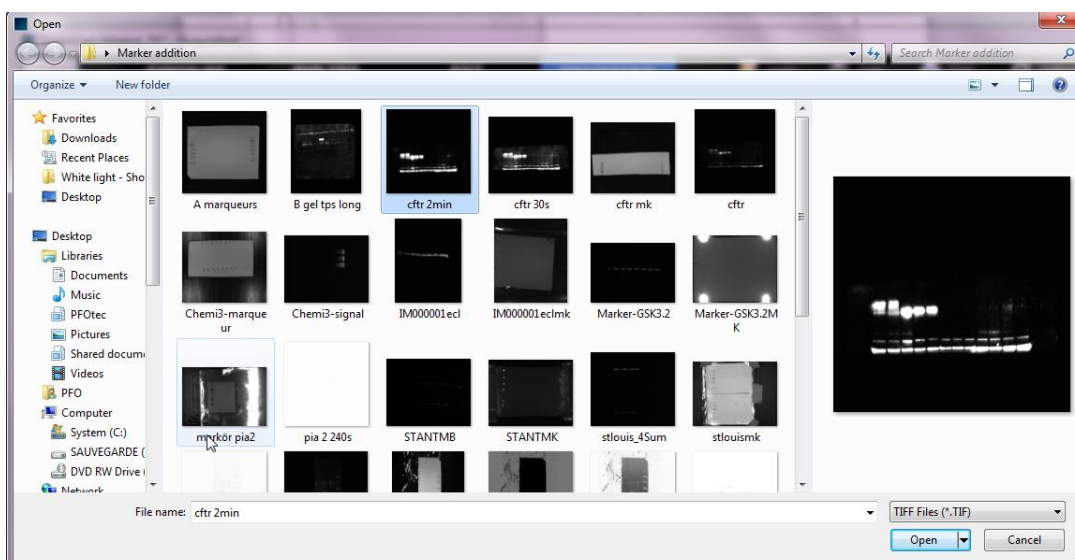


Click on the “Bioluminescence” button. A window displays the following menu:



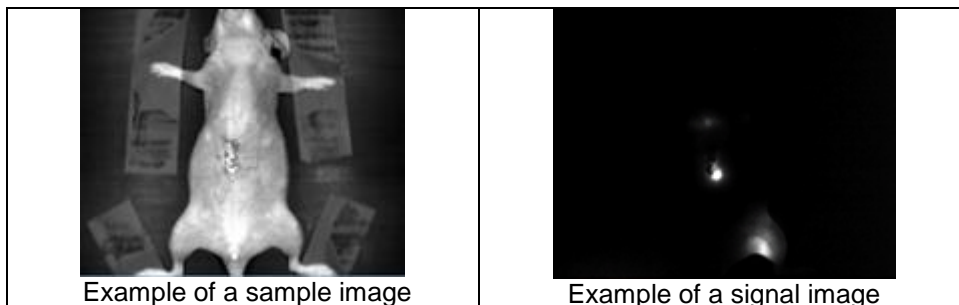
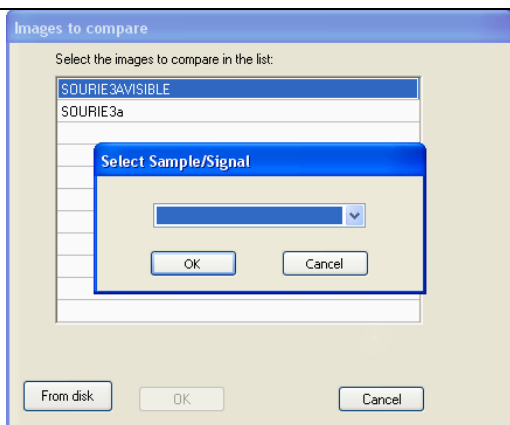
A list displays the image already opened.

You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:

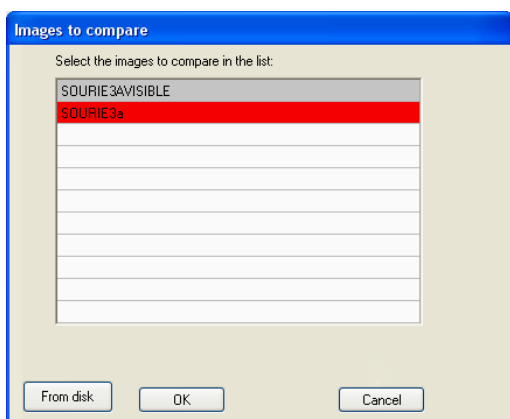


- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

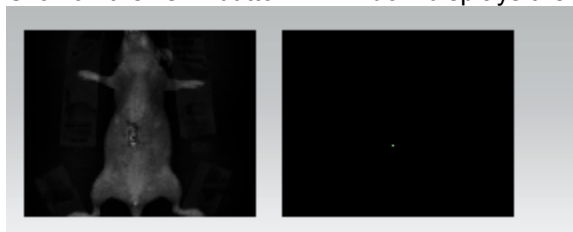
When all the bioluminescence images are gathered in the list, click on the first image. A pop-up window invite you to select the sample image and the signal image:



When the signal image is selected, proceed in the same way for the sample image. You will obtain an image list codified by color, red for the signal image and grey for the sample image:

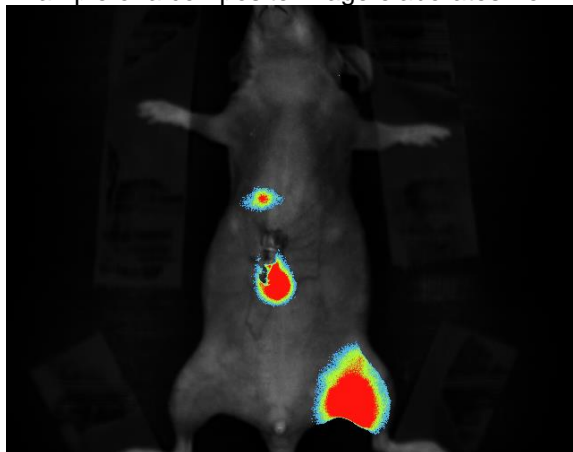


Click on the “OK” button. A window displays the following menu:

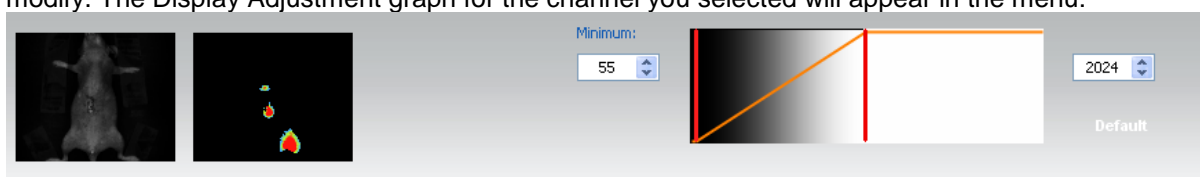


A new color composite image appears in the main windows, gathering the multiplexing images, channel by channel.

Example of a composite image elaborates from 3 different channels:



You can adjust the displays of the composite image. To proceed, click on the thumbnails you want to modify. The Display Adjustment graph for the channel you selected will appear in the menu:



Use the Display Adjustments to optimize the display to enhance the features of interest in the image. Adjust the display by moving the slider, or by typing a number in the value box.

To close the function, click on

Close

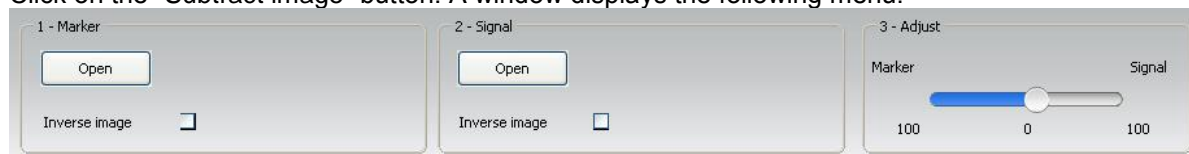
Subtract image

Subtract image

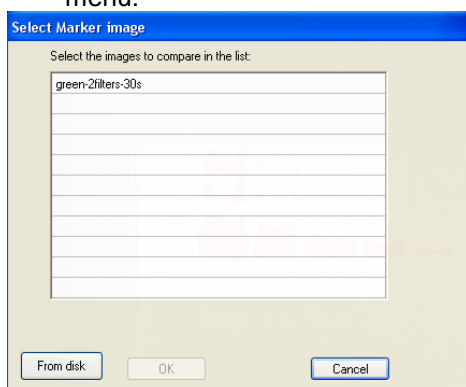
The Subtract image feature allows to subtract an image from another image. Subtracting images could be used to remove noise from a image by subtracting a dark image, or by deleting a signal from one image to another image. For instance to remove the Cy2 signal from a Cy3 image.



Click on the “Subtract image” button. A window displays the following menu:

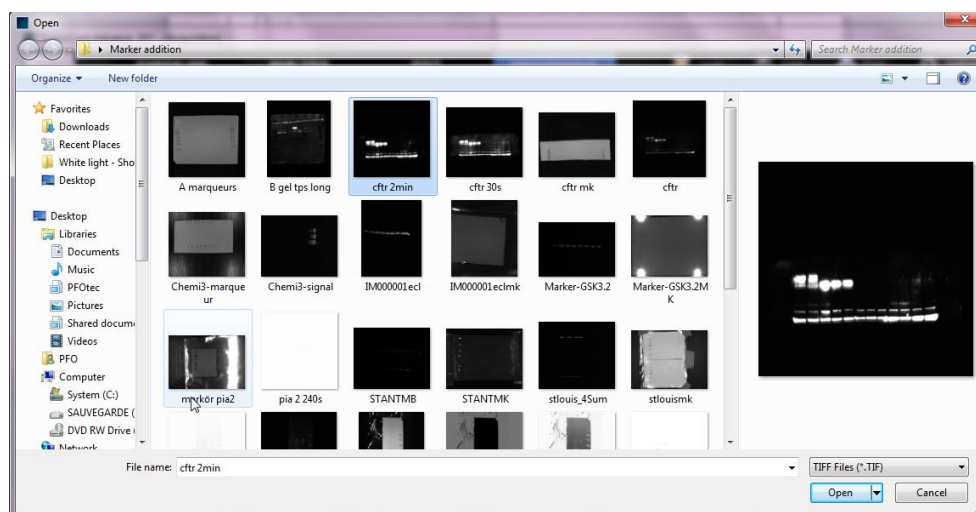


1- Select the first image by clicking on “Select image”. A pop-up window displays the following menu:



A list displays the image already opened.

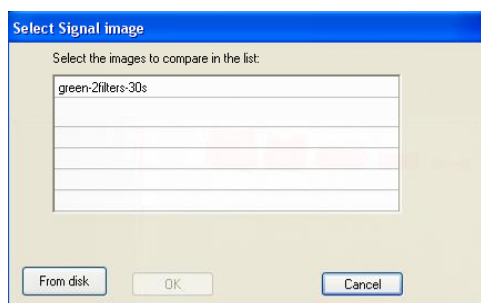
You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:



- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

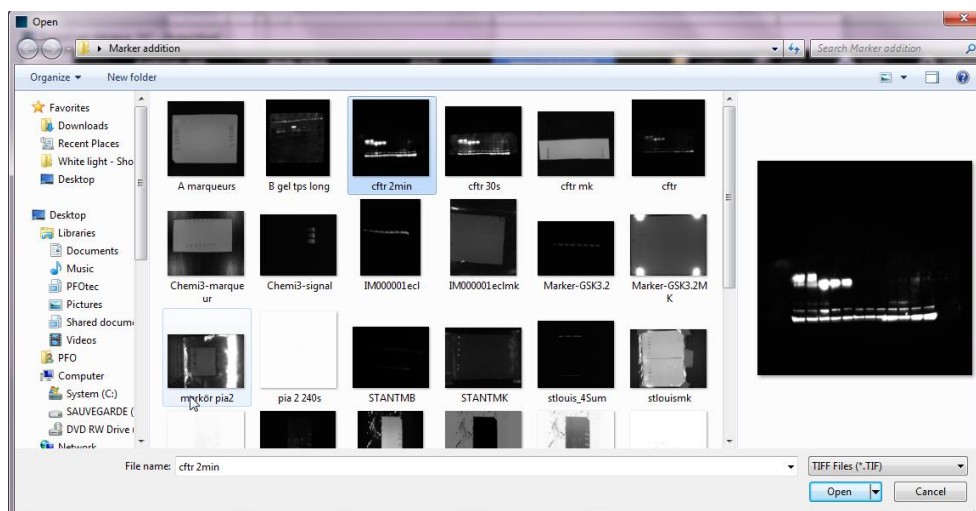
Note: only two positive or two negative images can be added. Thus, it could be necessary to inverse the image one or the image two for having satisfactory results.

- 1- Then, select the subtraction image by clicking on “Select image” from the Second image paragraph. A pop-up window displays the following menu:



A list displays the image already opened.

You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:

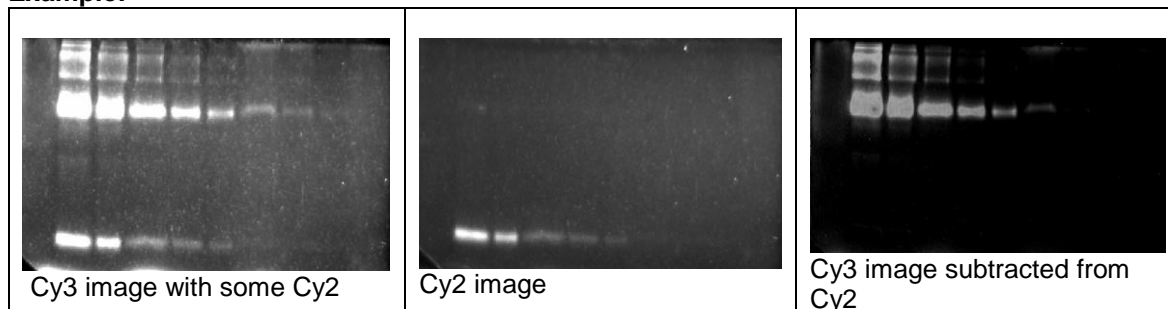


- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

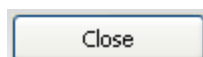
A new composite image appears in the main windows, subtracting one image from the other one.

- 2- Adjust the weight you want to give to each image
You can adjust the proportion of the marker and of the signals images in the composite image.

Example:



To close the function, click on



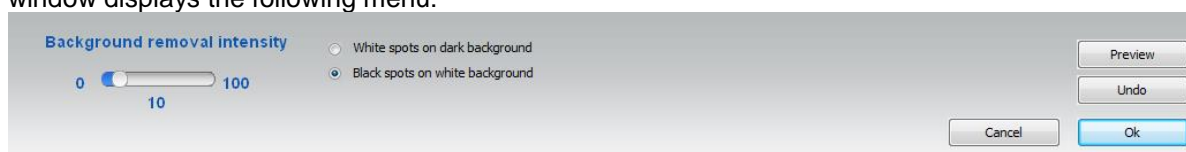
Subtract background

Subtract background

The Subtract background feature allows to separates foreground objects from their background clutter. Image background could interfere with quantification or signal visualization. Background could results from gel opacity, random signal noise, opacity of the carrier medium (film, gel matrix, or blot matrix) or film fogging.



The Subtract background applies to the active image. Click on the “Subtract background” button. A window displays the following menu:

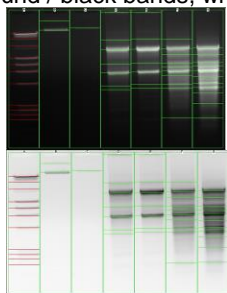


Select the removal intensity and click on apply. The background is then removed from the entire image.

The intensity will determine how much background will be subtracted. A large intensity will more closely follow the profile trace, removing more background. A too small intensity will result in poor Subtract background. A disk radius that is too small may subtract actual data.

Note: few seconds could be necessary to perform the background subtraction.

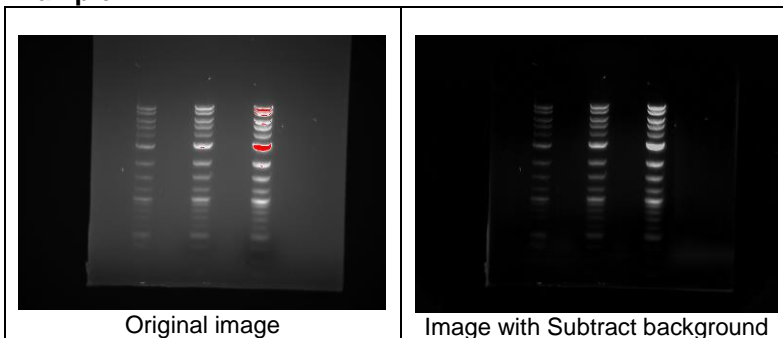
Note: For a more accurate background subtraction, you can set the bands parameters: white bands / black background / black bands, white background. You can select the following options:



White bands on dark background for images with white signals and black background

Black bands on light background for images with black signals and clear background

Example:



To close the function, click on

Ok

or

Cancel

Apply flat field

Apply flat field

The Apply flat field feature corrects for uneven illumination intensity for both the background and the signal.



Even under the best of imaging conditions, the illumination across a field of view isn't perfectly uniform. This is due to the light source imperfections (i.e. slight misalignments and additional physical properties) and to the optical elements constraints (bulb, filters, mirrors, objectives) within a light path.

Flat Field Correction is a commonly used approach for this problem. This process will compensate for different illumination intensity. In the flat fielded image, a uniform signal will create a fairly uniform output (hence flat-field).

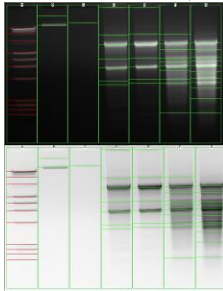
The Apply flat field applies to the active image. Click on the "Apply flat field" button. A window displays the following menu:



Click on preview to get the flat fielded image.

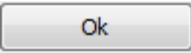

Note: few seconds could be necessary to perform the flat fielding.

