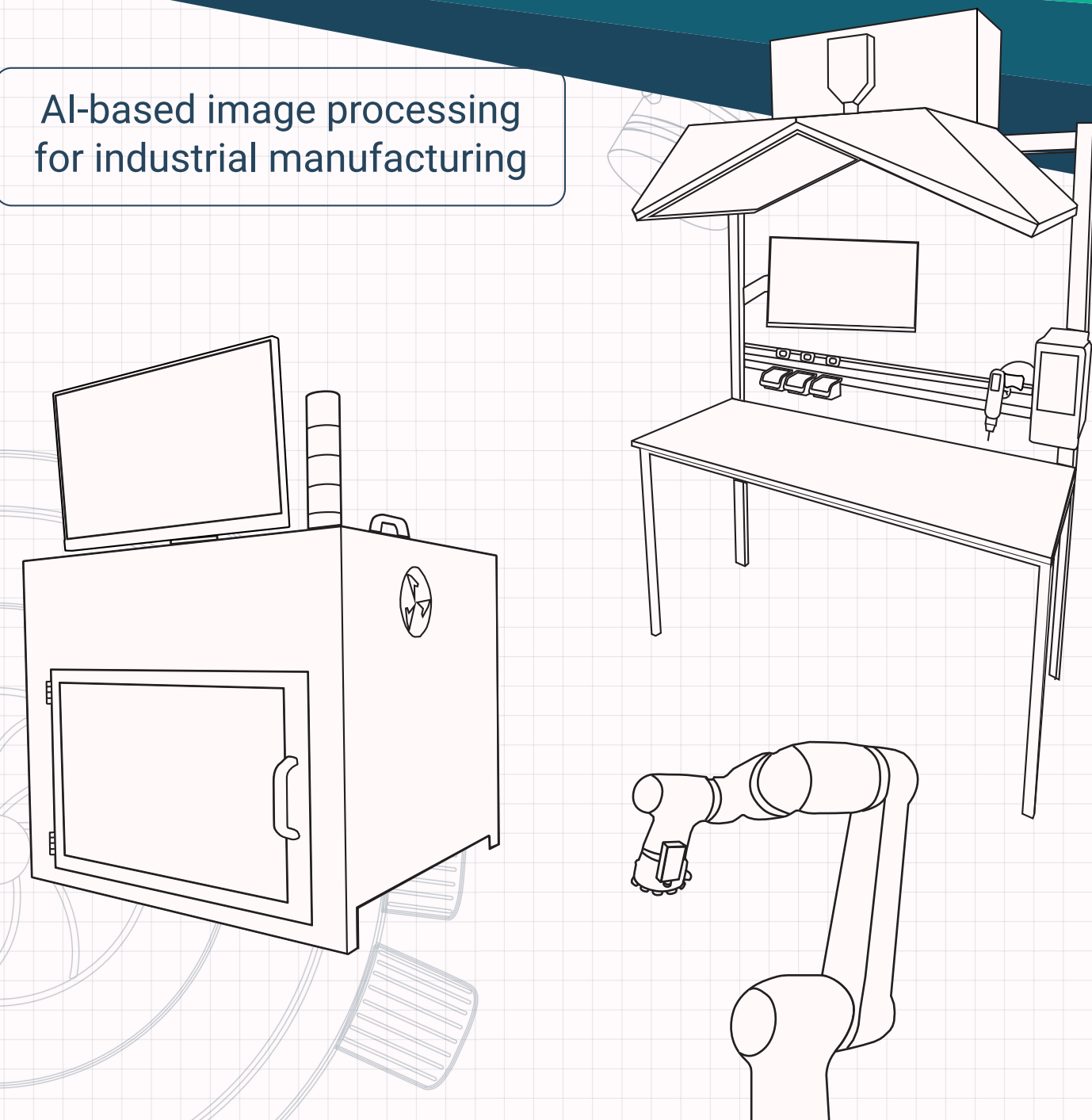
vision4 quality

Systems for

Optical
Quality control

AI-based image processing
for industrial manufacturing



About us

We're reimagining quality control: With our AI-based solutions, we create accessible yet high-performance solutions for manual workstations and automated production lines.

