TimeViewer Software

Ver. 1.2.x

User Manual

Ref. 1920-SU-10-C

Contents

Concerning TimeViewer

Use TimeViewer to capture and analyse video on your computer from digital high-speed video cameras (CamRecord CR Series, CamRecord Sprinter Series) by Optronis, and then edit and process the captured content. After editing the video content, which can include cutting and/or changing parameters, save and/or export your final project data. TimeViewer is optimized to work with single high-speed camera recordings.

System Requirements

TimeViewer is optimized to work with large amount of image data that can be handled best by modern system platforms. Typical system configuration would be:

- Microsoft Windows /10 (32bit/64bit)
- "Multi Core" Processor
- Large amount of memory RAM (e.g. 4 GByte)
- Large Hard disk (e.g. 1 TBytes)
- A modern high-performant graphic card

i
System configurations with less performance are not recommended. Especially "shared memory" graphic cards are not advised.

Install

After inserting the TimeViewer software CD, the installation process should start automatically. When it does not start automatically, please click on the file "setup.exe" to install TimeViewer.

Uninstall

Use the Windows Uninstall feature. You will find it when you select "Programs" in the Windows start menu. Choose "TimeViewer" from the list and select "Uninstall" in the popup menu.

Software Licenses and Liability

The software and this manual are the exclusive copyrights of Optronis.

Copying of the software or reproduction of this manual in whole or in part by any means is expressly forbidden without the written consent of the manufacturer.

Optronis makes no representations or warranties with regard to the use of the software and documentation and cannot be held responsible for the results of the use of this manual and the software.

Future upgrades of application and system software and any changes in specifications and functions will be announced separately.

Windows is the registered trademarks of Microsoft® Corporation.

The company names and product names in this manual are the trademarks or registered trademarks of their respective companies.

First Steps

We recommend that you familiarize yourself with the software in advance of your first project. Connect a camera, setup Live Video and familiarize yourself with focus distance and diaphragm setting of the lens. Setup the high-speed camera, create a project, capture some content, create recordings, edit the images and save and load the project.

Connect

Connect the high-speed video camera Optronis CamRecord CR or CamRecord Sprinter according to the manual provided with the camera.

Then start the TimeViewer software.

After starting the software, a camera selection window will appear that allows to select a camera that is found in the network.

Please check the checkbox to select the camera and press o.k.
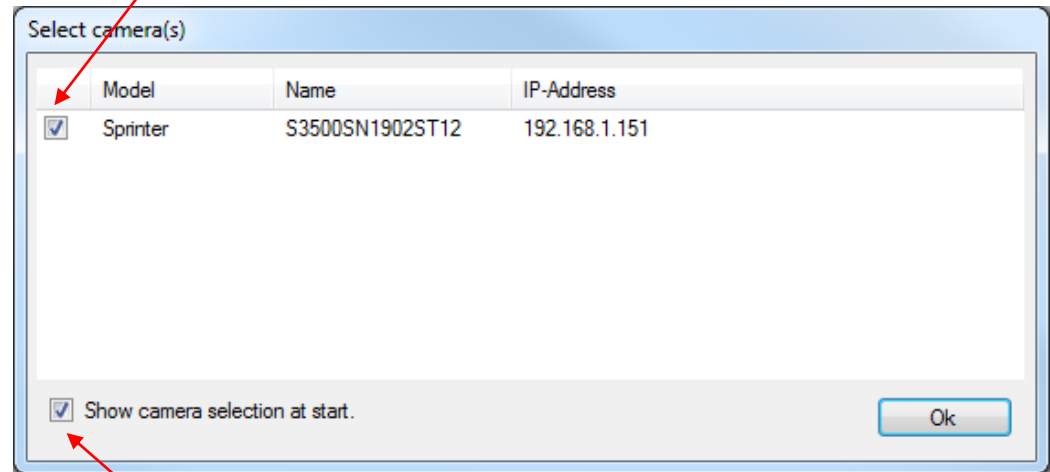
The camera selection window can be activated or hidden.

Remark:

Once hidden, the camera selection window can be re-activated in TimeViewer "Extra/Options"

Troubleshooting connecting the camera

Due to fire wall restrictions sometimes, the camera might not be found.

First disable temporarily the fire wall. Then start TimeViewer again.

If it is still not possible to find the camera, just verify the IP address of the Personal computer and the IP address of the camera as described in the Sprinter camera manual (Sprinter document: 1900-SU-02).

For CR series cameras please enter a virtual address in the properties of the TCP/IP-Connection. Restart TimeViewer.

Enable the fire wall.

TimeViewer Window

When a CamRecord CR-series or CamRecord Sprinter series camera is connected and identified by TimeViewer software, a project window and a camera window are opened. If the camera isn´t identified, only the project window will be opened.

i	
The project window allows to walk through existing projects and footages. The camera window allows to capture new footages.	
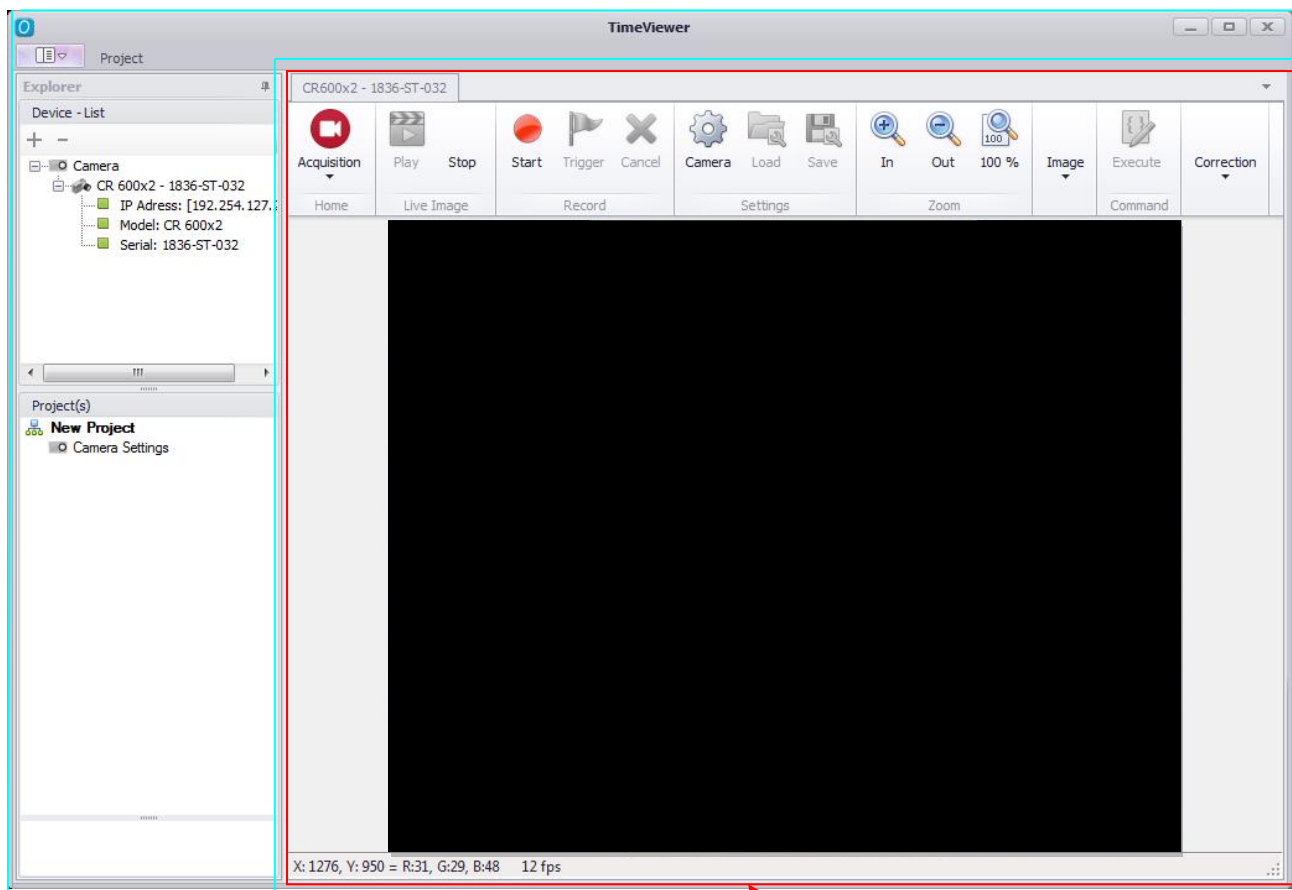
Project Window