Note: For a more accurate background subtraction, you can set the bands parameters: white bands / black background / black bands, white background. You can select the following options:



White bands on dark background for images with white signals and black background

Black bands on light background for images with black signals and clear background

To close the function, click on  or  button

Remove artifacts

Remove artifacts

The Remove artifacts removes dust or small defect from an image

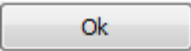



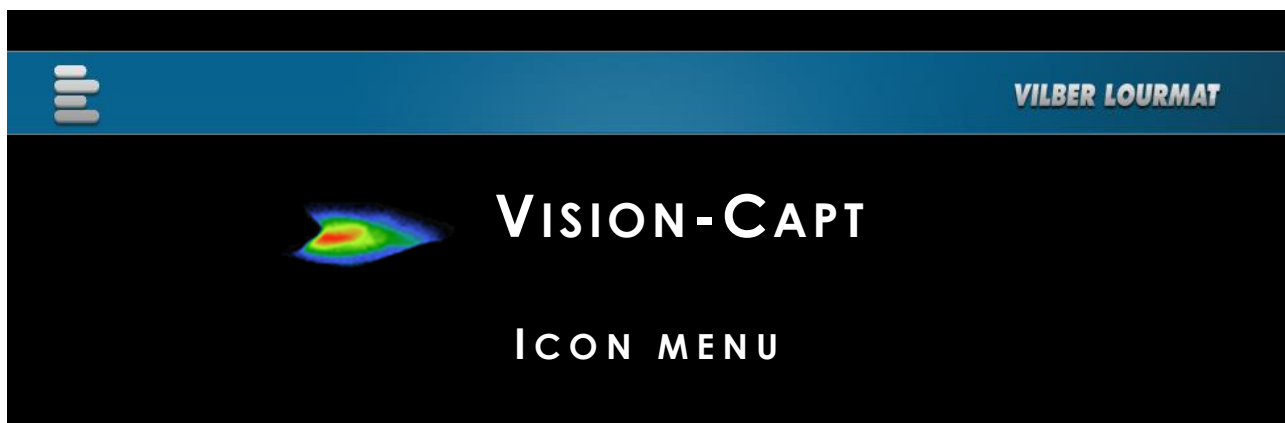
This function replace a pixel by the median of the pixels in the surrounding. The Remove artifacts applies to the active image. Click on the “Remove artifacts” button. A window displays the following menu:



The radius define the size of the artifacts to be removed. This value is given in pixel.
The threshold determines by how much the artifact pixel must deviate from the median to get replaced. This value is given in grey levels..
Which artifact determines whether the brighter pixels or the darker pixels than the surrounding should be replaced.

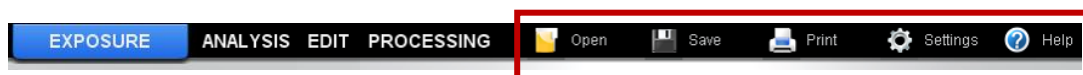
Click on Preview to remove the artifacts from the entire image.

To close the function, click on  or  button








Access to the icon module

Access the Icon menu from the menu bar:



Icon menu

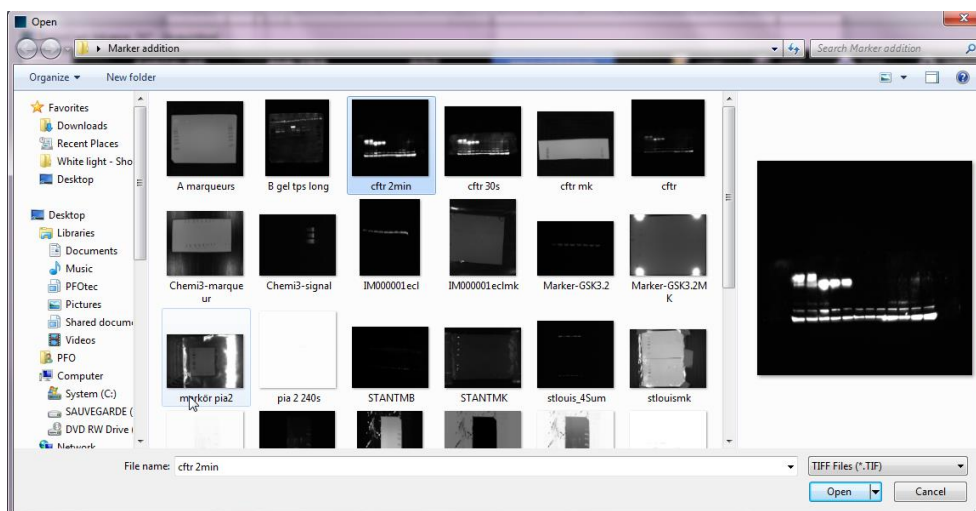
The Icon menu folders contain the following features:

| | |
|--|---|
|  Open | Opens an image file of a specified format (i.e; TIFF, BMP, GIF, JPEG ...). |
|  Save | Saves a previously unsaved image to a new file, or updates the changes to an existing image file, or save an image to a new file or file location |
|  Print | Prints a previously opened image as it appears in the image window. |
|  Settings | Adjust the system settings such as the filter controls or the lens calibration. |
|  Help | Access to the software help file. |

Open

This function opens an image file of a specified format (i.e; TIFF, BMP, GIF, JPEG ...).

Click on the “Open an image” icon to open an image. A pop-up window displays the following menu:

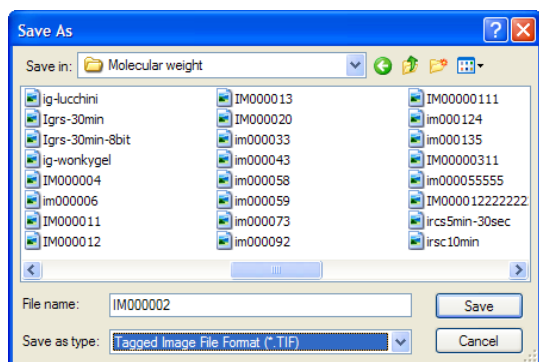


- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

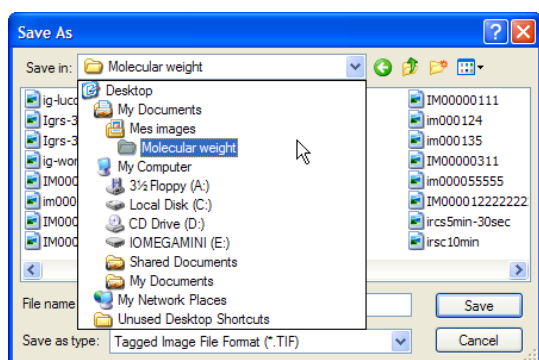
Save

This function saves a previously unsaved image to a new file, or updates the changes to an existing image file, or save an image to a new file or file location.

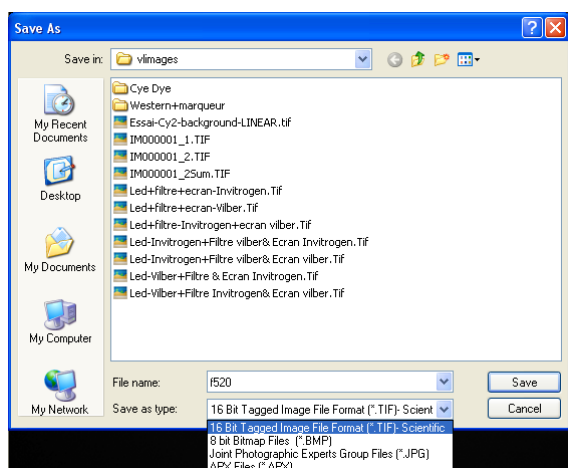
1. Click on the "Save" icon.
2. A pop-up window displays the following menu:



3. Browse to specify the image directory



4. Enter the desired file name, select a file extension and validate

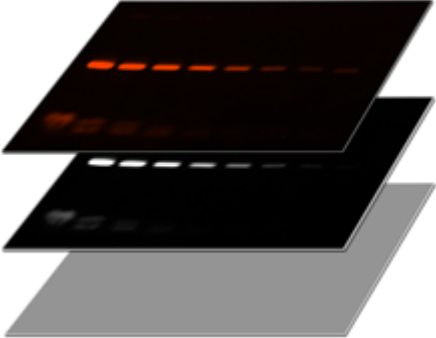
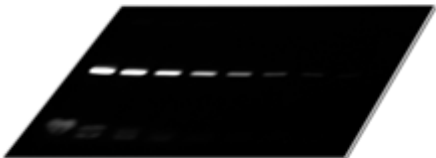


Note: the software proposes a default file name (im00000x). If the default file name is selected, it will be incremented by one each time an image is saved.

Images can be saved in CompatibilityPlus 16-bit TIFF scientific image format (recommended), 16-bit TIFF scientific image format, BMP (8-bit format only), JPEG (compressed) or APX (proprietary file format – 16-bit format).

The CompatibilityPlus file format is a multi-layer based format which contained the image as displayed in the software, the raw data image, the image settings and the GLP data.

In the standard 16-bit TIFF file format, the TIFF image contained only the raw data and the GLP data. The image is showed according to the software display preference. Other software use other displays settings. Thus, the image showed in the image acquisition software could look like different if opened in a Microsoft software for instance. The CompatibilityPlus file format provide an alternative to this process thanks to a multi-layer approach.

| | |
|--|--|
|  |  |
| <p>CompatibilityPlus format with:</p> <ul style="list-style-type: none"> - one layer containing the displayed image, - one layer containing the RAW image - and one layer containing the image data | <p>Standard 16-bit TIFF image and GLP image data</p> |

The first slice of the layer is a bitmap image of the image as displayed in the acquisition software. The second layer contains the raw image data. The third image layer contains the image information for the acquisition software: GLP, displays settings, ...

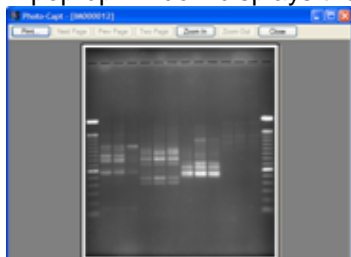
The CompatibilityPlus image format has the following advantages

- Respect of the image integrity
- Compatibility with other software platform
- Image information incorporated in the image file
- CompatibilityPlus image can be directly use for publication or reporting

Print

This function prints a previously opened image as it appears in the image window. Click on the “Print” icon.

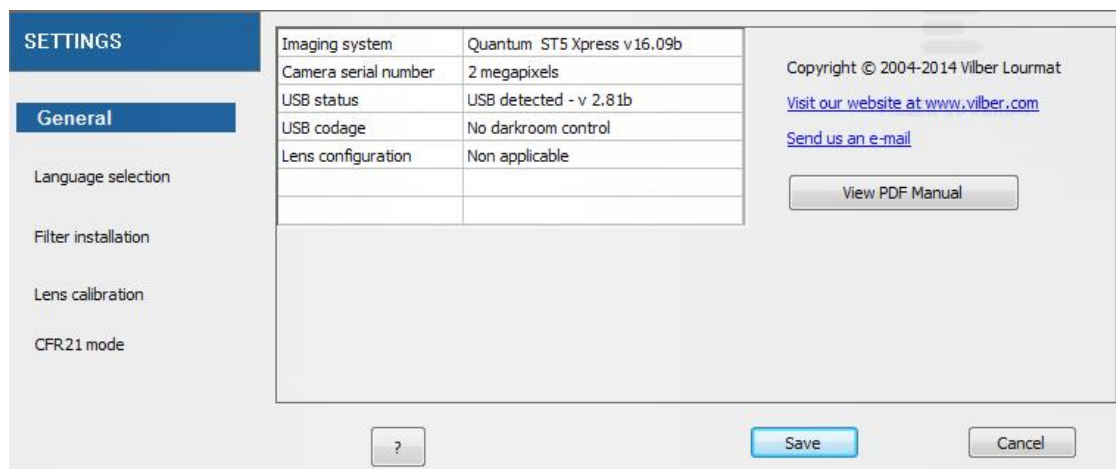
A pop-up window displays the print preview:



- ⇒ Click on Print to print as previewed
- ⇒ Click on Close to close the Print preview and to go back to the main menu

Settings

The Settings feature allows the adjustment of the system settings such as the filter controls or the lens calibration. Click on the “Settings” button. A window displays the following menu:



The Settings menu contains the following features, related to the image acquisition system:

| | |
|---------------------|---|
| General | Displays the Vision-Capt information such as the system option, the software version, the filters installed and the lens calibration state. |
| Language selection | Select the language you want the software to run |
| Filter installation | Install or remove a filter from the filter wheel |
| Lens calibration | Re-calibrate the lens for a perfect positioning of the focus for the preset tray and transilluminator position |
| CFR21 mode | Activate the CFR21 mode |

1-General

The General header from the Settings menu summarizes the information concerning your system and its set-up. It gives you access to the following information:

- ⇒ Systems name & version
- ⇒ Camera and darkroom state
- ⇒ Options installed
- ⇒ Calibration stat

| | |
|----------------------|--------------------|
| Imaging system | Quantum ST5 v16.08 |
| Camera serial number | 2 megapixel |
| USB status | No USB detected |
| USB codage | No darkroom |
| Lens configuration | Non applicable |
| | |
| | |

To proceed, select the General header from the Settings menu.

The screenshot shows the 'SETTINGS' window with the 'General' header selected in the left sidebar. The main area displays system information in a table:

| | |
|----------------------|----------------------------|
| Imaging system | Quantum ST5 Xpress v16.09b |
| Camera serial number | 2 megapixels |
| USB status | USB detected - v 2.81b |
| USB codage | No darkroom control |
| Lens configuration | Non applicable |
| | |
| | |

To the right of the table, there is copyright information: 'Copyright © 2004-2014 Vilber Lourmat', a link to 'Visit our website at www.vilber.com', and a link to 'Send us an e-mail'. Below these links is a 'View PDF Manual' button. At the bottom of the window are three buttons: a help button with a question mark, a 'Save' button, and a 'Cancel' button.

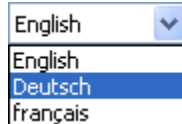
To close the Settings menu, click on  or .

2 – Language selection

The Capt Advanced software could run in English, in German, and in French. Select your language from the list. To proceed, select the Language selection header from the Settings menu:

The screenshot shows the 'SETTINGS' window with the 'Language selection' header selected in the left sidebar. The main area displays a 'Software language' dropdown menu with 'English' selected. At the bottom of the window are three buttons: a help button with a question mark, a 'Save' button, and a 'Cancel' button.

Then select the appropriate language from the pop-up windows:



You will be prompt to restart the software for the change to occur.

To close the Settings menu, click on  or .

3- Filter installation – Not applicable

4- Lens calibration – Not applicable

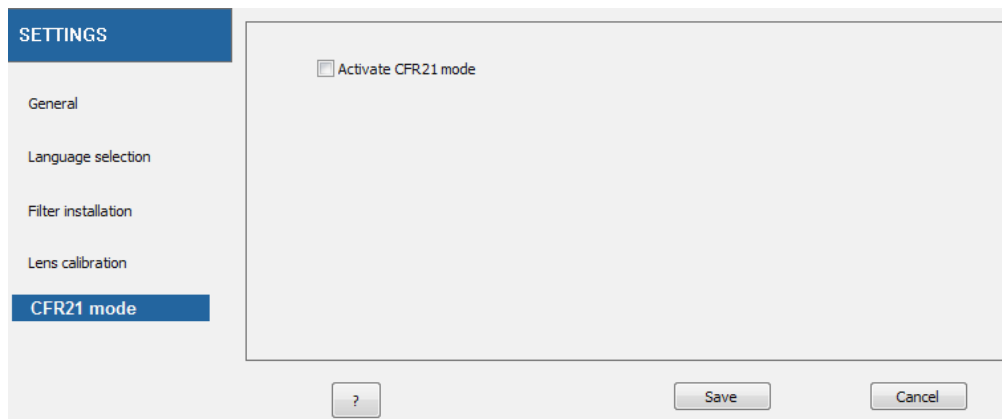
6- CFR21 mode

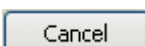
The 21-CFR mode is a closed system which ensures data security. These features are provided to ensure protection of records:

- The image data is saved in a document which contains all the actions taken to results in this image
- The image document is saved is a proprietary file format which can be open only with the Vilber's software set in the 21-CFR mode
- The data are saved with the user security of the signed-in user
- Records created on a 21 CFR 11 system cannot be opened on a non-21 CFR 11 system

To activate the 21-CFR mode, you will need the CFR21-Administrator software. Please contact your local dealer for more information.

From the Capt Advanced software, select the CFR21 mode header from the Settings menu and click on Activate the CFR21 mode:



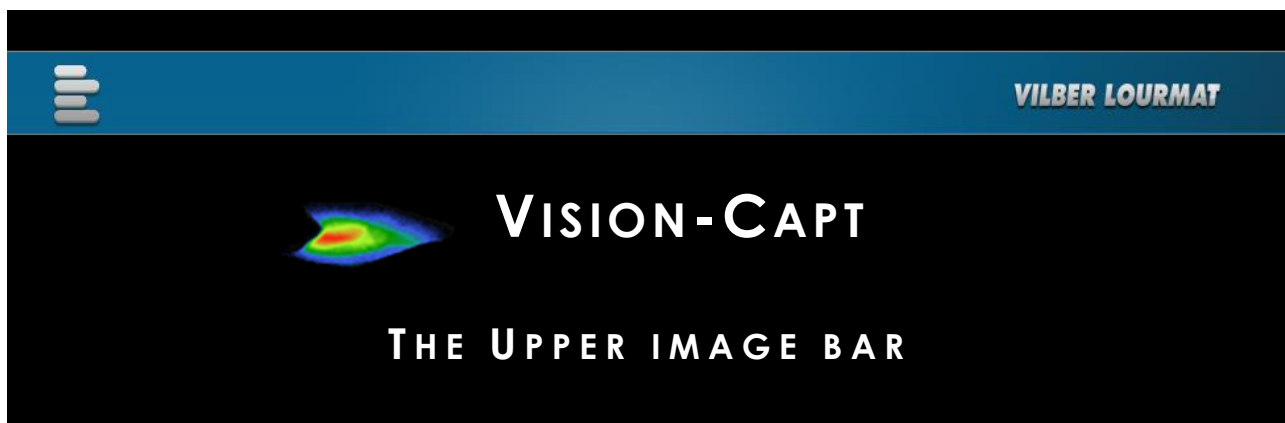
To close the Settings menu, click on  or .

