Network based digital comparison microscope

EVOFINDER®
Automated Ballistic Identification

Thank you for inviting us to participate and the opportunity to give you a basic overview and specifics of the instrument for ballistic evidence finding - the Evofinder®, produced by ScannBI Technology.

EVOFINDER®
Automated Ballistic Identification

ScannBI Technology was founded in 2006 by a group of highly qualified specialists working on the issue of automation of ballistic expertise since 1994. The structure of the company includes offices in Germany, Russia, and the USA. Since 2006 the company implemented the Evofinder® in several European countries (Germany, Switzerland, Belgium, Slovenia, Finland and others), as well as countries in Latin America and Asia.

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The Evofinder® configuration is based on three main integral parts:

1.)Specimen Analysis System

2.)Data Acquisition Stations

3.)Expert Workstations which are network-connected.

The Evofinder® operates in various network environments (LAN/WAN) over TCP/IP protocol and is capable of acquiring the digital images of the bullets and cartridge cases surfaces from remote sites and send them to the server via a VPN connection.

Single computer configuration is also available.

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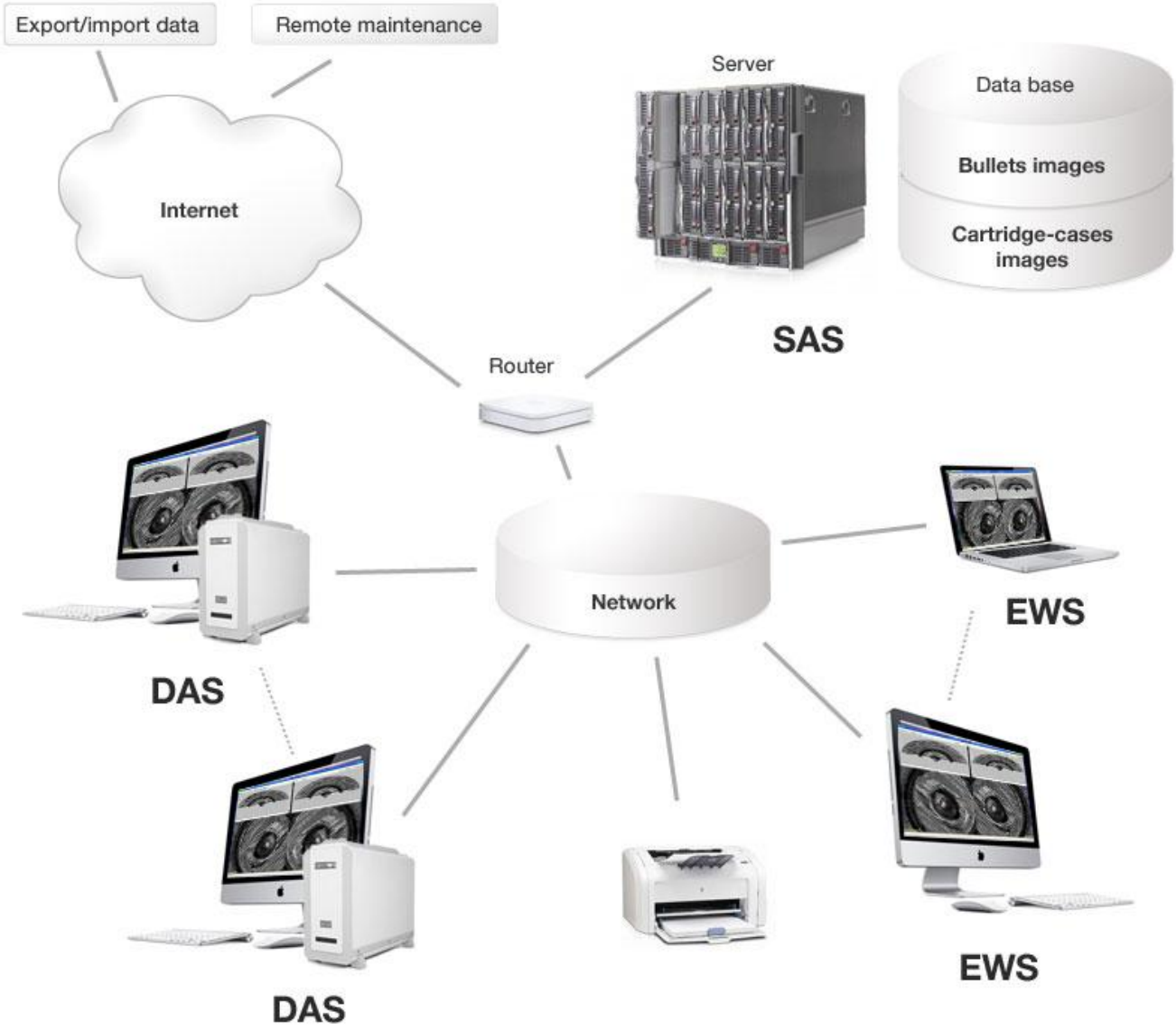