Camera Window

Project Window

Optronis Application Button

Project Menu Bar

Application Name

Minimize / Maximize / Close

TimeViewer

Explorer

Device - List

+ −

Camera
  CR 600x2 - 1836-ST-032
    IP Adress: [192.254.127.254]
    Model: CR 600x2
    Serial: 1836-ST-032

Project(s)

New Project
  Camera Settings

Footage Description Window

Project / Footage List Window

Device List Window

Explorer Window
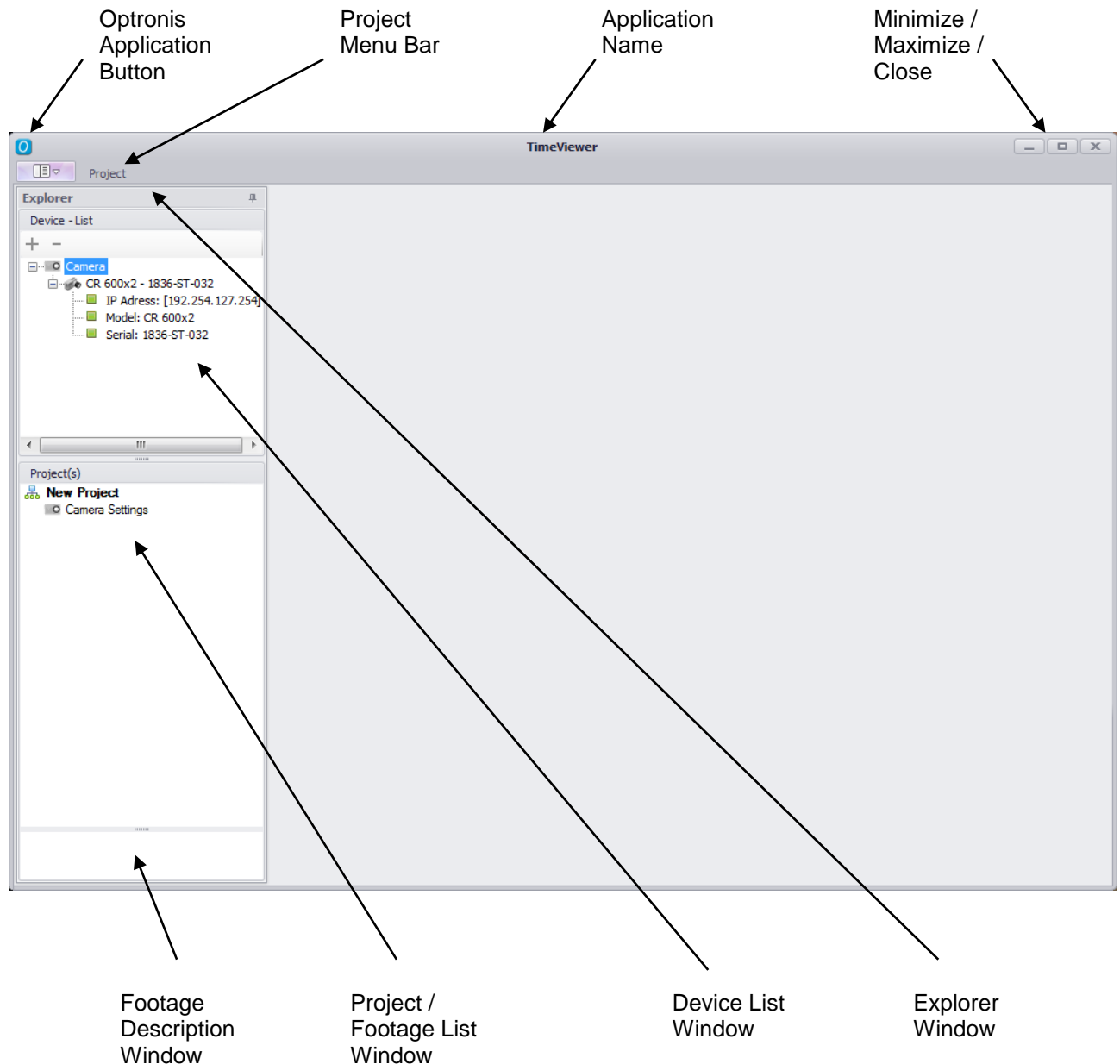
Optronis Application Button

Allows to minimize, maximize, change size and closes the application.

i	
Double Click on this Optronis symbol closes the application	
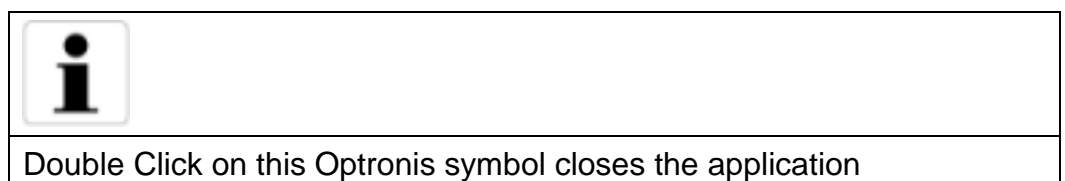
Application Name

The name of the application is "TimeViewer".

Device List Window

Shows the parameters of the connected device (camera) and storage device (SSD) if available (Sprinter camera).

Project Menu Bar

Contains the Project, Extra and Info Menu.

Project Menu
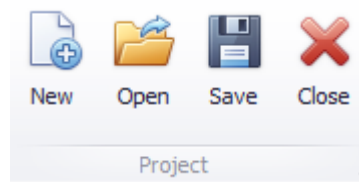
New

Creates a new project.

i	
	Please create a new project, if you would like to use camera functions as e.g. "Save / Load Camera Settings" or storing footages from Camera to Personal Computer.

Open

Opens a project.

i	
	Please open an existing project, if you would like to analyze existing footages or to add new footages to an existing project.

Save

Save the project.

Close

Closes a project.

Extra Menu
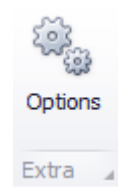
Options
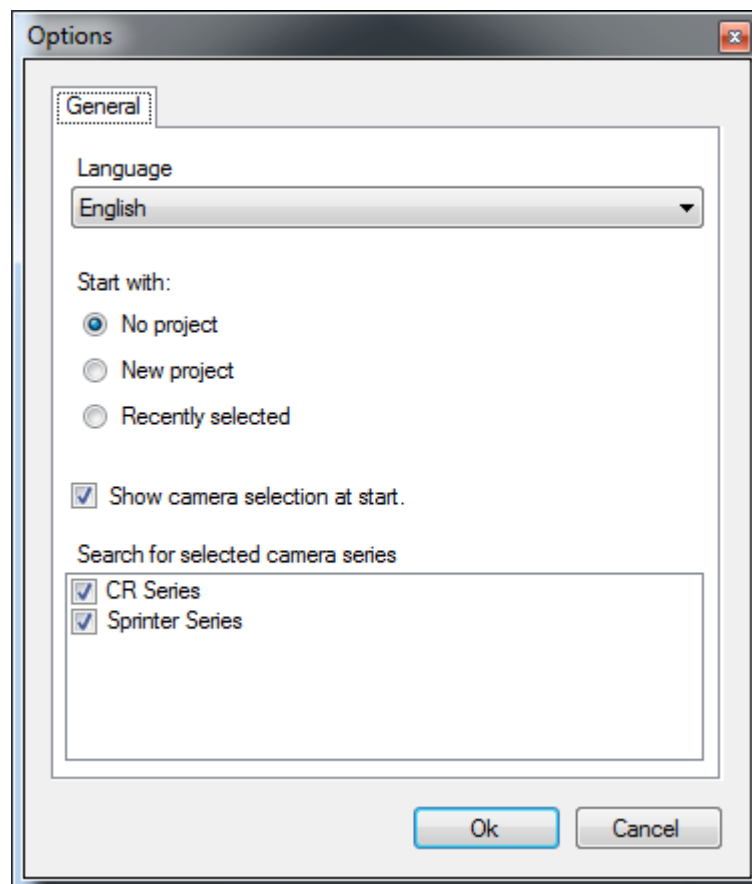
General

- Select Language.

- Start with No project / New project / Recently selected project

"Start with" allows to start the TimeViewer application with the options "No project / New project /Recently selected project".