We believe that technology should be simple and accessible, without complicated programming or technical hurdles. Our goal is to develop products that are straightforward and transparent at every stage—from purchase and setup to use and expansion.

„Our Values are the Foundation of our work“

Our company is characterized by diversity and a young, dynamic team. We are proud to develop innovative solutions and help shape the future of industrial image processing.

Vision4Quality in a nutshell

- 20 + Employees
- Customers across Europe
- Located in Würzburg
- Strong partnership with universities

Our Focus

- Quality control systems
- Operator guidance systems
- Automated inspection systems
- Assembly verification
- Robot guidance

Innovation

We are continuously developing our products to provide our customers with state-of-the-art solutions.

Precision

We strive for the highest quality in everything we do. That is the only way we can offer our customers the very best.

Accessibility

We offer an accessible product lineup to make precise quality inspections accessible to as many companies as possible.

Scalability

From small businesses to global players: we deliver clear benefits that can be scaled up across the entire production process.

Customer Focus

We don't build pipe dreams—we build concrete solutions tailored to our customers' needs.

Transparency

Openness and honesty are important to us. We communicate clearly and in a way that is easy to understand.

AI First

As one of the first companies in the industrial machine vision market, we recognized the potential of AI in quality control and have been pursuing an “AI First” approach ever since.

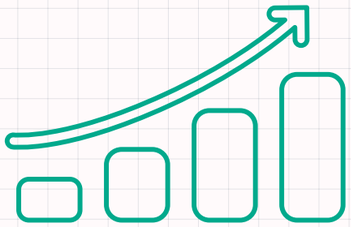
Within just a few years, artificial intelligence has sparked disruptive changes in various industries. These changes are particularly evident in optical quality control: systems are inspecting increasingly complex scenarios, making fewer errors, and becoming easier to use. And yet it is clear that its full potential is far from being realized.

Scalable

AI-based solutions can be easily expanded to other products or production lines. Systems that rely exclusively on traditional image processing are generally designed for very specific types of components. As soon as a new product is added or an existing one undergoes even a minor change, an entire process must be set in motion to adapt the inspection systems to the changed circumstances.

AI models, on the other hand, are more generalizable. Instead of, for example, recognizing only a very specific capacitor, a very specific cable, or a very specific screw, AI can recognize and distinguish an entire group of components.

Even for more specialized inspections that are not so easily generalized, artificial intelligence has the advantage. With the right software, you can build on existing data and create and implement a new, suitable AI model on your own within a few hours. Learn more about this type of software solution on page 10.



Efficient

The integration of artificial intelligence into industrial image processing not only improves the cost-effectiveness of quality control, but also opens up entirely new possibilities for automated inspection for companies.

Conventional systems quickly reach their limits when it comes to details that go beyond a simple “Is this component present?—Yes or No.” While more complex inspections are possible, they require more sophisticated—and therefore more expensive—technology and software.

AI uses existing resources much more efficiently and, with less technology and fewer staff, can perform even highly specialized and complex inspections, such as surface inspections or the identification of minute damage.

Focus on the future

Adaptive

Pseudo-defects are a major challenge that inspection systems have long struggled with. In traditional image processing, a target image is typically compared with an actual image. If the discrepancy is too great, the component is declared defective. While this may not seem problematic at first, it poses a risk.

When we see a varistor or a screw, we know exactly what it is. Even if we’re holding the same component from a different batch or under different lighting conditions, we still know what it is—we don’t even question it. But something has changed: the color is different. It’s a difference that seems marginal to us. The human brain automatically accounts for such variations.

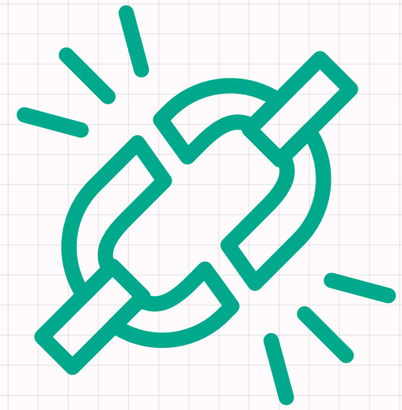
After all, we are familiar with this phenomenon; we are used to it. An inspection system, on the other hand, sees two images with completely different color and brightness values and flags the component as defective. It cannot adapt to the changed conditions because it does not understand the nature of the problem.