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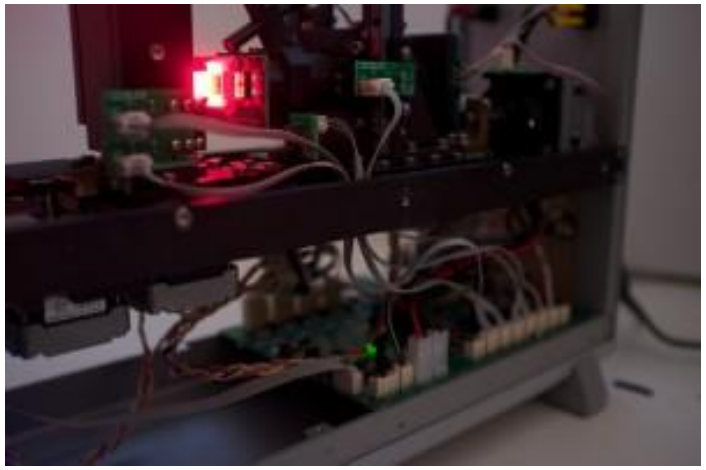
At the heart of the Evofinder® - a scanning device, that provides input of digital images of the examined objects - bullets and cartridge-cases.

Self –designed 4-motor mechanics provides high quality recording of bullets, including heavily deformed ones, and allows the use of a universal cassette to fixate both types of objects in the scanning device.

4-motor kinematics corresponds with the optimal parameters of the optics, electronic control and the sensor, creating a very compact, vibration-free device with “cabin size” format (130mm X 265mm X 340mm) and light weight (5.5 KG).

The scanning device is very portable, powered by 12 V power supply.