Info Menu
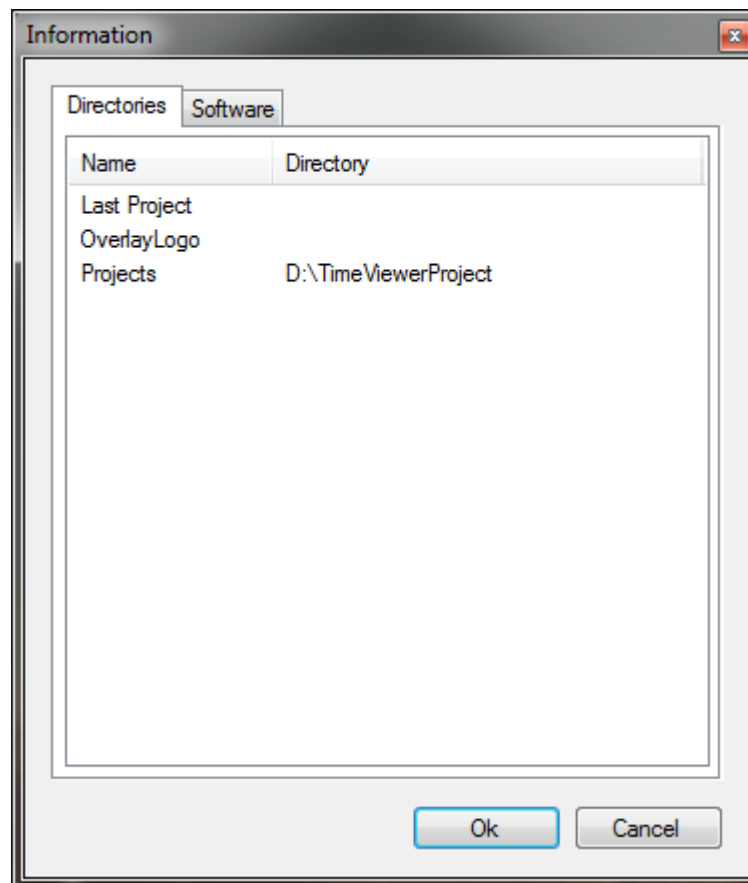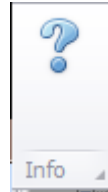
Directories

- Overlay/Logo Directory.

When an overlay logo is put to the footage, the last selected directory is shown in this information window.

- Project Directory

When a project is created or opened, the selected directory is shown in this information window

Software

Shows the Software Version of TimeViewer.
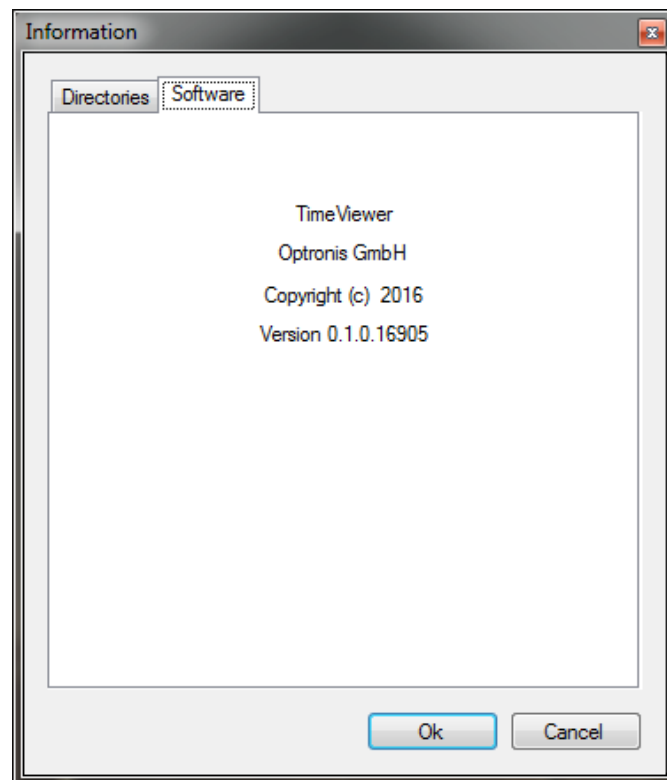
Explorer Window

Contains the Device List Window the Project / Footages List Window and the Footage Description Window.

Device List Window

Contains the name and the information about connected devices (cameras), internal storage devices if available (Sprinter camera) or external storage devices (SSD on Docking station).
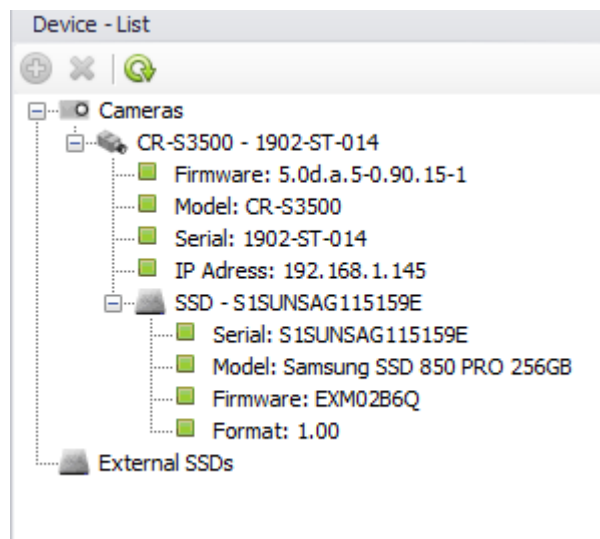
Project / Footages List Window

Contains the List of projects, camera settings and related footages.
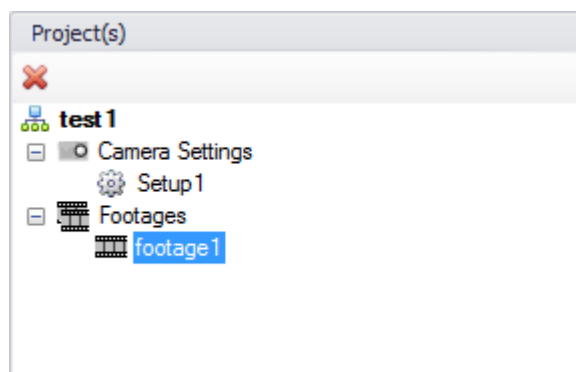
A footage in the footages List Window can be erased by selecting the footage and click on the right mouse button, or clicking on the red cross in top of the list

Footage Description Window

Contains the description of the selected footage.

Synchronization Groups

Synchronization groups support the synchrony control of several cameras. If cameras are part of a synchronization group the recording and replay of all cameras are synchronized. The synchronization point is the trigger position.

A synchronization group consist of one master and one or more slave cameras. The master camera can be handled like a single camera. The slave cameras have some restrictions. At slave cameras it's not possible to change the frame rate and the synchronization mode is set to 'External'.

Create a synchronization group

To create a synchronization group, you can click on the button "Add a new synchronization group" at the toolbar in the "Device – List" window or you can click with the right mouse button on the "Synchronisation Groups" element at the tree view and select "Add"

Add cameras to the synchronization group

To add a camera to the group, select the camera in the "Device – List" window press the left mouse button, move the camera to the group and release the left mouse button

The first camera which is added to the group is automatically the master camera. The Next cameras are the slaves. The master and slave status can be changed later.

Change master and slave cameras

To change the master and slave status you must click with the right mouse button on the slave camera to open the context menu and select "Set Master".

Limitations

The software experience might be impacted by using more than 5 cameras.

Have in mind that you acquisition system (PC + network adapter) might also limit your experience by lacking of processing power or network bandwidth.

