

ZENITH ALPHA

The Best Value 3D Automated Optical Inspection Solution

The Zenith Alpha is a True 3D AOI Solution powered by artificial intelligence and machine learning, combining the best mechatronics and algorithm technologies to deliver outstanding performance without sacrificing accuracy.



Enhanced 3D Measurement
Using Proprietary AI Technology



High Accuracy and Speed for
Demanding Production Line



Advanced Tall Component
Inspection



Whole-board Foreign Material
Inspection (WFMI)



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



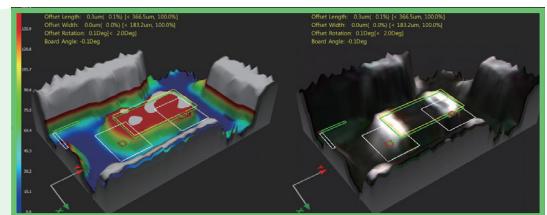


Enhanced 3D Measurement Using Proprietary AI Technology

- The Smart & Dynamic True 3D measurement inspection technology on the Zenith Alpha incorporates AI to deliver the accuracy needed for ultra-fine pitch and solder joint interreflection challenges.



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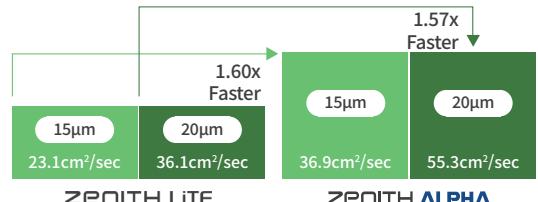


Ultra-Fine Pitch (Narrow Gap) Inspection



High Accuracy and Speed for Demanding Production Line

- Without sacrificing accuracy and speed, the Zenith Alpha combines mechatronics technology with cutting-edge measurement capabilities to yield high throughput suitable for demanding production lines.



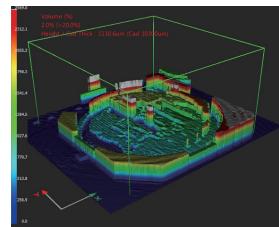
Advanced Tall Component Inspection

- Tall components on a board has traditionally been a challenge for AOIs. Yet the Zenith Alpha easily handles tall components up to 25mm through Koh Young's combined multi-projection Moiré interferometry system and incomparable AI technologies. The Zenith Alpha overcomes component shadow challenges.

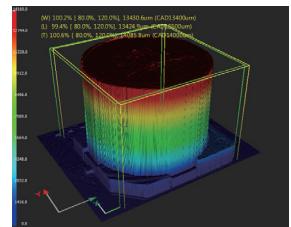


Tall Component Inspection

3D3D3D



Standard AOI

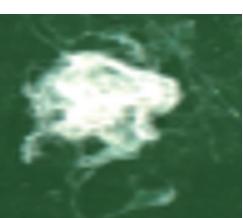
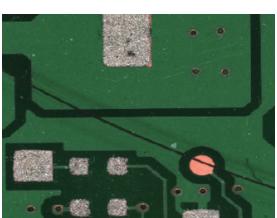


ZENITH ALPHA



Whole-board Foreign Material Inspection (WFMI)

- Inspection is not limited to components and solder joints. The Zenith Alpha combines 2D and 3D technologies to identify Foreign Object Debris (FOD) across the board. The WFMI technology provides solutions for misplaced chips, solder balls, burr, and other foreign materials that may lead to costly field failures.

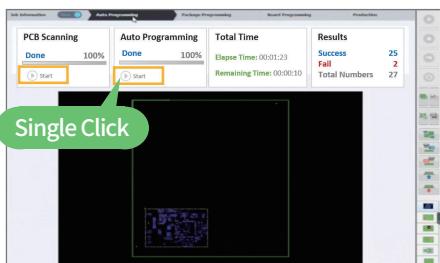


Identifies Foreign Object Debris Across Entire Board



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 minimizes time to production and reduces costs.