Help

Click on the “Contextual Help” icon. The standard mouse cursor is changed to the following cursor:

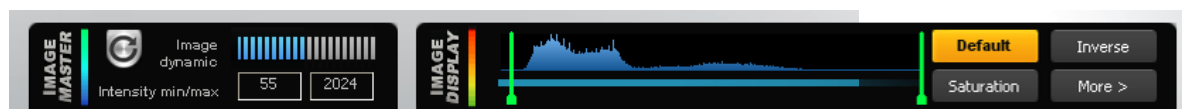
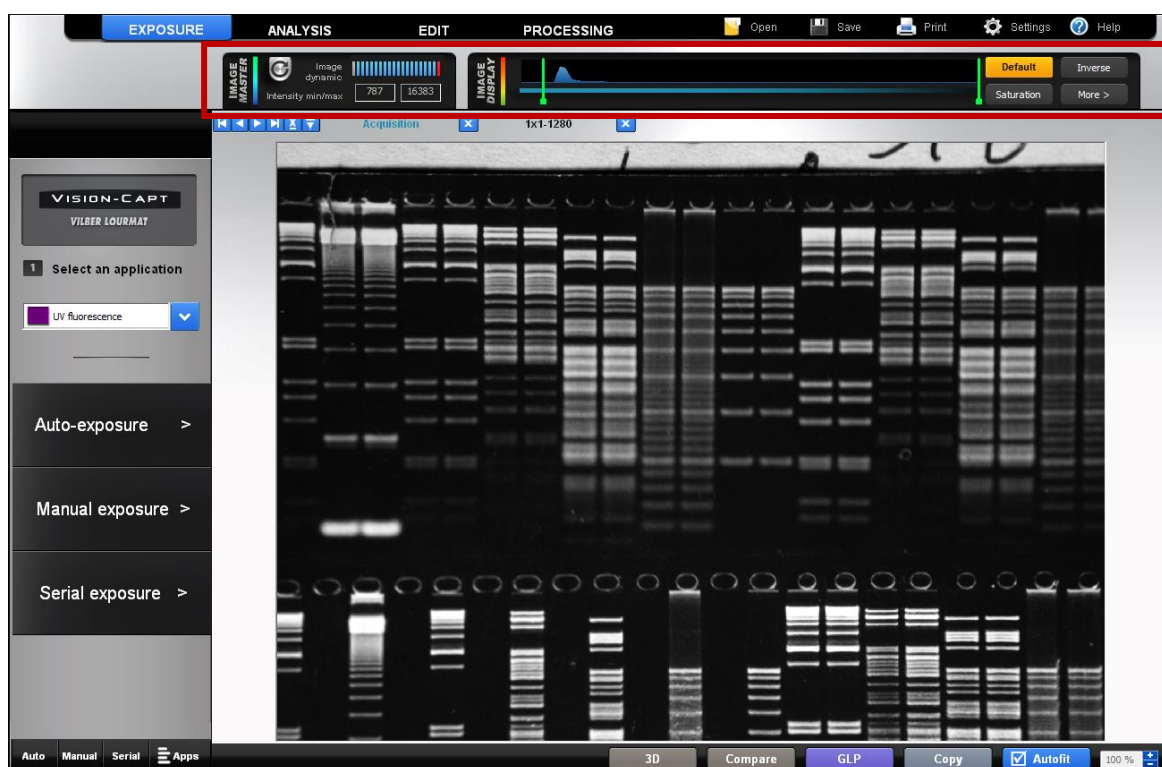


With the new mouse cursor, click on the function from which you want to access the user manual.





Access to the Upper image bar

Access the Upper image bar from the main Capt windows:



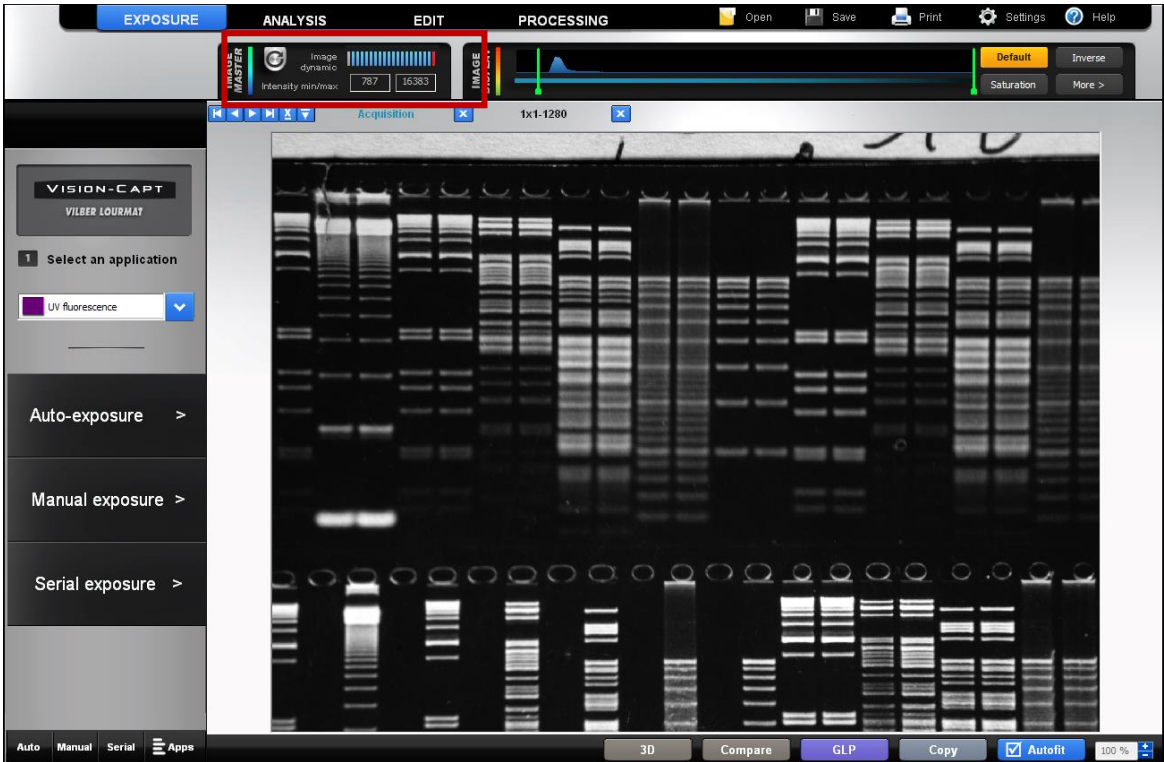
Upper image bar

The Upper image bar contains the following features:

| | |
|---|---|
|  | Provide information in regards of the image quality |
|  | Allow to modify the image display |

The Image Master

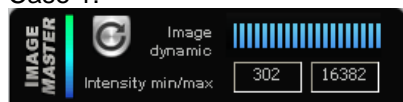
Access the Image Master from the main Capt windows:



The Image Master

The Image Master data informs you of the obtained dynamic on your image compared to the potential image depth. The largest the dynamic you have without reaching saturation, the better is your image as you obtained more quantitative data.

Case 1:



The Image Master indicates a full dynamic. This image has a maximum of quantitative data compared to the capability of the camera. This image is highly recommended.

Case 2:



The Image Master indicates an half dynamic. This image has only a portion of the quantitative data that it could have obtained. You can extend the dynamic by increasing the exposure time.

Case 3:



The Image Master indicates that this images contained saturated portion which could not be suitable for quantification.

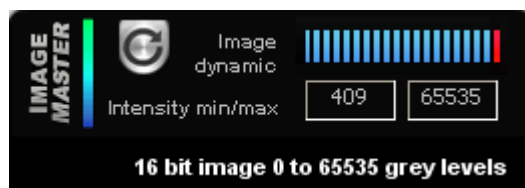
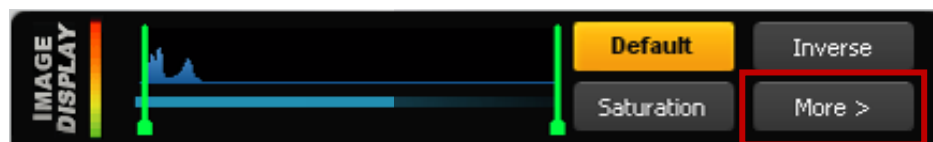
The image dynamic refers to the range of grey levels in between the minimum and the maximum pixel intensities obtained in an image.

Image depth is expressed as gradation level. In an image, the density range between white and black is divided into a number of gradation levels. For instance:

- A 8-bit image has 256 gradation levels.
- A 12-bit image has 4096 gradation levels.
- A 14-bit image has 16384 gradation levels.
- A 16-bit image has 65536 gradation levels.

The image dynamic refers to the number of grey levels in between the minimum levels obtained and the maximum level obtained on a specific image.

Note: By clicking on More from the Display menu, you could have more information in regards of the image depth of your image:



The Image Display

Access the Image Display from the main Vision-Capt windows:



The Image Display

The optimum display window is helpful to enhance the image display by modifying the image greyscale selection to be displayed.

Some images have a 12, 14 or 16-bit format and Windows® can only display 8-bit images (256 grey levels). Due to this limitation, the Bio-1D Advanced software handles two images:

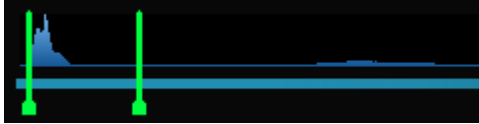
- A “memory” image corresponding to the 12, 14 or 16-bit format (4 096, 16 384 or 65 536 grey levels)
- A “displayed image” corresponding to the image displayed on the screen (256 grey levels)

The easiest way to calculate the “display image” would be to translate the full grey scale each time an image is acquired: the x grey levels values of the “memory” image corresponds to 256 values in the displayed image. In that case, it won't be possible to visualise faint spots on a dark image.

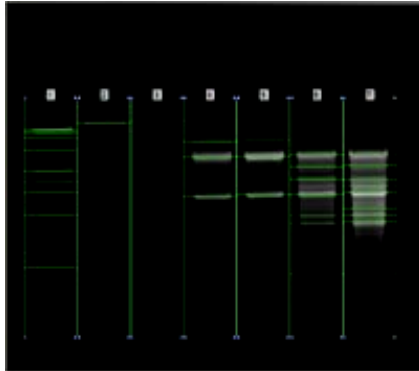
Capt Advance offers the possibility to select the grey level range to translate for the display image calculation. All the grey levels under the “Min value” defined will be converted to 0 (Black) in the displayed image. All the grey levels upper the “Max Value” defined will be set to 255 (White) in the displayed image. The grey levels between those two limits will be converted in an intermediate grey level value following a linear rule.

For both values, you can:

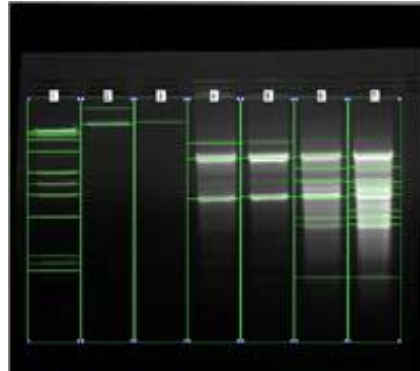
- Select the value by dragging and dropping the green arrows



- Click on the “Default” button: Capt Advance will then calculate the ideal values to be selected according to the parameters defined



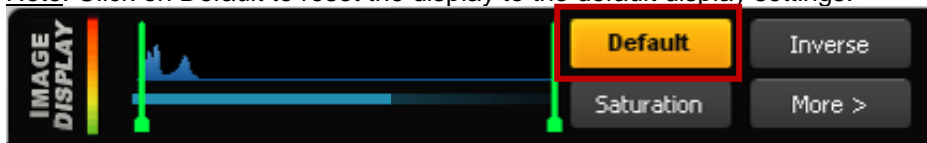
Default optimum display



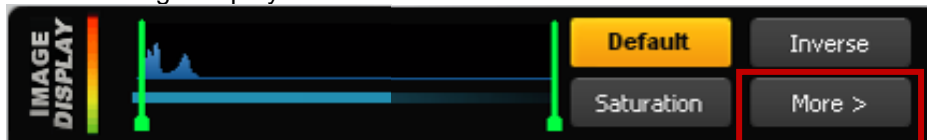
Optimum display enhancement
The image appears brighter. The faint bands are more visible.

Note: The optimum display has no impact on the analysis. Only the display of the image is modified.

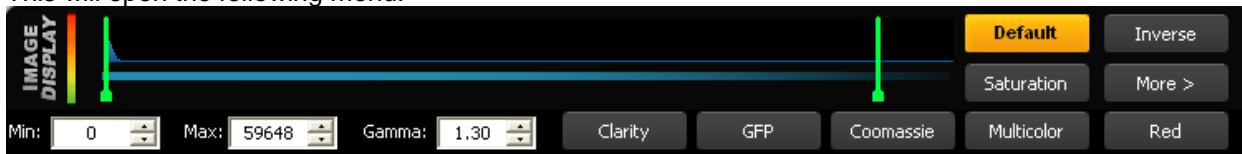
Note: Click on Default to reset the display to the default display settings:



Note: You can enter manually the lower and the upper display range values. To proceed, click on More from the Image Display menu:



This will open the following menu:

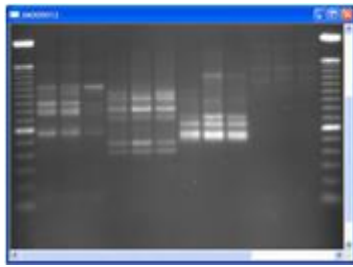
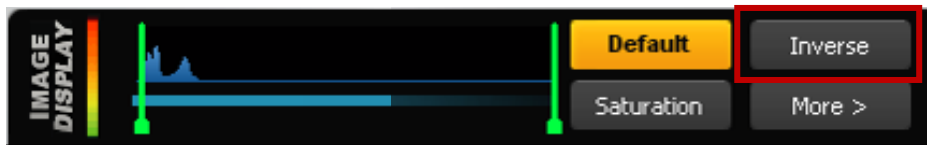


You can then edit manually the lower and the upper display range values in the corresponding edit field:

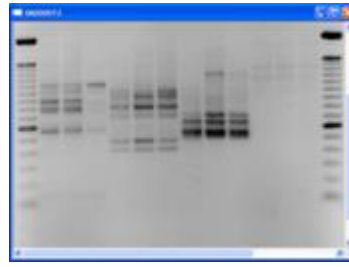


Inverse

Click on the “Inverse the image” to inverse the grey level of the image. This makes a negative image.



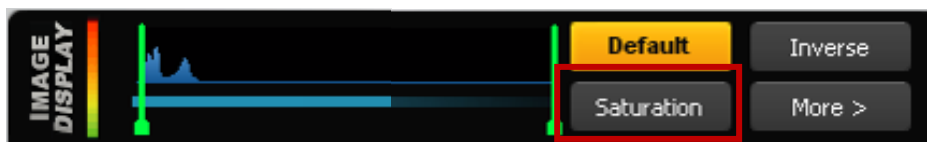
Positive image
(white spot, black background)



Inverted image - Negative image
(black spot, light background)

Saturation

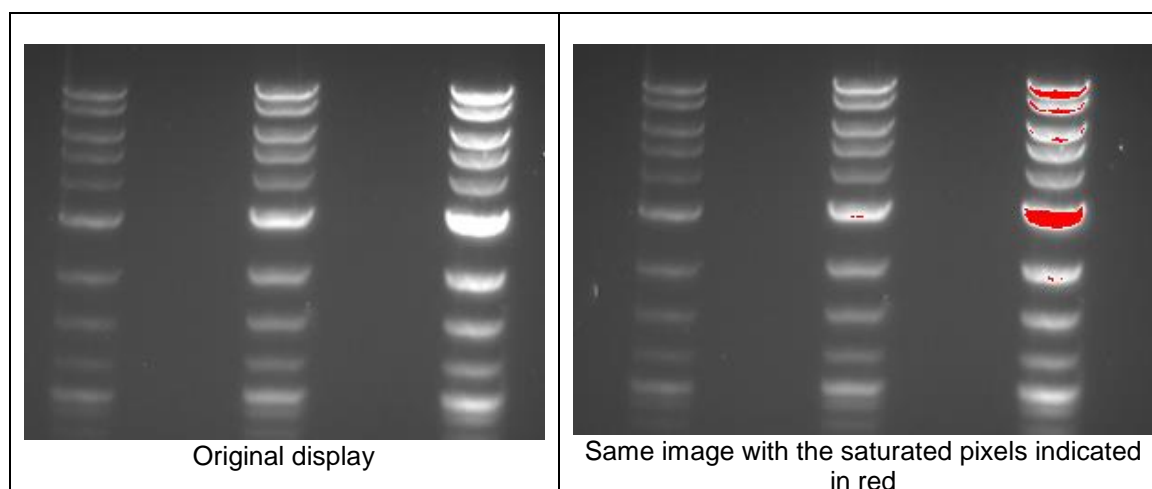
A saturated image is inappropriate for image quantification with image analysis software. The saturation option allows you to visualize in red, pixels that have the maximum grey level in order to avoid flattened peaks.



The maximum grey level depends of the bit-depth. For instance:

- A 8-bit image has a maximum grey level of 255.
- A 12-bit image has a maximum grey level of 4095.
- A 14-bit image has a maximum grey level of 16383.
- A 16-bit image has a maximum grey level of 65535

Select the saturation option and the saturated pixels are displayed in red:



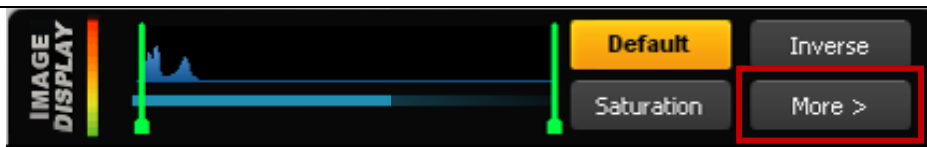
Note: If an image is being acquired and the «Saturation» option is checked, the modification is applied to the current acquired image

Note: A saturated image creates quantification error when studied by an image analysis software. Gel-doc systems have to indicate to the user if the image is saturated and if it is then necessary to modify the integration time.

