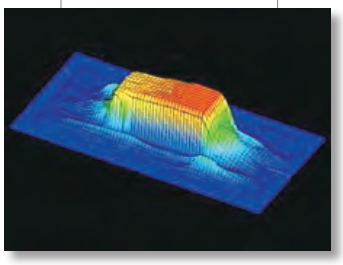
TRI innovation

TR7500 SIII 3D
SERIES

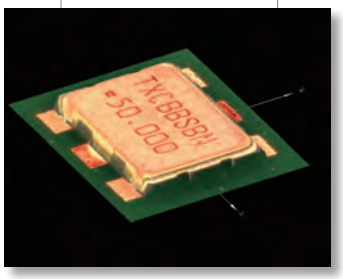
AUTOMATED
OPTICAL INSPECTION

TR7500 SIII 3D FEATURES

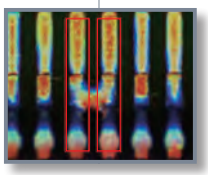
Defects



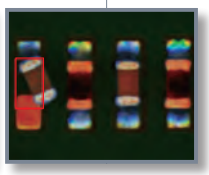
Lifted Components



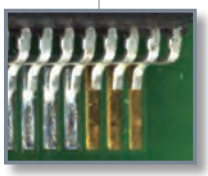
Metal-cased Reflective Components



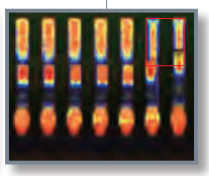
Bridging



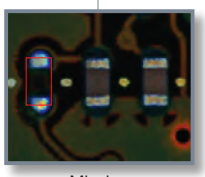
Skew



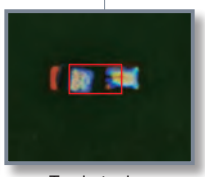
No Solder



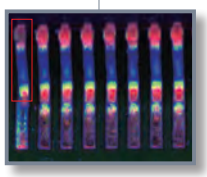
Lifted Lead



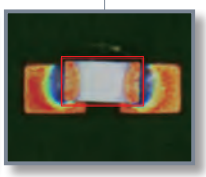
Missing



Tombstoning

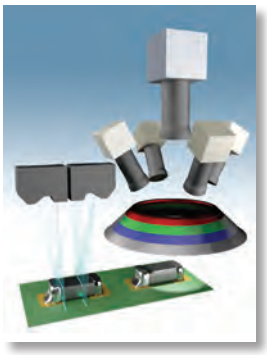


Lifted Pin



Upside Down

TR7500 SIII 3D AOI with Total Inspection Coverage



The TR7500 SIII 3D AOI combines the best of 2D and 3D technologies with new generation software to revolutionize PCB assembly inspection.

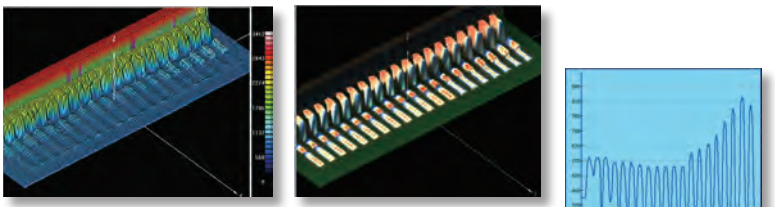
Complete Coverage at Full Speed

Combination of five multi-angle color cameras and true 3D profile measurement eliminates blind spots even on complex automotive and smartphone assemblies. TR7500 SIII 3D inspection range covers everything from basic SMT components to large thru-hole capacitors, switches, connectors and hidden joints.

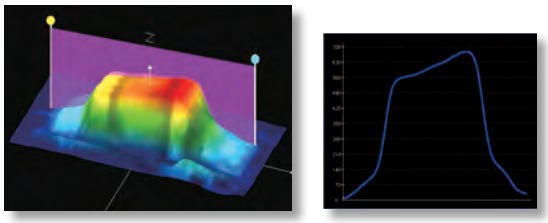
3D Inspection

Accurate laser sensor goes beyond other 3D technology boundaries. Its high measurement range ensures that components up to 20 mm high can be inspected with maximum precision. Working with laser light also eliminates problems with black or mirror-like components on low contrast background.

