

OPTRIX 3D

High-Speed Inline 3D System for Automated Optical Inspection



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OPTRIX 3D automated optical inspection (AOI) systems were developed for the highly accurate measurement of solder paste applications, component placements and chip positions. Exceptional reliability, precision and ease-of-use are the result of this sensor technology. vision-OS has recognized the importance of AOI especially operating at high production speed, because the longer an error remains unrecognized during the manufacturing process, the more difficult and expensive the troubleshooting process will be.

OPTRIX 3D delivers a comprehensive and flexible AOI solution for your complete SMT-line that can perform solder paste inspections as well as pre- and post-reflow inspections.

Thanks to Optrix 3D's new patented phase-measuring triangulation technology, the sensor measures not only the x/y dimensions, but also the height for true 3D measurements. The measurement is insensitive to typical surface structure reflectivity and color.

Key benefits at a glance:

- True volume measurement of paste via 3D sensor technology
- Mixed mode: Combine solder paste and placement inspections in a single step (shield assembly)
- Post-reflow detection of tombstones and lifted leads
- Calibrated height measurement range of 10 mm including PCB warpage
- User-friendly – Fast set-up time
- Offline programming with portability across multiple lines
- Component library can be e-mailed when support is needed
- Online statistics include just-in-time detection of error trends for improved first-pass yields and lower rework costs
- Low false alarm rate

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Automatic Optical Inspection Systems



Features:

- Fast inspection cycle for improved performance
- Extremely low number of false alarms and false accept rates
- Effective and extremely fast detection of solder paste and placement defects
- Shortest feedback times reduce repair costs
- More flexibility with customer-specified inspection criteria
- Low personnel costs
- Extremely short startup time
- Multiple line monitoring for faster responses and more stable processes
- 01005 feasibility

Additional features:

- Flexible statistics thanks to customizable SQL queries
- Integrated editor for flexible programming
- Quality Monitoring System (QMS) for monitoring multiple lines and communicating to P & P system
- Inspection, evaluation & rework station all integrated into a single system
- Optional Barcode and OCR capability

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Technical Data:

Inspection method	Non-contact 3D measurement using phase-measuring triangulation sensor with simultaneous 2-D inspection
Camera/sensor	Patented phase-measuring triangulation sensor, 1 to 3 cameras
Sensor resolution (x/y)	4 – 26 µm (depending on customer's requirements) standard head options: 5 µm, 19 µm, 23 µm, 26 µm
3D repeatability	Area repeatability 1 – 5 µm (depends on camera resolution)
Recognizable fiducials	All current types
False alarms/false accept rate	Up to 20/0 dpm
Inspection speed	Up to 40 cm ² /sec (for standard sensors)
Position tolerance	Axis tolerance ~ 1 µm with linear encoder
Smallest grid size	0.3 mm (0.1 mm for 5 µm sensor resolution)
Circuit board size	50 x 50 mm to 450 x 508 mm (single conveyor) 50 x 50 mm to 450 x 250 mm (dual conveyor) 50 x 50 mm to 450 x 450 mm (dual conveyor in single mode) Thickness: 0.3 – 4.5 mm (all other sizes on request)
Conveyor height	800 - 950 mm
Conveyor interface	SMEMA or SIEMENS (customer-specific interface upon request)
Frame	The foundation of the x/y unit is made of an artificial stone plate embedded in a welded steel housing
Computer	High-speed processor, Windows XP
Safety certifications	CE, VDE
Dimensions (W x D x H)	1,000 mm x 1,430 mm x 1,600 mm
Compressed air	6 bar, < 10 L/min (for conveyor operation only)
Power supply	240 V~, 1 ph., 5 kVA
Weight	~ 950 kg

Sample measuring speed for a 205 mm x 132 mm circuit board

Standard sensors	High Resolution	High Speed	Dual 4MP
FOV	~ 15 cm ²	~ 25 cm ²	~ 45 cm ²
Resolution	~ 18 µm	~ 26 µm	~ 23 µm
Sensors	3	3	2
Height repeat accuracy	3 µm	5 µm	4 µm
Time for sample	~ 17 s	~ 12 s	~ 7 s
Max. inspection speed	~ 20 cm ² / s	~ 33 cm ² / s	~ 40 cm ² / s

Other configurations upon request

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