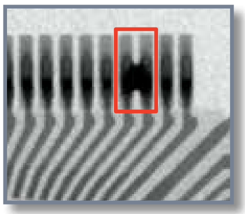
# TR7600F2D
## SERIES

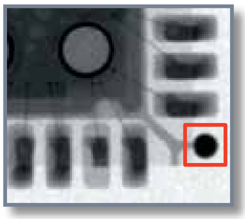
- Inline Ultra-high-resolution Inspection
- Shadow-free Block Scan imaging
- Automated Inspection for High-Mix productions

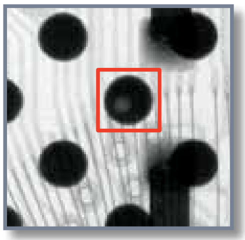
AUTOMATED
X-RAY INSPECTION

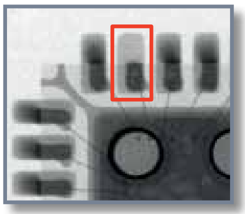
# TR7600F2D FEATURES

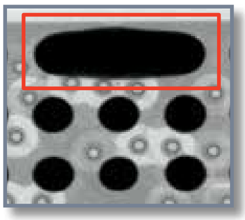
## Defect Symptom Images

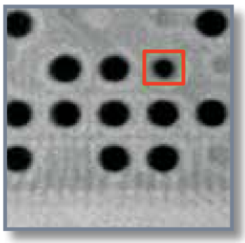

IC Lead Bridging


Solder Ball


BGA Void


QFN Open


BGA Bridging


BGA Open


Solder Void

## Ultimate Image Quality AXI

Focused on delivering the best image quality at top speeds, the TR7600F2D offers a flexible, reliable AXI platform designed for single layer PCB assembly inspection. Smart programming reduces changeover time and operator workload, making the TR7600F2D an ideal solution for high mix productions.

## Special Solution for NPI productions

Featuring both automated inline inspection and standalone real-time X-ray imaging, the TR7600F2D is an ideal solution for high mix, low volume productions which require maximum flexibility and high image quality. The powerful hardware platform and flexible imaging options make sure production engineers obtain desired images in minimum time, while delivering high throughput in automated inline mode.

## Inline 2.5D Automated X-ray Inspection

- Fast Inline Automated Inspection for Single layer PCBAs
- Ultra-high resolution imaging for ultimate quality at high speed
- Automated Inspection and Pass/Fail Evaluation
- User selectable X-ray power up to 130 kV/300 µA
- Patented 6-axis motion control for maximum flexibility
- Edge-to-edge board inspection up to 900 x 460 mm
- Real-time X-ray view for on-demand inspection

## Intelligent Software Solution

- Smart CAD-based or manual programming with auto tuning
- Intelligent detection of solder and assembly defects
- Automatic image quality enhancement
- Automated board warp compensation

## Defect Detection Capability

**Components**

- BGA/CGA/LGA
- Flip Chip
- PoP
- QFN
- Pressfit/Ventura Connectors
- 0402mm/01005in. Chip
- Fine Pitch Components/µBGA
- Gullwing and J-lead Solder Joints
- PTH

**TR7600F2D**

**Defect Symptoms**

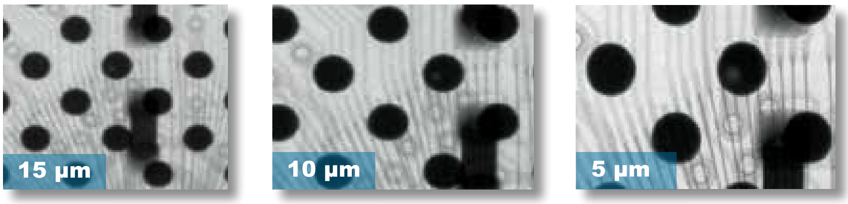
- Head-in-Pillow
- Open
- Bridging
- Void
- Solder Balls
- Barrel Fill
- Insufficient/Excess Solder
- Misalignment
- Wrong Size Parts
- Reversed Polarized Capacitors
- Tombstoning
- Billboarding
- Missing Components

## Patented 6-axis Motion Control

TRI's unique motion control system helps provide clearest images of shielded or overlapping components, enabling reliable automated PCBA inspection and eliminating most shadowing issues.

