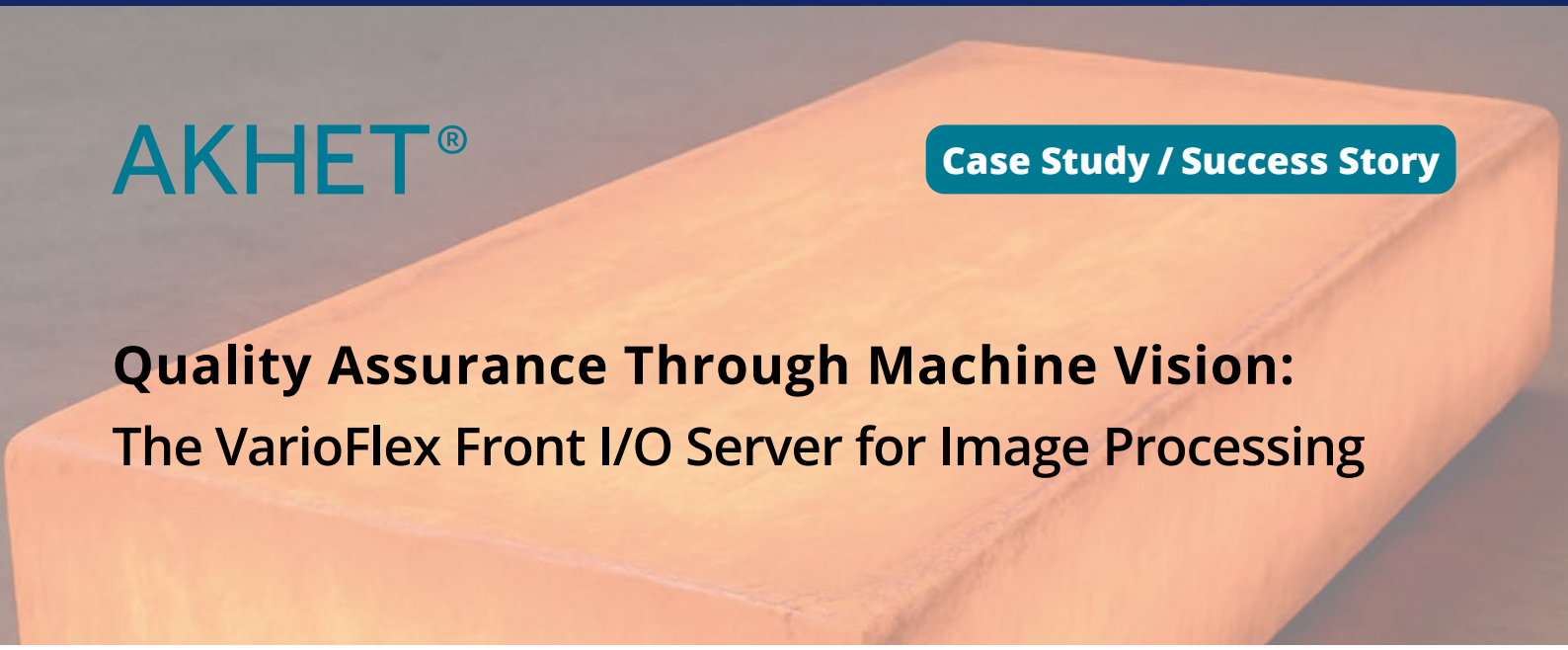

AKHET®

Case Study / Success Story

Quality Assurance Through Machine Vision:
The VarioFlex Front I/O Server for Image Processing

Introduction

A leading provider of industrial image processing (machine vision) offers systems that are used, among others, in the paper, printing and steel industries for inspecting surfaces..

These complex quality assurance solutions detect material impurities in the paper industry, printed image processing errors in the printing industry, and cracks in red-hot metal blocks in the steel industry.

The manufacturer has been relying on hardware from Pyramid Computer to control its machine vision systems for more than 10 years. The servers employed by the manufacturer are based on systems in the AKHET®. VarioFlex Front I/O series.

Pyramid Computer´s Services

- Development of customized systems
- System production
- Installation of provided images
- Quality assurance
- Technical service & after-sales support
- Provision of initial samples
- Monitoring the life cycle of the components

Challenges

The required quality control is performed by line and area scanning cameras that take high-resolution images of the paper webs. These run through the machine at speeds of up to 2000 m/min. Quality is also checked in real time at extreme speeds in the printing industry. Inline inspection systems detect color variations in printed images on corrugated cardboard, among other tasks. If a quality-relevant deviation is detected, the faulty sheet is automatically ejected.

The speed of production, the complexity of the production environment, and the dust caused by paper abrasion pose considerable challenges for inspection systems in both industries.

Pyramid's AKHET® servers form a powerful hardware foundation to control the interaction of cameras, lighting, sensors and conveyor units via the corresponding inspection software. AKHET® VarioFlex front I/O servers with an installation depth of 350 mm and a height of 4U (printing industry) or 1U (paper industry) are used for these machine vision solutions.

Manufacturers in the steel industry also rely on the 1U system for their inspection systems. Here, slabs that have just left the casting mold in a red-hot state must be inspected for cracks. A complex process of 2D and 3D object acquisition using laser triangulation makes it possible to determine the depth of the cracks and, depending on the result, to decide whether the metal block should be sent on to processing or melted down..

The inspection process is slower than in the paper and printing industry. At the same time, the 3D objects generate large amounts of data, which must be stored and processed by the AKHET® server in a very harsh environment with high temperatures.

AKHET® VarioFlex 4U 350 Front I/O

AKHET® VarioFlex 1U 300 Front I/O

Chassis: 19" rack

Connectivity

- 1 GB, 2,5 GB and 10 GB Ethernet
- RS232 (serial), USB 2, USB 3, USB 3.2
- Fieldbus and DCF module

Additional features and functions

- Short-rack chassis
- Custom embed Points
- Front I/O connections
- HexaCore Intel® CPU
- DDR4 and DDR5 RAM
- NVME boot drive

Solutions

As the algorithms of the machine vision software are computationally intensive, we equipped the three systems with processors that offer high single-thread performance at the manufacturer‘s request.

Special cards and components are also required for these inspection processes. We assemble these in our production facility in Ichtershausen, Thuringia: DCF modules, timing cards, PLC cards with relay function, and specific I/O cards, among others, to ensure connectivity to the respective customer’s fieldbus system..

The VarioFlex servers can integrate all the expansion hardware in a chassis with front connections and a depth of just 350mm. This makes the devices suitable for installation in control cabinets with small dimensions and a closed rear panel that does not allow cabling from behind.

Dust and dirt are part of the harsh everyday production environment in all three industrial environments described above, which endangers the functionality of the technical infrastructure. This is why appropriate particle filters in the servers help to prevent imissions.

A special kind of customization are the additional screw-on points that we install in the chassis of the server systems. They are used by the manufacturer to attach customer-specific modules. They are a good example of the extensive customizing provided by Pyramid for its AKHET® brand customers.

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 .