

CLAUSS

highest resolution .

Crime Scene Documentation and Forensics



Fast - Precise - Reliable - Fully Automatic

Documentation of Crime Scenes by Spherical Photography

Instruments of modern panoramic photography capture even complex crime scenes quickly and easily in their original situation. Sometimes it is necessary to re-enter the crime scene during further investigations or criminal proceedings. In the "virtual crime scene reality" it is possible anytime.

The photorealistic image of a crime scene in the virtual space offers the following advantages:

- Persons who were not at the scene of the crime can witness a virtual tour of the location immediately after the investigation has begun. This avoids "wrong traces" caused by too many people entering the crime scene.
- By adding further digital assets the virtual crime scene is extended to a descriptive digital case record.
- After the release of a crime scene further questions concerning previously unnoticed details are answered in the virtual reality.
- A photorealistic crime scene tour provides excellent illustrative material for judges, prosecutors and other parties involved to the case.



There is a wide field of applications for virtual tours which is not only limited to CSI:

- presentations at staff meetings
- case discussions and analyses
- emergency planning (e. g. for major events)
- inter-divisionally operational planning
- visual documentation and management of events and their locations
- education and training

Three Simple Steps to the Virtual Copy of the Crime Scene

Without any prior photographic knowledge each event location is captured at the push of a button and at the highest resolution due to the automation of the photographic process.

A special "processor software" stitches fully automatic the captured crime scene images to spherical 360° panoramic pictures in a very high resolution (512 megapixel) and optimal illumination.

These spherical crime scene recordings can be linked to available digital evidences in virtual reality, which creates a faithful copy of the original location. This copy can be accessed even months later to view all details.

Relevant evidences and information such as photos, testimonies, expert opinions, documents, video or audio recordings are easily integrated.

1

Automatic Spherical Photography

2

Automatic "Stitching"

3

Virtual Copy of the Crime Scene

piXplorer 500 Forensic - Spherical Images at the Push of a Button

The **piXplorer 500 Forensic** is a fully automatic panorama system which provides a specially designed HDR camera lens system and integrated lighting.

piXplorer 500 Forensic enables to record a complete and evenly illuminated spherical image of a crime scene at the push of a button.

The integrated ring light perfectly illuminates dark areas. This results in an almost natural color spectrum. At the same time the integrated HDR function (7 exposure levels are recorded automatically) ensures an ideal exposure of your images even in bright environments.

For image processing ("tone mapping" and "stitching") **piXplorer 500 Forensic's** processor software converts your crime scene recordings fully automatical and user-independent to optimal illuminated 360° images. All calculations are performed in a batch process, which means you load the recordings of a working day into the processor software and it generates fully automatic 360° panorama photos.

Image processing runs autonomously and efficiently simultaneously to your other daily tasks or through the night.



Advantages of *piXplorer 500 Forensic*

- fast photographic documentation in highest resolution
- different lighting conditions are balanced automatically
- time and cost savings by automatic photo recording and stitching process
- well suited for field operations due to its solid and robust design
- optimal image quality without any prior photographic knowledge
- excellent price-performance-ratio



Technical Specifications *piXplorer 500 Forensic*

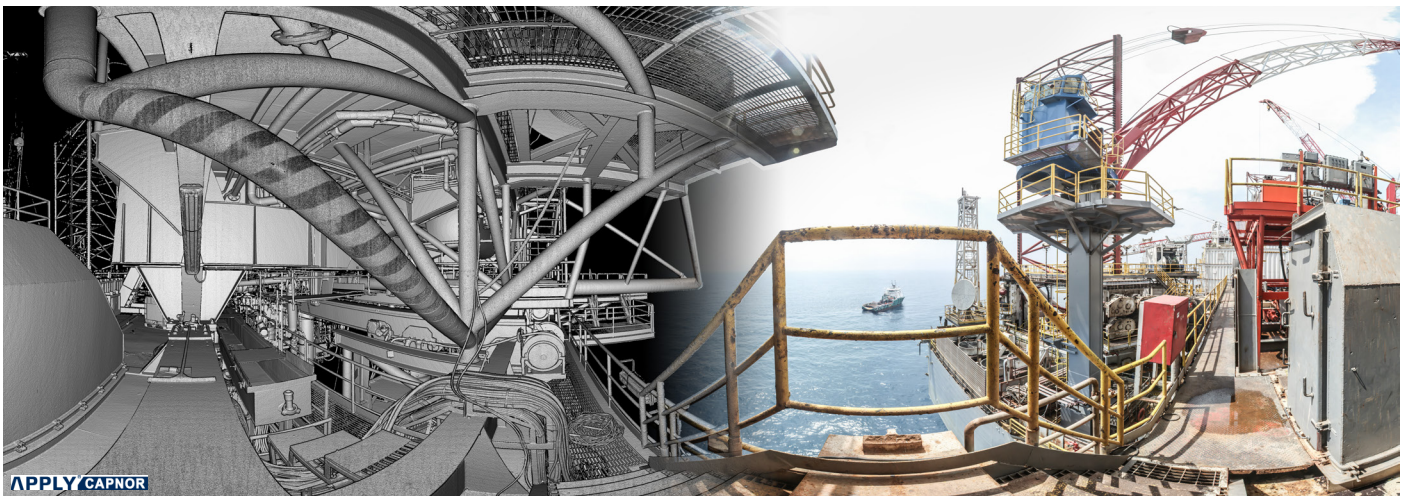
- **Image Resolutions**
up to 512 megapixel
- **Dynamic Range**
26 aperture stops
- **Recording Time**
4.5 minutes per location
- **Field of View**
360° x 180°
- **Battery Runtime**
about 75 locations
- **Working Temperature**
-5°C ... +40°C
- **Dimensions (mm) / Weight (kg)**
190 x 300 x 130 / 3.3
- **Infrared Remote Control**