However, this is not the case with an AI-based system. Artificial intelligence does not merely use a reference image for comparison; rather, it has learned what a component looks like from a large number of images. It has memorized certain characteristics of the component and learned that certain deviations fall within a normal range. AI does not just recognize 0 and 1, black or white—it can differentiate and adapt.

Self-sufficient

One particularly significant aspect of AI is that it empowers people; it makes them independent. This is now evident in many fields—knowledge is being democratized, and the industrial sector is no exception.

Of course, it’s not possible—nor is it cost-effective—to do everything in-house, but a higher degree of independence in the right areas creates flexibility and control. By using and independently developing AI models, you bring expertise in-house instead of purchasing it from external service providers, thereby creating precisely this independence.



Achieve zero-defect production with our products. Quality inspection, analysis, evaluation, and long-term data traceability—all in one solution.

The software for all of our products is based on the no-code principle. Neither implementation nor use requires any programming knowledge.

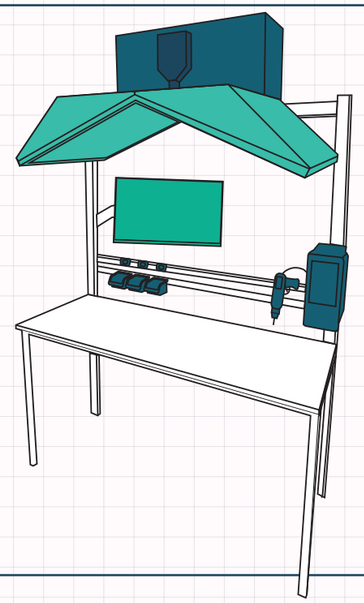
products 4quality

Individual Solutions
made to fit your production

Train your own AI models, and let's work together to build the system that's right for you!

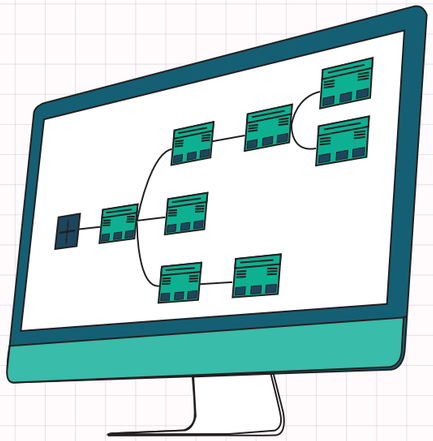
ModPCB

ModPCB is a camera-based operator guidance system. Right at the workstation, ModPCB guides workers through each step of the process while simultaneously checking each one. This allows errors to be corrected immediately and missing parts to be sorted out.



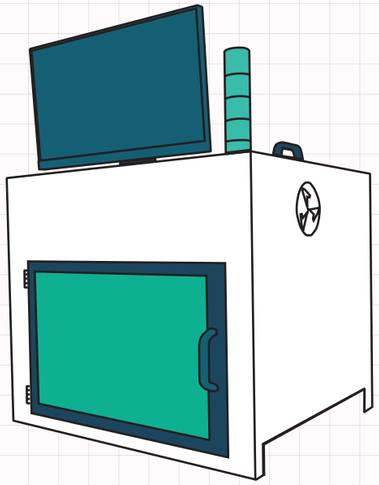
ModOFFICE

ModOFFICE is software that allows you to independently train AI models using data from your own production. These models can be used immediately in our inspection systems, where they guarantee the highest levels of precision and efficiency.