## BlockScan Customized Imaging

BlockScan module enhances the AXI test program coverage by optimizing imaging resolution, overlapping, X-ray power and timing for each FOV. This allows operators to get the best possible image quality and reduces the possibility of false calls on µBGAs, QFNs, and shielded parts.



Multiple Resolutions in One Program

## Accurate Inspection Results

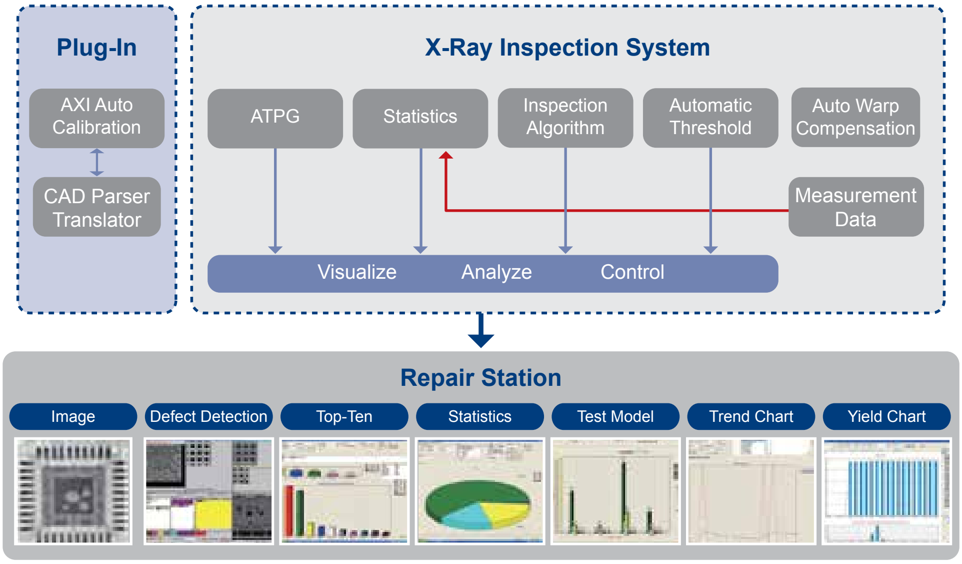
TRI's X-ray systems use intelligent analysis of X-ray data to reliably identify various solder and component defects on a range of components. By combining smart algorithms with ultra-clear imaging quality, the TR7600F2D is designed to provide the most accurate inspection results of BGAs, QFNs, IC lead solder joints and combined Flex-PCB assemblies with microphones and other atypical components.

## Radiation Safe Design

Designed with safety in mind, TRI's AXI systems have full lead shielding which prevents harmful exposure in everyday use and reduces X-ray leakage below background radiation levels of 0.5 μSv/hr.
The certified safety design conforms to USFDA Code of Federal Regulations Title 21, Part 1020.40.

## Repair Station

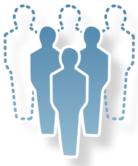
The TR7600F2D collects a wide range of inspection data to offer instantaneous process monitoring and analysis. This integrated approach offers clear statistical feedback that improves defect management and enhances the efficiency of the inspection process.

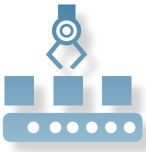


## Yield Management System 4.0

YMS 4.0 provides a M2M centralized inspection monitoring and remote access fine tuning throughout the SMT line. Built-in support for SPI, AOI, AXI and ICT systems helps track Alarms and SPC data to simplify production quality monitoring. YMS 4.0 is TRI's Industry 4.0 closed loop software to assure your production line Inspection quality and efficiency.