Colorizing of Laser Scans

piXplorer 500 Forensic – The best tool for coloring laser scans: In a fast and easy way you create evenly illuminated 360° images in highest resolution. These images can be used directly for coloring laser point clouds.

We offer height adapters suitable with all current laser scanners for the appropriate adjustment of **piXplorer 500 Forensic**'s recording center.

Due to the support of HDR and integrated lighting **piXplorer 500 Forensic** perfectly depicts objects in all light conditions.



Creation of Virtual Tours

You can create and publish virtual tours using universal panorama software offered by the provider of your choice. Locations are linked by an easy and intuitive user guidance. Photographs, plans, video and audio recordings as well as documents can be incorporated. Furthermore many software solutions provide a measuring function and an internal process protocol.

- HDR panoramic images import
- hotspots and other tools
- plans and maps
- integration of pictures, videos, audio recordings or documents
- personalizing the view
- export function



From the Spherical Panorama to the Virtual Crime Scene Copy

Interactive software packages, especially developed for forensic purposes, enable an easy and fast documentation of complex crime scenes. Such software combines plans, photographs, spherical recordings and other important digital evidences into a virtual copy of a crime scene. The photographic material at high resolution can be used for measurement.

The image-orientated structuring of the available information supports an efficient crime analysis in staff meetings but also during the presentation of the progression of events in court or towards other parties.




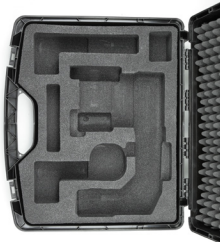

For example safety authorities worldwide successfully use **R2S Forensic Software** in their daily work for more than 15 years now. This software is characterised especially by its operator convenience and its high safety standard.



Features of Forensic Software

- simple linking, editing and presentation of crime scene information (documents, comments, pictures of evidence, crime scene structure etc.) in a clear visual format
- intuitive creation and evaluation of site plans including field of view information
- creation and perservation of a virtual crime scene copy for subsequent evaluation at staff meetings or presentations
- possibility of measurements in double shots
- spherical (360°) recordings in highest resolution can be loaded
- export of selected crime scene information or virtual tours into an "executable" format
- demonstration of selected evidences or crime details directly from a DVD or USB stick
- all information are protected against unauthorized access
- all work steps are documented retraceable
- solutions available for individual workstations or networking

piXplorer 500 Forensic - Scope of Delivery

<i>piXplorer 500 Forensic</i>		2-axis fully automated and calibrated robotic panorama head with integrated special camera and lighting, a handy and efficient solution for panoramic images at the push of a button
SD Cards		2 x ScanDisk Extreme PRO SDXC UHS-I Card, 95 MB/s, 128 GB, with spare-TAB for easier removal of the SD card from the device
C-Wrench		mounting aid for <i>piXplorer 500 Forensic</i> for special operating conditions
Transportation Case		stable suitcase with foam insert for safe transport of your equipment (not identical to hard shell transportation case)
<i>piXplorer 500 Software</i>		software for fully automatic calculation of panoramic views from the recordings of <i>piXplorer 500 Forensic</i> , without any user input