Image display – More > (Gamma / Pseudo colors)

You could access more display option from the Image Display menu.

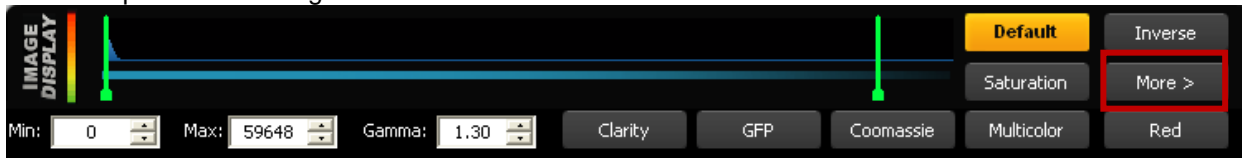




The Image Display menu

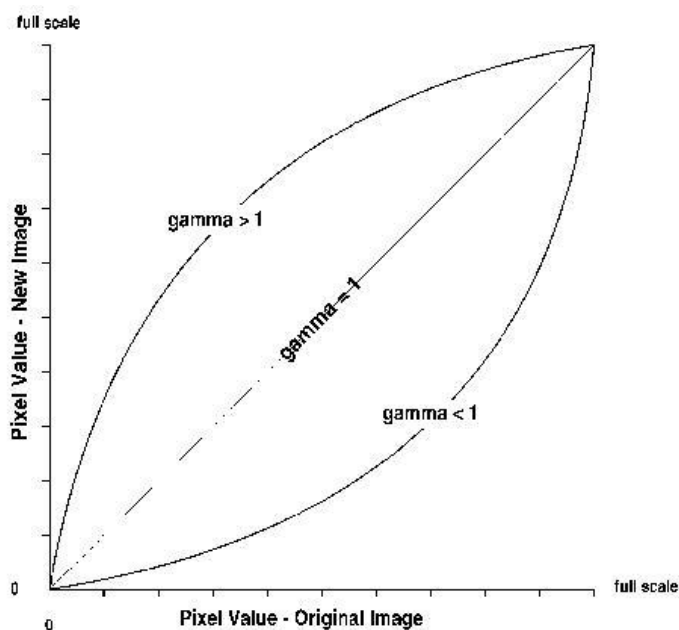
To proceed, click on More from the Image Display menu:

This will open the following menu:



Gamma

Gamma adjustment corrects an image by creating a new version of the original. To create the new image, the Gamma Adjust function reassigns the grey values of each pixel in the image according to the curve in the following graph:



The above graph demonstrates the basic principles of gamma adjustment:

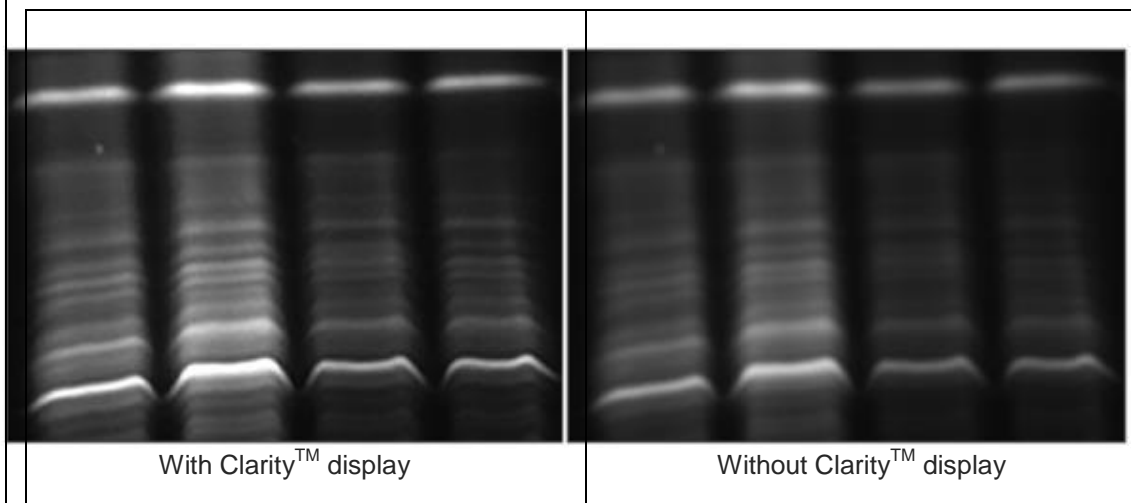
- Black (pixel value = 0) remains black at all gamma values.
- White (pixel value = full scale) remains white at all gamma values.
- Gamma values greater than one lift the darker areas of the original image into the brighter areas of the new image.

A gamma curve is smooth: there are no unexpected jumps or cut-offs. This means that when viewing a gamma adjusted image, you will be able to see the details (intensity differences) in both the black and white areas of the image.

When the bright areas of these types of images are correctly exposed, the darker areas can be so dark that they are in effect invisible. Gamma Adjust can remedy this problem. The gamma adjustment results in a better display of detail by lightening the darker areas without burning out bright areas or lightening black areas:

Clarity™

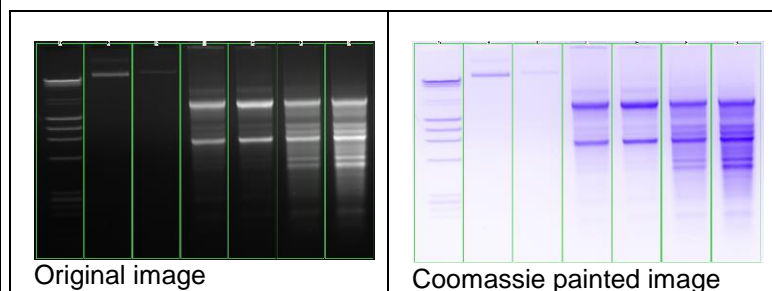
Clarity is a display filter which enhance the contrast and sharpness. Clarity does not affect the raw data.



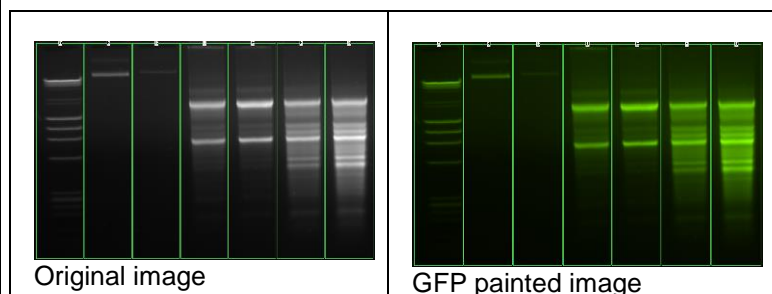
Pseudo colors

The pseudo colors can display different types or levels of fluorescence in an image. It replaces the original grey levels of the image by another palette color. The Bio-1D software has several predefined palette designs. Select your palette design from the followings:

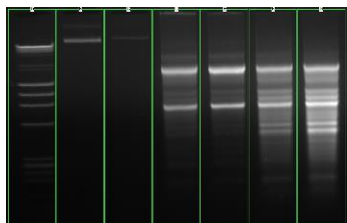
Coomassie



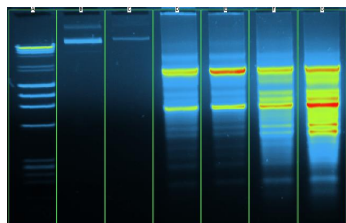
GFP



Multicolor

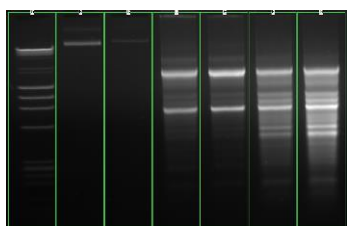


Original image

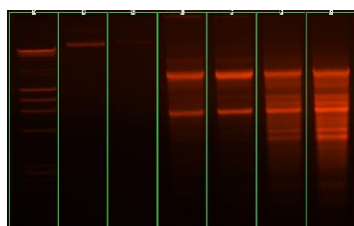


Multicolored painted image

Red



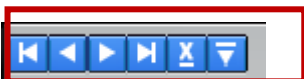
Original image



Red painted image


The Image tab

Access the Image Display from the main Capt windows:

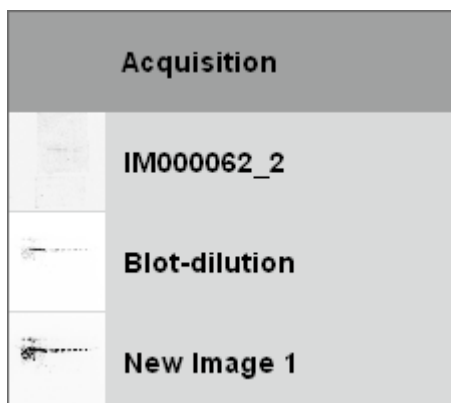


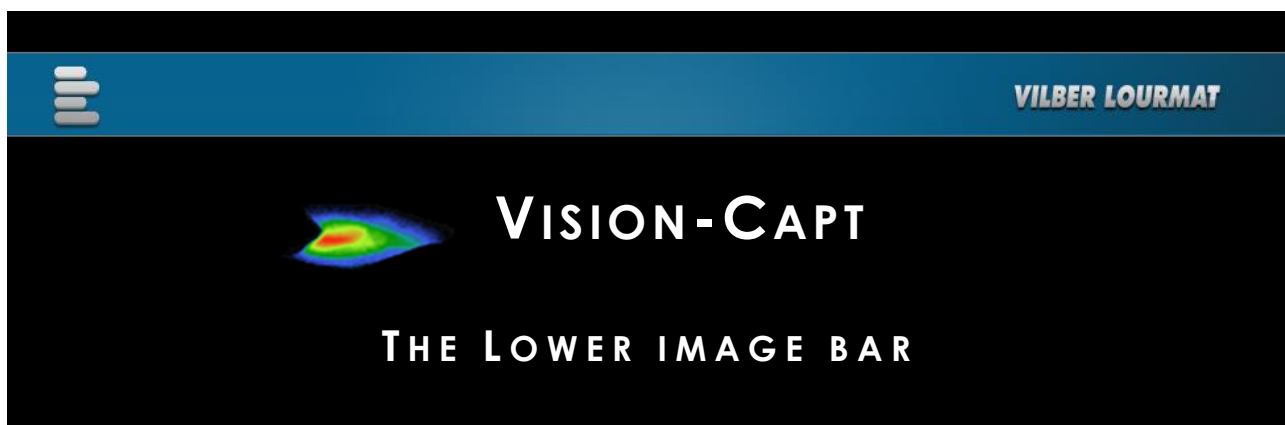
The Image Tabs

Several images could be opened at the same time. You can easily switch from one image to another image using the arrows.

With the , you can close all images.

With the , you can navigate from one image to another.











Access to the Lower image bar

Access the Lower image bar from the main Capt windows:

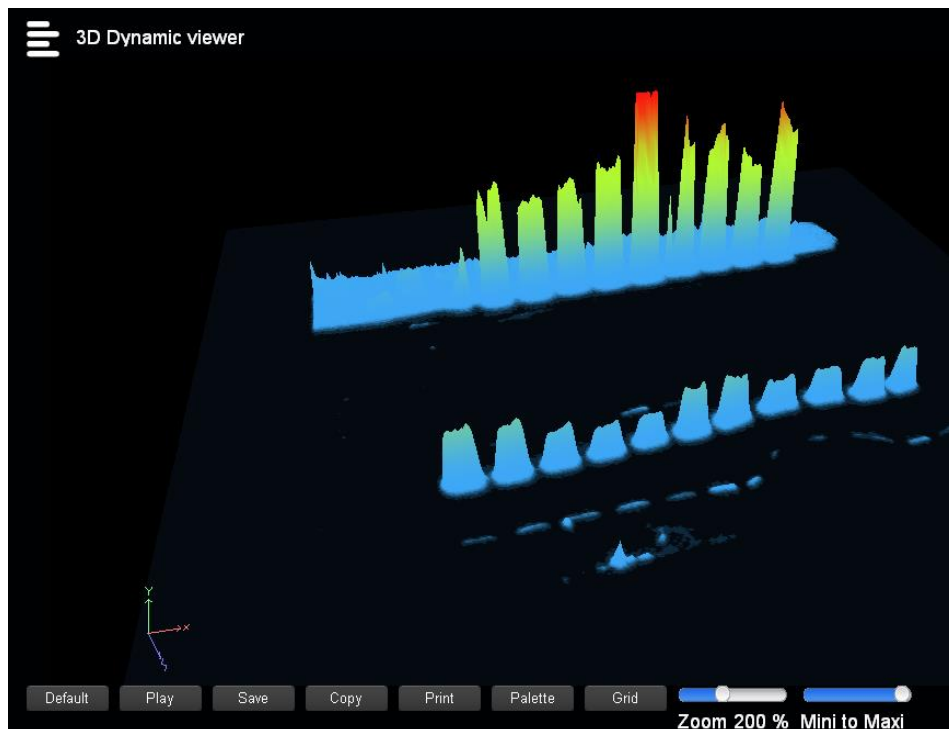


The Upper image bar contains the following features:

| | |
|---|---|
|  | Displays the image in a 3 Dimensional way |
|  | Compare two or several images |
|  | Access the Good Laboratory Practice (GLP) file which track all the image treatments performed with the software |
|  | Copy an image, a table or a graph onto the clipboard for insertion into another Windows program |
|  | Resize the image to fit the size of the monitor |
|  | Zoom in or out the image |

3D Dynamic Scan

The Vision-Capt 3D scan is a revolutionary approach in the field of molecular imaging. The Vision-Capt 3D Scan images your sample in real time and reconstructs the data to create live three dimensional model. The 3D reconstruction provides direct information regarding the image dynamic, background level and protein or DNA quantity. A little change of exposure time will refresh the 3D view automatically. The saturation effect can be controlled live before the image is frozen.



Default:

Default

Click on Default to reset the display to the default display settings

Play:

Play

Make the 3D view turning automatically.

Save:

Save

Saves a 3D view to a new file or file location.

Copy:



Copy a 3D view onto the clipboard for insertion into another Windows program.

Print :



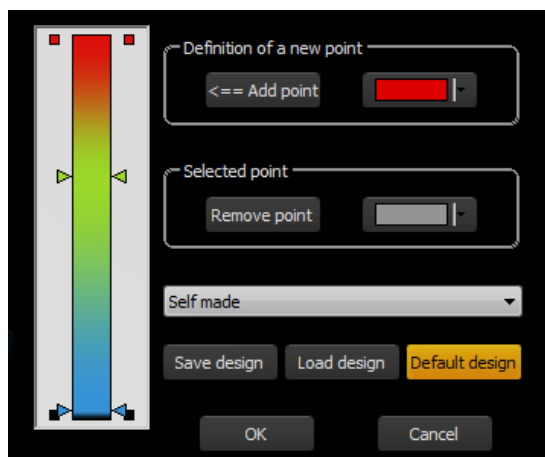
Prints a 3D view as it appears in the image window.

Palette

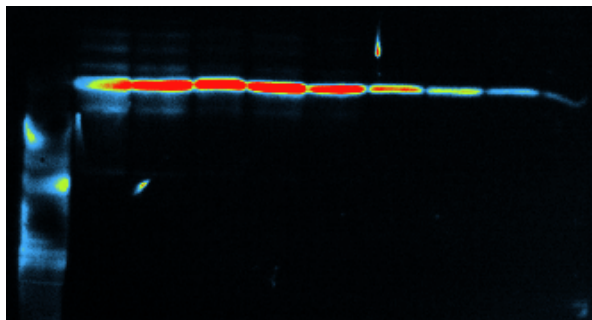


You can define and apply a color palette to your 3D image, allowing you to apply specific RGB values to monochrome images. The pseudo colors can display different types or levels of fluorescence in an image. It replaces the original grey levels of the image by another palette color.

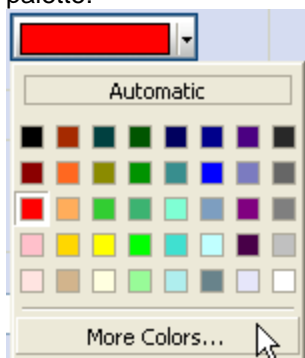
To proceed, click on the Pseudo-color button. A window displays the following menu:



There are seven pre-defined color options: Red, Green, and Blue, Greyscale, Inverted greyscale, Yellow and Multicolor. Click on the pre-defined option icon. The image is then displayed with the default pseudo-colors settings. For instance, the image could be as follows with the Multicolor option:



You can define custom palettes using the Add a point option:
Click on Add a point to add a color on the pseudo colors list. Select the color from the Add a point palette:



For the bicolor selection, click on the arrow to define the value of the color you want to modify. While keeping the mouse button pressed, move the arrow to its new value. Release the mouse button when value is satisfactory, the image is automatically updated. You can repeat these operations as many times as necessary for all pseudo colors.



If needed, select the point to remove and click on Remove point to remove a color from the pseudo colors list.