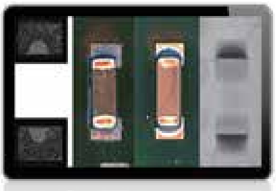

INCREASE
EFFICIENCY

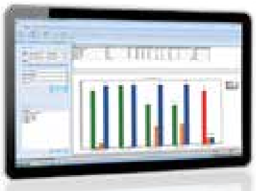

REDUCE
MANPOWER


LEANER
PRODUCTION LINE

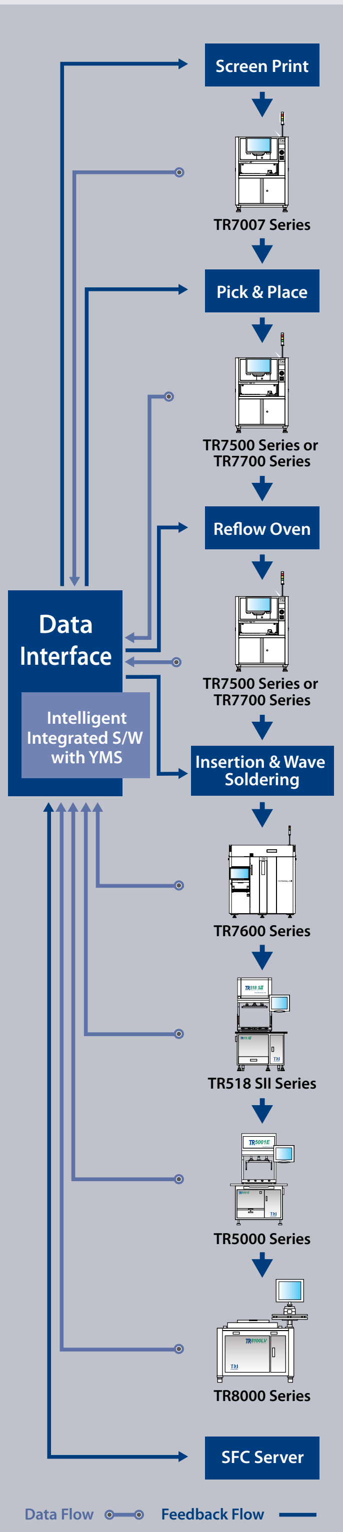
The Yield Management System allows operators to aggregate information from individual TRI inspection systems for statistical analysis of production line defect rates, reviewing and fine-tuning inspection results, and identifying component defect trends and emerging production issues.


PRODUCTION ANALYSIS


CENTRALIZED
INSPECTION CENTER


REAL TIME SPC
TREND

## Yield Management System



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

# SPECIFICATIONS

## X-Ray & Imaging System

| | |
|---|---|
| X-ray Source | 130 kV max (user adjustable) |
| Image Resolutions | 5 µm,10 µm, 15 µm (factory setting) |
| Camera | High resolution flat panel camera |

## Inspection Functions

| | |
|---|---|
| Component Level Defects | Missing, Misalignment, Tombstoning, Billboarding, Tantalum Polarity, Rotation |
| Joint Level Defects | Insufficient Solder, Excess Solder, Bridging, Open, Solder Ball, Non-wetting, Void, Lifted Lead |

## X-Y Table & Control

High-precision ball screw/servo motor with DSP-based motion controller

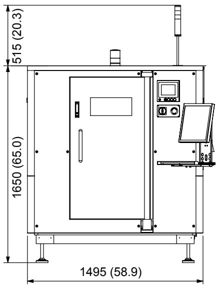
| | |
|---|---|
| X-Y Axis Resolution | 1 µm |

