

# Measure and Document Parts and Components

Whenever microscopes are used to test, evaluate and document the quality, properties and test results for electrical or other components, special software is recommended. One of the available software solutions for these purposes is pixel-fox from Dietermann & Heuser Solution (dhs). It is easy to use, saves time and produces reliable results. This leads to the decision of Phoenix Contact, a manufacturer of electronic components, to use the imaging package for quality-assurance purposes of the firm's "Overvoltage Protection Development" department.

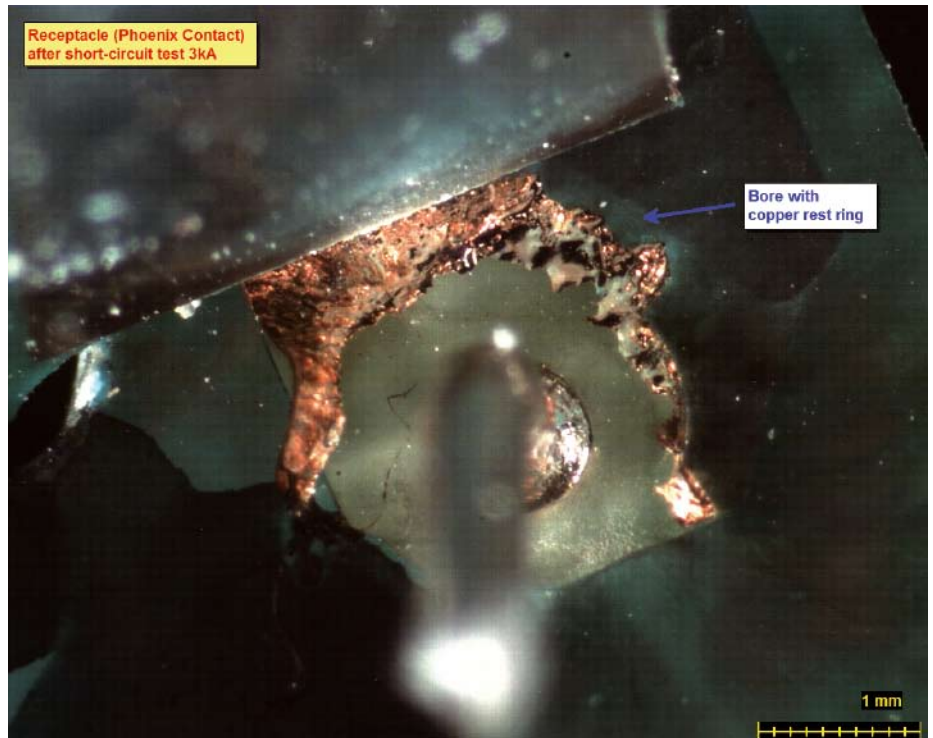


Image of "Receptacle" with labeling

Phoenix contact, established in Essen in the early 20s is a supplier for electronic parts and components. It now employs over 10,000 people around the world, including around 5,600 in Germany. It has additional production sites in the USA, China, Poland, Greece, India and Brazil. The company manufactures a wide variety of goods, from screws and other plastic/metal parts to tools and production machines. Its product range includes both electrical and electronic components. Connecting terminals, plug-in connectors, circuit-board connecting systems, overvoltage protection systems and signal converters are just some of the Westphalian company's many products. Its construction and development departments constantly come up with new ideas and turn them into new products for the automation, energy supply, toolmaking, mechanical engineering and plant engineering sectors.

## The Background

Manfred Reith is responsible for carrying out overvoltage protection tests as Development Manager within the "Overvoltage Protection Development" department, and receives support from the group's own central laboratories which

process samples using extremely complex measuring and analysis procedures (including computer tomography). The results of these tests provide the basis for a targeted development process and are also useful in the event of a complaint. "These complex tests require a great deal of organizational work in advance and therefore take a relatively long time", said the Development Manager. "In our department, however, it is important to recognize technical correlations within a few minutes and react accordingly." In view of this fact, the company's technological and product development divisions began looking for ways of performing specific tasks much more quickly and cheaply.