Camera Acquisition Window

Home Button:
- Acquisition
- Memory
- SSD

Camera
Acquisition
Menu

Camera Settings
Window

Camera Image
Window
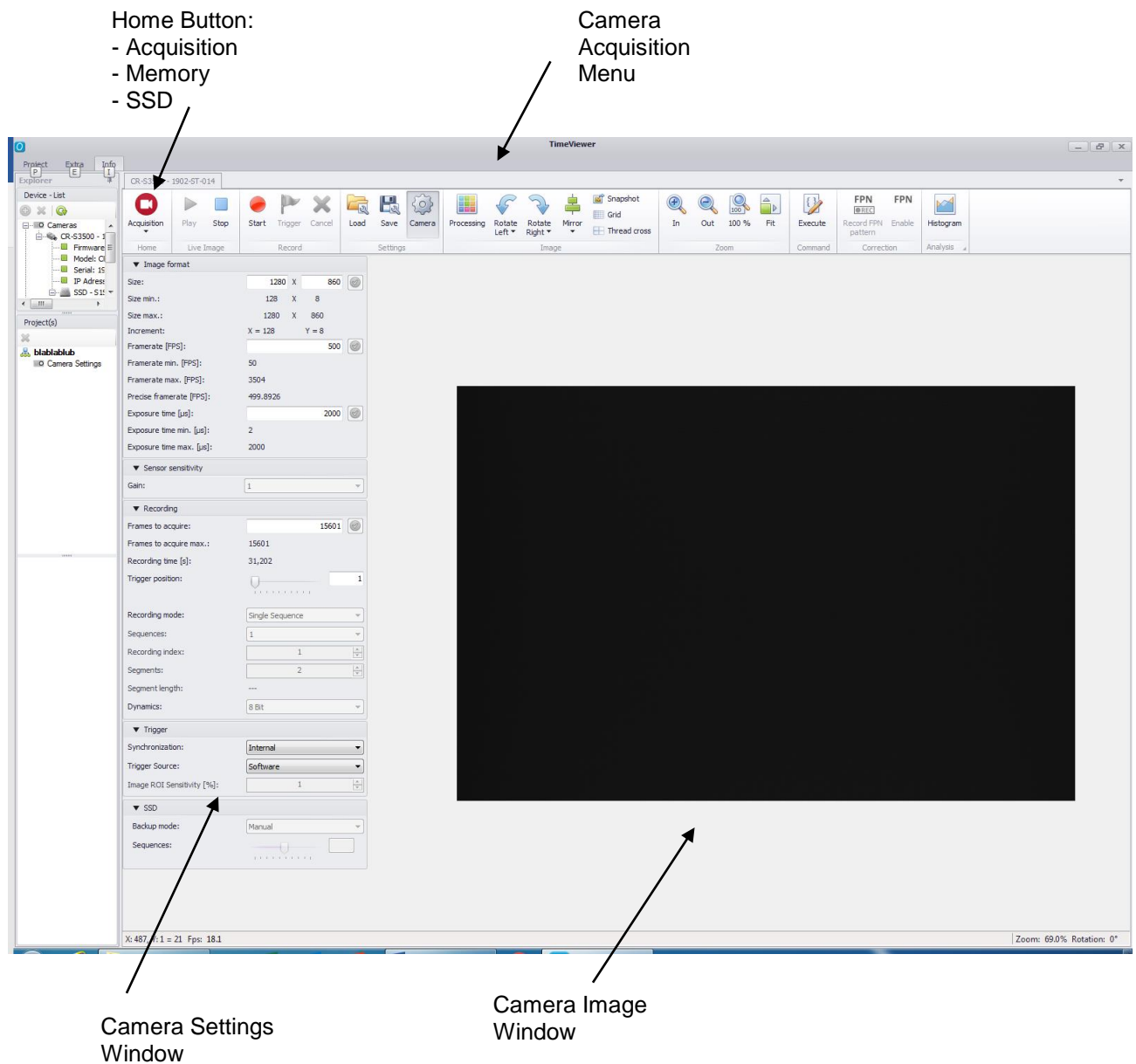
Camera Acquisition Menu

Only available when a device (camera) is connected.

Home Button

Moves between acquisition and playback from camera memory or SSD (Solid State Drive) if available. Depending on the selection, the camera menu bar shows different tools.

- Acquisition

Shows the acquisition menu and allows to create footages.

- Memory

When a footage is stored inside the camera memory, the camera memory menu is shown and allows to play the footage and save the footage to disk.

- SSD

When the camera is equipped by a SSD Drive (CamRecord-Sprinter series) the camera SSD menu is shown and allows to play footages from SSD.

Live Image Play / Stop

Starts / Stops the live image from the camera.

> **i**
>
> When several cameras are connected and to minimize processor load, the live view of the cameras may be stopped. Live images consume PC processor power. When processing power is needed for other tasks, please stop Live Image.

Start Recording

By clicking this button, the system starts recording into camera memory, deleting the recent recording and awaiting a trigger signal.

> **i**
>
> Performing a new recording may overwrite older recordings that remain in the video memory of the camera. "o.k." will overwrite the older recording.

Trigger Recording

By clicking this button, the video data is recorded in the memory of the camera. Alternatively, you can hit the Spacebar on the keyboard. The recording runs until the allocated memory space is used up. The allocated memory space depends on the entries made in the tab "Camera Settings".

Cancel Recording

Stops the recording at once and clears the camera memory.

Camera Settings

▼ Image format			
Size:	1280	X	860
Size min.:	128	X	8
Size max.:	1280	X	860
Increment:	X = 128		Y = 8
Framerate [FPS]:			500
Framerate min. [FPS]:	50		
Framerate max. [FPS]:	3504		
Precise framerate [FPS]:	499.8926		
Exposure time [µs]:			2000
Exposure time min. [µs]:	2		
Exposure time max. [µs]:	2000		

▼ Sensor sensitivity	
Gain:	1

▼ Recording	
Frames to acquire:	15601
Frames to acquire max.:	15601
Recording time [s]:	31,202
Trigger position:	1
Recording mode:	Single Sequence
Sequences:	1
Recording index:	1
Segments:	2
Segment length:	---
Dynamics:	8 Bit

▼ Trigger	
Synchronization:	Internal
Trigger Source:	Software
Image ROI Sensitivity [%]:	1

▼ SSD	
Backup mode:	Manual
Sequences:	

Size

Choose size (frame format) of the camera image. The size has to be set inside "Size min." and "Size max".

Frame rate

Choose Frame Rate of the camera. The frame rate has to be set inside "Framerate min." and "Framerate max".

Exposure time

Choose exposure time of the images. The exposure time has to be set inside "Exposure time min." and "Exposure time max".

i
The exposure time has to be set in Microseconds. 1 Microsecond is 1/1000000 seconds.

Gain

Gain is the ratio between input and output signal of the camera sensor. A higher gain will increase the sensitivity of the camera but will cause more noise in the image

Frames to acquire

Defines the allocated camera memory. The allocated camera memory is adjustable in steps of single frames.

Recording Time

The resulting record duration based on the allocated camera memory and the frame rate is shown here.

Trigger Position (Number of frames)

To allow for shifted recording the trigger position can be moved from the start of the recording.

> **i**
>
> Once armed (by pressing the record button), the camera continuously records images in loop mode, i.e. overwrites old images with newer ones. By setting the trigger position, you can define how many frames before the trigger activation are kept. When Number of "frames to acquire" is set to e.g. 1000 and "trigger position" to e.g. 500, then 500 frames are stored in front of trigger signal and 500 frames after the trigger signal.

Recording Mode

You can allocate the available camera memory in different ways:

Single sequence:

All available camera memory is allocated to one recording.

Multi sequence (only CamRecord CR-series):

The camera memory is divided in up to 16 parts. Before the recording of the next sequence select it via Selected Sequence. The recording then starts with triggering resp. retriggering.

> **i**
>
> In Multi Sequence acquisition mode each recording is absolutely independent and must be saved independently.

Sequences

Only active with the acquisition mode "Multi sequence". Enter the number of sequences. You can enter from 2 to 16 sequences.

Recording Index

Select the active segment either for recording or display in the memory section.

Dynamics

This setting allows to set dynamics of the image depending on the camera model. Image Quality of CamRecord Sprinter camera is limited to 8 bits.

Synchronization

Choose an internal or an external synchronization.

<table>
<tr><td>

i

</td></tr>
<tr><td>

Internal Synchronization uses the camera internal time base to generate the required frame rate. If the frame rate has to be synchronized to an external source please use external synchronization. For external synchronization an external TTL signal has to be applied to the "External Sync." Pin of the camera. Please refer to the camera user manual for more information about external synchronization.

</td></tr>
</table>

Trigger Source

The default trigger is via the software by clicking on the space bar of the keyboard. When a separate trigger device is used change the trigger source setting accordingly. Trigger can be active by software, by hardware switch and by TTL signal.

<table>
<tr><td>

i

</td></tr>
<tr><td>

Trigger on Software:

Please use the "space-bar" of the keyboard or the "trigger" button in the Device window.

Trigger Extern on Falling Edge (Trigger on Switch):

Please connect a switch to the external trigger input of the camera or connect a TTL signal (low impedance < 100 Ohm). Trigger will be performed on falling edge of the TTL signal or on closing contact of a switch.

Trigger on Extern TTL Rising Edge:

Please connect a TTL signal (low impedance < 100 Ohm) to the external trigger input of the camera. Trigger will be performed on rising edge of the TTL signal.

</td></tr>
</table>

SSD Backup mode

The default backup mode is "manual". This means, that image sequences that are stored inside the RAM memory can "manually" transferred to the SSD storage device (only Sprinter camera).

