KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

True 3D Smart Factory Solutions,
Powered by AI

# ZENITH UHS
Ultra High-Speed

## The Industry's Fastest True 3D AOI Solution

The Zenith UHS, industry's most popular 3D AOI Solution, measures true profilometric component shapes, foreign materials, patterns, and solder joints without compromising speed and overcoming inspection challenges with True 3D capabilities.

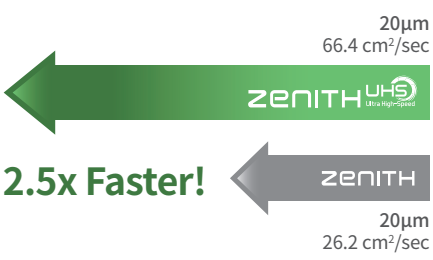
- Ultra High-Speed Inspection
- Incomparable True 3D Inspection Performance
- Advanced Tall Component Inspection
- Reliable Selective Solder Joint Inspection Capability
- Innovative Technologies for Varied Production Challenges
- Self-Diagnosis for Optimal Performance Maintenance
- AI-Powered Zero-Defect Process Optimization
- True 3D Measurement-based Smart Factory Solutions

ZENITH UHS Ultra High-Speed

The Industry's **Fastest** **True 3D AOI** Solution

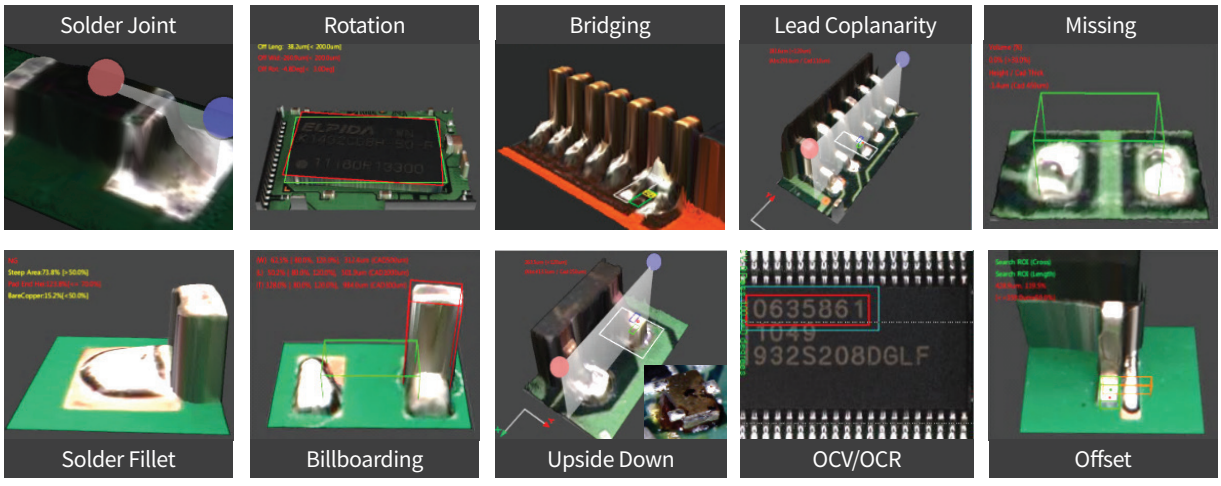
## Ultra High-Speed Inspection

- Faster than ever, the Zenith UHS measures components at high volume production rates for a wide range of defects without compromising inspection accuracy and repeatability.



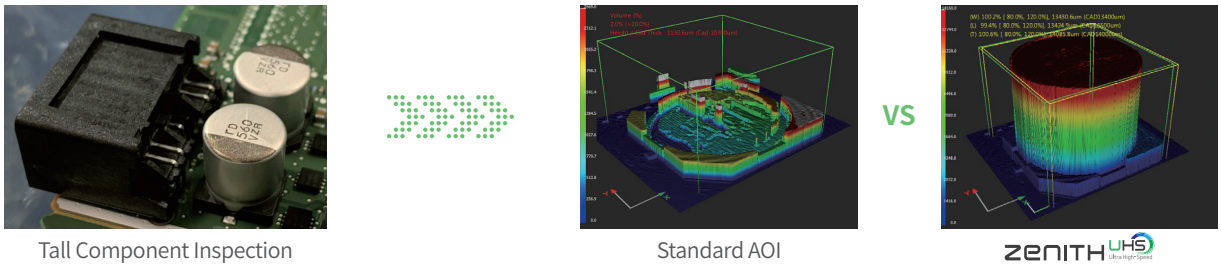

## Incomparable True 3D Inspection Performance

- 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, measurement capabilities on board with tall components has traditionally been a challenge for AOIs. 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.



