



Automated quality control with the Sirris Vision & Edge-AI Lab

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Practical AI and exposure technology support companies in accurate and efficient quality control.

Automated quality inspection is becoming increasingly important in today's fast-paced industry. At the [Sirris Vision & Edge-AI Lab](#), developed in collaboration with the [WalHub project](#), you will discover how to use proper lighting and AI to optimise your processes, reduce costs and improve reliability.

Why automate?

Quality inspection is a crucial step in any production process, yet it remains manual and time-consuming in many companies. The reliance on skilled operators makes it vulnerable, especially in times of labour shortages. Errors creep in more easily, and the cost of incorrect deliveries or product recalls can be significant.

By automating quality control with artificial intelligence and advanced vision technology, inspections become faster and more consistent. You improve the reliability of your process while reducing

operational costs. Moreover, automation makes it easier to collect and analyse data, generating valuable insights for process optimisation.

This technology is more accessible than ever. Early adopters gain a competitive advantage, while those who wait risk falling behind.

The importance of lighting in AI-driven quality inspection

A frequently overlooked element in AI-driven quality inspection is lighting. AI models learn from images, and the quality of those images determines how well the model can perform. Poor lighting leads to noise, unclear contours and unreliable defect detection. Good lighting, by contrast, reveals every detail and ensures consistent image quality.

Capturing an object correctly requires the right combination of contrast, sharpness, resolution and lighting angle. Even the smallest anomalies must be visible at all times, regardless of their position or orientation. In many cases, specific light sources, lenses or filters are needed to achieve this.

You can compare it to an experienced operator inspecting a product from different angles under the light. What that person does with their eyes, an automated system must replicate digitally. Only then can AI match — or even outperform — human performance. That is why consistent, optimal lighting is essential.

The Sirris Vision & Edge-AI Lab

To help companies develop and test automated inspection solutions, Sirris set up a dedicated lab in collaboration with the WalHub project. The Vision & Edge-AI Lab gives you the opportunity to build realistic test setups, compare technologies and develop proofs of concept with expert guidance.

The lab infrastructure is designed to be flexible and scalable, to support different sectors and product types. It includes:

- **Lighting setups** adapted to different inspection needs:
 - **Collimated backlights:** for sharp silhouette images, ideal for edge detection
 - **Lightbox and flat dome lighting:** combine diffuse and directional lighting to minimise reflections and shadows
 - **LED bar lights:** provide targeted lighting from specific angles
- **Camera equipment:** for capturing sharp, detailed images
- **Turntable:** enables 360° rotation of objects for full visual analysis
- **Telecentric lenses:** ensure accurate measurements without image distortion
- **Filter sets:** to suppress reflections or isolate specific wavelengths
- **Overhead frame:** for stable, reproducible camera mounting
- **Lab computer:** equipped with advanced imaging software for image processing and analysis
- **AI model library:** includes tools for rapid model development, such as transfer learning
- **Edge-AI hardware:** including NVIDIA Jetson Orin Nano, Google Coral, Raspberry Pi and Arduino, to evaluate the performance of final applications

Thanks to this setup, you can quickly test ideas, collect data, train models and simulate your application's performance in realistic conditions. And you won't have to do it alone: Sirris experts guide you through the entire process, from concept to test setup, offering independent support, full transparency and knowledge transfer so you can continue independently.

What can you do in the Vision & Edge-AI Lab?

1. Inspection of ball bearings

Ball bearings have highly reflective, spherical surfaces, which cause glare and can obscure defects. Using diffuse lighting and multiple camera angles, AI can still detect scratches, dents or discolouration.

2. Inspection of metal parts with complex geometry

Metal components reflect light unpredictably. Directional lighting makes it possible to visualise small surface defects such as scratches or burrs. The right lighting makes the difference between a detected and a missed flaw.

3. Quality control of injection-moulded parts

Injection moulding often produces large volumes. Even the smallest deviations can affect hundreds of products. Automated inspection with tailored lighting and trained AI models helps to detect deviations in time and adjust process parameters.

4. Real-time AI on embedded systems

Training a model is one thing. Running it efficiently on compact hardware such as a Jetson Orin or Google Coral is another. We help you optimise model architecture and inference engines to achieve real-time performance without compromising precision.

Ready to get started?

By investing in advanced lighting and AI-powered inspection systems, you enhance your quality assurance and streamline your production. The result: fewer errors, faster throughput and lower costs.

The Sirris Vision & Edge-AI Lab is here for companies ready to innovate, with independent advice and technical support. Together, we are building future-proof quality control.

[Book an introductory meeting.](#)

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