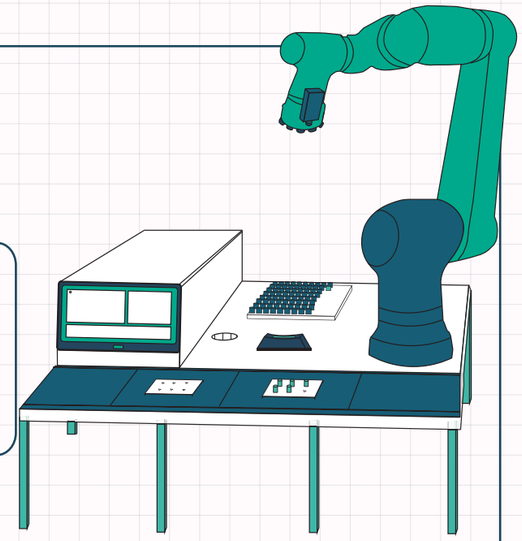
ModSPOT

As an AI-based AOI system, ModSPOT provides highly accurate and comprehensive quality control for printed circuit board manufacturing. From SMD and THT components to solder joints and conformal coating, the entire manufacturing process can be inspected for potential defects.



ModEYE

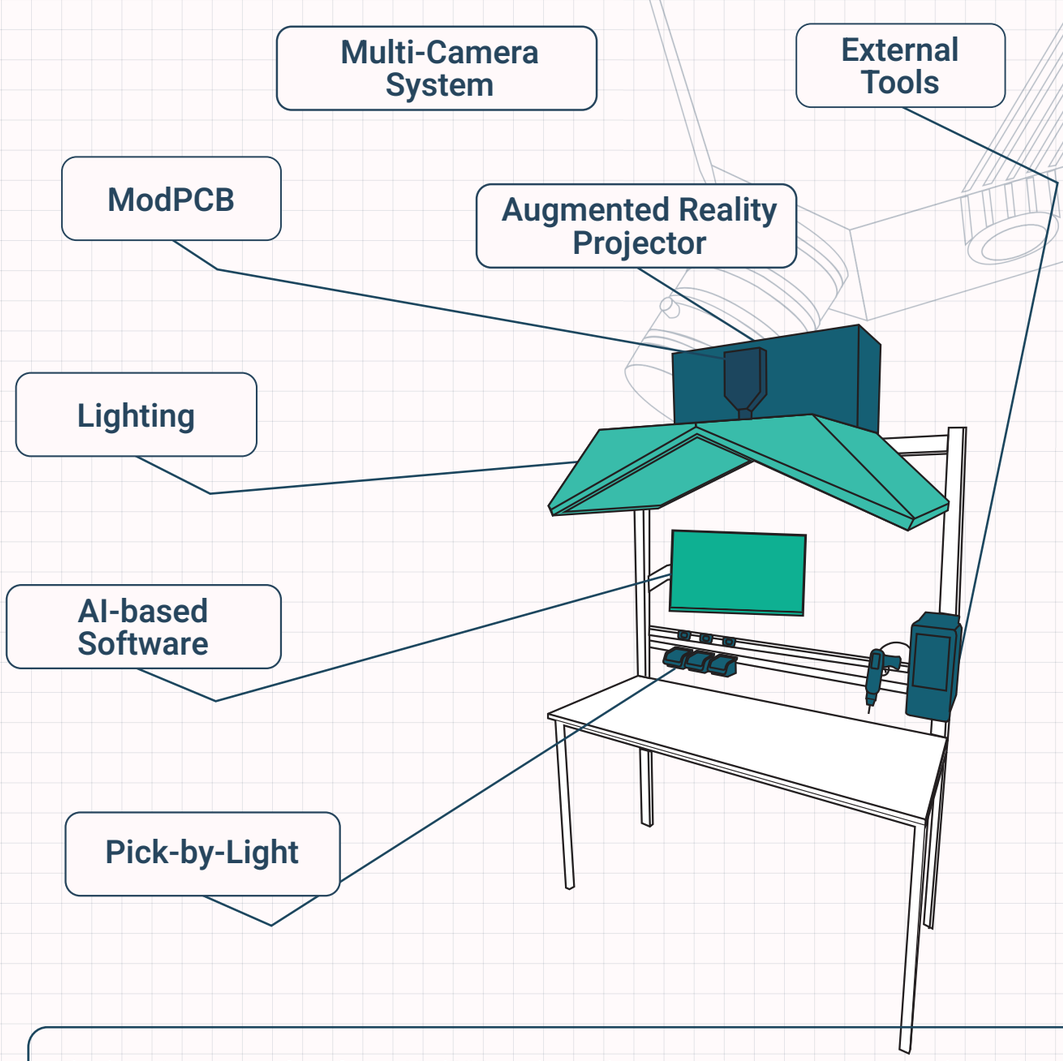
ModEYE is our project-based image processing solution. From conceptualization through implementation, we create a customized inspection system that integrates seamlessly into our customers' manufacturing processes.