Load / Save Settings

Allows to Save and Load camera settings. To Save camera settings, a project has to be generated first.
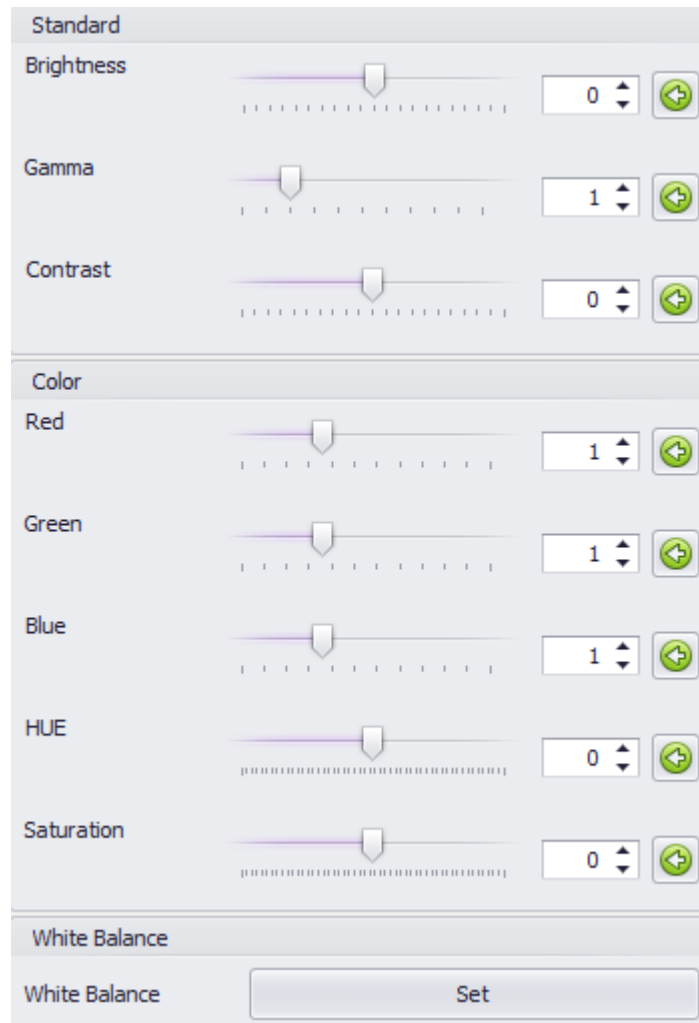
Camera Settings

Opens / closes the camera settings menu.

Processing Image

This opens a menu where the different settings of the displayed camera image are shown and edited. The displayed picture is actualized accordingly. Some settings may or may not be available depending of the camera.
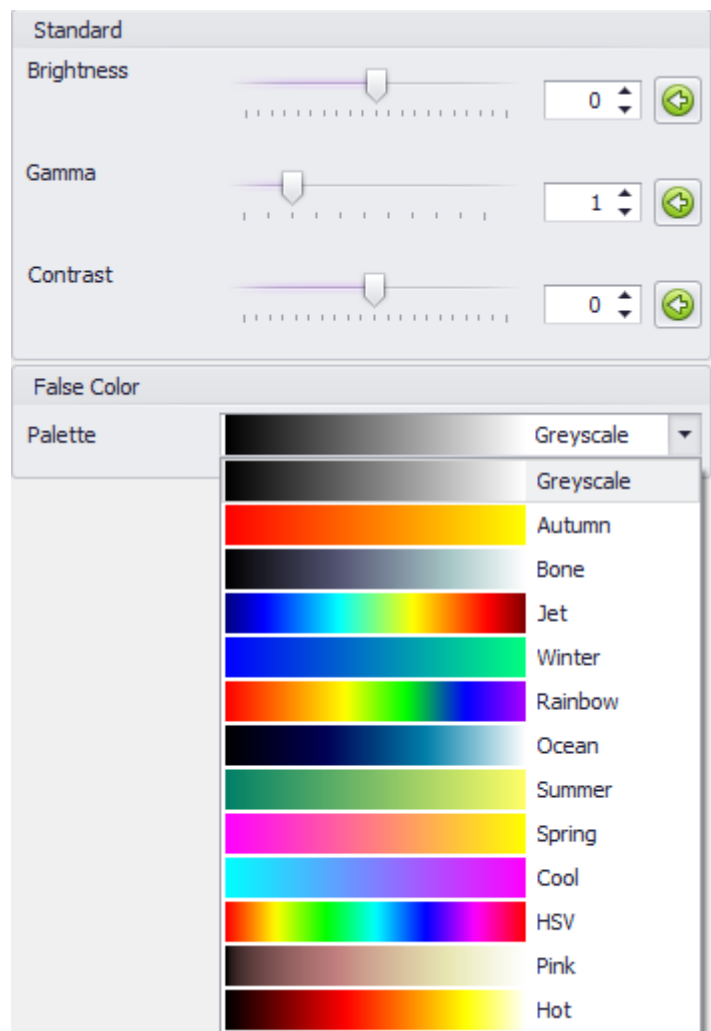
The Processing menu is subdivided in the submenus "Standard" and "Color".

To expand or deflate the submenus click on the submenu header.

Brightness

The general brightness of the image is set here. The setting span starts at -100 and ends at +100. The setting is changed via the slide bar. The default setting is 0. The set value acts as factor.

Gamma

The luminance of the displayed image is set here. The setting span starts at 0.10 and ends at 5.00. The setting is changed via the slide bar. The default setting is 1.00.

> **i**
>
> Gamma is the short form of a manipulation algorithm to adapt the image to the visual properties of the human eye. A physical linear rise of brightness is not perceived as such by the human eye. This is compensated by the Gamma function. A gamma greater 1 spreads bright values and compresses dark ones, a gamma less than 1 compresses bright values and spreads dark ones.

Contrast

The contrast of the displayed image is set here. The setting span starts at 0 and ends at +/-100. The setting is changed via the slide bar. The default setting is 0.

> **i**
>
> Contrast is the difference in visual properties that makes an object in an image distinguishable from other objects and the background.

False Color

Only for monochrome cameras: Please select a false color palette to show the image in false color and to enhance the contrast of the image.

Brightness red

Only for color cameras: The brightness for the red part of the image is set here. The setting span starts at 0.10 and ends at 3.00. The setting is changed via the slide bar. The default setting is 1.00. The set value acts as factor.

Brightness green

Only for color cameras: The brightness for the green part of the image is set here. The setting span starts at 0.10 and ends at 3.00. The setting is changed via the slide bar. The default setting is 1.00. The set value acts as factor.

Brightness blue

Only for color cameras: The brightness for the blue part of the image is set here. The setting span starts at 0.10 and ends at 3.00. The setting is changed via the slide bar. The default setting is 1.00. The set value acts as factor.

Hue

Changes hue of the color image. Span is from -255 to 255. Default setting is 0.

Saturation

Changes saturation of the color image. Span is from -255 to 255. Default setting is 0.

White balance

Different lighting colors the images distinctively, to correct this use the white balance feature. Put something white, e.g. a sheet of true white paper, in front of the camera so that only the white is showing. Then hit this button and the coloring of the image will disappear.

> **i**
>
> To set white balance please do not use white clothing as there is a strong blue shade is part of this perceived white.

Rotate / Mirror Image
Simple processing algorithms.

Snapshot Image
Takes a single shot of the image

Grid / Thread Cross
Adds a special Grid to the image

Zoom In / Out / 100% / Fit

Sets the size of the image window.

FPN Correction

Compensates for Fixed Pattern Noise.

To activate the FPN Correction, please "record FPN" first.

Record FPN

To record FPN, please close the lens in front of the camera with a lens cap, Stop the Live Image and then select "Record FPN".

ℹ
To perform FPN correction please stop Live Image first.

Enable / Disable FPN correction

After recording of the FPN, the FPN correction may be enabled or disabled.

Histogram

Shows a histogram of the image.

TimeViewer Auto Snapshot

With the auto snapshot function is it possible to make a single snapshot with predefined settings. The snapshot is saved with an automatically incremented index.

If the current camera is part of a synchronization group all group member creates a snapshot.

