

# AKHET®

## Success Story

Life science research thanks to advanced image processing: Pyramid offers customized high-performance IT solutions for high-content screening platforms.



## Introduction

Life science research has become an indispensable discipline in the 21st century, and its importance continues to grow. However, research in modern biomedicine is extremely resource-consuming and complex – especially in experimental research, which generates enormous amounts of data.

Elaborate screening experiments are required to research biomedical issues. Karlsruhe-based ACQUIFER AG is a specialist in the development of such platforms. At the heart of these systems are industrial computers especially developed for the imaging sector by Pyramid Computer GmbH in Freiburg.

When researching widespread diseases such as cancer or Alzheimer's, a very large number of samples are examined using fully automated microscopes.

However, hardly any laboratory has all the necessary equipment and resources of interdisciplinary staff in-house. Life science big data platforms enable collaboration and networking between different disciplines, pooling the required resources.

This includes robot-assisted laboratory automation, intelligent microscopes, automatic image analysis, and secure data exchange.

### 4 Good Reasons

- **High Performance**

Pyramid's systems are based on the latest technology standards and are therefore particularly proficient.

- **Long-Term Availability**

Long-term availability secures your investment

- **Flexibility**

Our modular systems enable precise system configuration according to customer requirements.

- **Customizable**

We can easily realize customer wishes in terms of appearance.

## Technology

The high-content screening platform developed by Pyramid for life science research is designed specifically for these applications and covers the entire life cycle: from the initial data acquisition to the publication of the results. The system consists of modular components that are precisely tailored to the scientific question and the model organism to be used.

An essential component for the transfer, storage and processing of large image data are the required high-performance industrial computers. For this reason, when developing their system, ACQUIFER placed the highest demands on the hardware to be used and its performance.

The key requirements for this complete solution were fast memory, high computing and graphics performance, and high network performance in a system with long-term availability. The platform also had to have a modular design, be housed in a single casing, and be quiet in operation. Finally, the hardware also had to offer controlled audit security.

To future-proof the investment in this high-quality solution, options to make adaptations easy were built in. For example, if the network connection is to be changed from copper to fiber optic, this can be accomplished without any tools by inserting a corresponding ELX (Easy LAN eXchange) module. Conveniently, there is a slot for this both on the front and back.

*„Pyramid was able to supply us with a custom ‚Made in Germany‘ modular solution for the imaging application, even in small quantities.*

*We were also impressed by Pyramid's flexible approach, their expert advice in the run-up to and during the project, and their global service and partner network.“*

Dr. Urban Liebel, ACQUIFER GmbH



## IBV Custom Solutions „Made in Germany“

Pyramid Computer GmbH is a specialist in the development and production of individual IT systems for customer-specific hardware solutions, imaging, industrial IT and customized IT services. The Freiburg-based company was able to offer a complete solution that matched the requirements profile exactly.

In addition to the technical specifications, the system also meets the requirement that the solution should be flexible and adaptable to the applications used. Pyramid provided the complete turn-key system from a single source and also took care of the necessary product certifications in advance.

As many of these custom solutions are in use worldwide, global service and support as well as the long-term availability of the overall solution is a basic requirement. This is of course an integral part of all Pyramid system solutions.

One particular challenge was to integrate the advantages of several systems into one modular system and to do so in extremely quiet housings. This modular system now makes it possible to scale projects seamlessly and adapt to future image processing challenges. Today's image processing always benefits from optimally matched hardware for distributed image processing routines. This is now possible thanks to Pyramid and ACQUIFER's joint development.

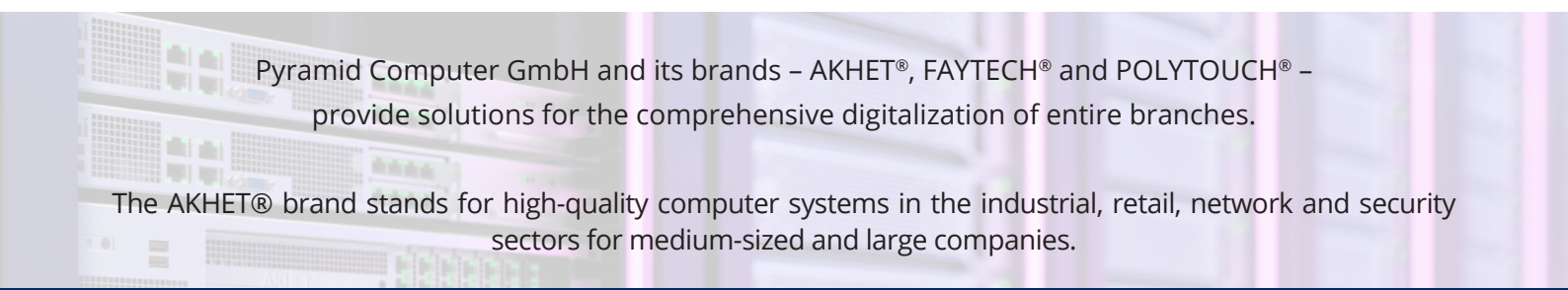
## High-Content Screening in Practice

ACQUIFER's main application with the Pyramid solution are microscopic investigations using zebrafish as a model system. The zebrafish is ideally suited for biomedical research, as its physiology and genetic information are very similar to that of humans. The screening microscopes act as *"intelligent automation tools"* that detect and visualize interesting structures, such as color changes, autonomously.

The Pyramid solution then takes care of the transfer, storage and processing of the huge image data sets. These 3D data sets are quickly captured, processed, and documented and made available to the participating scientists in a cloud-based portal in real time. The networking of laboratories results in enormous time and cost savings, including because the laboratories also have access to partial and interim results in real time. *"This solution has proven itself extremely well in test laboratories so far, so we are about to launch it on the market,"* explains Liebel.

## Future Developments

As the quality of the detectors and the associated data volumes in the life science sector are always increasing exponentially, ACQUIFER is planning to further expand its high-content screening platforms. The completely modular structure of the solution enables easy expansion of the network, memory and CPU performance in the future. *"We are also planning a smaller version of the platform that weighs less and has smaller dimensions,"* explains Liebel. *"Pyramid is the competent partner with whom future developments can also be driven forward."*



Pyramid Computer GmbH and its brands – AKHET®, FAYTECH® and POLYTOUCH® – provide solutions for the comprehensive digitalization of entire branches.

The AKHET® brand stands for high-quality computer systems in the industrial, retail, network and security sectors for medium-sized and large companies.