3D SPI
AUTOMATED OPTICAL INSPECTION

TR7007D Plus SERIES

High Precision Platform for Reliable Gauge R&R

Enhanced 2D Light for Improved Imaging

Smart Programming: Algorithm based Inspection

Real Time SPC Trends

Smart Board Warpage Control

EtherCAT – Faster Communication

TRI innovation

TR7007D Plus SPI

## High Performance 3D SPI Solution

The TR7007D Plus 3D SPI platform is equipped with an improved motion controller (EtherCat) and an enhanced 2D lighting module. The TR7007D Plus can accurately inspect low solder bridges and compensate board warpage for eliminating local PCB deformation.
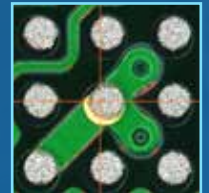
Inspection for

- **Solder Paste**
- **Bumps**
- **Flux**
- **Bare Board**

New Lighting Module

The TR7007D Plus platform has an enhanced 2D Lighting module for improved imaging. The captured inspection images have higher contrast and higher uniformity.
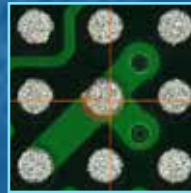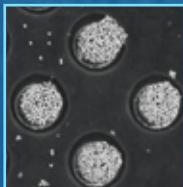

TR7007D

TR7007D Plus

Precise 3D Technology

Shadow-free Inspection

TRI's imaging technology provides an optimized 3D Shadow Free Fringe Pattern Technology with Dual Imaging Projectors. Total Solder Paste Defect coverage including low solder bridges inspection.

Smart Programming

Ready to Inspect in 5 Steps, quickly setup high-mix or low volume applications. TRI's SPI Software has preloaded Smart Inspection Libraries to ensure fast changeovers, minimal idle time and the reduction of operator's work load.

Load SPI File → Set Board Size → Set Board Offset → Set Fiducial Marks → Set Thresholds
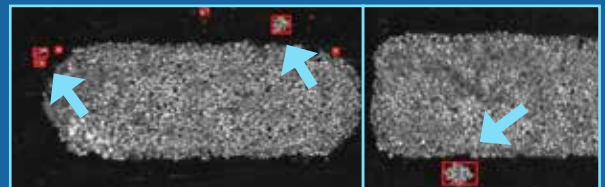
High Resolution Inspection

The 3D SPI can detect minute solder defects such as low solder paste bridges under 45 µm and detecting the presence of foreign objects.


Low Solder Bridge Inspection

Foreign Object Inspection

TRI innovation

Optimized Performance

Accurately inspect your PCBs with Dynamic Imaging, TRI's Optimal Scanning Path, to achieve the best available inspection while maintaining competitive imaging speed.The smart route optimization reduces the number of FOVs necessary to Inspect every board, saving inspection cycle time.
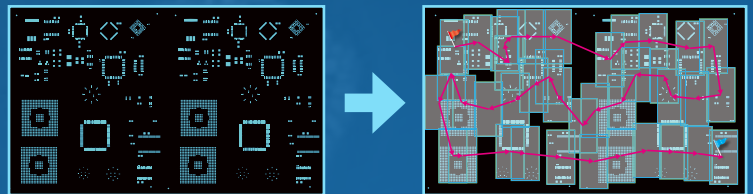
Smart Route Optimization

Smart Warpage Technology

Inspect with maximum stability with TRI's Smart Board Warpage compensation technology. TRI's Smart Warpage locates fiducial marks and compensates local board warpage.

Any 3 Points Create a Standard Surface

Board Warp Causes Surface Irregularity

Smart Board Warpage Correction
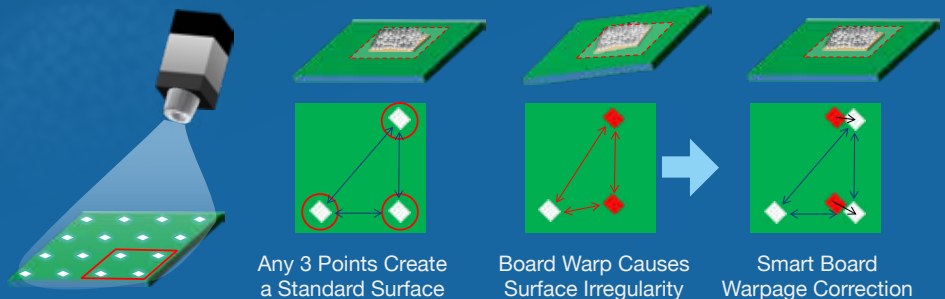
Closed Loop Ready

TRI SPI systems share inspection results with connected MES and SMT line equipment to help improve production yields and stabilize production quality while minimizing line stops and reducing production costs. TRI systems offer data feeds to a feedback and a feed-forward loop.