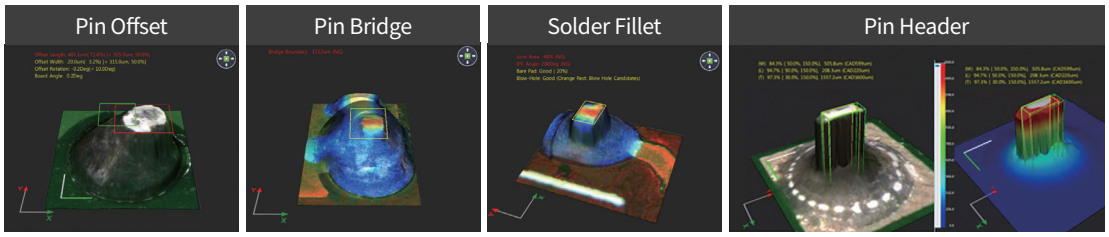

Tall Component Inspection

Standard AOI

ZENITH UHS

## Reliable Selective Solder Joint Inspection Capability

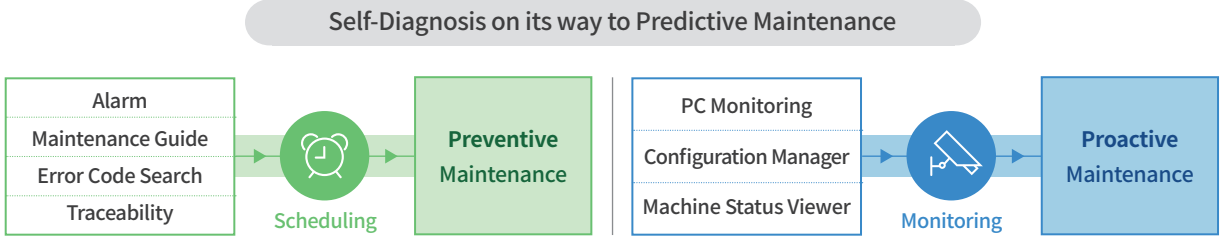
- Combining innovative vision algorithms and advanced optic technology, Koh Young overcomes the challenges of selective solder joint inspection with the highest reliability level.




## Self-Diagnosis for Optimal Performance Maintenance

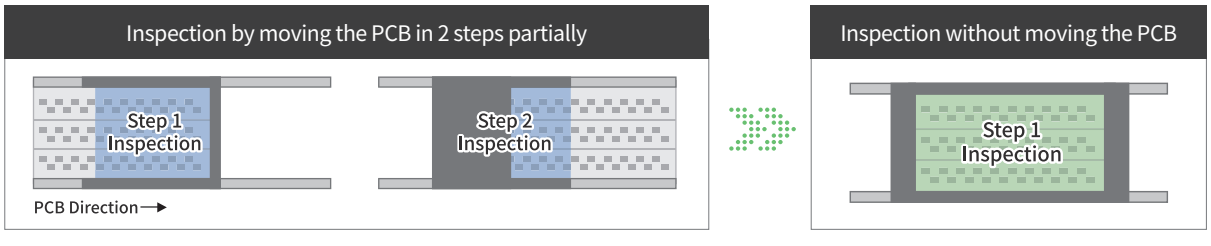
- Unscheduled downtime can cripple production. Self-Diagnosis allows operators to take precautionary measures through predictive maintenance in order to reduce process interruptions, enhance uptime, and ensure optimal machine performance.

- 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.

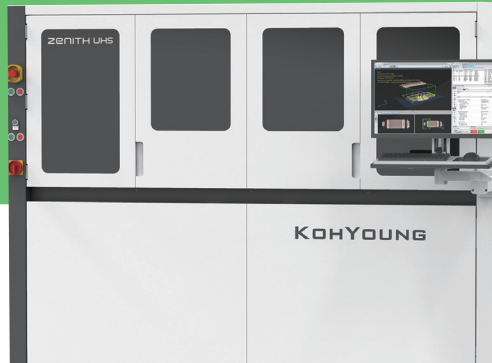



## Innovative Technologies for Varied Production

- 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




"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)

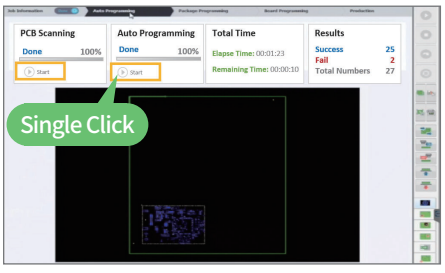
Cyber-physical system to optimize programs in a simulated environment using the identical machine and actual historical 3D images and measurement data.