piXplorer 500 Forensic - Accessories

Light Tripod		light tripod made of aluminium, weight: 3 kg, removable 3/8" adapter, high stability, torsion resistance, flip-locking mechanism
Elevator Tripod made of Aluminium		robust and stable tripod made of aluminium, height-adjustable and torsion-proof centre column, height adjustment by indirect crank drive, crank lift up to 800 mm, tripod adapter 3/8 inch, level for alignment, max. usable height: 2500 mm, weight: 9.2 kg, incl. transport bag
Infrared Remote Control		infrared remote control for controlling piXplorer 500 Forensic from a distance up to 20 m, operation compliant to the usual control, small indicator for direct feedback about every made keystroke
Crime Scene Inspection Label		rewritable labels (including pen) for showing location information directly in the panoramic picture
Polarization Filter Attachment		circular polarization filter with lens hood for reducing disturbing reflections e. g. on water surface, thread of filter attachment: 62 mm
Height Adjustments		Adapter for height adjustment between the tilting axis of laser scanners and the nodal point of piXplorer 500 Forensic for colorizing point clouds with high-resolution panos in best quality
Hard Shell Transportation Case		Hard shell case with foam insert for a safe transport of your equipment, military standard: stainless steel reinforced padlock-able points, corrosion-, crush-, water-, sand- and dustproof

RODEON ForensiScan

RODEON ForensiScan is a system especially adapted to the needs of forensics allowing to photographically capture evidences on any surfaces. Attention is especially payed to secure evidences, such as fingerprints on cylindrical objects like glass, bottles, and bullet casings as well as on reflective surfaces as chip cards, mirrors or CD's.

An exact positioning of object and camera as well as a completely automated scan process ensure a very productive workflow with brilliant results of high photographic resolution. We developed a homogeneous line lighting adapted for the recording principle of **RODEON ForensiScan** allowing a high recording quality. However, all present lighting procedures can still be used unlimited.



1

Object Positioning

2

Camera Positioning / Set Sharpness

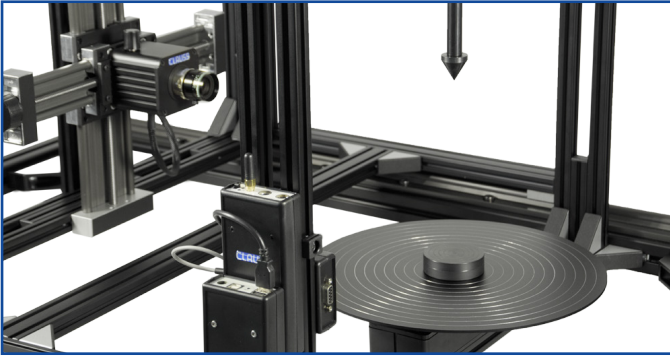
3

Set Lighting

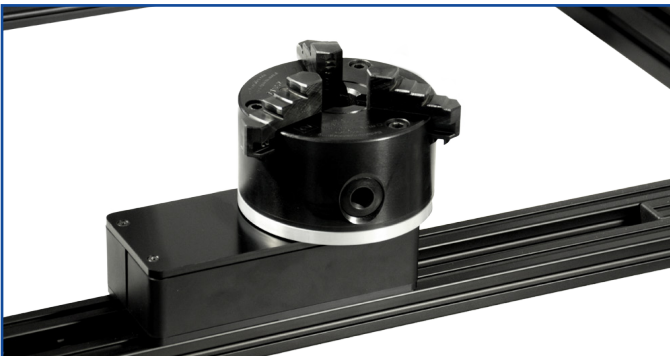
4

Start Recording

System Components



- Stable, torsion-resistant base frame
- Backlash-free precision gear with 72'000 steps, resolution 0,005°
- High-resolution camera (line mode, macro lens), two-axled backlash-free shiftable, image resolution for 1 complete scan: 276 megapixel
- Central, height-adjustable centring pin with exchangeable, pressure pieces, infinitely variable pressing power



- Precision turntable optional with
 - plane plate (diameter 50 cm) or
 - central clamping mechanism
- Maximum payload: 20 kg
- Maximum object size (D x H): 50 cm x 50 cm



Optional:

- Automatic line unit for recording flat evidences
- Resolution: 0,01 mm
- Movement: 40 cm

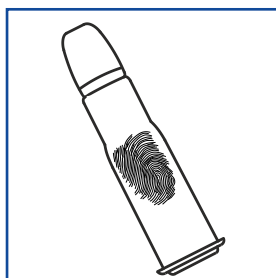


Optional:

- Line light for homogeneous lighting (red, green, blue, white, or UV)

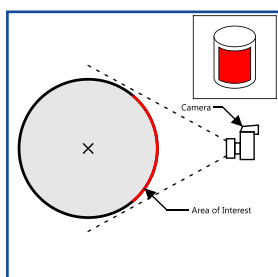
Traces on Curved, Reflective or Backside-Mirroring Exhibits

Evidences Occur on All Types of Shapes

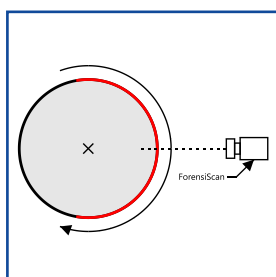


The **RODEON ForensiScan** captures the traces on evidence objects automatically by a scanning process, following the contour of the surface - without destroying the DNA. In contrast to other methods, e.g. using Cyanoacrylate, the traces do not have to be touched, got off or be unrolled.