In the "Options" dialog you can set the name, folder, image format and the next increment of the next snapshot.
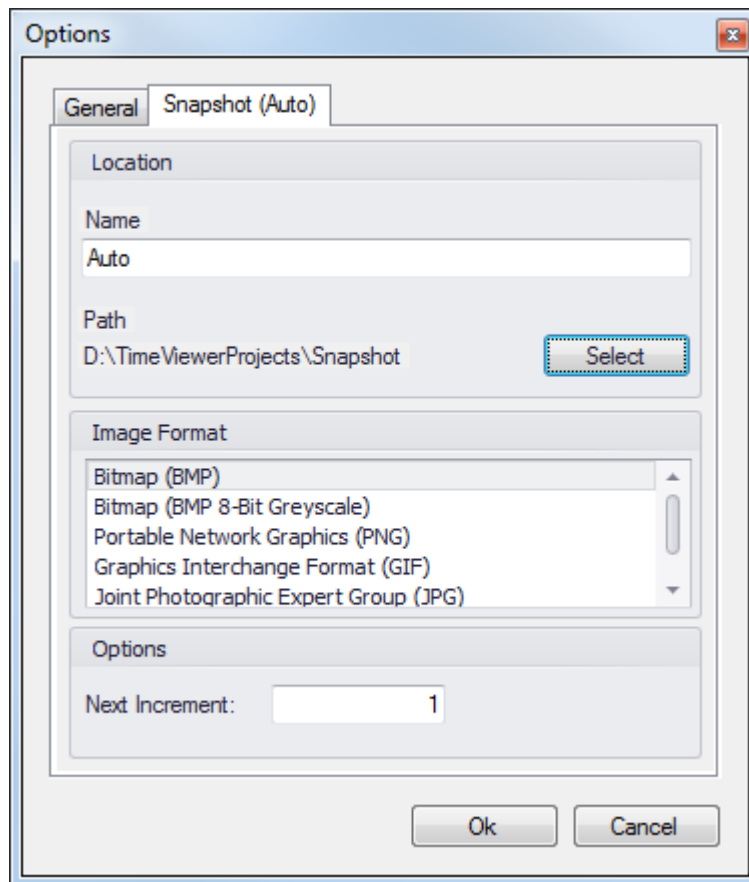
Camera Memory Window

> **ℹ**
>
> Please select the camera memory menu by the "Home Button" in the Camera Menu Bar. Please note, that the camera memory window is only available when a footage is stored inside the camera memory.

Home Button:
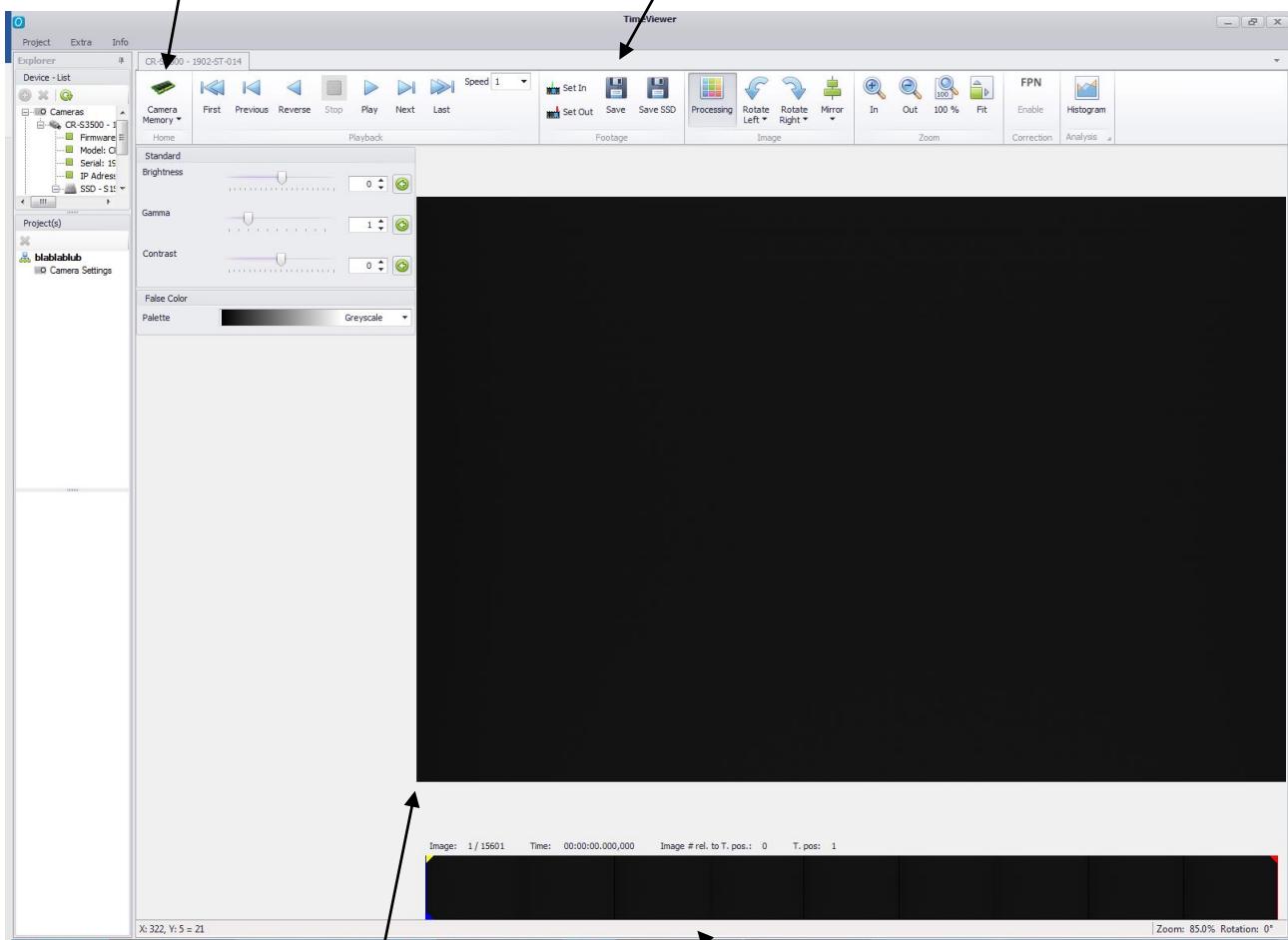- Acquisition
- Memory
- SSD

Camera
Memory
Menu Bar

Image
Window

Footage
Navigation
Window

Footage Navigation Window

Allows to navigate inside the footage. Please select the blue marker with the mouse button to move inside the footage. Please select the green (in) at the left side of the footage navigation window and red marker (out) at the right side of the footage navigation window to cut the image sequence.

Camera Memory Menu Bar

Playback buttons

The playback buttons allow to navigate forward and backward inside the footage. Please use also the Footage Navigation window to navigate inside the footage.

"Speed" allows to reduce / increase the playback speed.

Set In / Set Out

To save only a part of the footage, the footage can be cut by "Set In" and "Set Out".

To set the "Set in" marker please move the blue marker inside the footage window to the "Set in" (Footage starting point) position and click on "Set in". A green marker appears.

To set the "Set out" marker please move the blue marker inside the footage window to the "Set out" (Footage end point) position and click on "Set out". A red marker appears.

Save Footage

i
To save the footage from camera memory to PC, a project has to be created first.
"Save footage" stores the whole camera memory to PC or if defined by "Set In" and "Set out" only part of the footage.

Save SSD

i
To save the footage from camera memory to SSD
"Save SSD footage" stores the whole camera memory to SSD.

Zoom In / Out / 100%

Sets the size of the image window.

Processing Image

See "Camera Acquisition Menu / Processing Image".

Rotate Image left / right

See "Camera Acquisition Menu / Rotate Image left / right".