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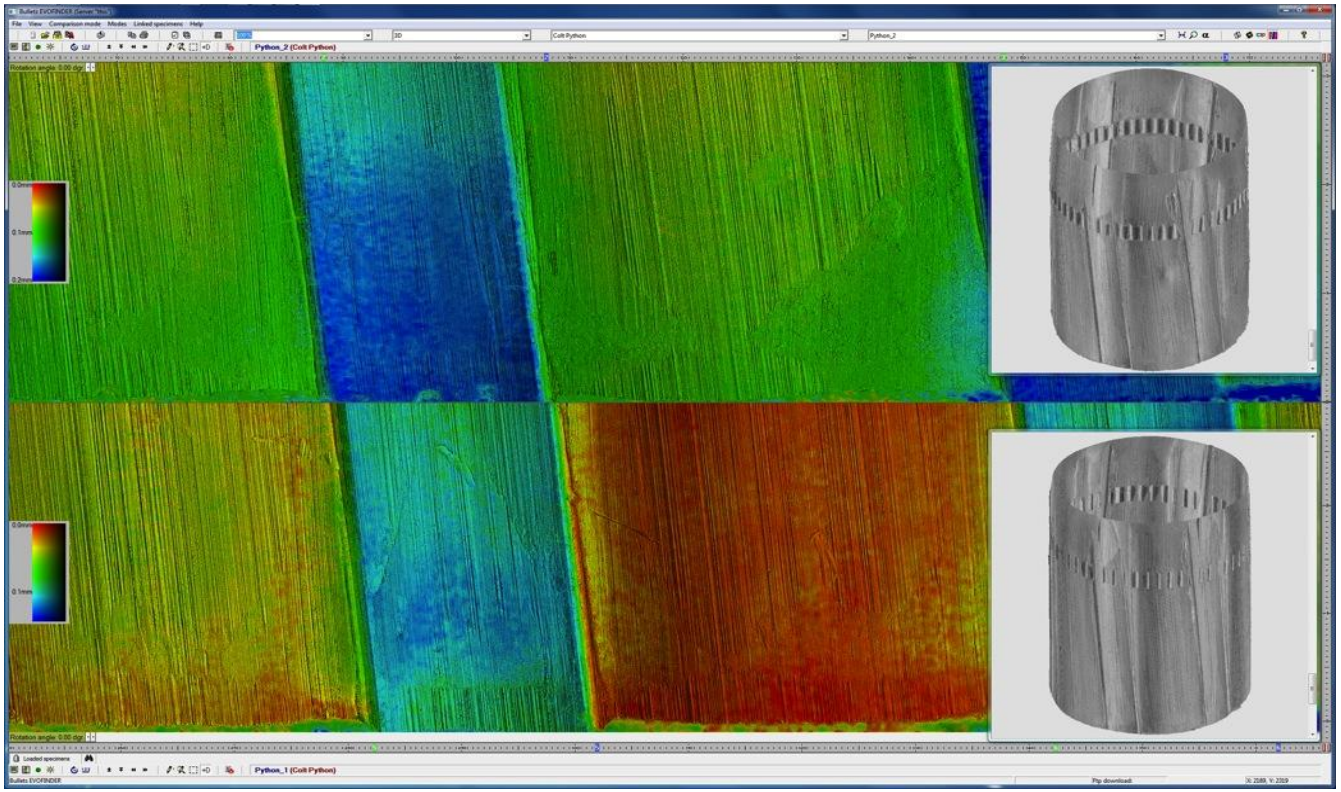
Applied imaging technology, so called “2D + D”, is based on a patented Frame-fragment technology - a combination of «Focus variation microscopy» and «Multi-sided illumination technology». It provides high-quality recording of objects surfaces and their mapping on the monitor screen in 2D, 2D + D and 3D.

Technologies such as «Floating frame technology», «Edge shifting technology», «Slope compensation technology» and others significantly improve the image quality of real objects.



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On this particular page, a 3D view comparison of 2 cartridge cases shot from the same barrel are shown.

