Koh Young Technology
Intelligent Inspection

True 3D Smart Factory Solutions, Powered by AI

ZENITH UHS USX

Ultra High-Speed

The Industry's Best-in-Class True 3D AOI for Extra-long Applications

Using patented True 3D technologies, Koh Young combines its best-in-class optomechatronics technologies with powerful vision algorithms and techniques to deliver the most optimized inspection solutions for extra-long electronics applications.

- Incomparable True 3D Inspection Performance
- Advanced Tall Component Inspection
- Reliable Selective Solder Joint Inspection Capability
- Optimized Solution for Extra-long Applications
- Self-Diagnosis for Optimal Performance Maintenance
- AI-Powered Zero-Defect Process Optimization
- True 3D Measurement-based Process Control System

ZENITH UHS USX

The Industry's **Best-in-Class True 3D** AOI Solution

Inspection Challenges for Extra-long Applications

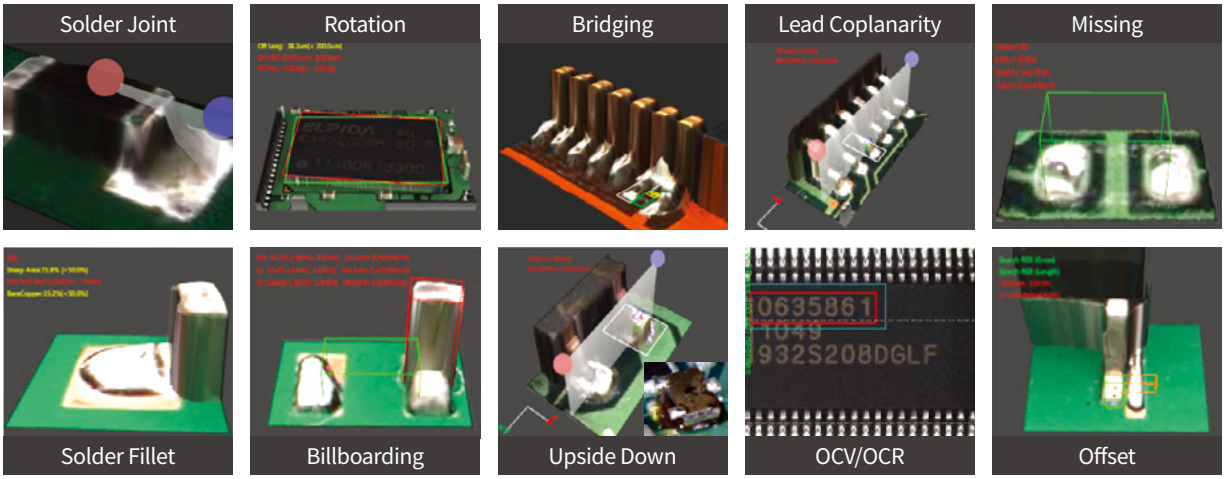
The application fields of printed circuit boards are becoming more and more extensive, especially in automotive electronics, LED panel & strip production, communications, and storage applications. Extra-long circuit board inspection proved to be a challenge due to how complex the board is and its extensive size.

This colossal machine uses patented True 3D technology to measure accurate profilometric component shapes and sizes and is equipped with powerful AI-powered algorithms to deliver a solution for the growing flexible printed circuit board (FPCB) assembly market for electric vehicles and LED lighting applications.