Unlimited Area



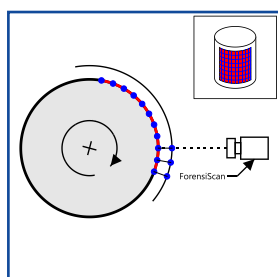
Limited area of conventional photographs



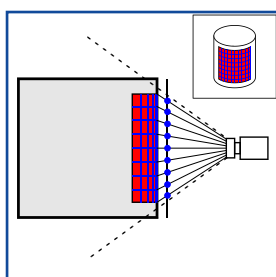
Unlimited area by using the **RODEON ForensiScan**

Cylindrical objects are rotated, while flat surfaces are moved linearly during the documentation with the **RODEON ForensiScan**. The area of capturing is not longer limited.

Distortion-Free Recording



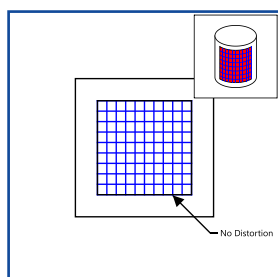
Length-preserving projection (transversal cut)



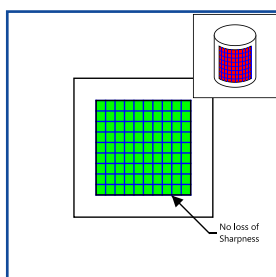
Length-preserving projection (sagittal cut)

RODEON ForensiScan captures only a line at once, and always at the same distance. Therefore this projection is also length preserving and a geometrically exact unrolling of the surface.

Constant Sharpness



Distortion free unrolling

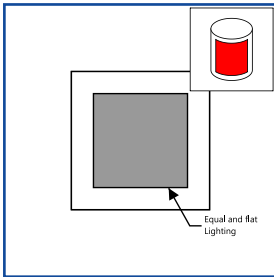


Result with no loss of sharpness

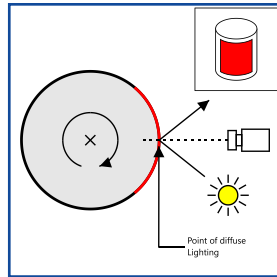
By using the **RODEON ForensiScan** and therefore scanning evidences a line at once, the distance between surface and recording unit remains the same for the whole process. The focus distance does not change and the sharpness of the result is overall constant.

RODEON ForensiScan

Constant Lighting



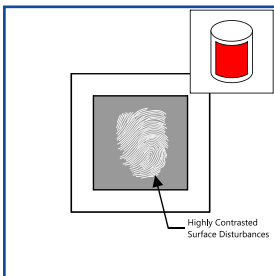
Evenly distributed light



Constant lighting due to movement of the object

Using the **RODEON ForensiScan**, the lighting for the whole surface is constant. The angle between light source, surface and camera stays the same during the recording process. A lighting change of the area is eliminated.

Contrast Enhancement



Diffuse reflection of fingerprint on CD (UNTREATED)

A different roughness of surface has a different ratio between specular and diffuse light. With **RODEON ForensiScan**, the contrast between surface and debris (e.g. finger print) is dramatically improved. Depending on the surface, the e.g. diffuse or specular reflection can be captured selectively to enhance the contrast between background and fingerprint.

Capturing Without Backside-Mirroring



Perpendicular capture of fingerprint on pocket mirror (UNTREATED)

If a fingerprint is placed on the surface of a mirror, it is very difficult to capture it by DSLR, as the image is mirrored on the backside of that mirror, giving an overlaid doubleimage. As the **RODEON ForensiScan** always captures perpendicular to the surface, double images can effectively avoided.

Advantages of **RODEON ForensiScan**

- complete solution for easiest operation including software for configuration and for starting the automatic scanning process without destroying the DNA
- distortion free capturing by geometrically exact unrolling of the surface
- no loss of sharpness by scanning always with a constant focus point
- constant lighting by scanning always at the same surface angle
- improved contrast by scanning selectively only the diffuse or specular light
- no backside-mirroring by scanning perpendicular to the surface

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