Interactive 3D models help operators quickly review found defects, such as lifted BGA components, IC leads, connectors, switches and other mounted devices for enhanced post-reflow inspection.



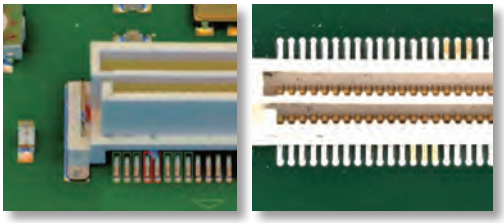
IC Lead Inspection Using 2D + 3D Technologies Efficiently Reveals Lifted Leads



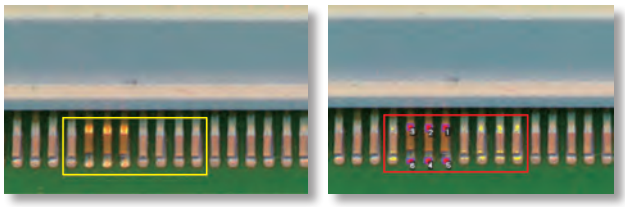
3D Chip Inspection Reveals Defects on Both Small and Oversized Components

Multi Angle Color Cameras

New generation color angle view cameras make side view inspection a breeze. Finding complex solder joint defects hidden from top view has never been easier, and new color space processing ensures reliable defect detection.



Hidden bridge defect on connector joints can only be revealed by angle view camera.

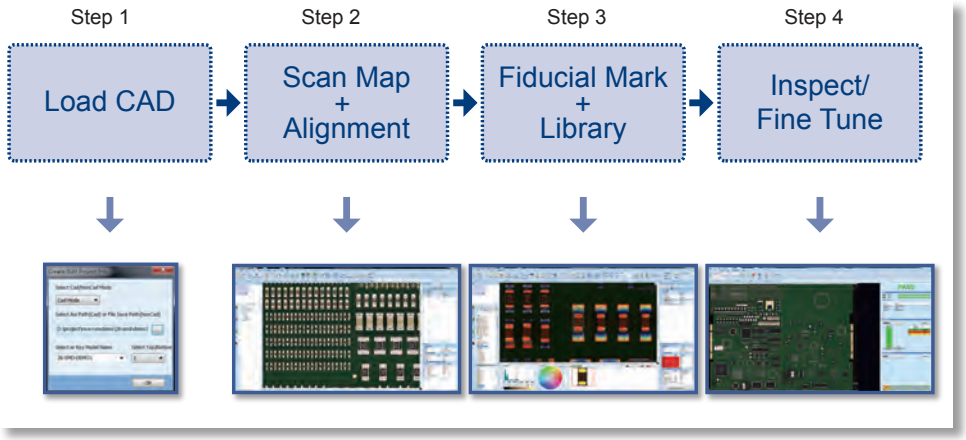


Lifted leads clearly identified using angle view camera.

Intelligent Easy Programming Interface

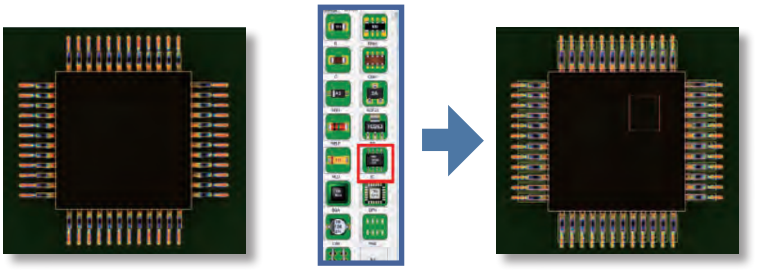
New intelligent programming process significantly reduces programming time using automated component library and integrated board warp compensation.