Incomparable True 3D Inspection Performance

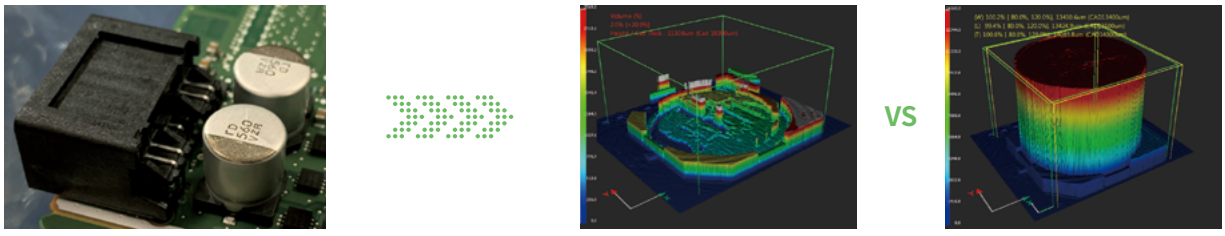
- The Zenith AOI Series is the only solution in the industry to base its inspection criteria according to IPC-610 standards for electronic assembly acceptability requirements. It provides clear and concise AOI measurements to accurately identify multiple defects. Because it uses a quantitative True 3D measurement-based approach, the system delivers exceptional accuracy and repeatability.

- **True 3D Inspection Performance :** Missing Solder, Offset, Polarity, Upside Down, OCV/OCR, Solder Fillet, Billboarding, Lifted Lead, Lifted Body, Tombstone, Bridging, and more.



Advanced Tall Component Inspection

- Due to the shadows cast upon shorter components near a tall part, measuring the board with tall components has been a challenge for AOIs for a long time. As an optional feature (9-Way Projection), the Zenith UHS handles components up to 25mm tall. The Zenith UHS overcomes component shadow challenges by incorporating multi-projection Moiré interferometry system.



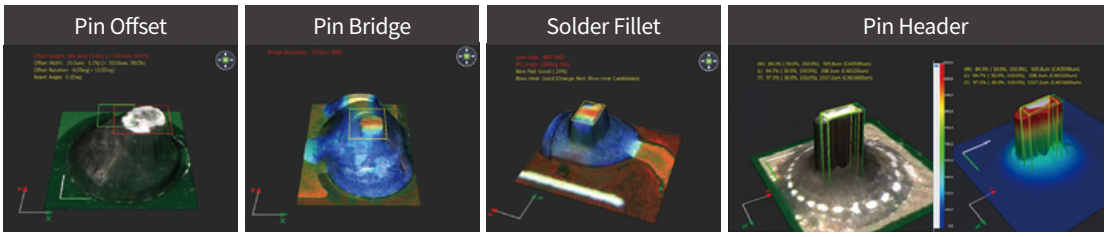
Tall Component Inspection

Standard AOI

ZENITH UHS

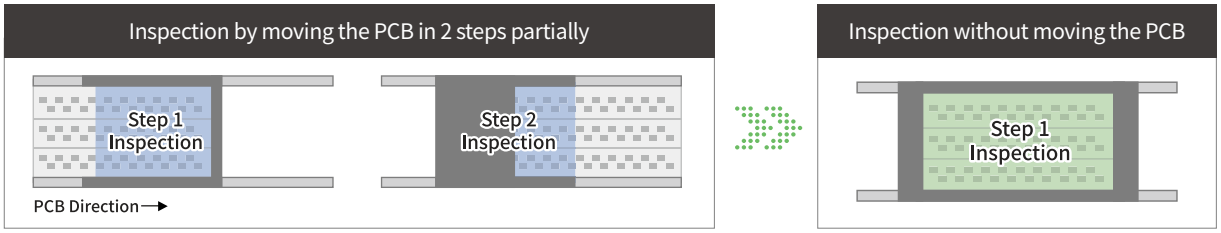
Reliable Selective Solder Joint Inspection Capability

- Combining innovative vision algorithms and advanced optic technology, Koh Young overcomes the challenges of selective solder joint inspection with the highest reliability level.