ModPCB

Camera-based Operator Guidance

ModPCB provides a clear, step-by-step guide through the assembly process while simultaneously inspecting every step and every component . Up to three cameras capture every detail from different angles. Errors are immediately reported to the worker, allowing them to be corrected right where they occur. At the same time, the assembly process is guided unambiguously by structured and clear instructions, which greatly simplifies the training of new employees in particular.



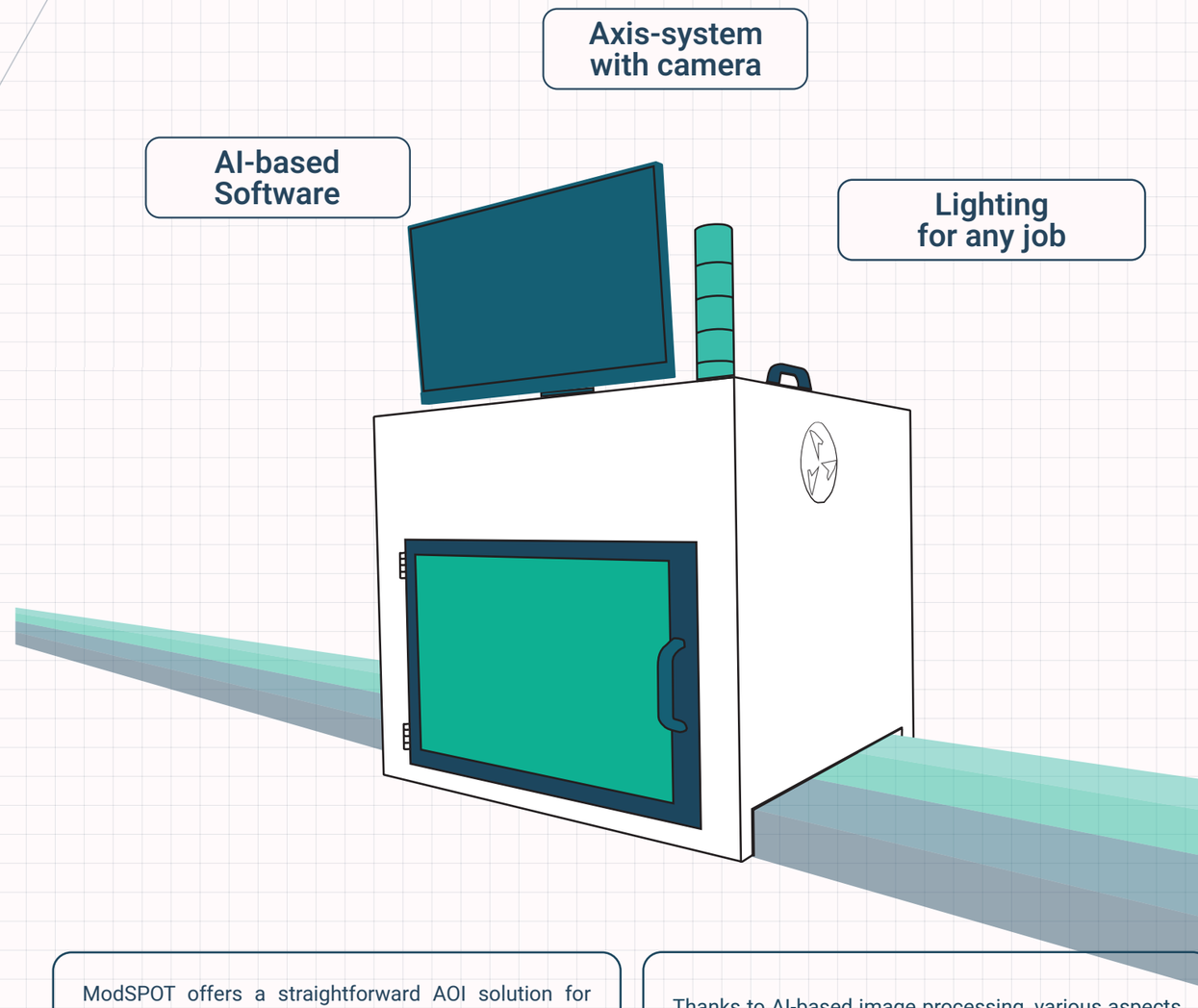
Thanks to its compact form factor, ModPCB can be easily integrated into your existing production lines and, thanks to a wide range of extensions, can be easily adapted to any manufacturing process.

