

Unveiling ViTrox's Latest AOI Series with Cutting-edge Technologies

Automated Optical Inspection has become a crucial aspect of modern manufacturing industries, especially with the increasing complexity and size of printed circuit boards (PCBs).

Posted on August 24, 2023

Today's manufacturing business relies on automation just as much as it does on humans. However, a Smart Factory, which is a hybrid of physical and digital capabilities, demands more: real-time data, networking, and artificial intelligence (A.I.) technology at the forefront.

Although there are still debates about whether the Moore's law is already dead or alive, the market for electronic goods is still going through rapid expansions – both in demand and in development. With the increasing complexity and number of product components, there has been a corresponding escalation in the stringency of inspection requirements and the need to speed up inspection processes. Therefore, the process of transforming your production floor into a Smart Factory while implementing A.I. leaves little opportunity for error or wastage of time.

Unveiling ViTrox's Latest **AOI Series** with Cutting-edge Technologies

- ⊕ Smart & Comprehensive Measurement Technologies
- ⊕ A.I. Smart Programming and A.I. Assist Buyoff (A.I. VVTS)
- ⊕ Industry 4.0-Ready Intelligent Control Tower
- ⊕ Revolutionary 3D Imaging Reconstruction



ViTrox AOI Series



Hereby we present the V510i Advanced 3D Optical Inspection (AOI) Solution series, a cutting-edge lineup that incorporates revolutionary technologies designed to revolutionise the quality control procedures in your manufacturing workflow.

1. **Unmatched Accuracy and Precision with a Comprehensive Measurement System**

Our V510i 3D AOI solutions are equipped with Smart Measurement & Smart Math technologies, thus combining defect detection and measuring capabilities in a single solution. The Smart Measurement technology amplifies our V510i 3D AOI solutions with extensive 2D and 3D measurement capabilities to deliver accurate results with a flexible datum set-up. Its ability to generate high-quality 2D and 3D images of complex and high-density printed circuit boards (PCBs) ensures the accurate detection of defects that may go unnoticed by human operators. Additionally, the Smart Math technology allows inspections of multiple component groups collectively under the same rule – thus speeding up inspection processes while achieving top-notch quality control.

2. **State-of-the-art A.I. Technology for Automated, Easy and Quality Programming**

A.I. integration in our V510i 3D AOI solutions brings a paradigm shift in programming and defect classification. With A.I. Smart Programming, you can now automate your programming process through intelligent and autonomous algorithm assignment, covering up to 90% of surface mount technology (SMT) components. This A.I. technology, equipped with predefined parameter compliance to IPC class with ensured algorithm and program quality control, allows you to reduce your programming time and labour by up to 88% and experience a program quality improvement of up to 99%! The dependency on human intelligence and technical skills is also reduced, making the entire process more efficient.

Moreover, **A.I. Assisted Defect Review (A.I. VVTS)** further enhances the post-inspection analysis and judgement, eliminating human judgement mistakes. This automation streamlines buy-off processes in repair stations and provides consistent inspection results with an impressive ~90 % A.I. accuracy, leading to less than a 1% escapee rate. Additionally, the A.I. VVTS has an A.I. coverage of over 90% for both common and challenging defects. Hence, this A.I. solution allows users to automate buy-off in production with up to 50% yield improvement and significant operating cost reduction!

3. **AOI Intelligent Control Tower for Production Process Optimisation**

In the dynamic realm of manufacturing, where efficient production processes and quality standards are paramount, ViTrox's V-ONE AOI Intelligent Control Tower emerges as a transformative solution. This innovation addresses the need for streamlined management and optimisation of SMT lines, which is crucial in electronics manufacturing. The V-ONE Control Tower empowers manufacturers to centrally oversee and fine-tune multiple AOI machines, even across different systems, through remote control. This results in enhanced operational efficiency, as engineers can remotely fine-tune machines without disrupting production. The system's intelligent impact calculation strategy prioritises critical issues, optimising task management and monitoring. Seamless integration, unified data management, and the ability to harness the centralised power of the Control Tower further solidify ViTrox's V-ONE as the ultimate solution for elevating manufacturing processes to new heights.

4. **3D Reconstruction Enhancement with the All-New Projector Multiverse**

Nowadays, PCB designs are becoming inherently more complex – due to the increasing number of components as well as the miniaturisation of boards. The combination of tall and short components creates a number of imaging difficulties. In addition, the components' various surface characteristics—transparent, dark, or specular—also present inspection challenges. To overcome these issues, we are pleased to present the ground-breaking Projector Multiverse. This breakthrough has the potential to revolutionise 3D imaging reconstruction. In essence, the Projector Multiverse sets itself apart by providing a variety of additional fringe settings, further increasing the flexibility of the already highly

capable Digital Light Processing (DLP projectors). This cutting-edge technology combination has been carefully designed to provide you with unrivalled capabilities in inspecting complicated PCB designs.

ViTrox's Comprehensive AOI Line-Up

ViTrox has developed a wide range of V510i Advanced 3D Optical Inspection (AOI) solutions to meet each of your specific needs, ranging from **V510i SE**, **V510i Optimus 3D**, **V510i XL**, **V510i 4.0**, to **V510i XXL**. Our V510i Solutions for the SMT line can support stringent process requirements and accommodate PCB sizes spanning from 510mm x 510mm (20" x 20") to 1320.8mm x 1320.8mm (52" x 52").

Furthermore, we are honoured to announce the launch of two cutting-edge AOI solutions that are set to transform the backend semiconductor and SMT PCBA manufacturing industry. With the first solution, ViTrox's **V510i 3D AOI Solution for Advanced Packaging (Semicon AOI)**, you can now inspect highly reflective die and components, such as leadframe and system-in-package (SiP) inspection. For more microscopic inspection requirements, including wire bond and die inspection, you can opt for our **V510i 3D AOI Solution for Advanced Packaging and Microelectronics (Micro AOI)**. This solution is equipped with a wide range of wire bond inspection algorithms for various defect detection and allows high inspection quality for SiPs with narrow component pitch of up to 30µm gap.

Key Takeaways

Stay ahead of the curve in the manufacturing field with our latest AOI innovations. Enhance your competitiveness, elevate customer satisfaction and solidify your position in the market with our trusted solutions. Another great news for you is that ViTrox's AOI solutions are **IPC-CFX-2591 validated**, therefore giving you further guarantee that we are committed to optimising your manufacturing processes. You can also read on how our customers from **LEDoptix GmbH**, **Jabil Wuxi** and **Etron Technologies** benefited from our V510i 3D AOI solution.

Contact us today at **enquiry@vitrox.com** to find out how you can benefit from our AOI solutions today!

Contact Us