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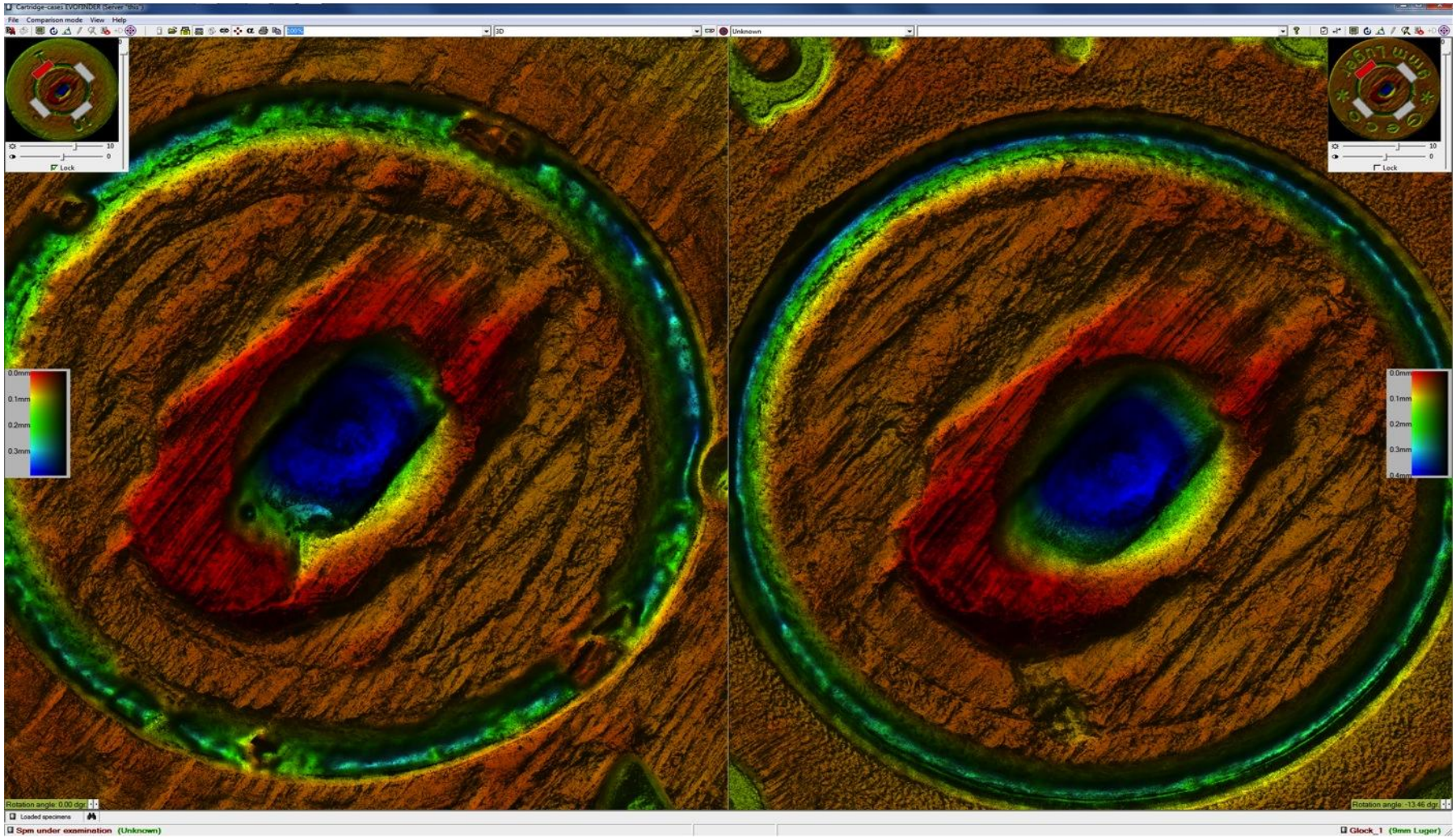

When color is added as an indicator of depth then the objects will look like this.

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Perspective allows us to examine the objects in a different plane.