User defined palette design

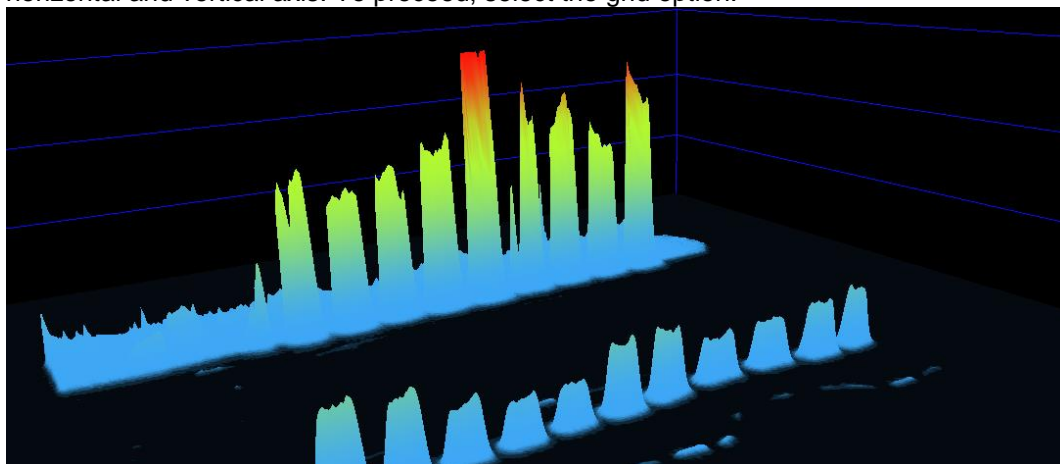
You can also save and load your own palette design. Define the set of colors you want to apply and click on Save to save the palette design. Click on Load to open your palette design.



Grid:



With the grid option, you can display a grid on the screen to visualize your 3D image gel according to horizontal and vertical axis. To proceed, select the grid option.



Zoom



Zoom in or out the 3D view

Mini to maxi



Select the scale of 3D visualisation

Image compare

Compare

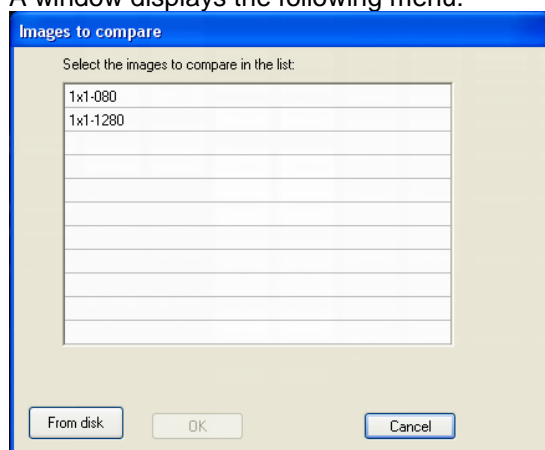
This function is used to compare two or several images in a single view.

Click on the "Compare" button from the lower image bar:



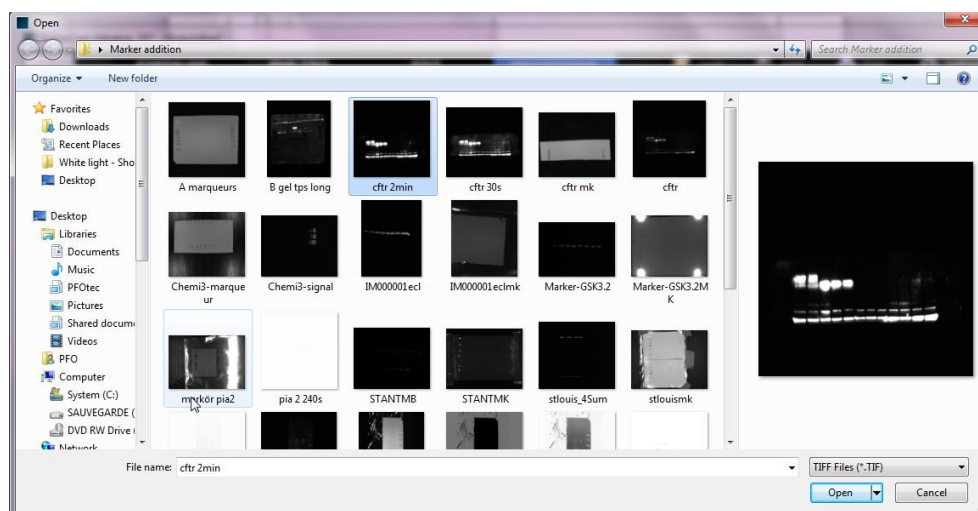
Lower image bar

A window displays the following menu:



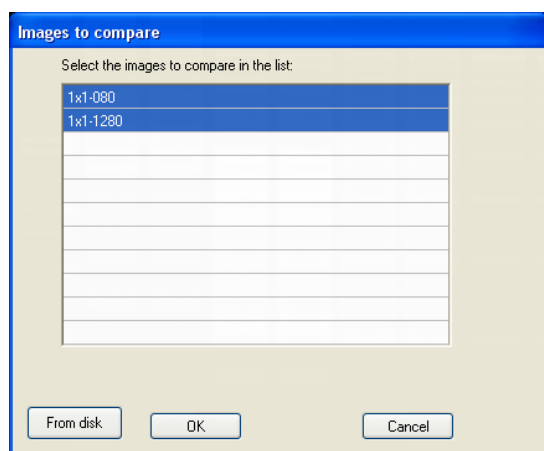
A list displays the image already opened.

You can also add an image to the list by opening an image from your computer. To proceed, click on the “From disk” button. A pop-up window displays the following menu:



- ⇒ Browse to specify the image directory
- ⇒ Double click on the image name you want to load

When all the images to be compared are gathered in the list, click on the image you want to compare: and validate by clicking on OK:



A new window opens with the compared image:



To close the compare view, click on the “Close” button:



Good laboratory practice file

GLP

The Good Laboratory Practice (GLP) file is made to track all the image treatments performed with the software. Click on the “GLP” icon. A pop-up window displays the following menu:

| | |
|--------------------|------------------------------------|
| Image name: | Led+filtre-Invitrogen+ecran vilber |
| Acquisition date | 19 July 2011 - 15:05:22 |
| Exposure time | 0 min 3 sec 920 msec |
| Sensor area used: | (0, 0, 2048,2048) |
| Tray position | Transilluminator |
| Imaging mode | Photo |
| Image manipulation | Information not available |

At the bottom of the window are buttons for '?', 'Export data', 'Print GLP only', 'Print with image', and 'Close'.

The GLP file has 4 different topics:

- the Image details which provide information on the way the image has been taken;
- the Application protocol which provide information on the Application protocol used to take the image;
- the System details which provide details on the system used to take the image;
- the Notes which provide you space to add information to your image.

Copy

Copy

This function copies an image, a table or a graph onto the clipboard for insertion into another program. This option is identical to the Windows® [Ctrl C] command.

To proceed, click on the Copy to clipboard icon. The image, the table or the graph is now ready to be pasted into another application.

Open the application that you want to paste the image into, and select from the available pasting options ([Ctrl V] command for Windows® software).

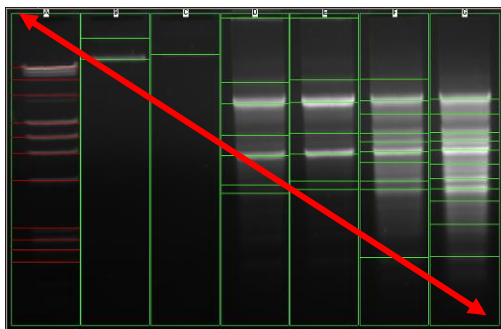
Autofit

Autofit

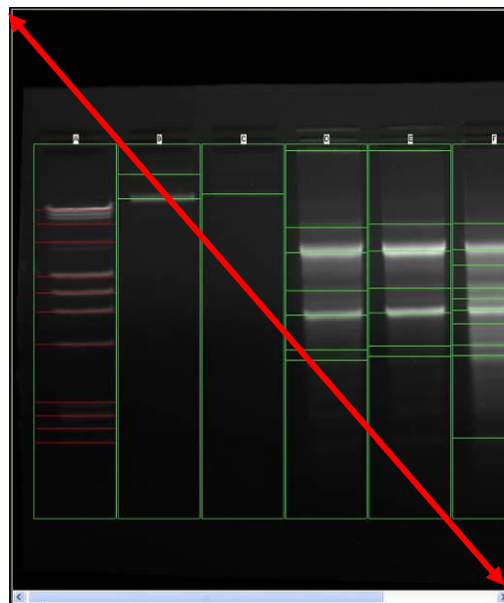
Click on the “Autofit” to resize the image to fit the size of the monitor.

The full resolution of the acquired may be larger than the screen resolution. The navigation requires the Windows scroll bar. The Autofit allows you to view the whole image, regardless of the window size. Typically, reducing the size of a window also cuts off part of the image. The Fit to Window option solves this problem by resizing the image so that it is always the same size as the window.

The Autofit feature proportions the display of the image to the screen resolution.



Autoscale (no scroll bar)

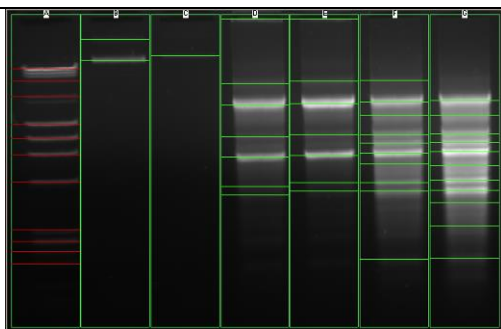


No Autoscale (scroll bar)

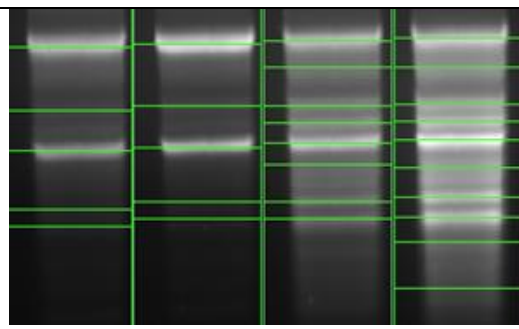
Zoom



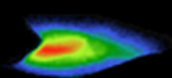
Click on the “+” or “-” to zoom in or out the image



Auto-scale (no zoom)



Zoom 150%



VISION-CAPT

THE APPLICATION PROTOCOL

What is an Application protocol

Capt Advance software runs with pre-defined image acquisition parameters to facilitate the use of the system for a specific application. These pre-defined parameters are gathered in the Capt Advance Application protocol.

The Application protocol automates a task or a set of tasks that you perform repeatedly or on a regular basis. It stores the following information:

- The image exposure pre-defined set-up;
- The live preview pre-defined parameters;
- The image display pre-defined set-up;
- The image printing pre-defined set-up;
- The image file pre-defined set-up.

The factory settings include 3 pre-defined Application protocols:

- SkyLight
- UV fluorescence
- Conversion screen

You can also create your own Application protocol.

The benefits of the Application protocol are as follows:

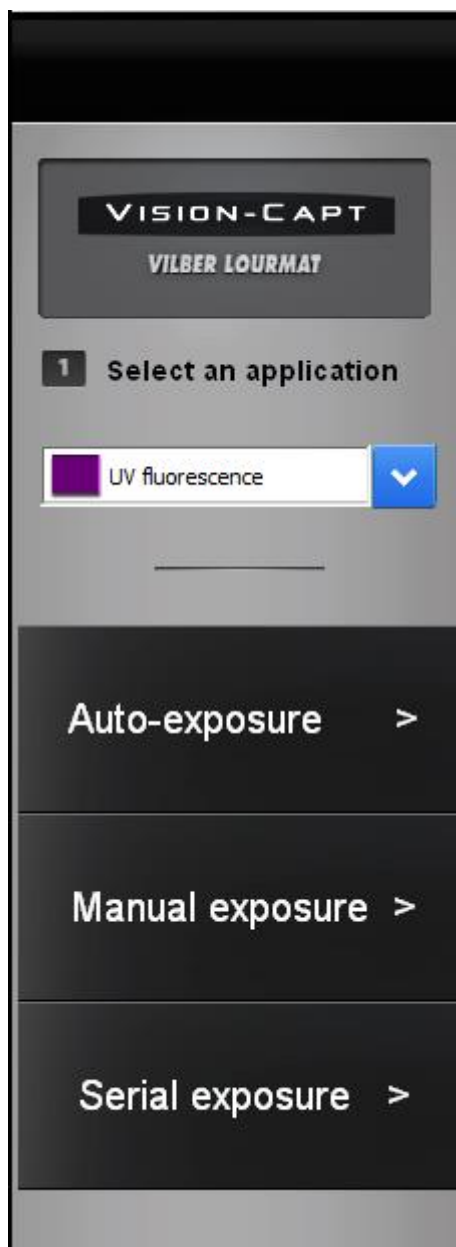
- ⇒ Time saving
- ⇒ Reproduction of image acquisition parameters
- ⇒ Protocol are modifiable, allowing the user to maintain an original template while modifying it for a slightly different result, with minimal effort

Access to the Application protocol

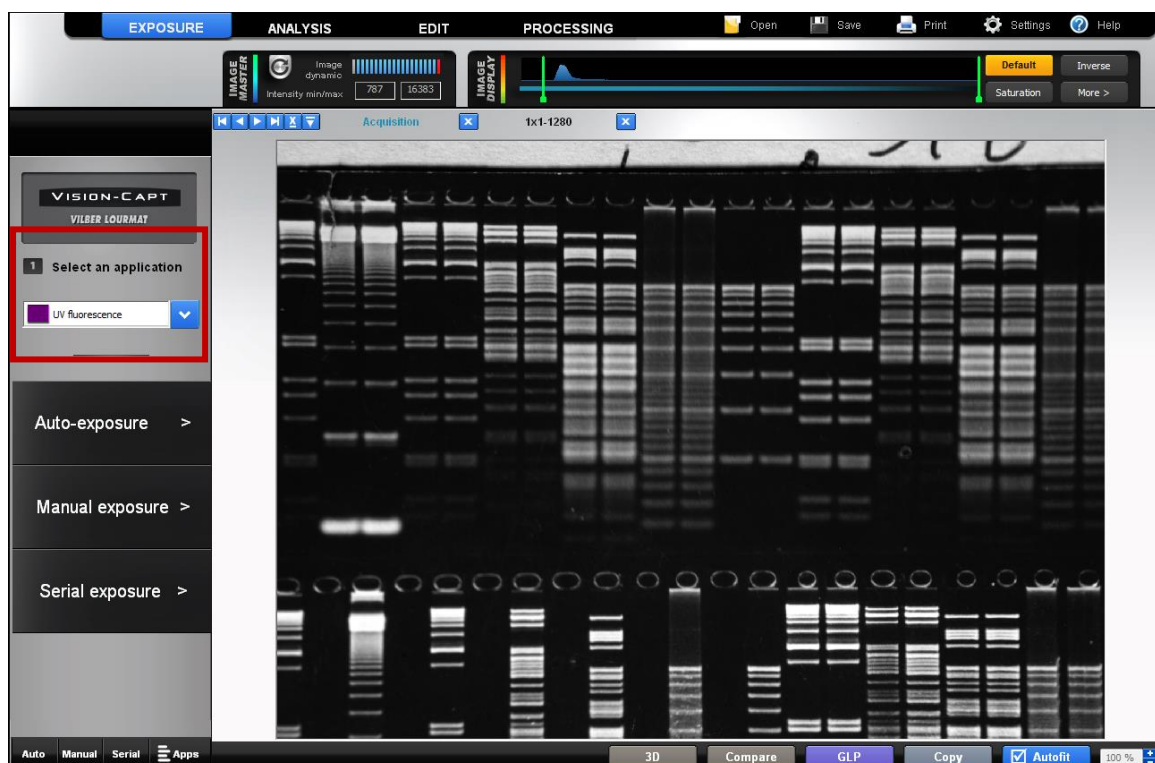
Select the Exposure module from the menu bar to access the Exposure menu:



This will open the Exposure function folder:

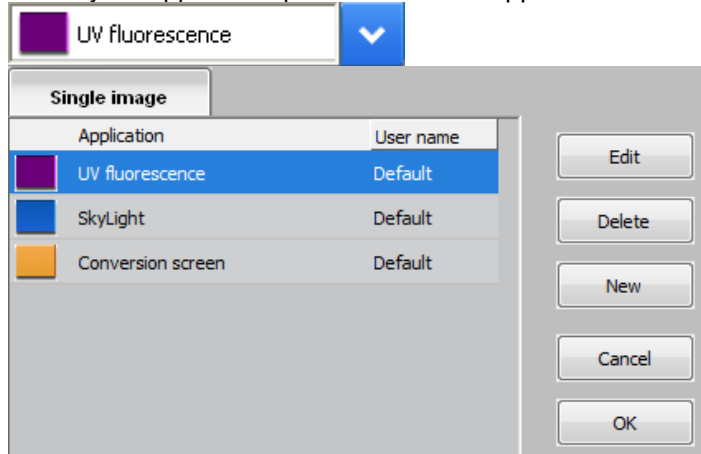


Select Auto-exposure, Manual exposure or Serial exposure. A new menu window will appear:



The access to the Application protocol is in the upper part of the menu.

Select your application protocol from the application menu



Click on OK to validate your selection.

Application protocol in details

The Application protocol can either be displayed with a summary view or with a complete view. By default, the application protocol is displayed with the summary view. Click on Advanced options to have access to all the application protocol features.

Default configuration

Exposure

Sensitivity

Full resolution

User's name

Default

Protocol's avatar

Inverse the image

Prefered image saving directory

c:\V\Images

>>

☒ Open the last used directory

Advanced options

Default parameter

Load a protocol

?

