

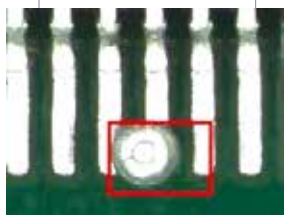
TR7700 SIII 3D SERIES



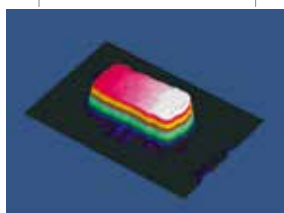
AUTOMATED
OPTICAL INSPECTION

TR7700 SIII 3D FEATURES

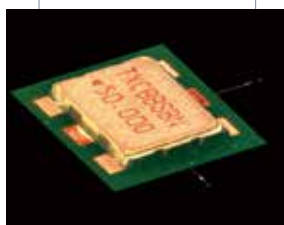
Defects



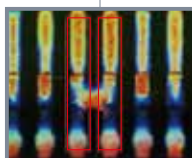
Foreign Material



Lifted Components



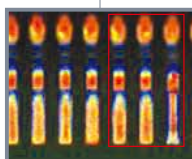
Metal-cased Reflective Components



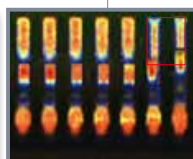
Bridging



Skew



No Solder



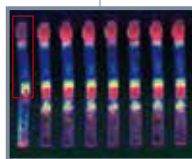
Lifted Lead



Missing



Tombstoning



Lifted Pin



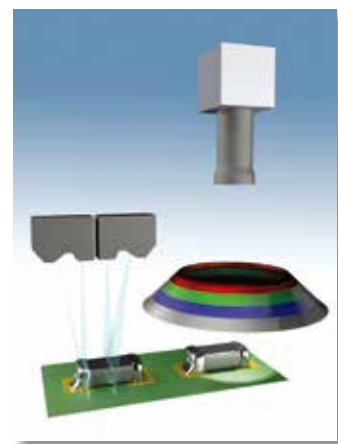
Upside Down

TR7700 SIII 3D AOI with Total Inspection Coverage

The TR7700 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

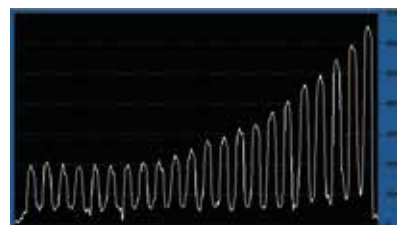
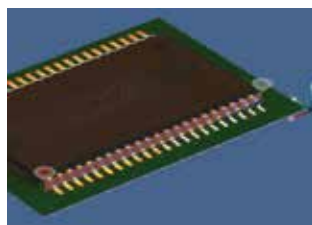
Combination of ultra-high-speed color camera and true 3D profile measurement completely inspects even complex automotive and smartphone assemblies. TR7700 SIII 3D inspection range covers everything from basic SMT components to large thru-hole capacitors, switches, connectors and hidden joints.



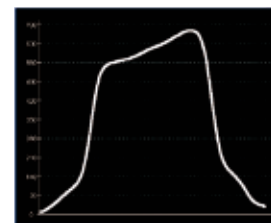
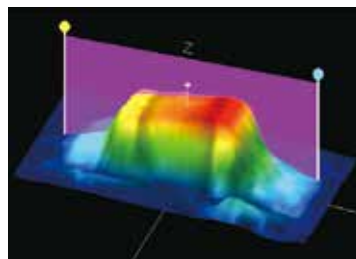
3D Inspection