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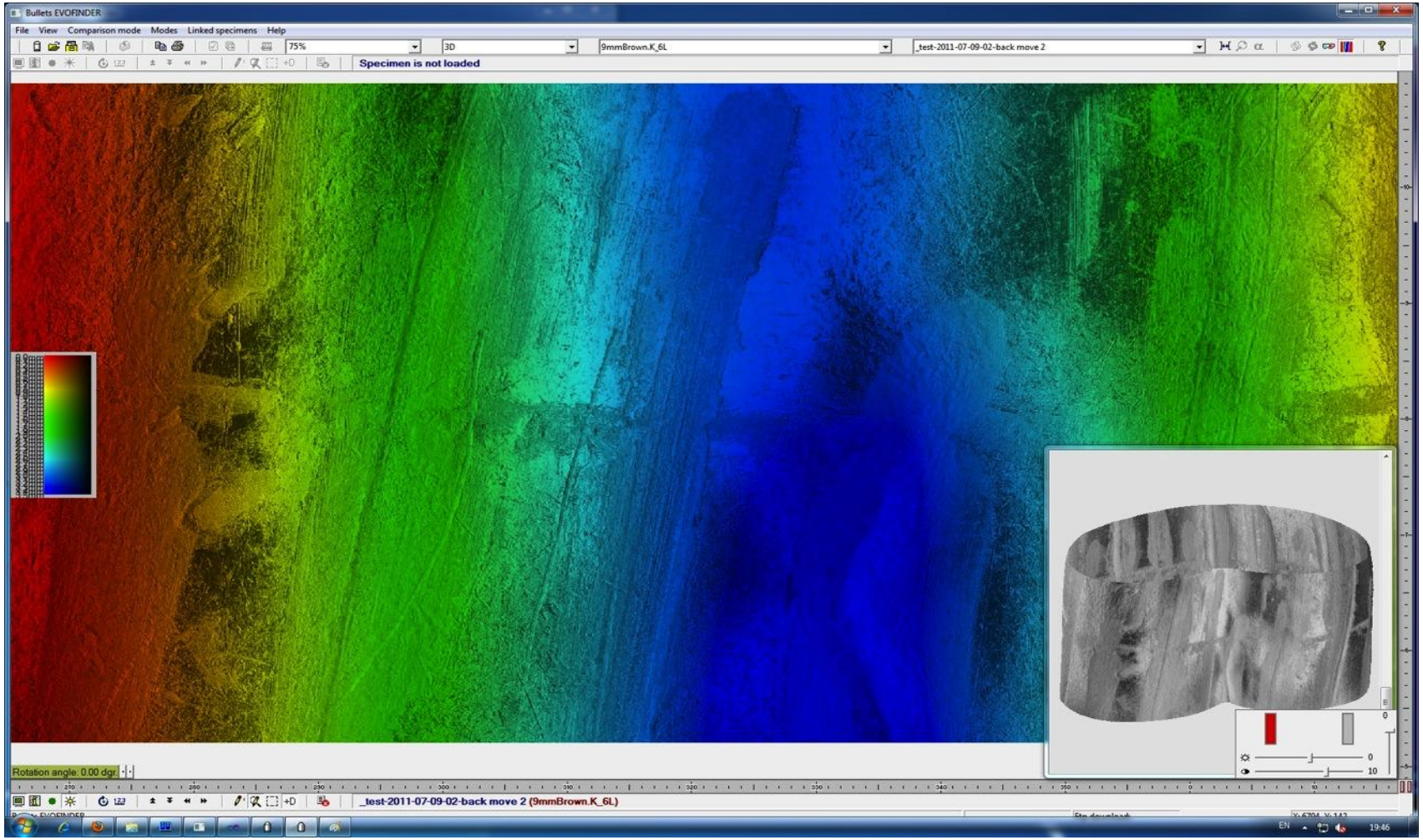
Self –designed 4-motor mechanics provides the ability to record heavily deformed bullets, even with negative curvature of the surface, by creating the same recording conditions for each scanned surface frame.