The all-in-one system combines high-performance hardware—including a PC, camera, and lens—with smart, no-code inspection software that includes a database. All settings can be configured on-site, and no additional devices are required. In addition, ModPCB is compatible with a range of features that ensure seamless integration into any production workflow.

ModSPOT

KI-basierte automatische Prüfung

ModSPOT is a fully automated optical inspection system for printed circuit board manufacturing. A camera is moved across a 500x500 mm area using an axis system, providing high-resolution images for precise quality control down to the smallest detail. Configurations of the lighting and camera orientation enable, among other things, the inspection of protective coating and the underside of a circuit board.



ModSPOT offers a straightforward AOI solution for every company, from SMEs to global players. The no-code software, which allows users to create new inspection programs in no time and without expert knowledge, provides flexibility and eliminates the need for external specialists.

Thanks to AI-based image processing, various aspects of a circuit board can be inspected within a single system: from classic placement errors involving THT and SMT components to damage or other defects in solder mask, protective coating, or solder joints.

ModOFFICE
AI-Building Software

ModOFFICE is AI-building software that provides your inspection systems with AI models for optical quality control. These models can be created from production data with just a few clicks and immediately integrated into the inspection process.

Intuitive

Like our inspection systems, ModOFFICE is also based on the no-code principle. This means that no programming or specialized knowledge is required to create AI models.

Using our inspection systems, you can collect data directly—that is, take images of your components. Based on these images, you can easily create your own AI models right from your PC. The finished models can be easily exported and are immediately ready for use in the respective inspection system.

Iterative

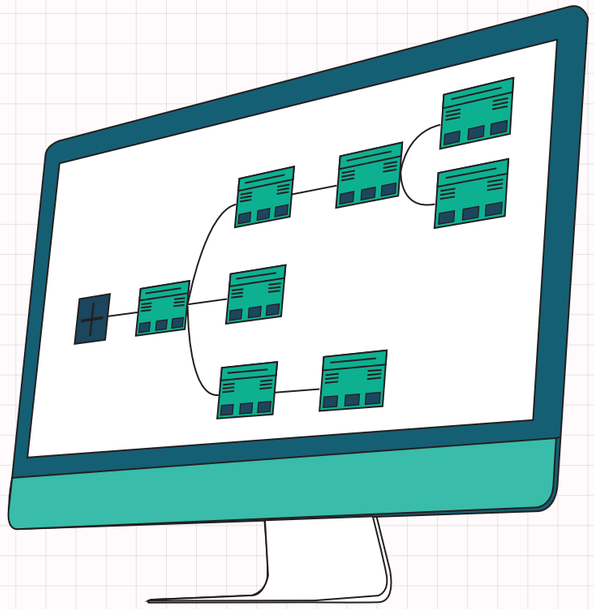
The creation and management of AI models in ModOFFICE follow an iterative process. This means that you can add additional images to an AI model's dataset at any time and use them to train a new iteration.

Very little is perfect the first time around, and that goes for most AI models as well. Right from the start, our customers build functional AI models that deliver real value. However, they also manage to continually refine these models over time and expand them to cover additional use cases.

