Case Study

Contact: support@pixel-fox.com
Website: www.pixel-fox.com

Measure and document parts at the microscope with the pixel-fox® imaging package

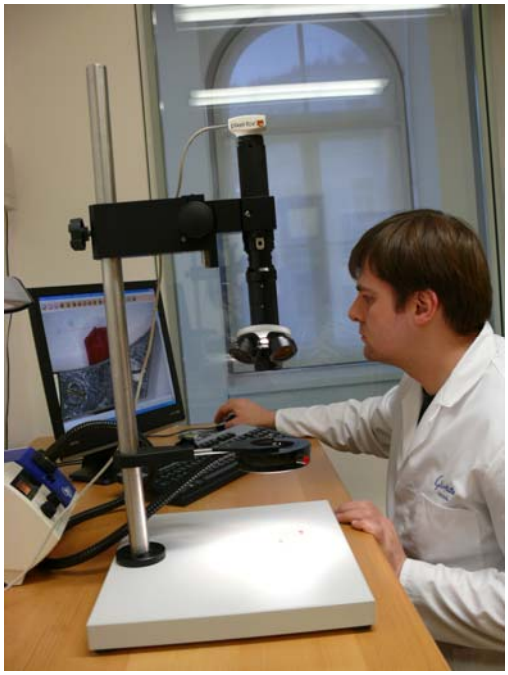
[Greifenstein-Beilstein / Glashütte] The world-famous watchmaking company Glashütte Original relies on the pixel-fox® imaging solution from software producer dhs Dietermann & Heuser Solution GmbH when using microscopes to test, evaluate and document the quality, surface finish and dimensional accuracy of precision parts for mechanical watch movements. The package from dhs is easy to use, saves time and produces perfect results.

The city of Glashütte in Saxony (Germany) has been an important centre of the watchmaking industry for over 160 years. *Glashütte Original* upholds this tradition to this day. The town has always set standards by producing largely hand-crafted "watchmaking works of art". The manufacture of a mechanical timepiece – from the construction of the movement and the production of virtually all components through to the final assembly – demands the very highest precision and great attention to detail at all individual stages. The company uses only the finest materials for its watches. Their surfaces and edges are ground and polished by hand and then manually engraved. This makes *Glashütte Original* one of the few genuine watchmaking companies left in the world. The company's "Handmade in Germany" slogan sums up its philosophy and is almost certainly one of the reasons why it opted for **pixel-fox®**. After all, it too is an all-German product.


The background

The "German Watch Museum Glashütte" opened in May 2008 and aroused great interest among the public. More than 400 unique exhibits are presented in a multimedia format which helps to enrich the experience for visitors. A variety of pocket watches, wristwatches and pendulum clocks dating back to various eras are on display. An important part of the museum and *Glashütte Original* is the attached restoration workshop. The manager of the workshop, Mr. Michael Reimann, uses a

microscope fitted with a digital imaging system to examine, measure and document parts belonging to historical watches. *"We use the **pixel-fox®** camera and software to capture images of tiny components such as coils, springs, and fourth-wheel pinions,"* said Reimann.

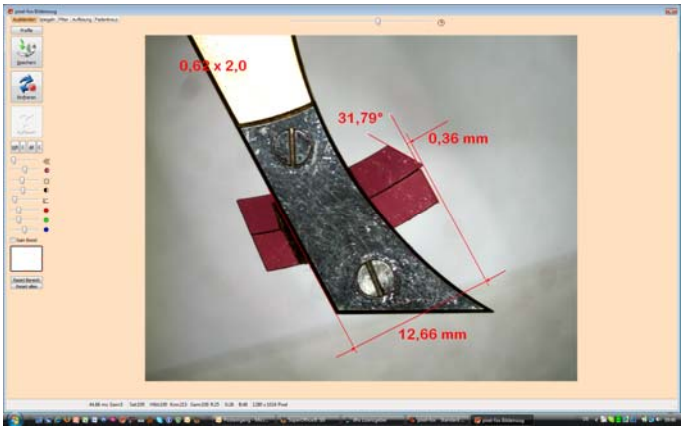


With his colleague Jürgen Franke, he repairs historical watches and makes them work again. The workshop also carries out maintenance on customers' watches (some of which are worth up to €20,000.00) and assists with the company's ongoing production work. A close-up view of the small components which make up the movement of a timepiece is essential for assessment and diagnostic purposes. Michael Reimann is delighted with the state-of-the-art technical equipment available to him and his distinguished team of watchmakers. This comprises a special microscope complete with a cold-light source as well as the **pixel-fox®** camera and software package. In the past, evaluating, measuring and documenting small parts was very difficult and time consuming. However, this can now be done much more easily thanks to the new solution.