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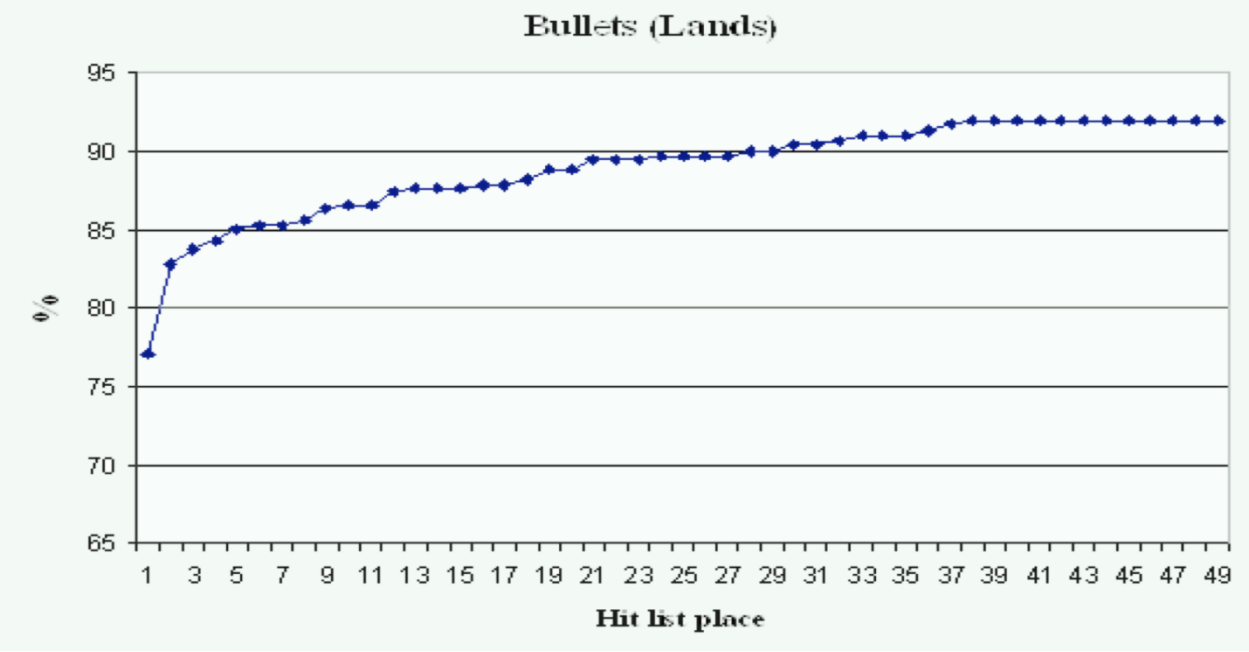
The basis of the effectiveness of automated identification system is the quality of the source material presented both in 2D and in 3D.

Excellent image quality and high degree of reproducibility of the same objects surface provide excellent results in the application of correlation algorithms.

The results of the Odyssey experiment – European Committee project – are presented below (9 mm Luger ammunition).



The percentage of the first ten places (ranks) for bullets by lands marks – 86.6%

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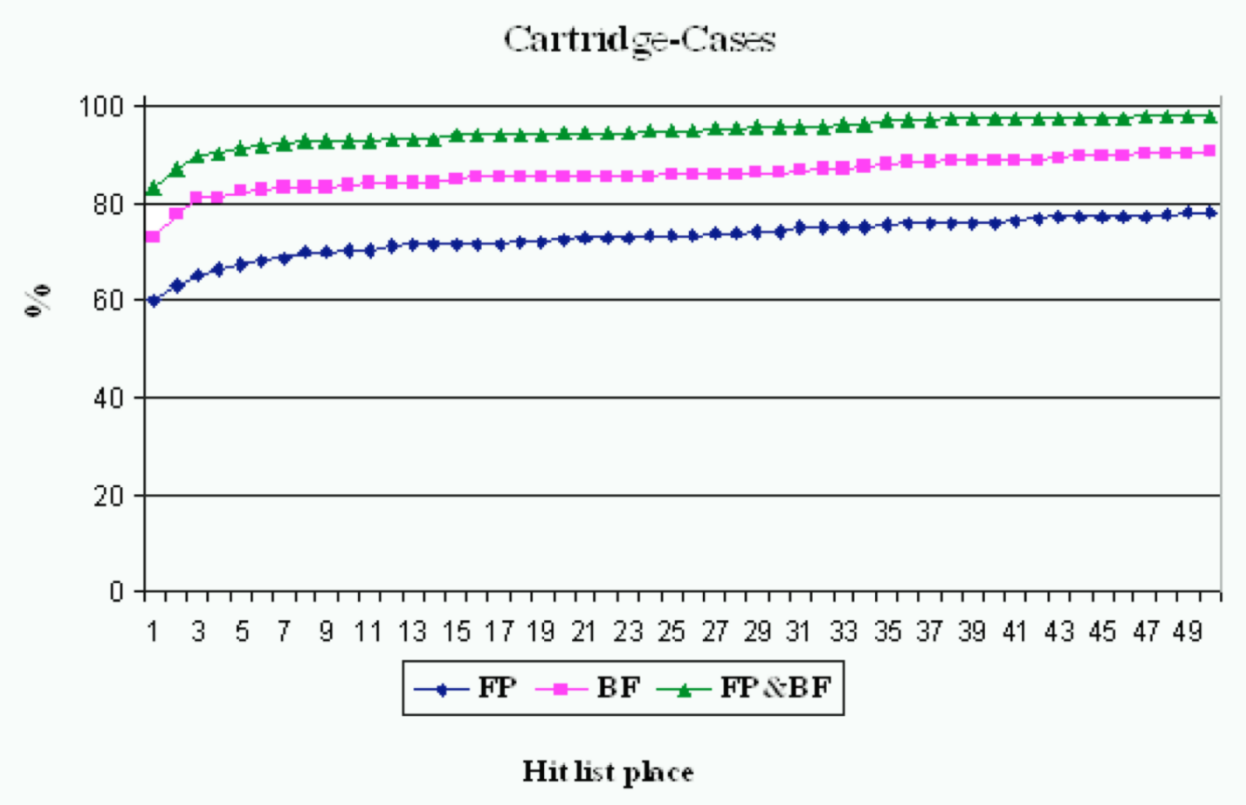