Save protocol as

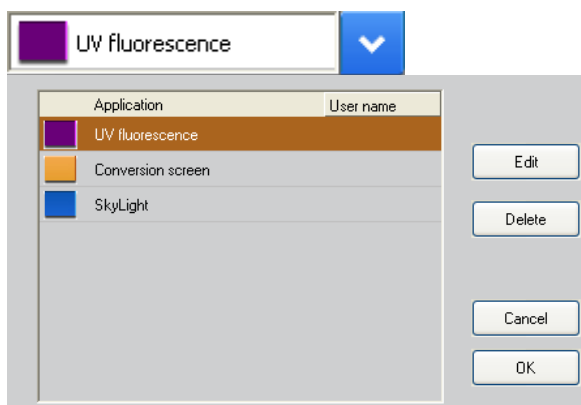
Save

Cancel

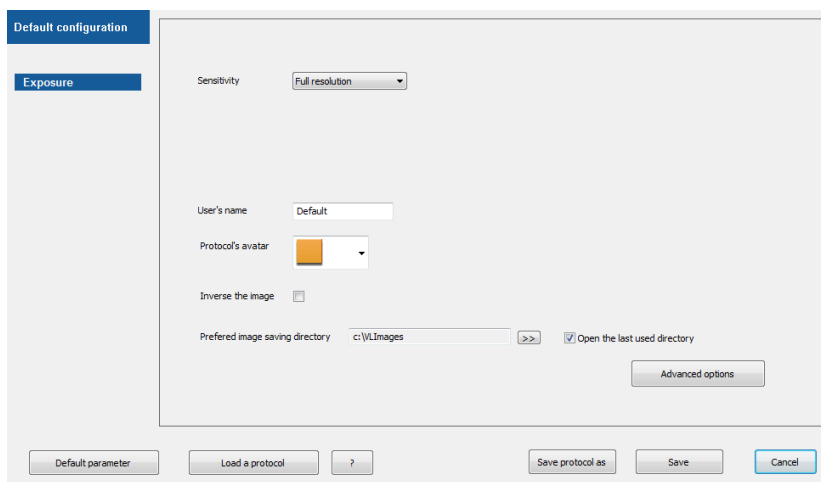
The Application protocol bar contains the following folders:

| | |
|-------------------|--|
| Advanced exposure | Contains the exposure pre-defined set-up |
| Preview | Contains the live preview pre-defined parameters |
| Display | Contains the image display pre-defined set-up |
| Printing | Contains the image printing pre-defined set-up |
| General | Contains the image file pre-defined set-up |
| Processing | Apply post process function to an acquired image |

To Edit an Application protocol, click on Edit:

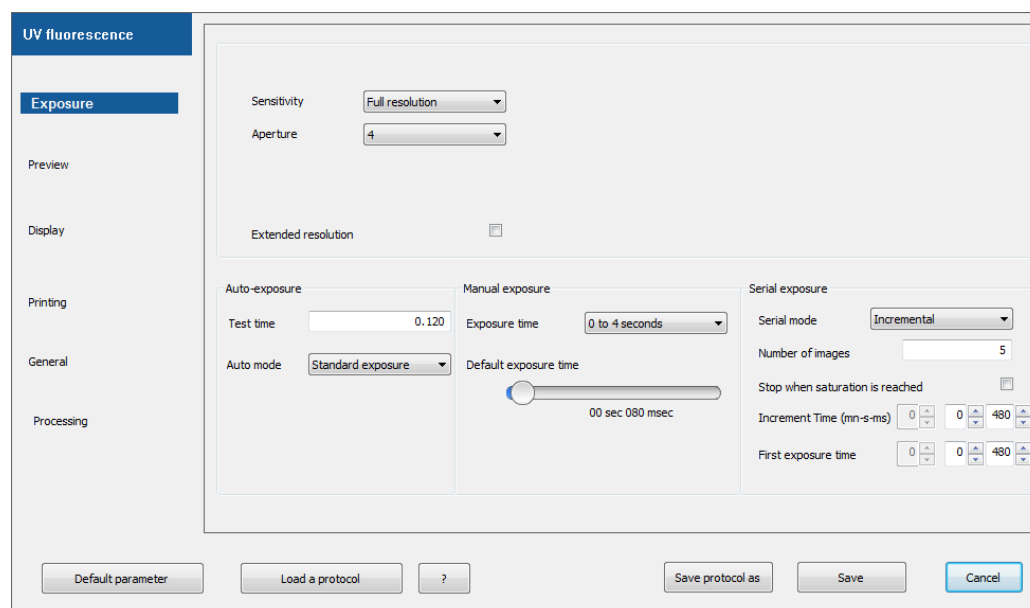


A pop-up window opens the following windows:



Exposure – Exposure predefined set-up

The Exposure folder contains the exposure pre-defined set-up:

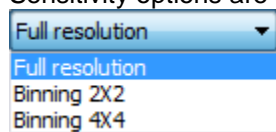


Typical Exposure set-up for a fluorescence application

Sensitivity

This option defines the image sensitivity for your image exposure. The Vision-Capt systems offer exquisite resolution and sensitivity to maximize quantifiable data. The system can be used at either its full resolution or with binning.

Sensitivity options are as follows



The full resolution is the native camera image.

The binning technique combines the charge from adjacent pixels so that the total charge can be read-out as a single pixel. The result is an increased signal and thus an improved sensitivity and a better signal-to-noise ratio. This allows reducing the exposure time. The reduction of the amount of pixels improved the frame rate of the image acquisition. However, the image resolution is decreased by the binning factor (i.e: 4 for a binning of 2 by 2).

A 2x2 binning factor means that pixels in two rows and two columns (a total of 4 pixels) are combined to be represented as one pixel. The sensitivity is heightened but the resolution is then divided by 4.

Aperture (Xpress series only)

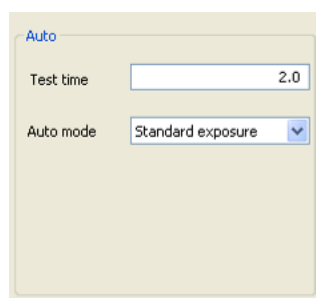
This option defines the aperture to be used for image acquisition. For UV Fluorescence, the aperture should be set at f4. For SkyLight, the standard aperture is f1.2.

Extended resolution

The effective pixels technology allows the extension of the camera native image resolution by software interpolation.

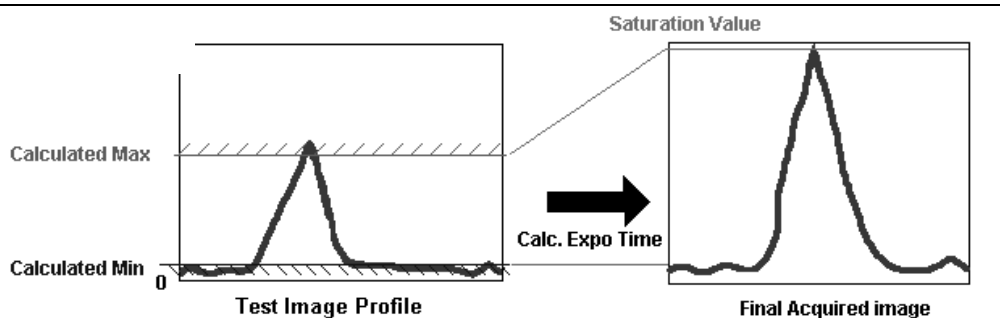
Note: This process requires important computer calculation and sometime could be necessary before the extended image is displayed.

Auto-exposure set-up



Test time

In order to calculate an ideal exposure time, the software needs to analyze a test image, taken in binning mode with a test exposure time. Then it searches for the minimum and maximum acceptable grey levels and calculate the exposure time so the highest grey levels values of the final image reach a maximum defined (Saturation Value).



Calculated Min ("Lower Gray levels" parameter) : Nr of Lower Gray levels with at least 10 pixels in the image

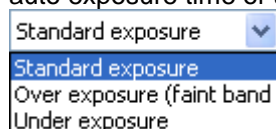
Calculated Max ("Higher Gray levels" parameter) : Nr of Higher Gray levels with at least 1 pixel in the image

For fluorescence, the standard test time is 0.2 seconds.

Note: in the case the au-exposure does not give you entire satisfaction for your specific application, we recommend increasing the test time.

Auto mode

The Auto mode options allow you to select between a standard auto exposure time, an extended auto exposure time or a reduced auto-exposure time.

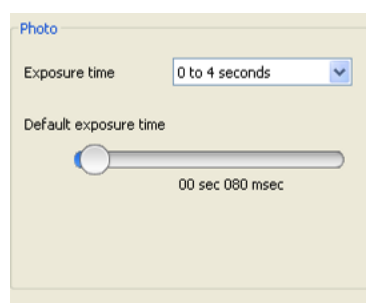


Standard exposure is optimized for all bands.

Over exposure (faint band) results in a longer exposure where faint bands are more visible, but more prominent bands may be over exposed.

Under exposure (bright band) results in a shorter exposure where bright bands are more visible, but more prominent bands may be under exposed.

Manual exposure set-up



Manual exposure set-up

This option defines the default imaging exposure time.

For the fluorescence mode, the Capt Advanced has two exposure time scales:

- One for short times: 80 milli-second to 4 seconds
- One for long times: 4 sec to 1 minute

Note: With the short integration time scale, the integration time increases or decreases by 40milli seconds.

Note: With long integration time, a delay could be necessary before an image is displayed on the monitor (up to twice the selected Exposure time).

Serial exposure set-up

The serial exposure has 4 different modes:

- Incremental
- Accumulation
- Repetitive
- Programmed

Incremental serial mode

Accumulation serial mode

Repetitive serial mode

Programmed serial mode

The incremental mode

In the incremental mode, you define the exposure time of the first image of the series, then the time to be added to this increment for each subsequent image:

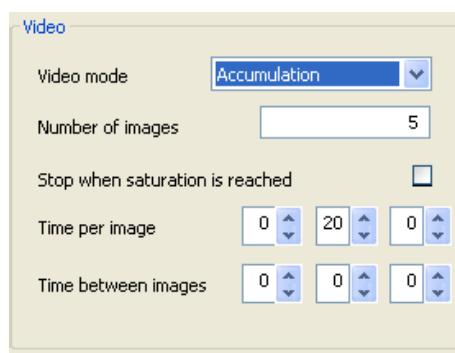
Example:

| | | |
|---|----------------|-------------------------------------|
| Image 1 | 20s | 20second is the First exposure time |
| Image 2 | 20s | |
| | + 30s -Image B | = Image 2 |
| <p>The increment time is 10s. Image B has the exposure time of the previous image (20s) plus the increment time (10s). Image 2 is the result of the addition of image 1 plus Image B.</p> | | |

| | |
|---------|--|
| Image 3 | <div> <div>Image 2</div> <div>+</div> <div>40s -Image B</div> <div>=</div> <div>Image 3</div> </div> <p>The increment time is 10s. Image C has the exposure time of the previous image (30s) plus the increment time (10s). Image 3 is the result of the addition of image 2 plus Image C.</p> |
| n Image | <p>...</p> <p>The number of images of the serie is defined by the Number of images parameter.</p> |

Note: the series could stop automatically before the Number of images parameter is reached if the Stop when the saturation is reached is selected. If this option is on, the serial process is stopped automatically when the saturation pixel is reached on the obtained accumulated image.

The Accumulation mode



In the accumulation mode, you define a same exposure time for each image of the series. Then from the second image acquired, each new image is added to the previous one.

Example:

| | |
|---------|---|
| Image 1 | <div>20s</div> <p>20second is the Time per image</p> |
| Image 2 | <div> <div>20s</div> <div>+</div> <div>20s -Image B</div> <div>=</div> <div>Image 2</div> </div> <p>Image B has the exposure time of the previous image (20s) Image 2 is the result of the addition of image 1 plus Image B.</p> |
| Image 3 | <div> <div>Image 2</div> <div>+</div> <div>20s -Image B</div> <div>=</div> <div>Image 3</div> </div> <p>Image C has the exposure time of the previous image (20s). Image 3 is the result of the addition of image 2 plus Image C.</p> |
| n Image | <p>...</p> <p>The number of images of the serie is defined by the Number of images parameter.</p> |

Note: the series could stop automatically before the Number of images parameter is reached if the Stop when the saturation is reached is selected. If this option is on, the serial process is stopped automatically when the saturation pixel is reached on the obtained accumulated image.

Note: you can define a time elapse between the images. The software will wait for the defined time elapse prior to acquire the subsequent image.

The Repetitive mode

Video

Video mode

Repetitive

Number of images

5

Stop when saturation is reached

☐

Time per image

0

20

0

Time between images

0

0

0

In the accumulation mode, you define a same exposure time for each image of the series. Then from the second image acquired, each new image is added to the previous one.

Example:

| | | |
|---------|-------------|---|
| Image 1 | 20s–Image 1 | 20second is the Time per image |
| Image 2 | 20s–Image 2 | |
| Image 3 | 20s–Image 3 | |
| n Image | ... | The number of images of the serie is defined by the Number of images parameter. |

Note: the series could stop automatically before the Number of images parameter is reached if the Stop when the saturation is reached is selected. If this option is on, the serial process is stopped automatically when the saturation pixel is reached on the obtained accumulated image.

Note: you can define a time elapse between the images. The software will wait for the defined time elapse prior to acquire the subsequent image.

The Programmed mode

Video

Video mode

Programmed

Stop when saturation is reached

☐

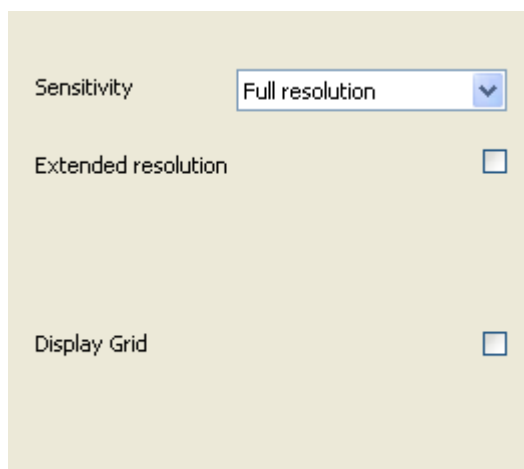
Define parameters >>

The programmed mode is as the repetitive or the accumulation mode in which you can define an exposure time per image.

Note: You will be prompt to save the image prior the start of the serial acquisition.

| | |
|--|---|
| | <p>After acquiring image N°2 the following files are created IM0000xx_2.tif: native image acquired IM0000xx_2Sum.tif: sum of pixel value of images xx_1 and xx_2 After acquiring image N°3 IM0000xx_3.tif : native image acquired IM0000xx_3Sum : Sum of Im0000xx_2Sum and image Im0000xx_3</p> |
|--|---|

The Live folder contains the live review pre-defined set-up:

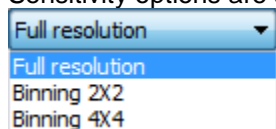


The screenshot shows a light beige rectangular panel with three settings. The first setting is 'Sensitivity' with a dropdown menu currently showing 'Full resolution'. The second setting is 'Extended resolution' with an unchecked checkbox. The third setting is 'Display Grid' with an unchecked checkbox.

Sensitivity

This option defines the image sensitivity for your image exposure. The Vision-capt systems offer exquisite resolution and sensitivity to maximize quantifiable data. The system can be used at either its full resolution or with binning.

Sensitivity options are as followed:



The screenshot shows a dropdown menu with 'Full resolution' selected and highlighted in blue. Below it are two other options: 'Binning 2X2' and 'Binning 4X4'.

The full resolution is the native camera image.

The binning technique combines the charge from adjacent pixels so that the total charge can be read-out as a single pixel. The result is an increased signal and thus an improved sensitivity and a better signal-to-noise ratio. This allows reducing the exposure time. The reduction of the amount of pixels improved the frame rate of the image acquisition. However, the image resolution is decreased by the binning factor (i.e: 4 for a binning of 2 by 2).

A 2x2 binning factor means that pixels in two rows and two columns (a total of 4 pixels) are combined to be represented as one pixel. The sensitivity is heightened but the resolution is then divided by 4.

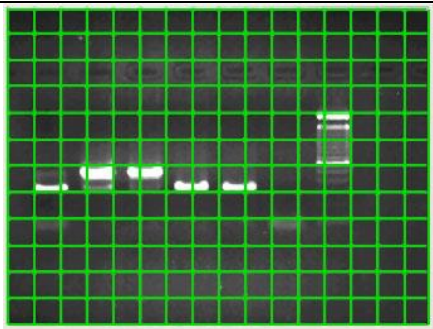
Extended resolution

The effective pixels technology allows the extension of the camera native image resolution by software interpolation.

Note: This process requires important computer calculation and some time could be necessary before the extended image is displayed.

Grid

With the grid option, you can display a grid on the screen to adjust your gel according to horizontal and vertical axis. To proceed, select the grid option.

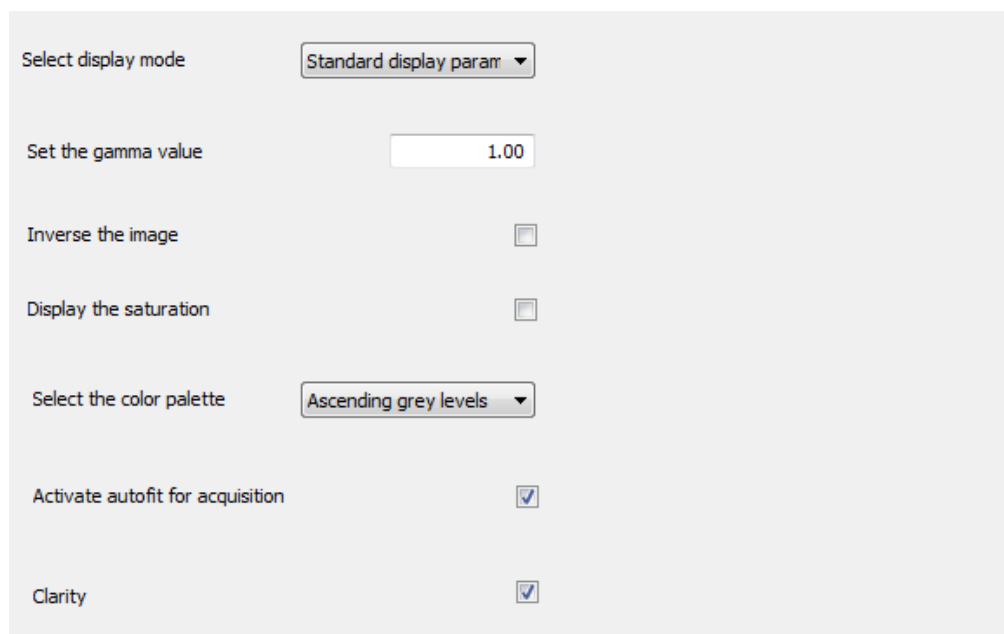


Note: The grid option is only available with the Live mode and is not available for 8x8 binning mode.

Note: You can remove the grid option by deselecting this option.