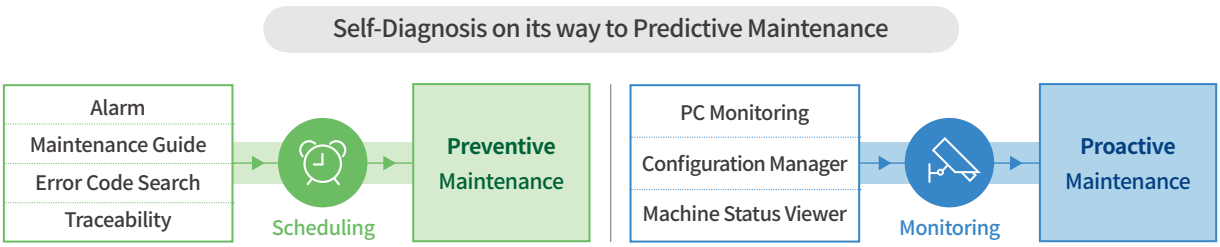
Optimized Solution for Extra-long Applications

- Evolving applications like LED lighting, electronic vehicles (EVs), communications, and even storage can challenge manufacturers, especially in terms of board length. The new USX series allows manufacturers to efficiently inspect boards up to 1,300mm long in a single pass and can be optionally configured to handle boards up to 1,800mm long.

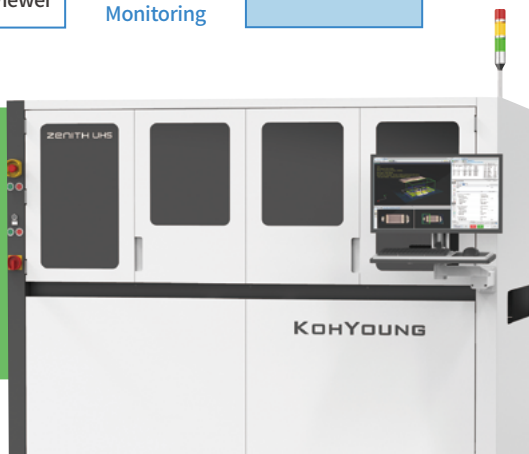


Self-Diagnosis for Optimal Performance Maintenance

- Unscheduled downtime can cripple production. Self-Diagnosis allows operators to take precautionary measures through predictive maintenance in order to reduce process interruptions, enhance uptime, and ensure optimal machine performance.
- The Self-Diagnosis feature comes with distinct modules which offers periodical machine checkups on critical items such as 3D/2D light intensity, PZT feed, height accuracy, and XY offset.



"Thanks to Koh Young's measurement data, operators no longer have to worry about defects. We want our operators to trust the equipment and let the machine do all the work. Especially, the new AOI USX inspects our entire 1,250mm board at once. Koh Young helped improve our overall production speed by an incredible amount and brought us to a point where we can completely trust their inspection machine." - EV Battery Manufacturer



Zero-Defect Process Optimization, powered by AI

- Creating a closed-loop, connected electronics manufacturing floor for defect-free production by applying an ever-evolving AI-powered suite of interconnected software modules.

Real-time Koh Young Process Optimizer (KPO) Mounter

Based on Koh Young's accurate True 3D measurement data and its proprietary deep learning technology, KPO Mounter enables real-time mounting process optimization. With seamless communication between the mounter and a pre-reflow AOI, the software analyzes defects, provides real-time feedback, identifies the root causes, and provides actionable information - all based on Koh Young's proprietary AI engine.

Koh Young Offline Program Optimizer (OPO)

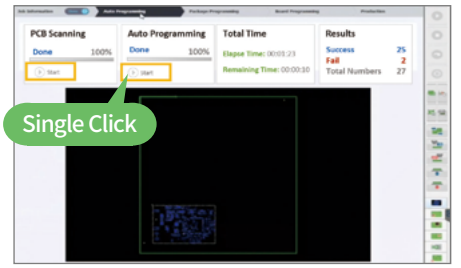
Cyber-physical system to optimize programs in a simulated environment using the identical machineand actual historical 3D images and measurement data.

The Gateway to a Smart Factory

- Maximizing production efficiency by combining industry standards with AI engines to go beyond simple machine connectivity and open the gates to a smart factory to everyone.

AI-powered Auto-Programming (KAP)

Industry-leading 3D profilometry technology converges with Koh Young's proprietary AI technology to deliver true automatic programming. The innovative geometry-based Koh Young Auto Programming (KAP) software solution reduces the programming process to minimize production preparation and reduces costs.