The percentage of the first ten places (ranks) for cartridge-cases (fire-pin + breech face) – 92.6%

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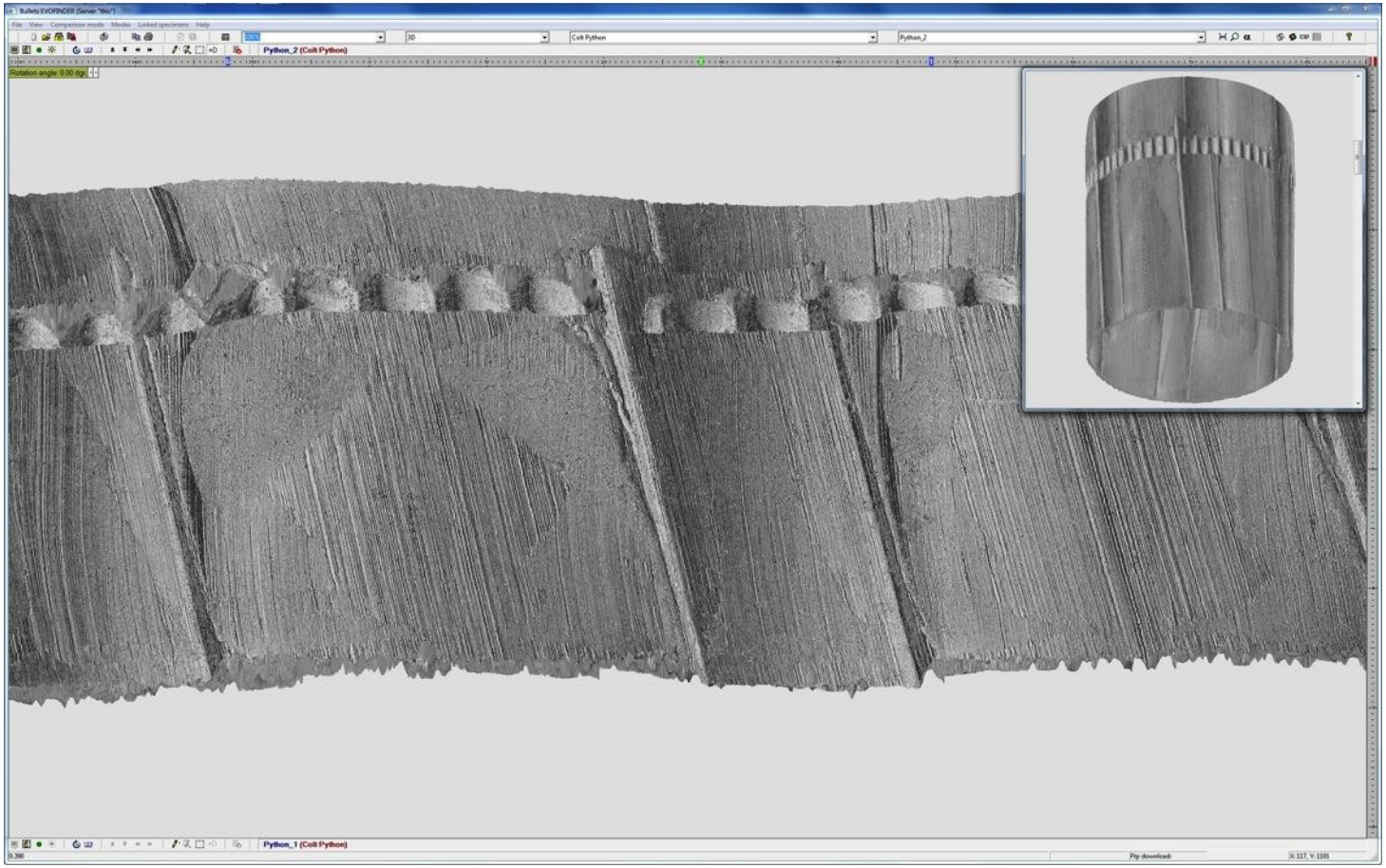
High image quality and reliability allow to deny the use of a traditional comparison microscope at the final stage of the expert conclusion (repeatedly confirmed in Germany, Switzerland, Brazil and other countries). In this sense, the Evofinder® is a "closed", self-sufficient instrument for ballistic examination.