Feed Back

Feed Forward

Feed Backward

Skip Board Data
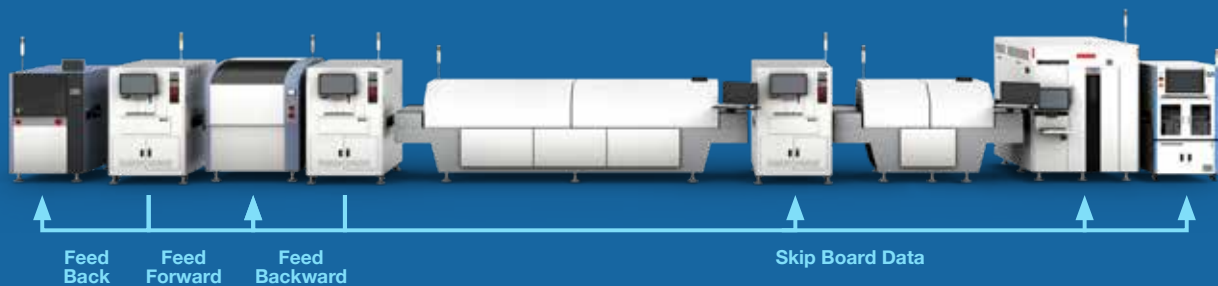
YMS 4.0

Yield Management System 4.0 (YMS 4.0) is TRI's Smart Central Monitoring Solution that interconnects test and inspection solutions from SPI, AOI, and AXI to ICT. YMS 4.0 promotes continuous improvement of the production line's yield rate by offering statistical analysis of production line defect rates, reviewing and fine-tuning inspection results, and identifying component defect trends and emerging production issues.
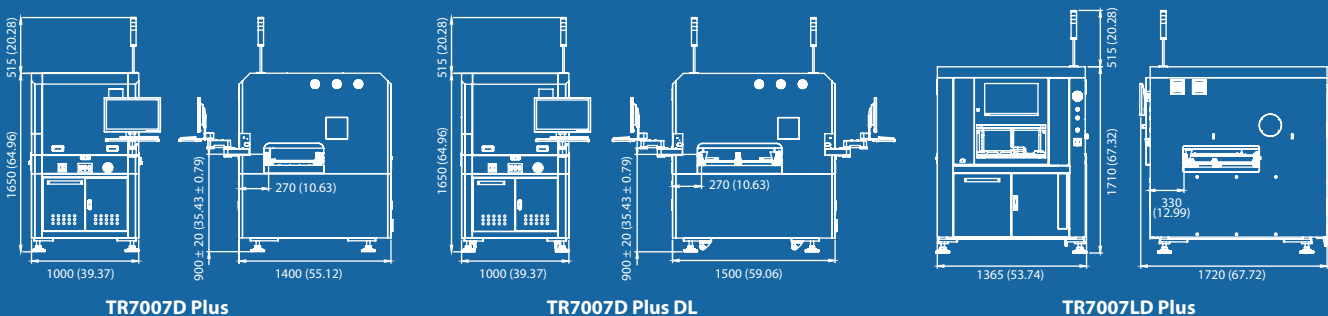
Defect Image Analyzer