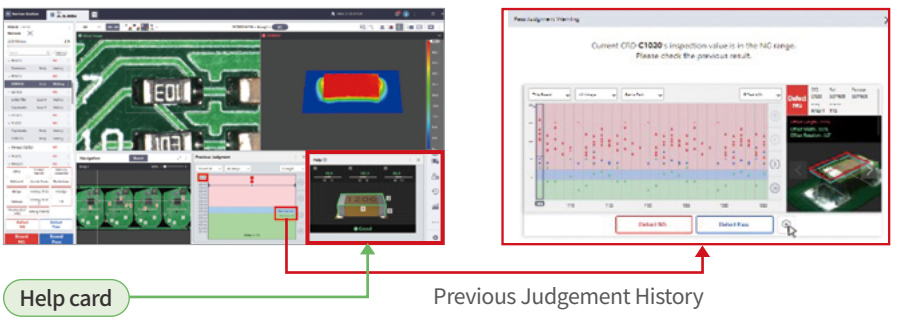


One Click Needed To Start KAP

Programming Time Saved by 70%

Autonomous Judgement and Classification (Smart Review)

Maximize production performance by reviewing defects from multiple lines and offering judgement history and help cards with auto-classified defect information.



Explain the defect and what OP should check.

KSMART Solutions: True 3D Measurement-based Process Control System

KSMART Solutions use Artificial Intelligence to help automate process control while focusing on data management, analysis, and optimization. It collects data from across the factory line for defect detection, real-time optimization, enhanced decisions, and traceability to improve metrics, increase quality, and lower costs by eliminating variance, false calls, and escapes.

- Converts data into knowledge for effective and quality-driven actions
- Delivers an AI-powered process analysis and optimization tool
- Achieves an autonomous process optimization facility

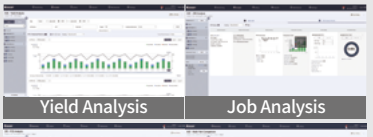
KSMART Solutions Process Flow

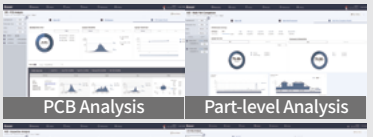
01 Line Problem Detection

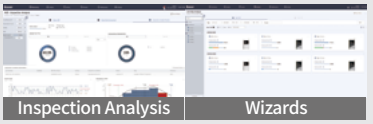

Monitoring & Analysis


Notifications

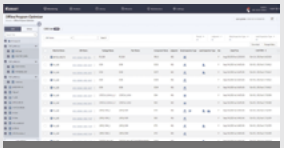
02 Using Data for Problem Analysis


Yield Analysis | Job Analysis

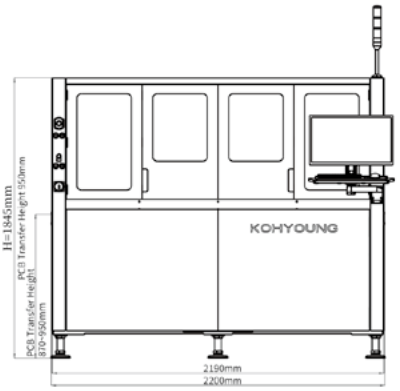

PCB Analysis | Part-level Analysis

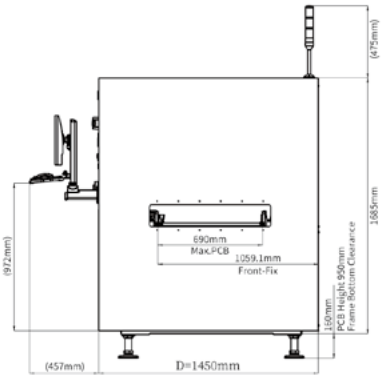

Inspection Analysis | Wizards

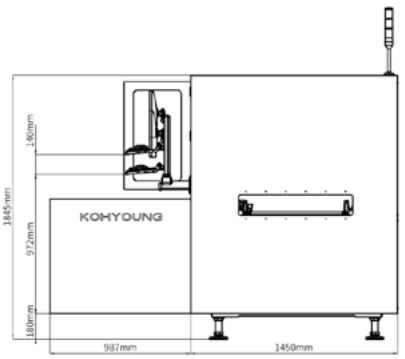
03 Using Data to Solve Problems


Offline Program Optimizer


Library







"Koh Young's Zenith UHS is different. With its best algorithms and capabilities, it inspects our board in the blink of an eye. It's truly the fastest AOI ever." - OEM Lead Process Engineer