Mirror Image

See "Camera Acquisition Menu / Mirror Image".
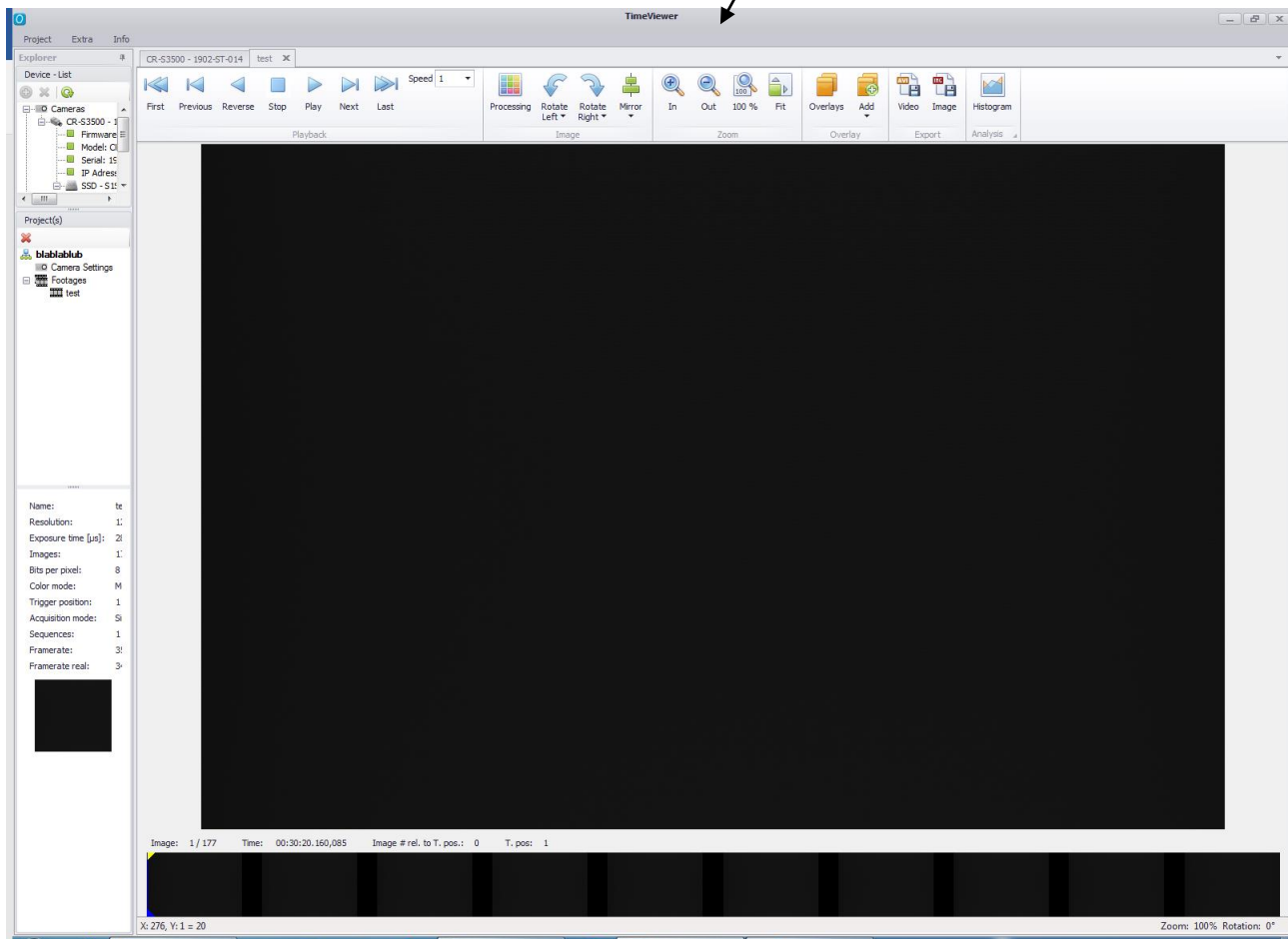
Enable / Disable FPN correction

See "Camera Acquisition Menu / FPN correction".

Footage Window

Only available when a footage is stored inside the PC.

Footage
Menu Bar

Footage
Navigation
Window

Footage Navigation Window

Allows to navigate inside the footage. Please select with the left mouse button the blue marker inside the Navigation window.

Footage Menu Bar

Playback buttons

The playback buttons allow to navigate forward and backward inside the footage. Please use also the Footage Navigation window to navigate inside the footage.

"Speed" allows to reduce / increase the playback speed.

Zoom In / Out / 100%

Sets the size of the image window.

Overlay

Allows to add and organize overlays. Overlay allows to add text, a logo or image information to the footage. Overlays may be moved inside the image by selecting the appropriate overlay by "Select" or by selecting the overlay inside the image.

Measurement

Allows to add and organize measurements like point, line, distance, angle and velocity. Point and line is just a graphical element. Distance, Angle and Velocity are related to measurements.

i
Please add first a reference line to define "real world" dimensions before adding distance or velocity.

i
Velocity calculates the speed from reference point 1 to reference point 2. Reference point 1 and Reference point 2 have to be placed on different images.

Processing Image

See "Camera Acquisition Menu / Processing Image".

Rotate Image left / right

See "Camera Acquisition Menu / Rotate Image left / right".

Mirror Image

See "Camera Acquisition Menu / Mirror Image".

Export Video

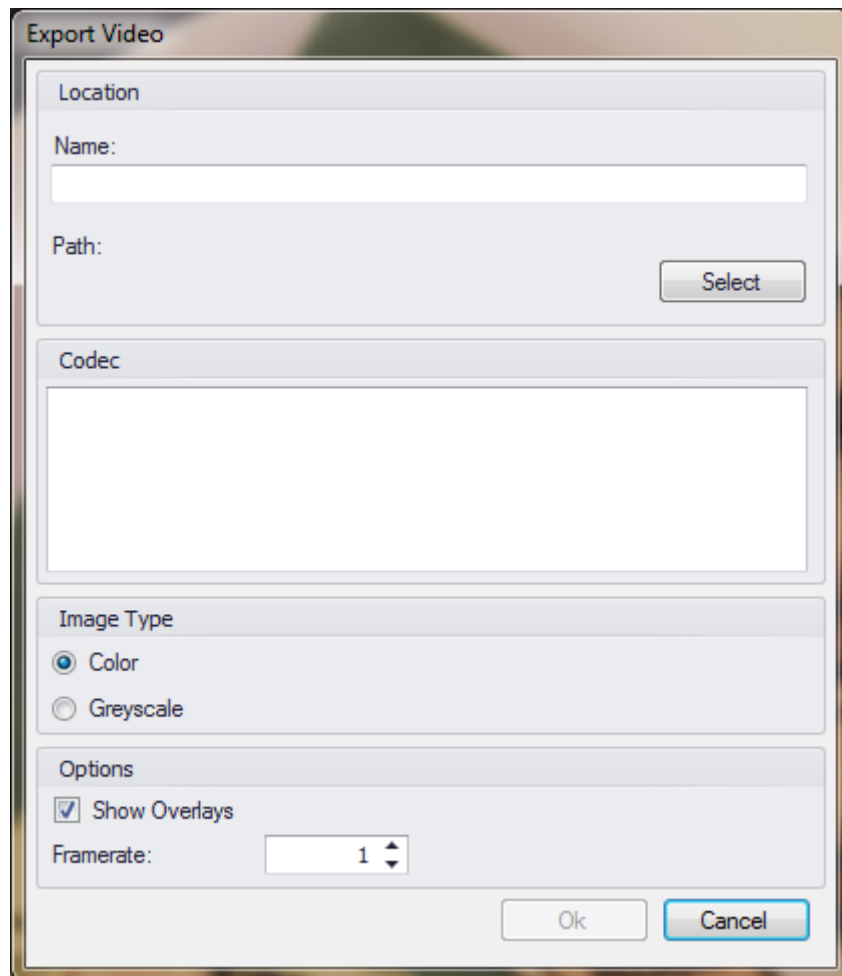Allows to export footages as AVI Videos.

i
Please use "Set In" and "Set out" buttons to cut the footage as required

To export footages as AVI please type the name of the footage and select the storage path.
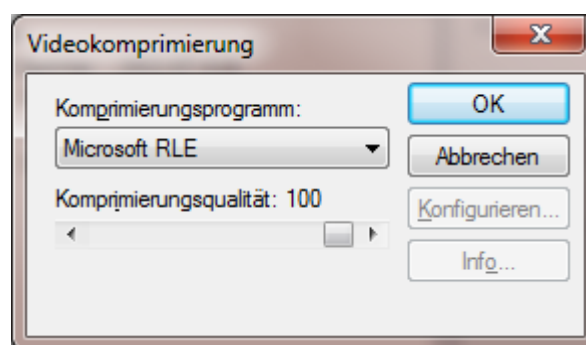
i
Please type prefix (Name) and suffix (.AVI) to generate an AVI
For example: Test.AVI