Comprehensible

AI is known to be a black box. No one can fully understand exactly how AI learns or what it learns. Nevertheless, it is possible to extract important information from the training data that can help us train better models.

That is exactly why ModOFFICE was designed to allow for the thorough analysis and testing of pre-trained AI models. In this way, we shed some light on the process and make it easier to understand and continuously improve your own models.

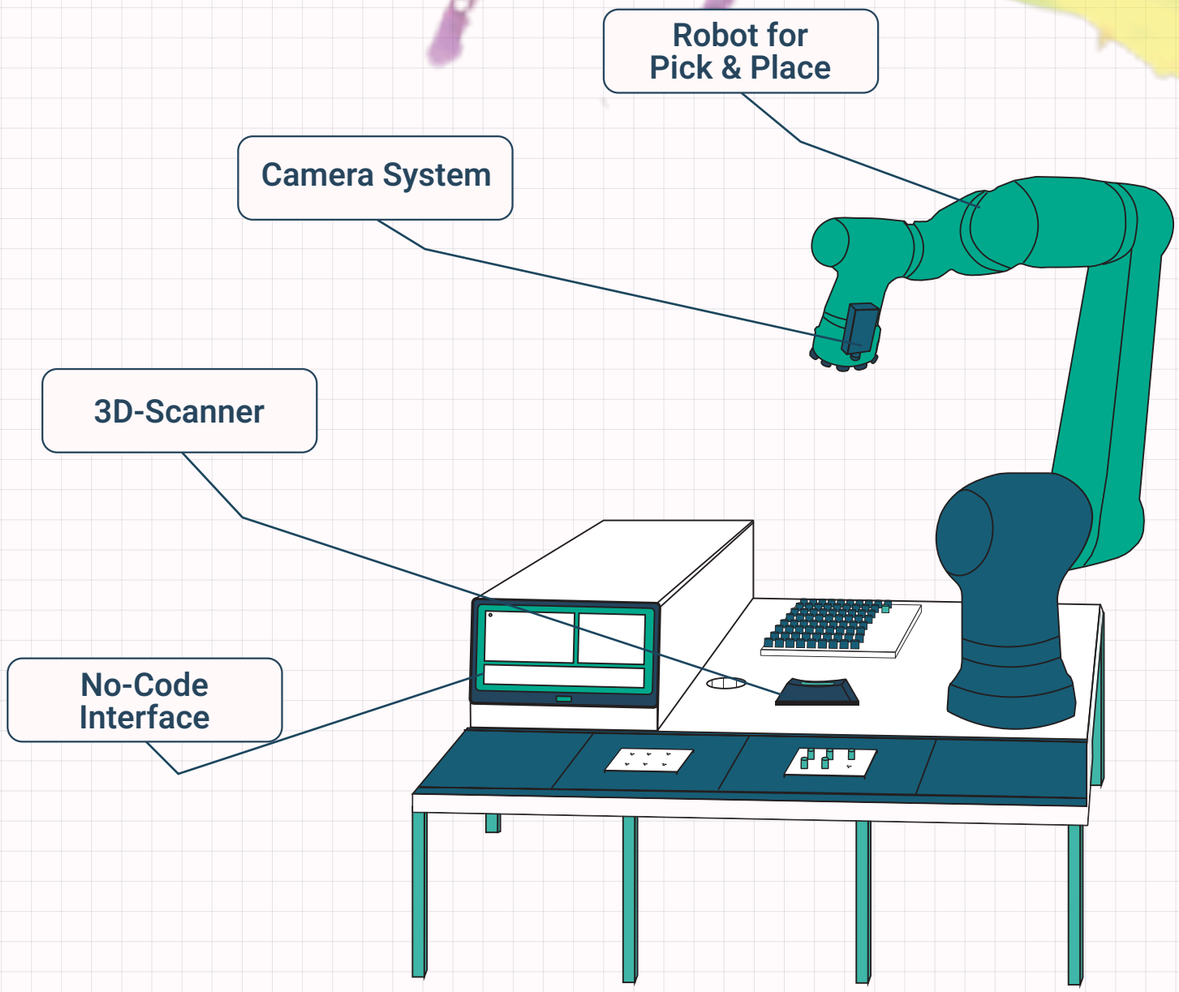


AI pays off

The use of artificial intelligence in image processing offers a wide range of significant advantages. Quality control becomes more efficient, is easier to scale, and generates fewer false positives. Our customers also particularly value the independence from external service providers that comes from being able to train AI models themselves using their own production data. Learn more about the benefits of AI on pages 4 and 5 of this brochure.