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

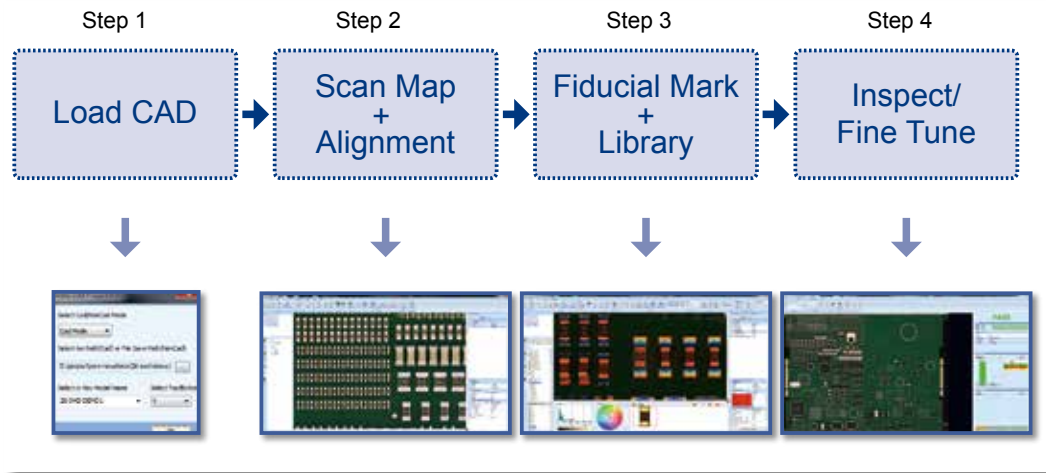


3D Chip Inspection Reveals Defects on Both Small and Oversized Components

Intelligent Easy Programming Interface

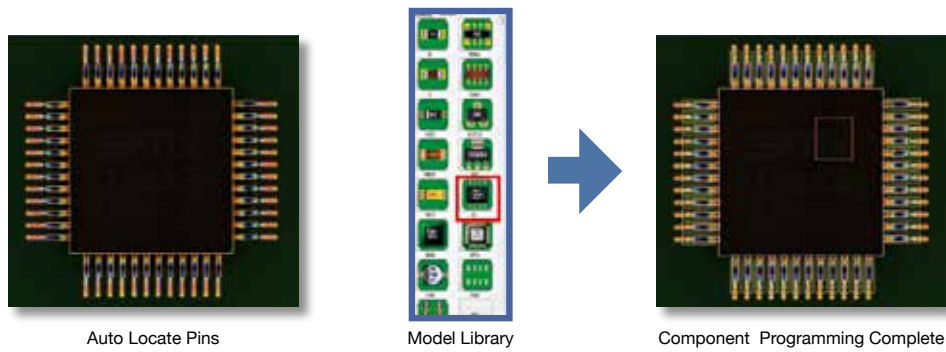
New intelligent programming process significantly reduces programming time using smart component library and integrated board warp compensation.

Programming Flowchart



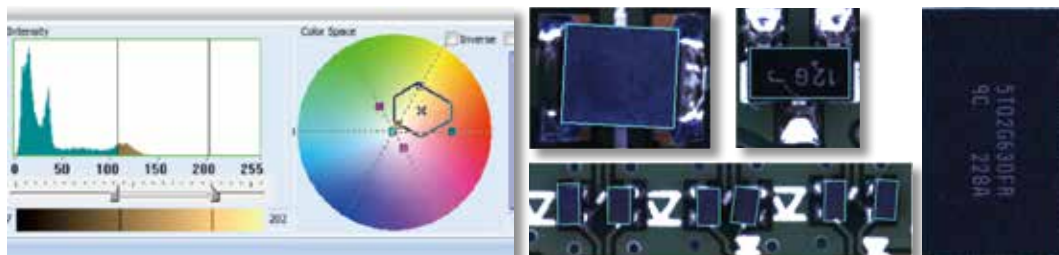
Smart Library + Model Library

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



New Color Space Algorithms

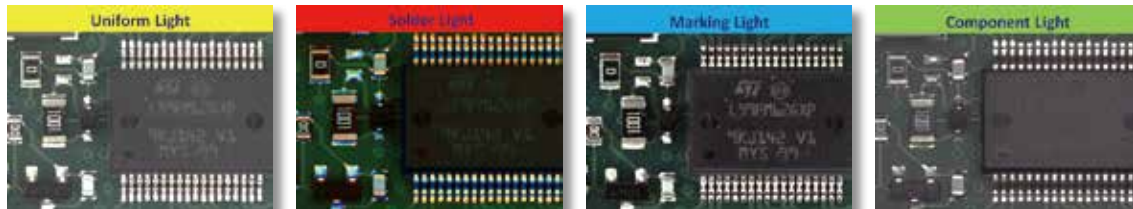
TRI's new adaptive algorithms use color space processing to increase inspection accuracy, reduce false calls and improve inspection results while reducing time necessary for inspection fine tuning and the number of alternative images required.