Must-Check Requirements of a 3D AOI System

Requirements	Solutions
Solution to shadow problem	3D shadow free moiré technology & 8-way projection
Specular problem	
Shadowed area between tall components	
Small (01005 in) component inspection	Multi-frequency moiré technology
Wide measurement range	
Real-time PCB warp compensation	Active warp compensation (Pad-referencing + multi-frequency moiré technology)
Dark component & white body component location	True 3D measurement
Component body, lead coplanarity inspection	
Solder joint profile inspection	
3D polarity inspection	
Component crack inspection	

Inspection Task	Missing, offset, rotation, 3D polarity, upside down, OCV/OCR, coplanarity, solder fillet, lifted lead, billboarding, tombstone, bridging, dimension error

Inspection Performance	Camera	Pixel Resolution	Full Speed Inspection Speed	Max. Measurement Height	Height Accuracy	Illumination
	12 Mpix	15 µm	Up to 46.0 cm²/sec	10 mm	±3% (on Koh Young Calibration Target)	IR-RGB LED Dome-Styled Illumination
	12 Mpix	10 µm	Up to 23.0 cm²/sec	5 mm		
	9 Mpix	20 µm	Up to 66.4 cm²/sec	10 mm		
	8 Mpix	20 µm	Up to 56.0 cm²/sec	10 mm		
	8 Mpix	15 µm	Up to 31.1 cm²/sec	10 mm		
	8 Mpix	10 µm	Up to 15.0 cm²/sec	5 mm		
	8 Mpix	7 µm	Up to 8.0 cm²/sec	2 mm		

PCB Handling						
	Conveyor Width Adjustment		Automatic	Max. PCB Weight		15 kgs
	Conveyor Fix Type		Front / Rear fixed (Factory setting)	Edge Clearance	Top	6.0 mm
	PCB Size	Max.	1,300 x 690 mm		Bottom	6.5 mm
		Min.	150 x 150 mm	Clearance	Top	50 mm
	PCB Thickness		0.6 ~ 8 mm		Bottom	50 mm

Software		
	Supported Input Format	GERBER Data (274X, 274D), ODB++, Placement File, Mounter JOB file, Allegro, Zuken, Mentor (Optional)
	Programming Software	ePM-AOI, AOI GUI
	Statistical Process Control Tool	AOI SPC, Review station
	User-Friendly Features	Library Manager, KYCAL (Auto Camera Calibration, Auto Illumination Calibration, Auto Height Calibration)
	Operating System	WINDOWS 10 IoT ENTERPRISE LTSC 2019

Add-on Solutions

- 1D & 2D Handy Barcode Reader
- 1D & 2D Inline Barcode Reader
- Auto-Verification
- Integrated Calibration Target
- Long Board Option
- 25mm Height Inspection0 (9-Way Projection)
- Offline Programming Station
- Review Station
- Offline AOI SPC Software
- Panasonic iLNB Interface
- IPC-CFX Interface
- KSMART Solutions
  (Monitoring & Analysis, Remote Access, Offline Optimizer, Link Data Analysis, Notification)
- KPO Mounter (Advisor, Feedback)
- Fuji Nexim Interface
- ASYS OIC

Installation Requirements		
	Machine Weight	1,300 kgs
	Machine Size (W x D x H)	2,200 x 1,450 x 1,845 mm (based on the PCB transfer height of 950 mm)
	Supplies	**(Electrical Supply)** 200~240 VAC, Single Phase, 50/60Hz **(Compressed Air)** 5 Kgf/cm² (0.45 MPa)

* The above specifications are subject to change without prior notice.

KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

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