One Click Needed To Start KAP



Programming Time Saved by 70%

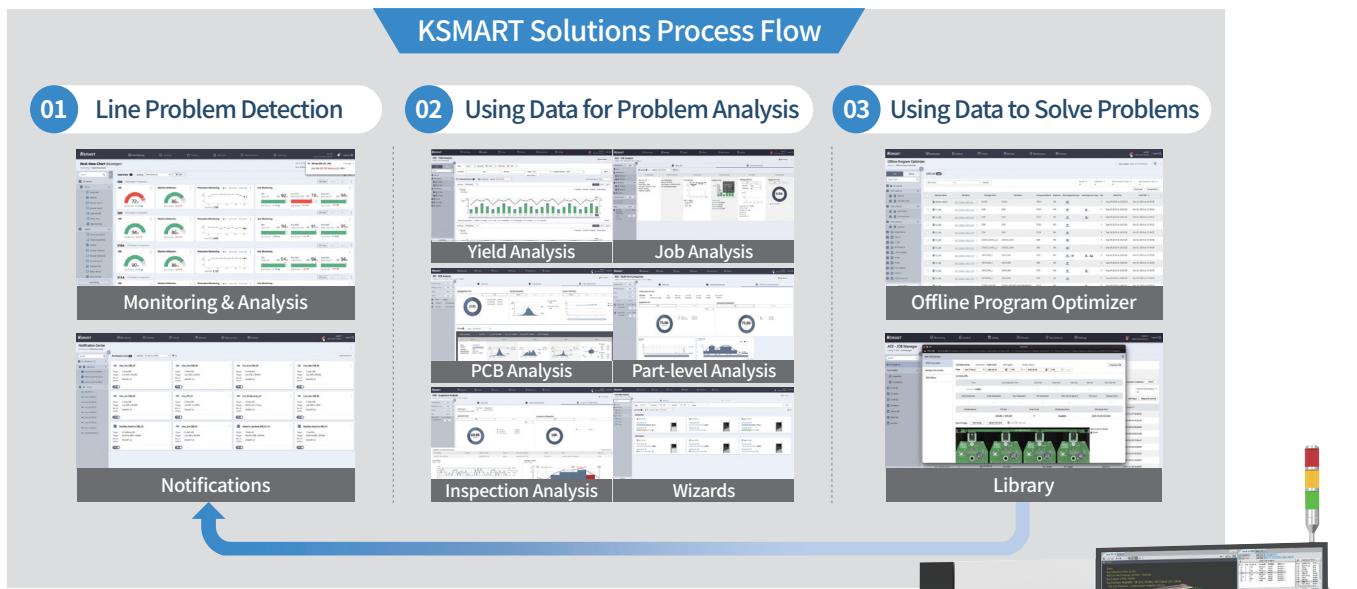


KSMART Solutions: True 3D Measurement-based Process Control System

- Koh Young pioneered True 3D measurement technology 20 years ago to create a zero-defect future. This gave rise to KSMART Solutions and its continuous efforts to leverage data and connectivity.
- KSMART Solutions uses 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.

“KSMART Solutions is the Gateway to a Smart Factory”

- 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



“We didn't think we would be able to satisfy both ends, however the Zenith Alpha proved otherwise. It is truly a best value AOI machine as it is equipped with Koh Young's best algorithms and capabilities without it being unreasonable.”

- Global Industrial Manufacturer

Must-check Requirements of a 3D AOI System

| Requirements | | | | | Solutions | | | | | | |
|---|--|---------------------|---|--|---|---|---------------------------------------|--|--|--|--|
| Shadow Problem Solution | | | | | 3D Shadow Free Moiré Technology & 4-Way Projection (Zenith Alpha HS & Zenith Alpha UHS) / 5-Way Projection (Zenith Alpha HS+ & Zenith Alpha UHS+) | | | | | | |
| Specular Problem Solution | | | | | Multi-Frequency Moiré Technology | | | | | | |
| Shadowed Area between Tall Components | | | | | Warp Compensation (Pad Referencing + Multi-Frequency Moiré Technology) | | | | | | |
| Small (01005 in) Component Inspection | | | | | Real Time PCB Warp Compensation | | | | | | |
| Wide Measurement Range + Accuracy (Measurement Range Problem) | | | | | Dark Component & White Body Component Location | | | | | | |
| Component Body, Lead Coplanarity Inspection | | | | | Component Body, Lead Coplanarity Inspection | | | | | | |
| Solder Joint Profile Inspection | | | | | 3D Polarity Inspection | | | | | | |
| 3D Polarity Inspection | | | | | Component Crack Inspection | | | | | | |
| Inspection Items | Inspection Task | | Missing, Dimension, Offset, Rotation, Polarity, Upside down, OCV/OCR, Coplanarity, Solder fillet, Lifted lead, Lifted body, Tombstone, Bridging | | | | | | | | |
| Zenith Alpha Inspection Performance | Model | Camera / Resolution | FOV Size | Full 3D Inspection Speed | Max. Measurement Height | Height Accuracy (KY Calibration Target) | Illumination | | | | |
| Zenith Alpha Inspection Performance | HS | 6.5M 20µm | 51 x 51 mm | 55.3 cm ² /sec (0.47 sec/FOV) | 3 mm | ±3% | IR-RGB LED (Dome Styled Illumination) | | | | |
| | | 8M 10µm | 28 x 28 mm | 17.8 cm ² /sec (0.44 sec/FOV) | 4 mm | | | | | | |
| | | 8M 15µm | 42 x 43 mm | 36.9 cm ² /sec (0.49 sec/FOV) | 4 mm | | | | | | |
| | HS+ | 6.5M 20µm | 51 x 51 mm | 49.1 cm ² /sec (0.53 sec/FOV) | 20 mm | | | | | | |
| | UHS | 8M 15µm | 42 x 43 mm | 32.1 cm ² /sec (0.55 sec/FOV) | 25 mm | | | | | | |
| | | 12M 10µm | 41 x 31 mm | 28.2 cm ² /sec (0.45 sec/FOV) | 4 mm | | | | | | |
| | UHS+ | 12M 15µm | 61 x 46 mm | 57.3 cm ² /sec (0.49 sec/FOV) | | | | | | | |
| | UHS+ | 12M 10µm | 41 x 31 mm | 28.2 cm ² /sec (0.45 sec/FOV) | | | | | | | |
| | UHS+ | 12M 15µm | 61 x 46 mm | 57.3 cm ² /sec (0.49 sec/FOV) | 25 mm | | | | | | |
| PCB Handling | Conveyor Width Adjustment | | Automatic | | | | | | | | |
| | Conveyor Fix Type | | Front / Rear Fixed (Factory setting) | | | | | | | | |
| | (Optional Built-In Flipper) Machine Size | | PCB Size (X*Y) | PCB Thickness | Clearance (Top / Bottom) | | PCB Weight | | | | |
| | 1000 x 1600 x 1627 mm (39.4 x 63.0 x 64.1 in) | | Max: 500 x 500 mm (19.7 x 19.7 in) Min: 100 x 100 mm (3.9 x 3.9 in) | 1.0 ~ 5 mm (0.04 ~ 0.2 in) | Clearance: 40 mm / 50 mm (1.6 x 2.0 in) Edge Clearance: 3 mm / 3 mm (0.1 x 0.1 in) | | Max: 2 kg (4.4 lbs) | | | | |
| Software | Supported Input Format | | GERBER Data (274X, 274D), ODB++, Mounter JOB file, Allegro, Zuchen, Mentor (Optional) | | | | | | | | |
| | Programming S/W | | ePM-AOI, AOI GUI | | | | | | | | |
| | Statistical Process Control Tool | | SPC Plus, Review Station | | | | | | | | |
| | Operator User-friendliness | | Library, 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 - Integrated Calibration Target | | - Offline SPC Pro Station - Review Station - Whole Board Foreign Material Inspection (WFMI) | | - KSMART Solutions (Monitoring & Analysis, Remote Access, Offline Programming Optimizer, Link Data Analysis, Notification) | | | | | | |