Programming Flowchart



Auto Library + Model Library

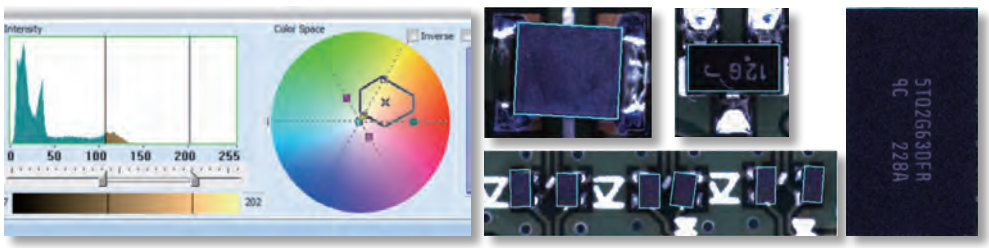
Auto Library speeds up programming by automatically allocating inspection windows for IC leads.



Auto Locate Pins | Model Library | Component Programming Complete

New Color Space Algorithms

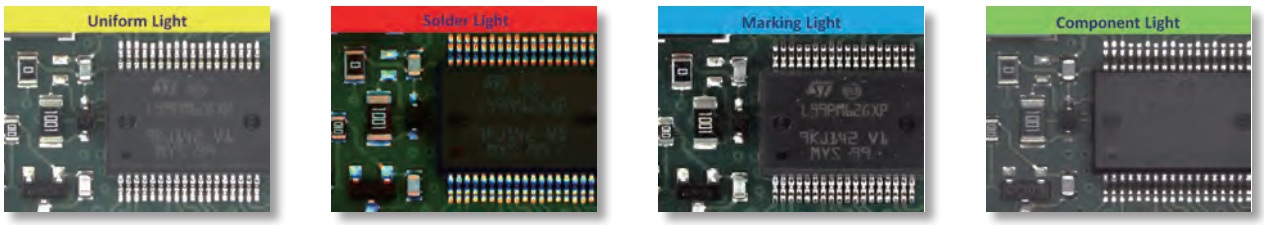
TRI's new adaptive algorithms use color space processing to increase inspection accuracy, reduce false calls and improve inspection results while reducing time necessary for inspection fine tuning and the number of alternative images required.



Color Differentiation Analysis for Black Resin Parts

Multi-phase Lighting

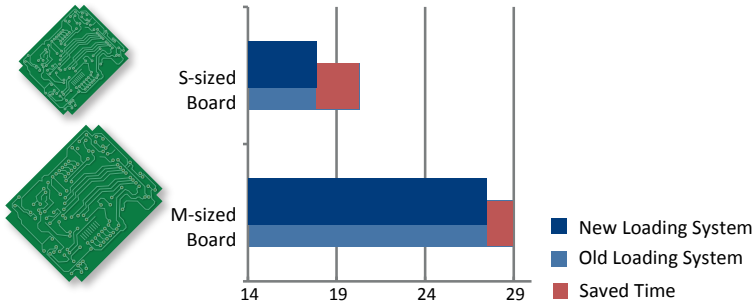
Four individual lighting phases improve inspection of individual defect types using specialized lighting conditions. High speed camera allows inspection at constant speed even with multiple lighting phases.



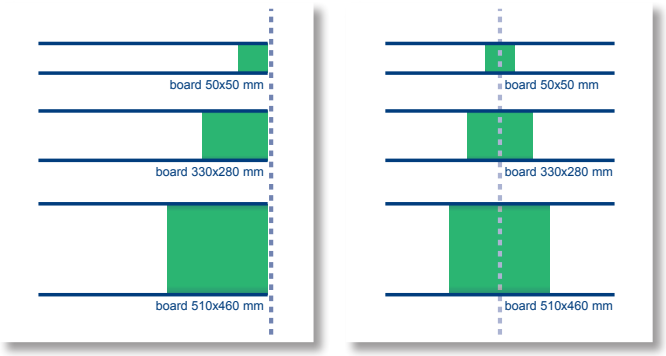
Intelligent Auto Conveyor System

IACS automatically optimizes board stopping position in the conveyor, reducing load and unload time by up to 2.5 seconds, depending on board size.

- Reduced load & unload time (saves 0.5-2.5 sec. per board.)