Live Inspection Status

Line View Monitoring

Specifications
TR7007D Plus SERIES

Model			TR7007D Plus	TR7007D Plus DL	TR7007LD Plus
Imaging System	Camera	4 MP Camera Link	10 µm / 15 µm	10 µm / 15 µm	N/A
		12 MP Camera Link	5.5 µm / 10 µm / 15 µm	10 µm / 15 µm	N/A
		12 MP CoaXPress	6 µm / 10 µm	10 µm	6 µm / 10 µm / 15 µm
	3D Technology		Dual Digital Fringe Pattern Projector		
	Lighting		Enhanced 2D Lights (RGB+W)		
	FOV	4 MP Camera Link	10 µm: 20.3x20.3 mm (0.8x0.8 in.), 15 µm: 30.5x30.5 mm (1.2x1.20 in.)		
		12 MP Camera Link	5.5 µm: 22.5x16.5 mm (0.89x0.65 in.),10 µm: 40.6x30.7 mm (1.6x1.21 in.), 15 µm: 61x46 mm (2.4x1.81 in.)		
		12 MP CoaXPress	6 µm: 24.3x18.4 mm (0.96x0.72 in.), 10 µm: 40.6x30.7 mm (1.6x1.21 in.), 15 µm: 61x46 mm (2.4x1.81 in.)		
	Inspection Speed		4 MP Camera Link: Up to 3 FOV/sec, 12 MP Camera Link: Up to 1.8 FOV/sec, 12 MP CoaXPress: Up to 2.6 FOV/sec		
Inspection Functions	Defects Detected		Insufficient Paste, Excessive Paste, Shape Deformity, Missing Paste & Bridging		
	Measurement		Height, Area, Volume and Offset		
Mechanical Stage	Stage Type		XYZ-Axis Ball Screw		
	Motion Control		EtherCAT		
	XY Resolution		0.5 µm		
	Z Resolution		1 µm		
Inspect Performance	Volume Repeatability		Calibration Target (at 3σ) <1%		
	Height Repeatability		Calibration Target (at 3σ) <1% Solder GR&R (±50% Tolerance) <<10% at 6 σ		
	Height Accuracy		10 µm/15 µm: 1.5 µm; 5.5 µm/6 µm: 1 µm (on Calibration Target)		
	Max. Solder Height		10 µm/15 µm: 420 µm/750 µm; 5.5 µm/6 µm: 210 µm/310 µm (on Calibration Target)		
	Height Resolution		10 µm/15 µm: 0.45 µm; 5.5 µm/6 µm: 0.22 µm		
PCB & Conveyor System	Min PCB Size		50x50 mm (1.97x1.97 in.)		
	Max PCB Size		5.5, 6 µm: 400x330 mm (15.75x12.99 in) 10, 15 µm: 510x460 mm (20.08x18.11 in.)	10, 15 µm: 510x310 mm (20.08x12.20in.) x 2 Lanes 510x590 mm (20.08x23.23in.) x 1 Lane	6,10,15 µm: 765x610 mm (30.12x24.02 in)
	PCB Thickness		0.6 - 5 mm (0.02 - 0.20 in.)		
	PCB Transport Height		880 - 920 mm (34.65 -36.22 in.)		
	Max PCB Weight		3kg (6.61 lbs.). Optional: 5 kg (11.02 lb)		
	PCB Carrier / Fixing		Belt/Pneumatic		
	Clearance — Top	4 MP Camera Link	10 µm/15 µm: 50 mm (1.97 in.)		
		12 MP Camera Link	5.5 µm: 25 mm (0.98 in.), 10 µm/15 µm: 50 mm (1.97 in.)		
		12 MP CoaXPress	6 µm: 25 mm (0.98 in.), 10 µm/15 µm: 50 mm (1.97 in.)		
	Bottom		40 mm (1.57 in.)		
	Edge		3 mm (0.12 in.). Optional: 4 mm (0.16 in.) / 5 mm (0.20 in.)		
Weight			775 kg (1,708.58 lb)	825 kg (1,818.81 lb)	982 kg (2164.94 lb)
Power Requirement			200 – 240 VAC, Single Phase, 50/60 Hz, 3 kVA		
Air Requirement			72 psi – 87 psi (5 – 6 bar)		
Optional			SPC, Offline Editor, Gerber Tool, Barcode Scanner (Linear & 2D) and Support Pins, Closed Loop Function, Yield Management System (YMS 4.0), Linear Encoder Module		

Unit: mm (in.)

TR7007D Plus — 515 (20.28), 1650 (64.96), 900±20 (35.43±0.79), 270 (10.63), 1000 (39.37), 1400 (55.12)

TR7007D Plus DL — 515 (20.28), 1650 (64.96), 900±20 (35.43±0.79), 270 (10.63), 1000 (39.37), 1500 (59.06)

TR7007LD Plus — 515 (20.28), 1710 (67.32), 330 (12.99), 1365 (53.74), 1720 (67.72)

Global Network

Shenzhen, China	shenzhen@cn.tri.com.tw	**Tokyo, Japan**	trijp@tri.com.tw
Suzhou, China	suzhou@cn.tri.com.tw	**Ansan, Korea**	trikr@tri.com.tw
Shanghai, China	shanghai@cn.tri.com.tw	**Penang, Malaysia**	trimy@tri.com.tw
San Jose, USA	triusa@tri.com.tw	**Bac Ninh, Vietnam**	trivn@tri.com.tw
Nuremberg, Germany	trieurope@tri.com.tw		

HEADQUARTERS
7F., No.45, Dexing West Rd., Shilin Dist.,
Taipei City 11158, Taiwan
+886-2-2832-8918   Sales@tri.com.tw

TRI 德律 TRI INNOVATION®

www.tri.com.tw