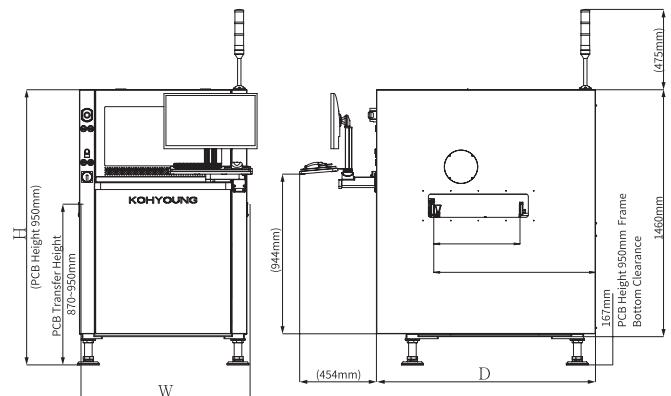
(The above specifications are subject to change without notice.)

| L | | XL | | | |
|--|---|--|--|--|--|
| Single Lane | Dual Lane | Single Lane | Dual Lane | | |
| Max. PCB Size (X x Y) | 490 x 510 mm (19.29 x 20.01 in) | Single Mode | Single Mode | | |
| | | 490 x 580 mm (19.29 x 22.83 in) | 690 x 580 mm (27.17 x 22.82 in) | | |
| Max. PCB Size (Clearance Extension Option) | 470 x 510 mm (18.50 x 20.01 in) | Dual Mode | Dual Mode | | |
| | | 490 x 320 mm (19.29 x 12.60 in) | 690 x 320 mm (27.17 x 12.60 in) | | |
| Min. PCB Size | 50 x 50 mm (1.97 x 1.97 in) | Single Mode | Single Mode | | |
| | | 470 x 580 mm (18.50 x 22.83 in) | 670 x 580 mm (26.37 x 22.82 in) | | |
| PCB Thickness | 0.4 ~ 5 mm (0.02 ~ 0.2 in) | Dual Mode | Dual Mode | | |
| | | 470 x 320 mm (18.50 x 12.60 in) | 670 x 320 mm (26.37 x 12.60 in) | | |
| Max. PCB Weight | 4kg (8.82 lbs) | 10kg (22.05 lbs) | | | |
| Machine Weight | 600kg (1322.77 lbs) | 700kg (1543.24 lbs) | | | |
| Clearance (Top/Bottom) | 40mm(1.57 in) / 50mm(1.97 in) 100mm(3.93 in) / 70mm(2.75 in)** | | | | |
| Supplies | 220 Vac ± 10%, 1 Phase, 50/60 Hz, 5Kgf/cm ² (0.45MPa) | | | | |
| W x D x H | 1000x1295x1627mm (39.37x50.98x64.06 in) | 1000x1475x1627 mm (39.37x58.07x64.06 in) | 1200x1475x1627 mm (47.25x58.07x64.06 in) | | |

* Please contact us for more information about PCB Sizes.

** Clearance Extension Option

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