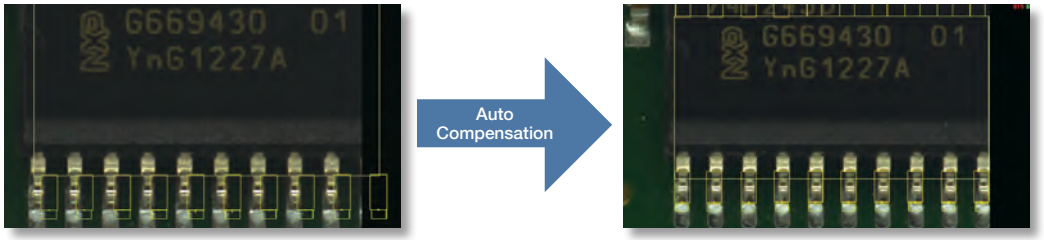
- Automatic adjustment of conveyor speed based on board size & weight saves time for manual adjustment and training.
- Automatic conveyor width adjustment (Optical direct adjustment system without returning to default position).



Auto Warp Compensation

Board warping reduces automated inspection stability and requires additional fine tuning. TR7500 SIII automatically compensates for any warping and keeps inspection windows fully aligned.

Board Warping



Automated Board Warping Compensation Effectively Readjusts Inspection Window Position

SMT Line Integration

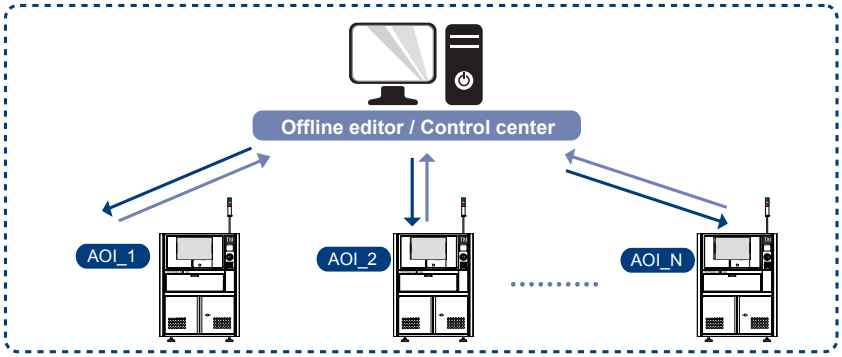
Centralized production line management increases operator productivity and response time. TRI's integrated solution includes the following four components.

• Offline Editor

This application allows for centralized independent adjustment and fine tuning of inspection algorithms on previously scanned images while providing immediate feedback. The completed program can then be uploaded to the in-line inspection machines to improve inspection stability and accuracy.

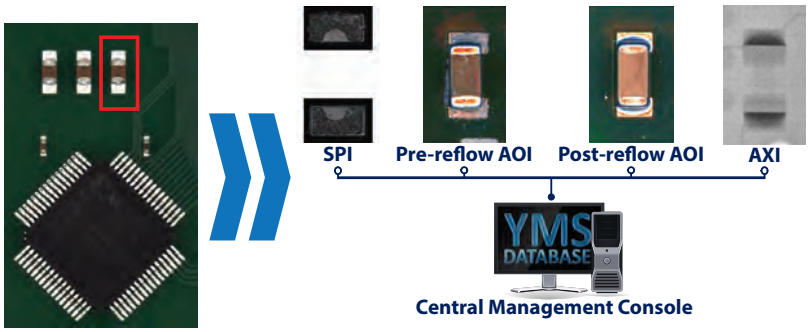
• Control Center

The core component at the heart of a production facility, the control center allows real-time monitoring and operation of multiple inspection machines across production lines.