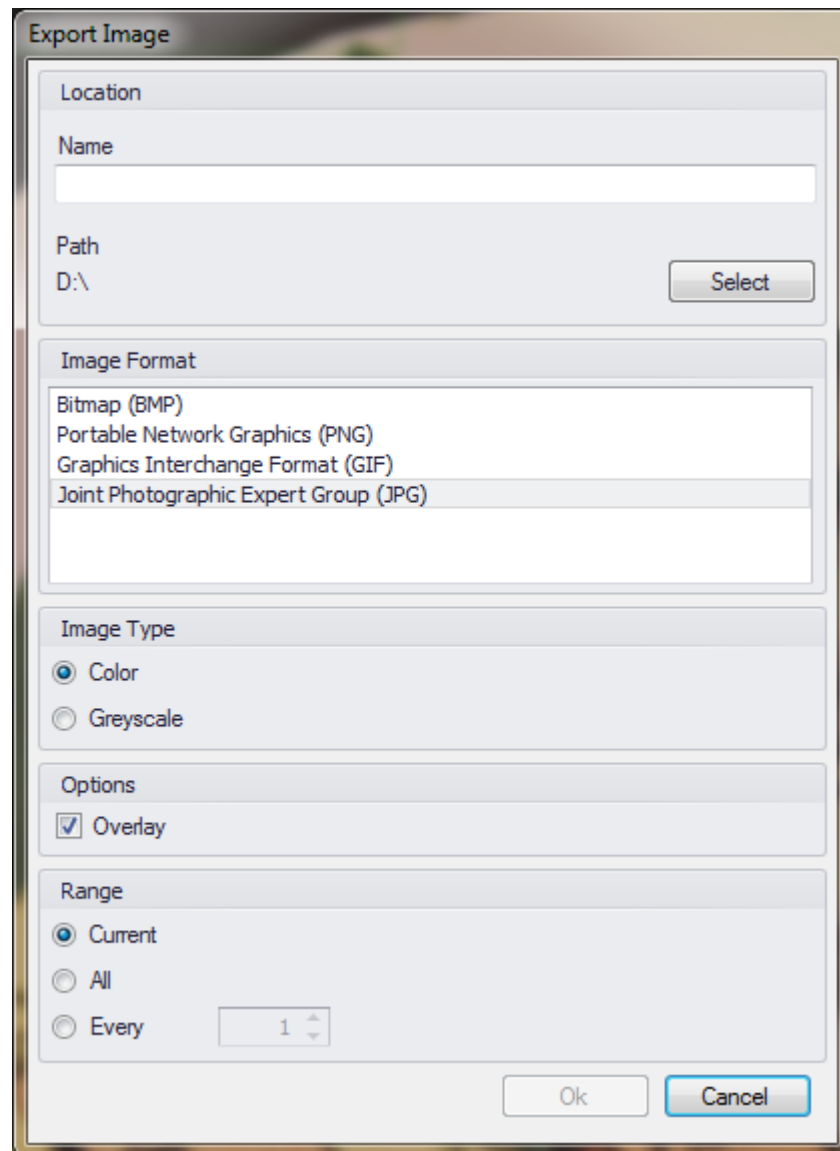Select then the Framerate (typical 25fps) and click on o.k.

Select then the desired Codec within the next dialog box and click on o.k. to generate the AVI file.
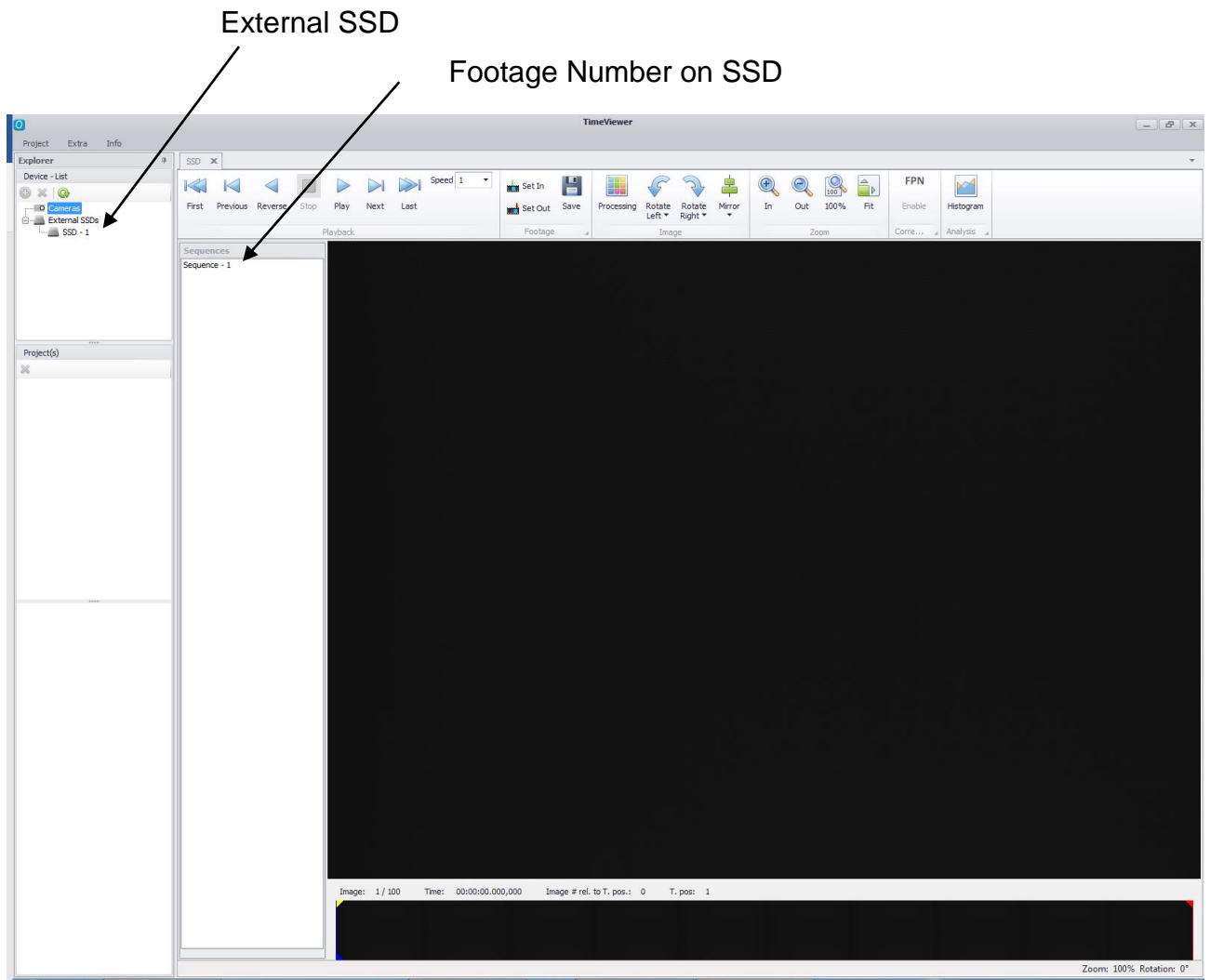

Export Image

Allows to export footages as Image Sequence of single images.

SSD on Docking Station

External SSD

Footage Number on SSD

ℹ️
Please add the docking station to an USB3 port (USB2 has lower performance) and verify, that the docking station is detected by Windows operating system.
Please start TimeViewer software with Administrator rights.
Without Administrator rights, the TimeViewer software is not allowed to perform access to the docking station and readout the footages that are stored on the SSD storage device.
To clean the SSD storage device please format the SSD with TimeViewer software.

Feature List

TimeViewer 1.1 features	Description	Comments
Recording Mode	Live Video	
	Single Sequence	
	Multi Sequence	Only CR-series
Frame Format	Free	
Exposure Time	Free	
Frame Rate	Free	
Save Recording	Raw	
Play Recording	Play Memory	
	Play File (Raw)	
Export Recording	AVI	
	JPEG	
	PNG	
	TIF	
	BMP	
Import Recording		
Trigger	Software	
	External Switch	
	External TTL	
Synchronization	Internal	
	External	
Camera Memory	Ring Buffer	
Image Processing	Brightness	
	Contrast	
	Gamma	
	Brightness RGB	
	False Color	
	Mirror Horizontal	
	Mirror Vertical	
	Rotate	
	Hue	
	Saturation	
	White Balance	

	Flat Field	
Measurement (Overlay)	Distance	
	Velocity	
	Angle	
Text in Image (Overlay)	Logo	
	Image Info	
	Text	
Extended camera features		
Extended software features		
Reporting		
Languages	English	
Operating System	Windows 7,8,10, 32b / 64b	
Supported Devices	CR-S3500, CR-series	

Appendix

Customer Service

For any questions or problems, please do not hesitate to ask our customer service:

Optronis GmbH

Ludwigstrasse 2

77694 Kehl

Tel: +49 (0) 7851 9126 0

Fax: +49 (0) 7851 9126 10

e-mail: info@optronis.com

In case of problems please prepare the following information:

- Name of the device:

    (e.g. CamRecord CR-Series or CamRecord Sprinter Series)

- Serial-Number of the camera:

- Operating System:

    Windows 7,8,10 (32-bit, 64-bit)

- Software Version

- Short description of the problem