## The Gateway to a Smart Factory

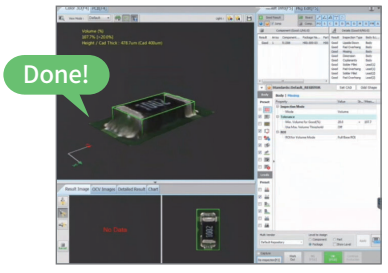
- Maximizing production efficiency by combining industry standards with AI engines to go beyond simple machine connectivity and open the gates to a smart factory to everyone.

### 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.



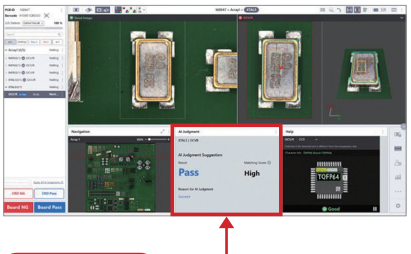

One click needed to start KAP




Programming time saved by 70%

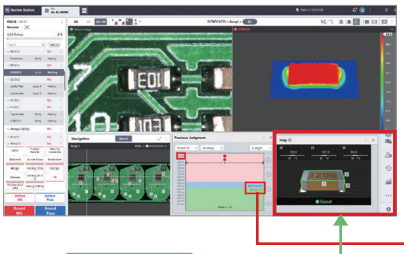
### Smart Review: Autonomous Judgement and Classification

Combining proprietary vision algorithms with a learning-based AI engine from Koh Young, the Smart Review system reduces false calls and operator intervention by automatically assessing OCV and OCR readings. By minimizing false calls, the Smart Review system increases line operator efficiency and boost production line utilization to reduce overall costs. The system also maximizes production performance by reviewing defects from multiple lines, offering judgment history and the help cards with auto-classified defect information.



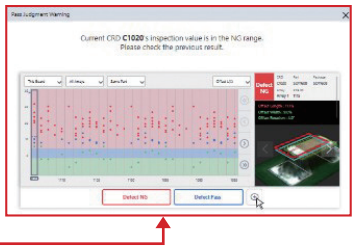

AI Judgment

Provide a smart judgement guide based on AI



Help Card

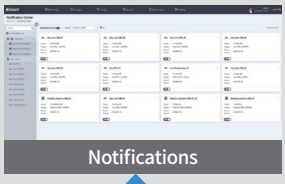
Explain the defect and what OP should check