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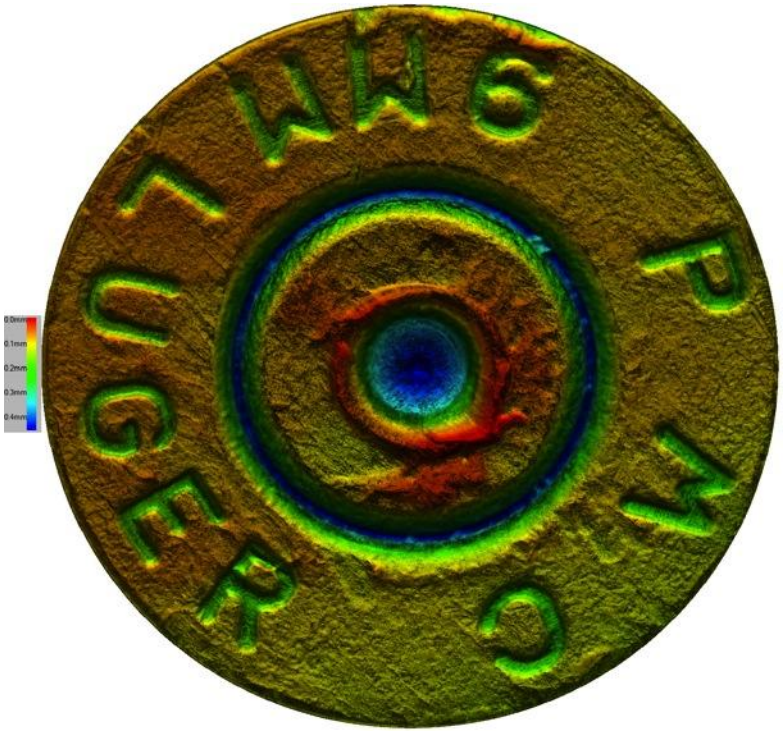
Our future plans include:

1.) Acceleration of the imaging process (currently 2.5 min for Luger 9mm ammunition - bullets as well as cartridge-cases) up to 1.5 min due to a new, self-designed camera.

2.) Further image quality improvement through the use of modernized lighting units,

3.) Improving of the algorithms for auto-searching

4.) The implementation of algorithms for automatic layout of significant marks on the bullet using the 3D information.



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Summary.

The Evofinder® can be posed as a *network based digital comparison microscope*. Being built on advanced manufacturing sciences and modern computer technologies the Evofinder® provides:

- the fastest imaging process and the highest image quality
- highly effective results while correlating
- very friendly interface with the ability to examine objects manually on the monitor screen
- easy usage and high robustness
- compact size and light weight - portability
- reasonable price.