Color Differentiation Analysis for Black Resin Parts

Multi-phase Lighting

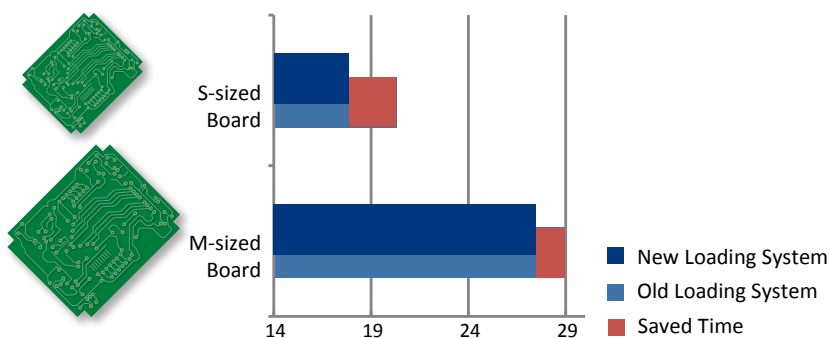
Four individual lighting phases improve inspection of individual defect types using specialized lighting conditions. High speed camera allows inspection at constant speed even with multiple lighting phases.



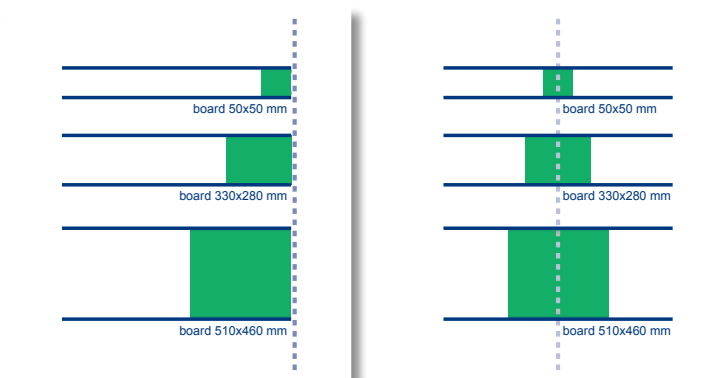
Intelligent Auto Conveyor System

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).



SMT Line Integration

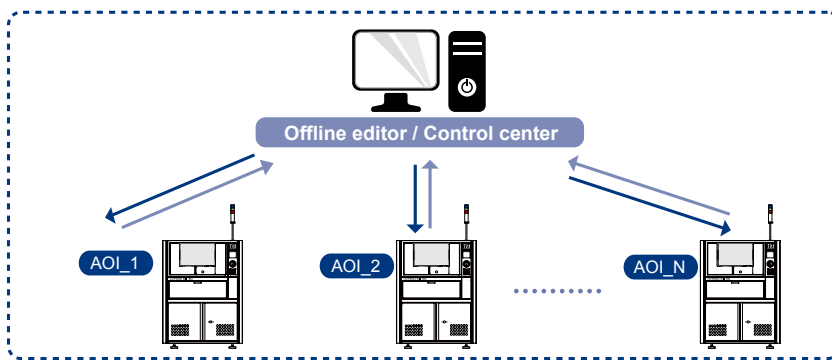
Centralized production line management increases operator productivity and response time. TRI's integrated solution includes the following four components.

- 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.

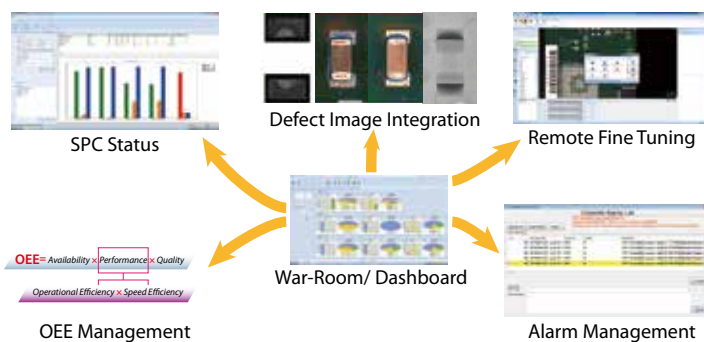
- Control Center

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.