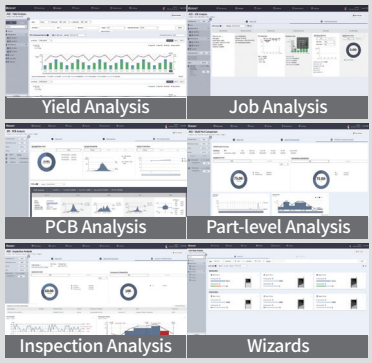
Previous judgement history

## KSMART Solutions Process Flow

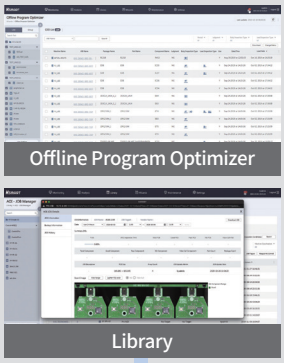
**01 Detecting Line Problems**

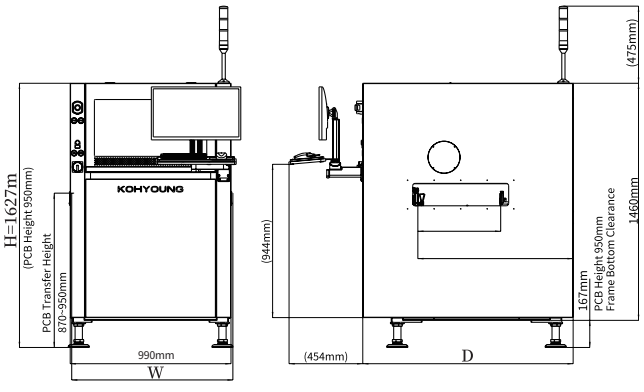




**02 Using Data for Problem Analysis**

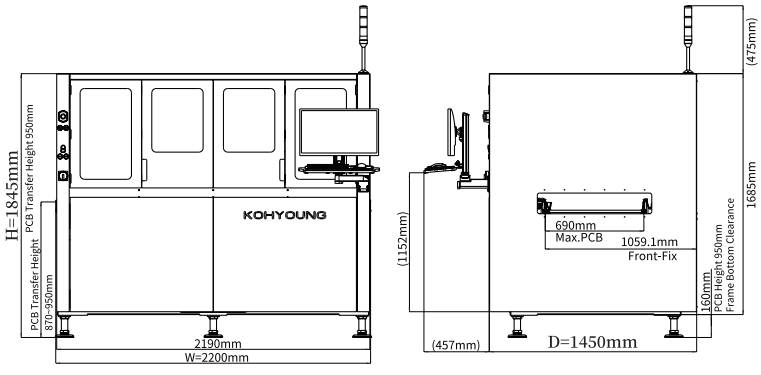



**03 Using Data to Solve Problems**




[Zenith UHS (L-size)]




[Zenith UHS (USX-size)]

"The KSMART monitoring and analytics allow us to do more than watch and report. The data provided allows us to identify any weaknesses and focus on improvements, whether product, process, or system related. The Koh Young KSMART software is fantastic. It's intuitive and allows me to run reports from my desk or remotely. It also allows us to create the dashboards each stakeholder needs to succeed."

– Chief Operations Officer from a Tier 3 EMS company

# 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<br>(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**

| Model | Camera | Pixel Resolution | Full Speed Inspection Speed | Max. Measurement Height | Height Accuracy | Illumination |
|---|---|---|---|---|---|---|
| UHS | 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 | 20 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 | | |
| UHS+ | 12 Mpix | 15 µm | Up to 46.0 cm²/sec | 20 mm | | |
| | 12 Mpix | 10 µm | Up to 23.0 cm²/sec | 20 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
- Built-in Flipper
- 25 mm Height Inspection (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

**PCB Handling & Installation Requirements**

| | | M | | L | | XL | | USX 1.0 | USX 2.0 |
|---|---|---|---|---|---|---|---|---|---|
| Conveyor | Width Adjustment | Automatic | | | | | | | |
| | Fix type | Front / Rear Rixed (Factory Setting) | | | | | | | |
| PCB Size | | Single Lane | Dual Lane | Single Lane | Dual Lane | Single Lane | Dual Lane | Single Lane | Single Lane |
| Max.PCB Size | | 310 x 320 mm (12.2 x 12.6 in) | Single Mode: 310 x 580 mm (12.2 x 22.8 in)<br>Dual Mode: 310 x 320 mm (12.2 x 12.6 in) | 490 x 510 mm (19.2 x 20.1 mm) | Single Mode: 490 x 580 mm (19.2 x 22.8 in)<br>Dual Mode: 490 x 320 mm (19.2 x 12.6 in) | 690 x 690 mm (27.2 x 27.2 in) | Single Mode: 690 x 580 mm (27.2 x 22.8 in)<br>Dual Mode: 690 x 320 mm (27.2 x 12.6 in) | 1,300 x 690 mm (51.2 x 27.2 in) | 1,500 x 690 mm (59.05 x 27.17 in) |
| Min. PCB Size | | 50 x 50 mm | | | | | | 150 x 150 mm | |
| PCB Thickness | | 0.4 ~ 5 mm | | | | 0.4 ~ 8 mm | | 0.6 ~ 8 mm | 5 ~ 300 mm |
| Max. PCB Weight | | 4 kgs | | | | 10 kgs | | 15 kgs | 30 kgs |
| Edge Clearance | | [ Top / Bottom ] 2.5 mm / 3.5 mm | | | | | | 6.0 mm / 6.5 mm | N/A / 15.5 mm |
| Clearance | | [ Top / Bottom ] 50 mm / 50 mm (2.0 in / 2.0 in) | | | | | | | |
| Supplies | | [ Electrical Supply ] 200~240 VAC, Single Phase, 50/60Hz [ Compressed Air ] 5 Kgf/cm² (0.45 MPa) | | | | | | | |
| Machine Weight | | 550 kgs | 600 kgs | 600 kgs | 700 kgs | 750 kgs | 750 kgs | 1,300 kgs | 1,600 kgs |
| Machine Width | | 820 mm | | 1,000 mm | | 1,200 mm | | 2,200 mm | 2,500 mm |
| Machine Depth | | 1,295 mm | 1,475 mm | 1,295 mm | 1,475 mm | 1,475 mm | 1,475 mm | 1,450 mm | 1,726 mm |
| Machine Height | | 1,627 mm | | | | | | 1,845 mm | 2,076 mm |

* The above specifications are subject to change without prior notice. Please contact us for more information about the PCB sizes per type.


KOH YOUNG TECHNOLOGY
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