• YMS Lite

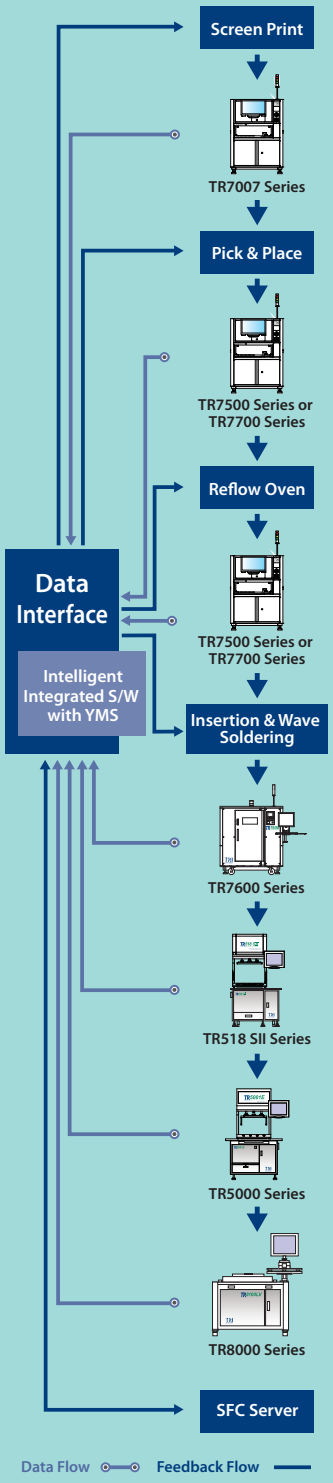
TRI's Yield Management System links inspection data from SPI, AOI and AXI systems to trace defect roots throughout the PCB assembly line. Modular architecture provides centralized inspection management, real time defect monitoring with analysis and defect knowledge management necessary to identify problems and implement solutions to maximize production yields.



• Quality Validation

Fully automated collection of good/failed images from a complete production run allows testing, tuning and verification of adjusted program parameters without reloading tested boards. This allows engineers to save inspection time when fine tuning and significantly speeds up New Product Introduction (NPI)

Yield Management System*



- Inspection results and data integration
- Real time SPC and production yield management
- Quality reports and closed loop tracking
- Support defect component analysis and improvements
- Knowledge Management (KM)
- Productivity and Quality Management

* Optional

SPECIFICATIONS

Optical & Imaging System

Top View Camera	4 Mpx high speed color camera
4 Angled View Cameras	High resolution color camera
3D Laser Sensor	High resolution and high measurement range
Lighting	Multi-phase RGB+W LED
Optical Resolution	10 or 15 μm
Imaging Method	Dynamic Imaging with true 3D profile measurement
3D Inspection Range	20 mm

Imaging/Inspection Speed

	2D	2D+3D
15 μm	120 cm^2/sec	40 - 60 cm^2/sec
10 μm	60 cm^2/sec	27 - 39 cm^2/sec

*depending on board size

Pre-/Post-Reflow Inspection Functions

Component	Missing, Tombstoning, Billboarding, Polarity, Rotation, Shift, Wrong Marking (OCV), Defective, Upside Down, Lifted Component, Extra Component
Solder Joint	Excess Solder, Insufficient Solder, Bridging, Through-hole Pins, Lifted Lead, Golden Finger Scratch/Contamination

X-Y Table & Control

Ballscrew + AC servo with motion controller

X-Y Axis Resolution	1 μm

PCB & Conveyor System

	TR7500 SIII 3DS	TR7500 SIII 3D	TR7500L SIII 3D
PCB Size	50 x 50 – 300 x 460 mm (1.97 x 1.97 – 20.1 x 18.1 in)	50 x 50 – 510 x 460 mm (1.97 x 1.97 – 20.1 x 18.1 in)	50 x 50 – 660 x 460 mm (1.97 x 1.97 - 26.0 x 18.1 in)
PCB Thickness	0.6 – 5 mm		
PCB Transport Height	880 – 920 mm (34.6 - 36.2 in)		
Max. PCB Weight	3 kg (6.61 lbs)		
PCB Carrier/Fixing	Step motor driven/pneumatic clamping		
Clearance Top Bottom Edge	 25 mm (0.98 in) 40 mm (1.58 in) 3 mm (0.12 in)		

Dimensions

Dimensions (W) x (D) x (H)	1000 x 1555 x 1550 mm (39.3 x 61.2 x 59.0 in) (not including signal tower, height: 520 mm)	1100 x 1670 x 1550 mm (43.3 x 65.7 x 61.0 in) (not including signal tower, height: 520 mm)	1300 x 1610 x 1560 mm (51.2 x 63.4 x 61.4 in) (not including signal tower, height: 520 mm)
Weight	960 kg (2116 lbs)	1030 kg (2271 lbs)	1250 kg (2756 lbs)
Power Requirement	200 – 240 V, single phase, 50/60 Hz 3 kVA		
Air Requirement	0.6 MPa (87 psi)		

Options

Barcode Scanner, Offline Editor, OCR & TRI's Yield Management System(YMS), YMS Lite

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