- Yield Management System 4.0

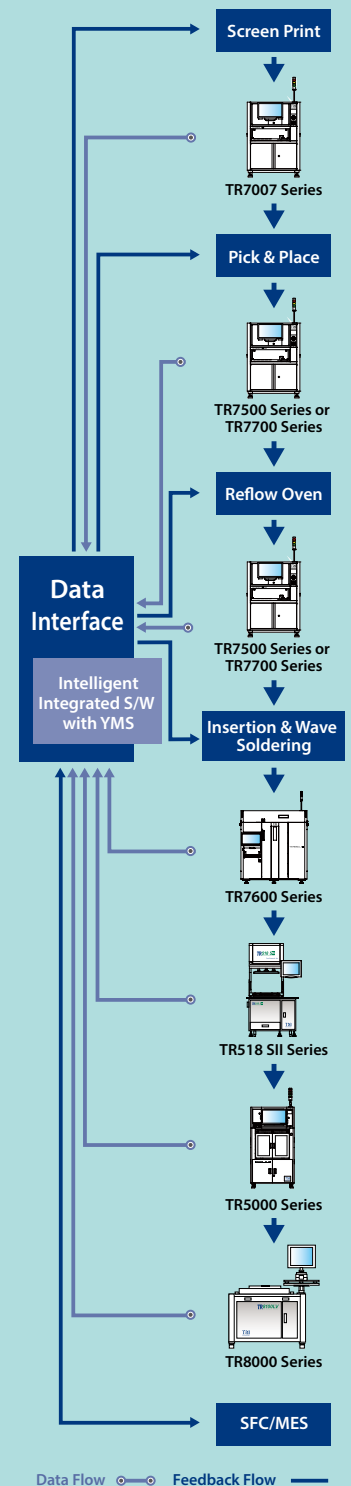
YMS 4.0 provides real-time inspection status across SPI, AOI and AXI systems and monitors SPC and Alarm status, and supports remote fine-tune throughout the SMT line. The centralized inspection management provides top 5 to 10 defects and defective images, OEE review and management, issue and root cause drill down line by line, by station and by process, which improves quality and productivity analysis. YMS 4.0 supports Industry 4.0 initiative.



- 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

Optical & Imaging System

Top View Camera	4 Mpix high speed color camera
3D Laser Sensor	Single/Dual 3D Laser sensors
Lighting	Multi-phase RGB+W LED
Optical Resolution	10 or 15 μ m (factory setting)
Imaging Method	Dynamic Imaging with true 3D profile measurement
3D Inspection Range	20 mm

Imaging/Inspection Speed

	2D	2D+3D
15 μ m (cm ² /sec)	120	40 - 60*
10 μ m (cm ² /sec)	60	27 - 39*

*depending on board size and laser resolution

Pre-/Post-Reflow Inspection Functions

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

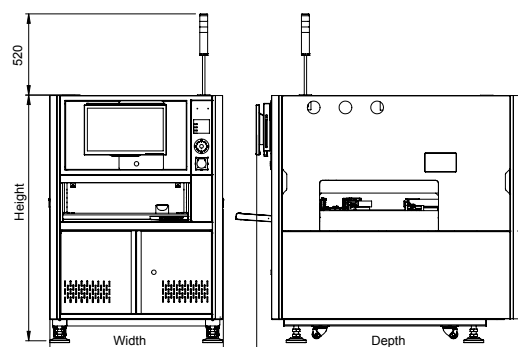
X-Y Table & Control

Ballscrew + AC servo with motion controller	
X-Y Axis Resolution	1 μ m

PCB & Conveyor System

	TR7700 SIII 3D	TR7700L SIII 3D	TR7700 SIII 3D DL
PCB Size	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.)	50 x 50 - 510 x 250 mm x 2 lanes (1.97 x 1.97 - 20.1 x 9.84 in x 2 lanes) 50 x 50 - 510 x 550 mm x 1 lane (1.97 x 1.97 - 20.1 x 21.7 in x 1 lane)
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	25 mm (0.98 in.)		
Bottom	40 mm (1.58 in.)		
Edge	3 mm (0.12 in.) [5 mm (0.2 in.) optional]		

Dimensions



	TR7700 SIII 3D	TR7700L SIII 3D	TR7700 SIII 3D DL
Width	1100 mm (43.3)	1300 mm (51.2)	1100 mm (43.3)
Depth	1670 mm (65.7)	1630 mm (64.2)	1770 mm (69.7)
Height	1550 mm (61.0)	1655 mm (65.2)	1550 mm (61.0)
Weight	1030 kg (2271 lbs)	1250 kg (2756 lbs)	1150 kg (2530 lbs)
Power Requirement	200 - 240 VAC, single phase, 50/60 Hz, 3 kVA		
Air Requirement	72 psi - 87 psi (5 - 6 Bar)		

Unit : mm (in.)

Options

Barcode Scanner, Repair Station, Offline Editor, OCR, TRI's Yield Management System (YMS 4.0), YMS Lite, Support Pin

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TRI 德律 TRI INNOVATION

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