Display – Image display pre-defined parameters

The Display folder contains the image display pre-defined set-up:



Select display mode: Standard display param

Set the gamma value: 1.00

Inverse the image: ☐

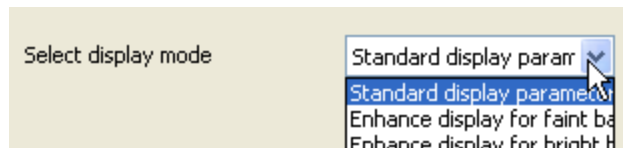
Display the saturation: ☐

Select the color palette: Ascending grey levels

Activate autofit for acquisition: ☒

Clarity: ☒

Select display mode



Select display mode: Standard display param

- Standard display parameter
- Enhance display for faint bands
- Enhance display for bright bands

The Select display mode options allow you to select between a standard display, an enhance display for the faint band and an enhance display for the bright band.

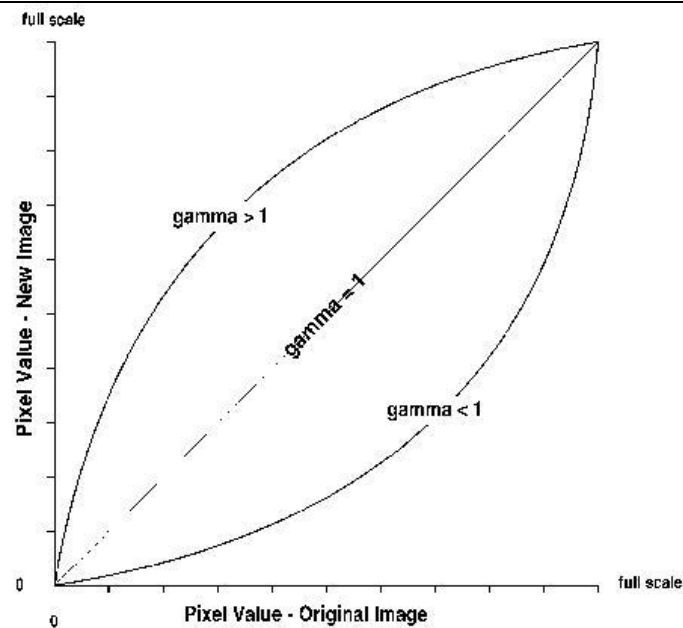
Standard display is optimized for all type of image.

Enhance display for faint band ensure the faint bands are more visible, but more prominent bands will look very strong. This is well adapted for blot sample.

Enhance display for bright band ensure the bright bands are more visible compared to their background. This is well adapted for fluorescence sample.

Set the gamma value

Gamma adjustment corrects an image by creating a new version of the original. To create the new image, the Gamma Adjust function reassigns the grey values of each pixel in the image according to the curve in the following graph:



The above graph demonstrates the basic principles of gamma adjustment:

- Black (pixel value = 0) remains black at all gamma values.
- White (pixel value = full scale) remains white at all gamma values.
- Gamma values greater than one lift the darker areas of the original image into the brighter areas of the new image.

A gamma curve is smooth: there are no unexpected jumps or cut-offs. This means that when viewing a gamma adjusted image, you will be able to see the details (intensity differences) in both the black and white areas of the image.

When the bright areas of these types of images are correctly exposed, the darker areas can be so dark that they are in effect invisible. Gamma Adjust can remedy this problem. The gamma adjustment results in a better display of detail by lightening the darker areas without burning out bright areas or lightening black areas:

Inverse the image

Select "Inverse the image" to inverse the grey level of the image. This makes a negative image.



Positive image
(white spot, black background)



Inverted image - Negative image
(black spot, light background)

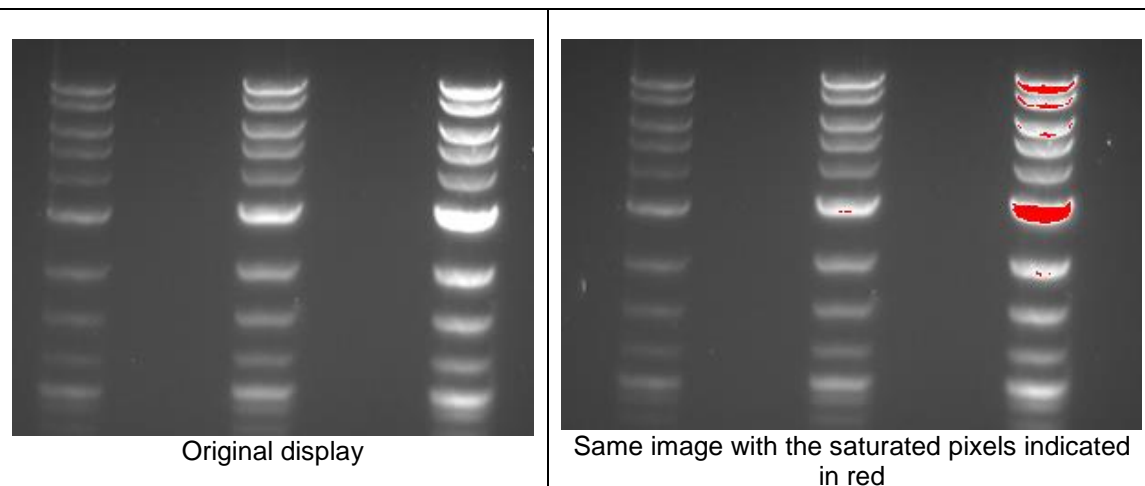
Display the saturation

A saturated image is inappropriate for image quantification with image analysis software. The saturation option allows you to visualize in red, pixels that have the maximum grey level in order to avoid flattened peaks.

The maximum grey level depends of the bit-depth. For instance:

- A 8-bit image has a maximum grey level of 255.
- A 12-bit image has a maximum grey level of 4095.
- A 14-bit image has a maximum grey level of 16383.
- A 16-bit image has a maximum grey level of 65535

Select the saturation option and the saturated pixels are displayed in red:

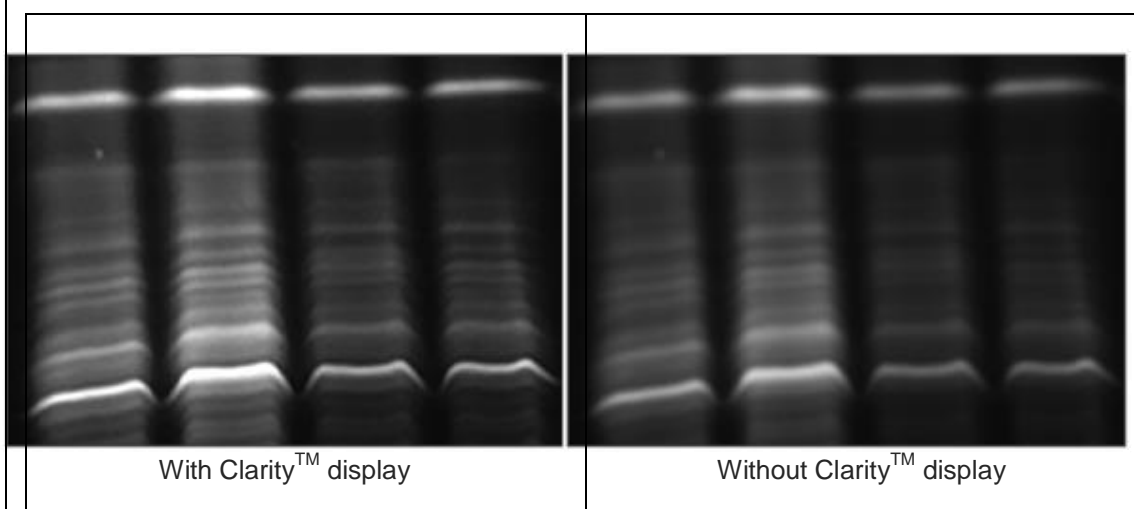


Note: If an image is being acquired and the «Saturation» option is checked, the modification is applied to the current acquired image

Note: A saturated image creates quantification error when studied by an image analysis software. Gel-doc systems have to indicate to the user if the image is saturated and if it is then necessary to modify the integration time.

Clarity™

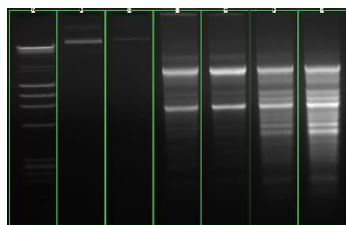
Clarity is a display filter which enhance the contrast and sharpness. Clarity does not affect the raw data.



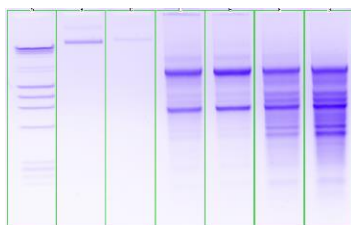
Select the color palette

The pseudo colors can display different types or levels of fluorescence in an image. It replaces the original grey levels of the image by another palette color. The VisionCapt software has several predefined palette designs. Select your palette design from the followings:

Coomassie

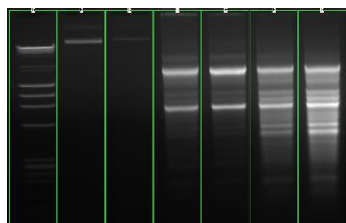


Original image

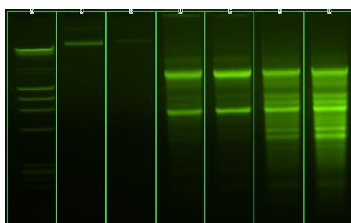


Coomassie painted image

GFP

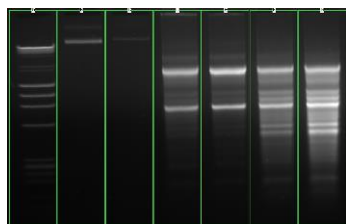


Original image

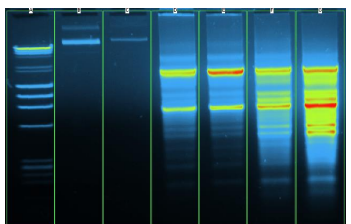


GFP painted image

Multicolor

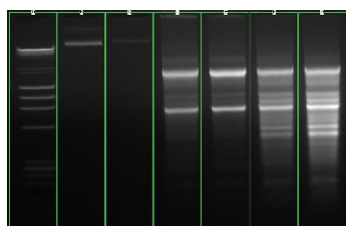


Original image

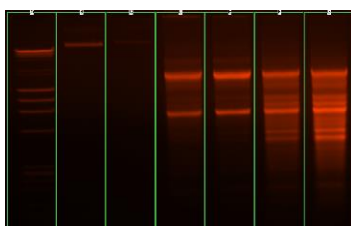


Multicolored painted image

Red



Original image



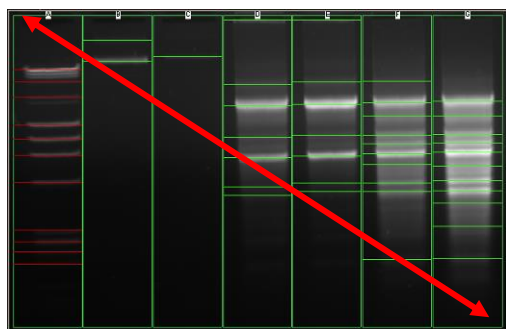
Red painted image

Activate autofit for acquisition

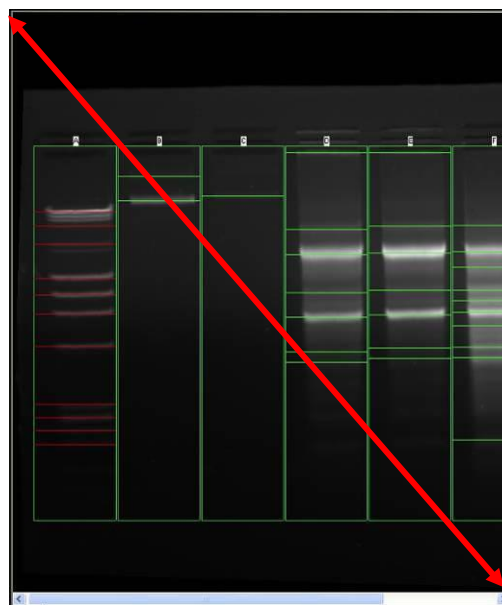
Click on the “Autofit” to resize the image to fit the size of the monitor.

The full resolution of the acquired may be larger than the screen resolution. The navigation requires the Windows scroll bar. The Autofit allows you to view the whole image, regardless of the window size. Typically, reducing the size of a window also cuts off part of the image. The Fit to Window option solves this problem by resizing the image so that it is always the same size as the window.

The Autofit feature proportions the display of the image to the screen resolution.



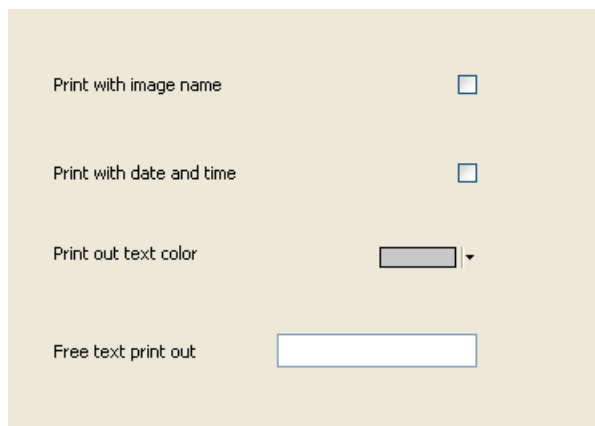
Autoscale (no scroll bar)



No Autoscale (scroll bar)

Printing – Image printing pre-defined parameters

The Printing folder contains the image printing pre-defined set-up:



The screenshot shows a dialog box with a light beige background. It contains four settings:

- Print with image name**: A checkbox that is currently unchecked.
- Print with date and time**: A checkbox that is currently unchecked.
- Print out text color**: A color selection area showing a grey swatch and a small downward arrow.
- Free text print out**: A text input field that is currently empty.

Print with image name

Print the image with its name.

Print with date and time

Print the image with the computer time.

Print out text color

Select the color of the text printing.

Free text print-out

You can select a free text (for instance the name of your institute), the image name (if the image has been previously saved) and date and time.

The text is then displayed on the image print out:



General – Image file pre-defined parameters

The General folder contains the image file pre-defined set-up

The screenshot shows a settings window with two sections. The top section has four items: 'User's name' with a text input field; 'Protocol's avatar' with a color selection button showing a purple square; 'Bit depth' with a dropdown menu set to '16-Bit per pixel'; and 'Keep all captured images in a single view' with a checked checkbox. The bottom section has five items: 'Default file name' with a dropdown menu set to 'Image name with prefix'; 'Image name prefix' with a text input field containing 'IM'; 'File format' with a dropdown menu set to 'TIFF Files (*.TIF)'; 'Preferred image saving directory' with a text input field containing 'c:\VLIImages' and a '>>' button, plus an unchecked checkbox 'Open the last used directory'; and 'Preferred settings saving directory' with a text input field containing 'c:\VLConf' and a '>>' button.

User name

You can define the name of a user for an application protocol. The user could be the name of a working group, the name of a user or a subtitle to the name of the application.

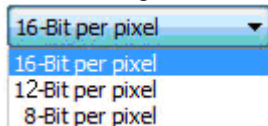
Protocol's avatar

To simplify the reconnaissance of the Application's protocol, an icon is provided to differentiate the application by a color.

Bit depth

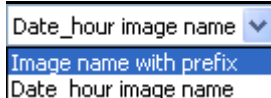
The Vision-Capt systems offer the possibility to select the bit-depth for more convenience, from 16-bit, 12-bit and 8-bit.

- 8-bit images has 256 grey levels;
- 12-bit images has 4096 grey levels;
- 16-bit images has 65 536 grey levels.



The default bit depth mode is 16-bit.

Default file name / Image name prefix



The default file name could either be based on the Date and Hour the image has been taken or by a prefix. You can decide of the default generic file name to simplify the file name generation. By default, the name is IM00000x. The image could also be named according to the time and hour it has been taken.

File format

Images can be saved in CompatibilityPlus 16-bit TIFF scientific image format (recommended), 16-bit TIFF scientific image format, BMP (8-bit format only), JPEG (compressed) or APX (proprietary file format – 16-bit format).

Preferred image saving directory

This option defines the directory where the image is saved by default

Alternatively, you can select to always open the last used directory by clicking on the following option:

☒ Open the last used directory

Preferred settings saving directory

This option defines the directory where are saved the configuration files.

Processing – Applying post process function to an acquired image

The Processing folder contains the image post process options:

- Subtract background
- Apply flat field
- Remove artifacts.

The screenshot shows three distinct panels for image post-processing settings. The first panel, titled 'Subtract background', includes a checkbox for 'Apply after image acquisition', a slider ranging from 0 to 100 with a value of 10, and two radio button options: 'White spots on dark background' (selected) and 'Black spots on white background'. The second panel, titled 'Flat field', features a checkbox for 'Apply after image acquisition' and a dropdown menu for 'Kind of image' set to 'Black spot white background'. The third panel, titled 'Remove artifact', contains a checkbox for 'Apply after image acquisition', a slider ranging from 0 to 1 with a value of 10, a text input for 'Threshold' set to '1000', and a dropdown menu for 'Which artifact' set to 'Bright'.

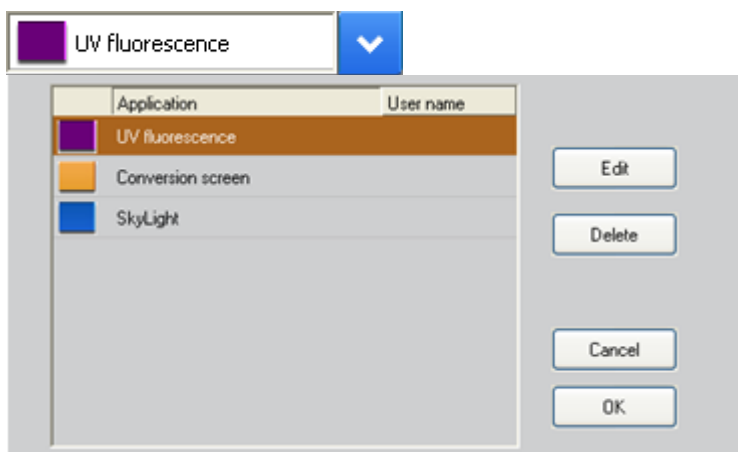
Select ☒ Apply after image acquisition to automatically activate the post processing after the image acquisition.