ModEYE
AI-based image processing

ModEYE is at the heart of our project-based solutions, consisting of our intuitive no-code software and various camera configurations. Its applications range from workstations for assembling large components to fully automated robots.



Some projects have such specific requirements that they call for customized solutions. For precisely these cases, we offer our ModEYE image processing system as part of a system tailored to your needs. As a solution provider, we support you throughout the entire process—from the concept phase, including an application study, all the way through to on-site implementation. Please feel free to contact us for more information and an initial consultation!

The right tools for any project

Our products offer a wide range of configuration options and additional add-ons. Customize your inspection system to suit your specific needs and preferences!

Digital Tools

Thanks to our integrative software, external devices such as screwdrivers, calipers, or barcode scanners can be easily integrated into the inspection process. This allows for the inspection of non-visual parameters as well (e.g., torque for screws).

Workplace lighting

Permanently installed lighting ensures consistent conditions and helps ensure precise inspection. Special types of lighting (e.g., UV) expand the range of possible applications.

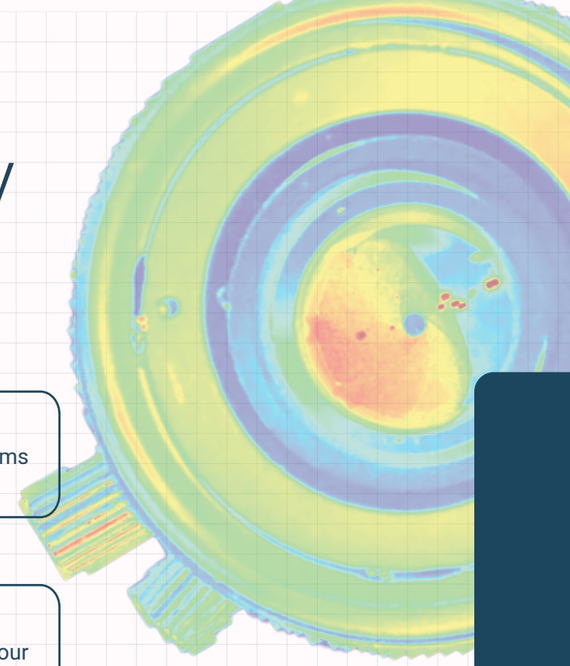
Projector + Pick-by-Light

Projecting instructional elements onto the work area and markings directly onto the components ensures even greater efficiency and precision.
The projector can also be used for pick-by-light.

Signal outputs

From signal lights to production lines:
To ensure seamless integration into your production process, all of our systems can communicate with external devices.

An eye for quality



Resolution

With resolutions of up to 20MP, our inspection systems don't miss a single detail.

Extra cameras

One camera is good; having several is better. If needed, our systems can be equipped with additional cameras to ensure that inspections are successful from every angle.

Specials

Thanks to specialized solutions, such as our thermal imaging cameras, our systems ensure quality even in situations where the human eye reaches its limits.

Performance for any pace

Every production process has its own unique workflow and pace. Inspection systems should integrate seamlessly into these workflows and not slow down production.

The various performance levels of our systems provide the necessary computing power for every requirement.

Vision4Quality GmbH

Telephone: +49 931 73048223
Mail: Sales@Vision4Quality.de
Adress: Magdalene-Schoch-Straße 5
97074 Würzburg - Germany

Court of Registration: Würzburg; RB 15543
Tax ID No.: DE3 4086 0757
Authorized Managing Directors:
Matthias Tuchscherer - Thomas Kürschner