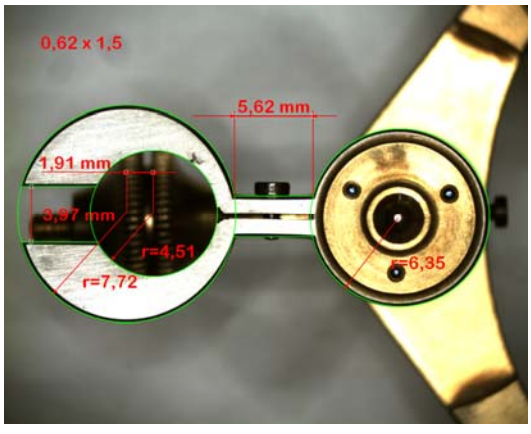
The task / problem solving

The objective when looking for a solution to the problem was to come up with a system which would produce optimum images of watch parts whilst allowing rapid and precise 2D measurements and much faster communication. After examining various solutions in detail, the company opted for **pixel-fox®**. After all, this complete package not only contains a high-resolution digital microscope camera (which could easily be mounted on the existing microscope using a C-mount adapter), but also boasts very easy-to-use software for adjusting the image parameters, for subsequent measuring and labelling, and for saving / documenting the images.

The unit, consisting of microscope, camera and software, is calibrated with the stage micrometer that also comes with the package. This is done just once for each optical enlargement of the microscope; the calibration is then saved in the PC and simply allocated to the respective image in day-to-day practice. A scale bar can therefore be incorporated into an image at the click of a mouse and everyone who reads the relevant report gets an immediate idea of the proportions.

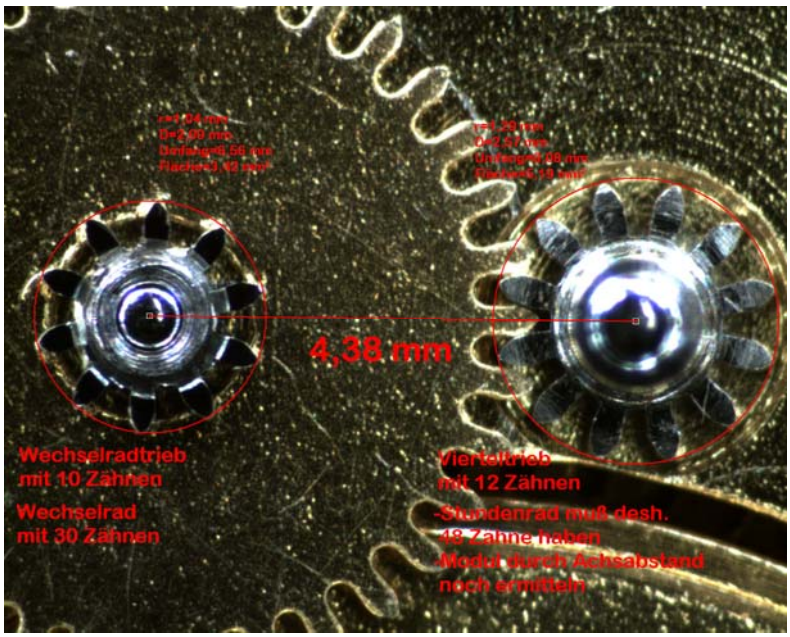


Software screenshot with "anchor"



"Anchor fork" with measurement and label

"We use the software's extensive range of features for a variety of purposes. These include measuring the distance, radius, angle and area of motion works, cogs and anchors for example. The entire system is highly intuitive and we got the hang of it in next to no time," said the experts from Glashütte.



High precision watch gears

The solution also offers functions such as crosshairs, labelling and a live preview of measurement results. Structures are easily recognisable to document and explain the problem – even after the report has been printed. The report is sent by eMail internally and externally within just a few seconds, with no loss of quality, and is available at any time to anyone.

The benefits

Software and hardware were installed in no time at all, basic system requirements facilitate easy implementation – as does the compatibility with all current Windows operating systems (Win 2000, XP and Vista). Holger Dietz, Sales and Marketing Manager at dhs, described various other advantages offered by the product: *"A standard USB2.0 interface is used to supply the power and quickly transfer the data from the camera to the PC. The image source can be mounted on virtually any existing optical equipment. Not only microscopes, but also macroscopes, endoscopes, C-mount lenses etc. can be connected".*

The format-filling, extremely fast live image from the camera ensures ideal ergonomics for all users. Within just a few seconds, images are adjusted correctly (exposure time, brightness, contrast, colour saturation, mirroring, white balance – much of this fully automatically), recorded, calibrated and saved. The uncomplicated software design makes it very easy for users to familiarise themselves with the product and, if any questions arise, integrated online help is available with the F1 key or free eMail support. Mr. Reimann and his colleagues really benefit from the new system: *"We can now take measurements, archive images and distribute test results quickly and easily in digital form. Everyone can access the images and reports from their PC. This makes our day-to-day work a great deal easier!"*

Many customers – now in more than 35 countries throughout the world – have realised this and have purchased **pixel-fox®** through one of the more than 50 resellers. No problem, the software is available in German and English.

Summary

This imaging package consisting of a digital microscope camera and innovative software for capturing, measuring and archiving images is a modern aid for use in all laboratory, microscopy, endoscopy and QA departments. It is based on the manufacturer's 20 years of experience with high-end systems (dhs Image Data Base). Easy to operate, flexible connection to existing equipment, highest standard quality, absolutely reliable operation and a surprisingly low price are the main features.

Acknowledgement: This article was compiled with the friendly assistance of "Glashütte Original" in Glashütte (Saxony), Germany.