## The Task / Solution to the Problem

The objective when looking for a solution to the problem was to put in place a system, which would produce visual images of electronic components whilst allowing rapid and precise 2D measurements and much faster communication. After examining various solutions in detail, the company finally chose the German software solution. After all, this complete package not only contains a high-resolution digital microscope camera (which can easily be mounted on an ex-



Holger Dietz, Vice President Sales & Marketing at dhs

isting stereo microscope using a customary C-mount adapter) but also contain easy-to-use software for adjusting the image parameters, for subsequent measuring and labeling, and for saving and documenting the images (fig. 1).

The unit, consisting of the microscope, camera and software, is calibrated with the stage micrometer that also comes with the package. This is done just once for each optical microscope enlargement. The calibration is then saved on the PC and simply allocated to a particular image in day-to-day use. A scale bar can therefore be incorporated into an image by a mouse

click and everyone who receives a report with such images gets an immediate idea of the proportions involved (fig. 2).

"The software offers a comprehensive range of options. For example, it allows us to assess damaged tracks by taking distance, radial, angular and area measurements. These immediately show us how a product could be optimized following extreme stress." Extreme stress of this type is replicated during a so-called TOV test (Temporary Overvoltage). The process simulates a fault in the electricity network by applying a voltage of 1,200 V to the test samples for a period of 200 ms. This inevitably destroys a number of components and circuit boards. The samples are then examined under a microscope to determine whether the changes, which have occurred, would pose a danger to the surroundings.

In another scenario, a so-called wobble rivet was used during the construction phase for an adapter. This caused problems early on. The parts were therefore repeatedly assessed under the microscope. This helped the company to come up with immediate improvements and quick solutions to the problem (fig. 3).

"The entire system is highly intuitive and you can get the hang of it in next to no time", said the expert. The solution also offers functions such as crosshairs, labeling and a live preview of measurement results. To help document and explain any problems, all sample details are easily identifiable. With just a few simple steps, the images generated can be included in a report and are just as clear even when the report is printed out. These reports are then sent via eMail within seconds. They can be distributed internally or externally with no loss of quality and are available to anyone at any time.

### The Benefits

The software and hardware – all "Made in Germany" – were installed in no time at all. The low system requirements facilitate implementation, as does compatibility with all current Windows operating systems (Win 2000, XP and Vista). Some of the other benefits

of the product: A standard USB 2.0 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 full-frame, high-speed live camera image ensures ideal ergonomics for all users. Within just a few seconds, images are adjusted correctly (exposure time, brightness, contrast, color saturation, mirroring, white balance – much of this fully automatically), captured, calibrated and saved. The uncomplicated software design makes it very easy for users to familiarize themselves with the product. If any questions arise, integrated online help is available by pressing the F1 key. The company also provides free eMail support. Mr. Reith and his colleagues really benefit from the new imaging package: "Thanks to the new system, we can measure and archive our components much more quickly and accurately and then distribute the test results in digital form. The fact that everyone can access the images and documents via the company network has made our day-to-day work a lot easier."

### Summary

This imaging package consisting of a digital microscope camera and software for capturing, measuring and archiving images is a modern aid for use in all laboratory, microscopy, endoscopy and QA applications. It benefits from the manufacturer's 20 years' experience of working with high-end systems (dhs Image Data Base).

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Fig. 1: Camera fitted to a microscope

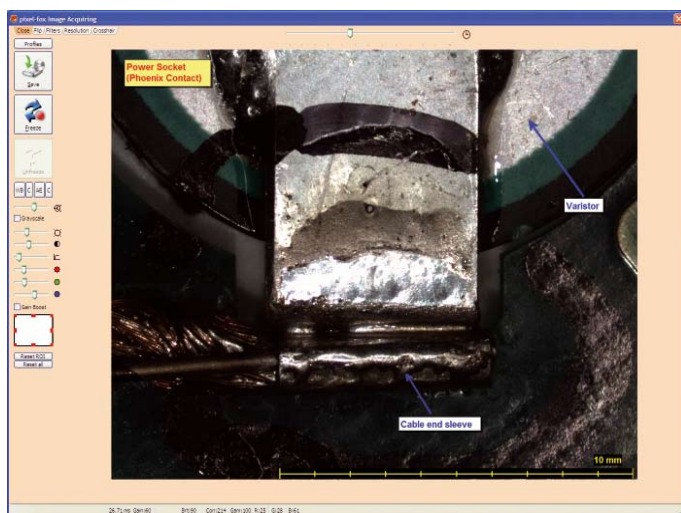


Fig. 2: Software screenshot with a "power socket"



Fig. 3: "Ring terminal" with measurement and label