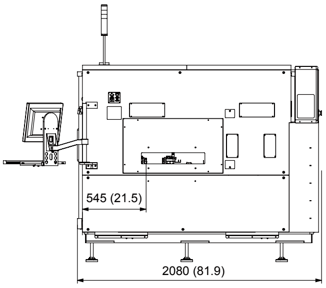
## PCB & Conveyor System

| | | |
|---|---|---|
| Max. PCB Size | | 900 x 460 mm (35.4 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 (7 lbs) [8 kg (18 lbs) optional] |
| PCB Carrier/Fixing | | Motor Driven/Clamping |
| Clearance | | |
| Top | 15 µm | 30 mm (1.18 in.) |
| | 10 µm | 20 mm (0.79 in.) |
| | 5 µm | 10 mm (0.39 in.) |
| Bottom | | 40 mm (1.58 in.) |
| Edge | | 3 mm (0.11 in.) |

* SMEMA Compatible

## Dimensions





Unit: mm (in.)

| | |
|---|---|
| Weight | 3250 kg (7165 lbs) |
| Power Requirement | 200 – 240 VAC single phase, 50/60 Hz, 4 kVA |
| Air Requirement | 72 psi – 87 psi (5 – 6 bar) |

## Optional Accessories

Barcode Scanner, Repair Station, Offline Editor & Yield Management System (YMS 4.0), YMS Lite

TRI has a patent in System and Method for Laminography Inspection

TRI 德律 TRI INNOVATION

## Test Research, Inc.

**Headquarters**
7F., No.45, Dexing West Rd.,
Shilin Dist., Taipei City
11158, Taiwan
TEL: +886-2-2832-8918
FAX: +886-2-2831-0567
E-Mail: sales@tri.com.tw
http://www.tri.com.tw

**Linkou, Taiwan**
No.256, Huaya 2nd Rd.,
Guishan Dist., Taoyuan
City 33383, Taiwan
TEL: +886-2-2832-8918
FAX: +886-3-328-6579

**Hsinchu, Taiwan**
7F., No.47, Guangming 6th
Rd., Zhubei City, Hsinchu
County 30268, Taiwan
TEL: +886-2-2832-8918
FAX: +886-3-553-9786

**Shenzhen, China**
5F.3, Guangxia Rd.,
Shang-mei-lin Area,
Fu-Tian Dist., Shenzhen,
Guangdong, 518049, China
TEL: +86-755-83112668
FAX: +86-755-83108177
E-mail: shenzhen@cn.tri.com.tw

**Suzhou, China**
B Unit, Building 4, 78 Xinglin St.,
Suzhou Industrial Park,
215123, China
TEL: +86-512-68250001
FAX: +86-512-68096639
E-mail: suzhou@cn.tri.com.tw

**Shanghai, China**
Room 6C, Building 14,
470 Guiping Rd., Xuhui Dist.,
Shanghai, 200233, China
TEL: +86-21-54270101
FAX: +86-21-64957923
E-mail: shanghai@cn.tri.com.tw

**USA**
832 Jury Court, Suite 4,
San Jose, CA 95112 U.S.A
TEL: +1-408-567-9898
FAX: +1-408-567-9288
E-mail: triusa@tri.com.tw

**Europe**
O'Brien Strasse 14
91126 Schwabach
Germany
TEL: +49-9122-631-2127
FAX: +49-9122-631-2147
E-mail: trieurope@tri.com.tw

**Japan**
2-9-9 Midori, Sumida-ku,
Tokyo, 130-0021 Japan
TEL: +81-3-6273-0518
FAX: +81-3-6273-0519
E-mail: trijp@tri.com.tw

**Korea**
No.207 Daewoo-Technopia,
768-1 Wonsi-Dong, Danwon-Gu,
Ansan City, Gyeonggi-Do, Korea
TEL: +82-31-470-8858
FAX: +82-31-470-8859
E-mail: trikr@tri.com.tw

**Malaysia**
C11-1, Ground Floor, Lorong
Bayan Indah 3 Bay Avenue,
11900 Bayan Lepas Penang,
Malaysia
TEL: +604-6461171
E-mail: trimy@tri.com.tw