Note: Please refer to the Processing menu to have more details on the post process working principles.

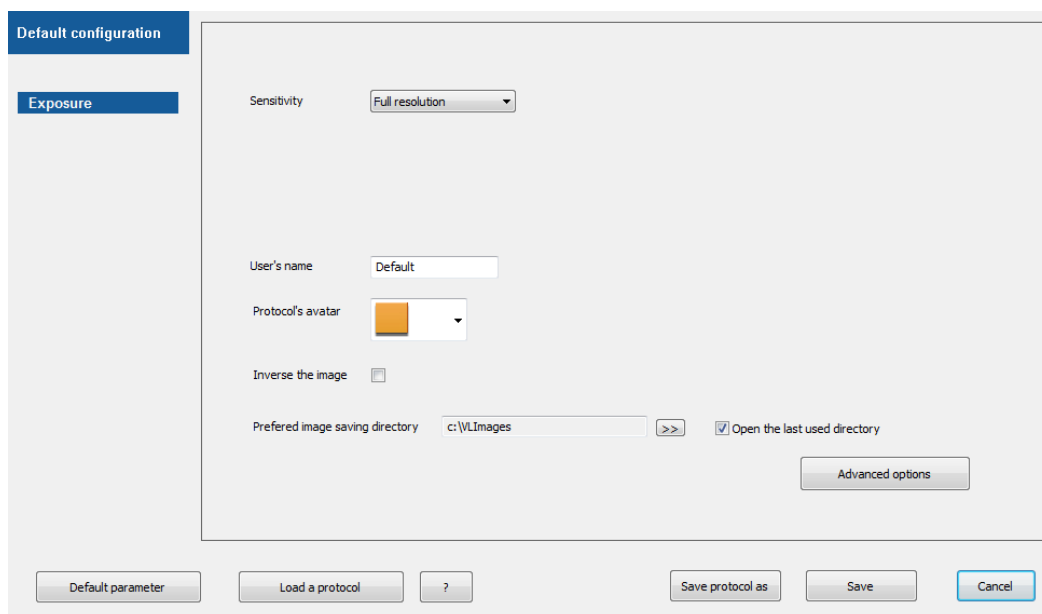
Creating custom Application protocol

You can create your own Application protocol.

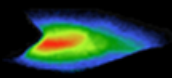
To create an Application protocol, click on Edit:



A pop-up window opens the following windows:



Modify the settings according to your need. Then, Save as the Application protocol.



GEL-DOC SYSTEMS

INFINITY ST5, QUANTUM ST5, BIO-PRINT ST4
MAINTENANCE

Camera room

The maximum ambient air temperature in which the Imaging system should be used is 25°C.
Clean this part only with a soft dry cloth.

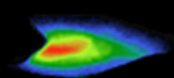
Working part

Clean the tray by using a non-abrasive solvent or tepid water. Dry it with a soft cloth.

Air admission grid

Never obstruct the air admission grids. Regularly free all of them from dust.

Request from your distributor the intervention of a duly qualified technician if the system needs a technical intervention



GEL-DOC SYSTEMS

INFINITY ST5, QUANTUM ST5, BIO-PRINT ST4 TECHNICAL INFORMATION

Electrical specifications

Power supply

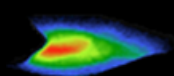
- Current (A) = 1A/0.5A
- Fuse FST (A) = 2A
- Voltage (V) = 100/230V~ (5%)
- Frequency (Hz) = 50/60Hz
- Power = 150 watts

Fuses

- Type FST.
- Time-lag T.
- Ø 5 x 20
- 2A

Climatic conditions

- Altitude 2000 meters
- Operating humidity: 20% to 70% (no condensation allowed)
- Operating temperature: The maximum ambient temperature should be 25°C.



GEL-DOC SYSTEMS

INFINITY ST5, QUANTUM ST5, BIO-PRINT ST4 SPARE PARTS

General advices

- To clean the surface of the filter, use mild solvent or warm water. Dry with a soft cloth
- The filter is porous, so try to keep it dry

All our units are fitted with one or two safety fuses. They are found in the plug at the rear of the unit

TYPE OF FUSE

Type FST
Time-lag T
Ø 5 x 20

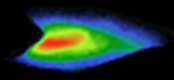
Spare parts

CN-900/1100 series

| Réf. article | LED's module | Tubes T-8.M | Tubes T-8.L | Starter ST-151 FG7-P (100V) | Fuse Ø 5x20 | | Filter with support | |
|---------------------------------------|--------------|-------------|-------------|-----------------------------|-------------|----------------------------|---------------------|------------|
| | | | | | Qty | 100V ~ 115V ~ 230V ~ | Qty | Réf |
| CN-900.20M CN-1100.20M | 2 | 6 | / | 6 | 2 | 2A | 1 | FS-TC20.CM |
| CN-900.20M CN-1100.20M | 2 | 6 | / | 6 | 2 | 2A | 1 | FS-TC26.CM |
| CN-900.26MX CN-1100.26MX | 2 | 6 | / | 6 | 2 | 2A | 1 | FS-TC26.MX |
| CN-900.26LM CN-1100.26LM | 2 | 6 | 5 | 11 | 2 | 2A | 1 | FS-TC26.CM |
| CN-900.26LMX CN-1100.26LMX | 2 | 6 | 5 | 11 | 2 | 2A | 1 | FS-TC26.MX |
| CN-900. SKYLIGHT CN-1100. SKYLIGHT | 2 | / | / | / | 2 | 2A | 1 | FSF-B |

CN-1300 series

| Réf. article | LED's module | Tubes T-8 | | | Starter ST-151 FG7-P (100V) | Fuse Ø 5x20 | | | Filter with support | Filter transilluminator |
|------------------------|--------------|-----------|---|---|-----------------------------|-------------|----------------------------|-----|---------------------|-------------------------|
| | | C | M | L | | Qty | 100V ~ 115V ~ 230V ~ | Qty | Réf | Réf |
| CN-1300.WL 20M | 2 | / | 6 | / | 6 | 2 | 2A | 1 | FS-1300.WL | FS-TC20.CM |
| CN-1300.WL 26M | 2 | / | 6 | / | 6 | 2 | 2A | 1 | FS-1300.WL | FS-TC26.CM |
| CN-1300.WL 26MX | 2 | / | 6 | / | 6 | 2 | 2A | 1 | FS-1300.WL | FS-TC26.MX |
| CN-1300WL/LC 20M | 2 | 2 | 6 | 2 | 10 | 2 | 2A | 1 | FS-1300.WL/CM | FS-TC20.CM |
| CN-1300WL/LC 26M | 2 | 2 | 6 | 2 | 10 | 2 | 2A | 1 | FS-1300.WL/CM | FS-TC26.CM |
| CN-1300WL/LC 26MX | 2 | 2 | 6 | 2 | 10 | 2 | 2A | 1 | FS-1300.WL/CM | FS-TC26.MX |
| CN-1300 SKYLIGHT.WL | 2 | / | 6 | / | 6 | 2 | 2A | 1 | FSF-B | FS-TC26.CM |
| CN-1300 SKYLIGHT.WL/LC | 2 | 2 | / | 2 | 4 | 2 | 2A | 1 | FSF-B | FS-TC20.CM |



E - BOX VX5

E - BOX VX5 MAINTENANCE

Camera room

The maximum ambient air temperature in which the E-BOX VX5 system should be used is 25°C.
Clean this part only with a soft dry cloth.

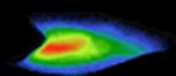
Working part

Clean the tray by using a non-abrasive solvent or tepid water. Dry it with a soft cloth.

Air admission grid

Never obstruct the air admission grids. Regularly free all of them from dust.

Request from your distributor the intervention of a duly qualified technician if the system needs a technical intervention



E - BOX VX5

E - BOX VX5 MAINTENANCE : CHANGING THE UV TUBES

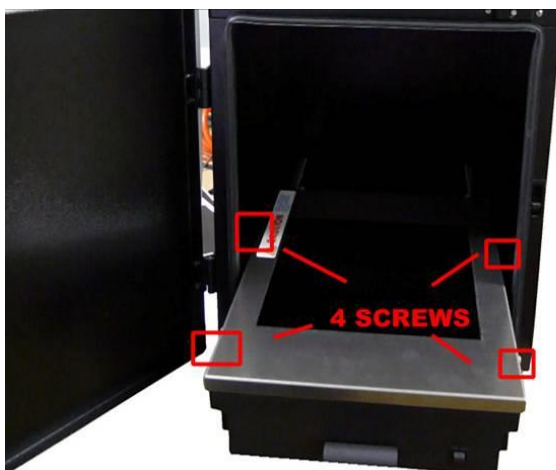
Changing the UV transilluminator tubes



Before dismantling, switch-off and unplug the E-Box VX5.
Ensure the system is unplugged before operating.



Unscrew the transilluminator filter plate



Remove the transilluminator filter plate:





Remove the UV tubes:



Remove the reflector:



Change the 6 starters

Replace the reflector as it was:

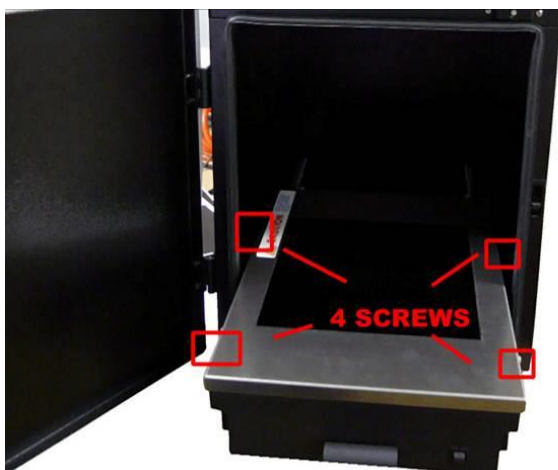


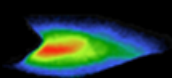


Change the 6 UV tubes



Replace the transilluminator UV filter as it was:





E - BOX VX5

E - BOX VX5 TECHNICAL INFORMATION

Electrical specifications

Power supply

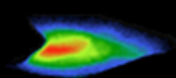
- Current (A) = 1A/0.5A
- Fuse FST (A) = 3.15A / 4A
- Voltage (V) = 100/230V~ (5%)
- Frequency (Hz) = 50/60Hz
- Power = 90 watts

Fuses

- Type FST.
- Time-lag T.
- Ø 5 x 20
- 2A

Climatic conditions

- Altitude 2000 meters
- Operating humidity: 20% to 70% (no condensation allowed)
- Operating temperature: The maximum ambient temperature should be 25°C.



E - BOX VX5

E-BOX VX5 SPARE PARTS

General advices

- To clean the surface of the filter, use mild solvent or warm water. Dry with a soft cloth
- The filter is porous, so try to keep it dry

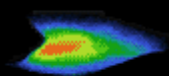
All our units are fitted with one or two safety fuses. They are found in the plug at the rear of the unit

TYPE OF FUSE

Type FST
Time-lag T
Ø 5 x 20

Spare parts – E-BOX VX5

| Réf. article | WL LED's bar | Tubes T-8.M | Tubes T-8.L | Starter ST-151 FG7-P (100V) | Fuse Ø 5x20 | | Filter with support | |
|----------------|--------------------|----------------|----------------|-----------------------------------|-------------|----------------------------|---------------------|------------|
| | | | | | Qty | 100V ~ 115V ~ 230V ~ | Qty | Réf |
| EBOX VX5.20M | 1 | 6 | / | 6 | 2 | 3.15A | 1 | FS-TC20.CM |
| EBOX VX5.20MX | 1 | 6 | / | 6 | 2 | 3.15A | 1 | FS-TC26.MX |
| EBOX VX5.20LM | 1 | 6 | / | 6 | 2 | 3.15A | 1 | FS-TC20.CM |
| EBOX VX5.20LMX | 1 | 6 | 5 | 11 | 2 | 3.15A | 1 | FS-TC26.MX |

**DOC-PRINT****DOC-PRINT VX5 TECHNICAL INFORMATION****Electrical specifications****Power supply**

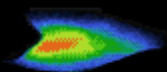
- Current (A) = 1A
- Fuse FST (A) = 3.15A
- Voltage (V) = 100V, 115V or 230V (~5%)
- Frequency (Hz) = 50/60Hz
- Power = 40 watts

Fuses

- Type FST.
- Time-lag T.
- Ø 5 x 20
- 3.15A

Climatic conditions

- Altitude < 2000 meters
- Operating humidity: 20% to 70% (no condensation allowed)
- Operating temperature: The maximum ambient temperature should be 25°C.

**DOC-PRINT****DOC-PRINT VX5 SPARE PARTS****Spare parts**

| DOC PRINT VX5 with ECX-F transilluminator | Tubes T-8.WL | Tubes T-8.M | Starter ST-151 FG7-P (100V) | Fuse Ø 5x20 | | Filter with support | |
|--|-----------------|----------------|-----------------------------------|-------------|------------------|---------------------|-------------|
| | | | | Qty | 100V ~ 230V ~ | Qty | Reference |
| DOC-PRINT VX5 | - | - | - | 2 | 3.15A | - | - |
| DOC-PRINT VX5 20M | 1 | 6 | 7 | 2 | 3.15A | 1 | FS-TC20.CM |
| DOC-PRINT VX5 26MX | 1 | 6 | 7 | 2 | 3.15A | 1 | FS-TC26.CMX |

| DOC PRINT VX5 with CN1100 darkroom | Tubes T-8.WL | Tubes T-8.M | Tubes T-8.L | Starter ST-151 FG7-P (100V) | Fuse Ø 5x20 | | Filter with support | |
|--|-----------------|----------------|----------------|-----------------------------------|-------------|----------------------------|---------------------|------------|
| | | | | | Qty | 100V ~ 115V ~ 230V ~ | Qty | Reference |
| DOC-PRINT VX5 | - | - | - | - | 2 | 3.15A | - | - |
| DOC-PRINT VX5 1120.20M | 1 | 6 | 6 | 7 | 2 | 2A | 1 | FS-TC20.CM |
| DOC-PRINT VX5 1126.26M | 1 | 6 | / | 7 | 2 | 2A | 1 | FS-TC26.CM |
| DOC-PRINT VX5 1126.26MX | 1 | 6 | / | 7 | 2 | 2A | 1 | FS-TC26.MX |
| DOC-PRINT VX5 1126.26LM | 1 | 6 | 5 | 12 | 2 | 2A | 1 | FS-TC26.CM |

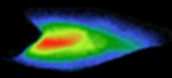
GENERAL ADVICE

- To clean the surface of the filter, use a mild solvent or warm water. Dry with a soft cloth
- The filter is porous, so try to keep it dry

All our units are fitted with one or two safety fuses. They are found in the plug at the rear of the unit

TYPE OF FUSE

Type FST
Time-lag T
Ø 5 x 20



WARRANTY

SYSTEM AND SOFTWARE WARRANTY

Our products (except Compact Flash[®], light tubes and filters) are warranted against faulty construction or defective material for a period of TWO YEARS from the date of supply. Our products are not warranted for damage due to carelessness, incorrect use or bad maintenance.

The following defects are also specifically excluded:

- Defects caused by improper operation.
- Repair or modification done by anyone other than VILBER LOURMAT or an authorized agent.
- Corrosion caused by improper solvents or samples.
- Use of spare parts supplied by anyone other than VILBER LOURMAT.
- Damage caused by accident or misuse.
- Damage caused by disaster.

This instrument should not be modified or altered in any way. Modification or alteration of this instrument will:

1. Void the manufacturer's warranty.
2. Void the conformity certifications.
3. Create a potential safety hazard.

The Compact Flash[®], the tubes and the filters are not cover by our warranty.

The use of consumable products or non-original spare parts not recommended by our service department is at the user's own risk and therefore automatically invalidates the warranty.

Tubes, filters, batteries and consumable products are not included in the warranty.

We reserve the right to decide where the faulty goods will be repaired (in our workshop or elsewhere), and whether or not the faulty part is to be replaced; all other freight charges incurred being at the cost of the purchaser.

Returned goods will not be accepted for repair unless previous written authorisation is obtained from our service department. A request for authorisation must be accompanied by an itemised list of products, model numbers and the corresponding invoice numbers under which they were originally shipped.

All returned goods should have a certificate of decontamination.

The Buyer must bear all costs and risks incurred during the transportation of the goods from their collection at VILBER LOURMAT warehouse.

In the case VILBER LOURMAT incorporates some devices or equipment from another supplier in the manufacture of its products, the extent and the duration of the warranty will be those conceded by the suppliers or sellers.

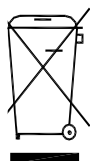
Manufacturer cannot be held responsible for any loss, bodily injury or material accident incurred by any failure of this supply, whatever the origin of this failure may be.

The responsibility of Manufacturer is strictly limited to its staff and to its own supplies.

In the case of dispute, only the commercial court of Meaux (FRANCE) shall be competent, even in third party claims proceedings or when there are several co-defendants.

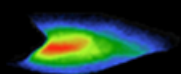
NOTE: VILBER LOURMAT is not responsible for any injury or damage caused by use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by VILBER LOURMAT.

France only: Decontamination, collection and elimination of waste



The buyer ensures and finances the decontamination, the collection and the disposal of waste electrical and electronic equipment (WEEE) under the conditions provided in the Articles 21 and 22 of the Decree No. 2005-829 dated of 20 July 2005.

In France, for tubes recycling, contact the Recylum, www.recylum.com
Improper disposal may be harmful to the environment and human health.



CONFORMITY

SYSTEM CONFORMITY



This system complies with the requirements of the EC Directive 2004/108/CEE, 2006/95/EEC and EN 61010-1, relating to Electro-magnetic compatibility and low voltage.

The Electro-magnetic susceptibility has been chosen at a level that gains proper operation in residential areas, on business and light industrial premises and on small-scale enterprises, inside as well as outside of the buildings. All places of operation are characterised by their connection to the public low voltage power supply system.