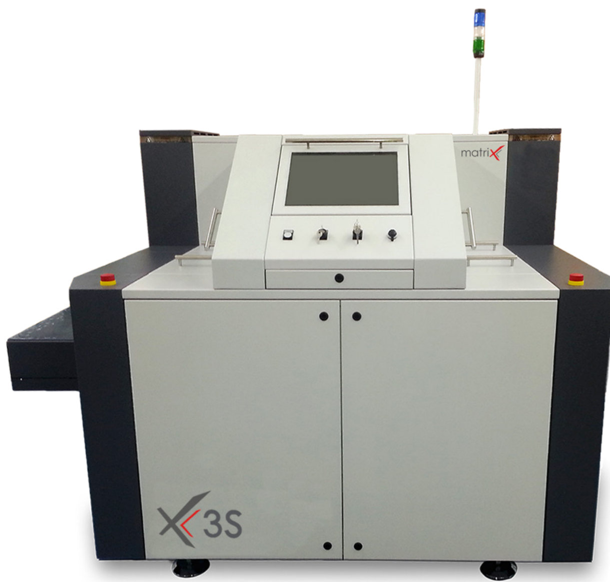

Automated X-ray Inspection System

SFT™ - Off-Axis - 3D SART

X3S

High-Speed In-line X-ray system

The MatriX **X3-S** is an automatic X-Ray inspection system featuring combined Transmission (TR) and 3D Technology for sophisticated high-speed inspection in electronic production. The system is based on the MatriX X2/3 AXI system platform but is equipped with additional detector axis system used to generate the angle-shot images for the 3D reconstruction. The 3D SART reconstruction software generates high resolution slice images for 3D analysis of solder joints. Main applications are double-sided boards with critical overlapping areas.

MIPS_Tune is an off-line programming software package for test program generation with automatic CAD import or alternatively without CAD data. It features automated inspection list generation based on an advanced algorithm library for transmission and off-axis joint inspection. Proprietary **Tree-Classifcation** technique with integrated automatic rule generation, graphical measurement & yield display for program optimization.

The verifcation software module MIPS_Verify with its closed-loop repair concept is capable of in-line or off-line verifcation using a graphical board layout display and X-ray image with defect marking. **MIPS_Verify** supports parallel display of off-axis, transmission and optical images of the same defect for easy and reliable defect verifcation. **MIPS_SPC** is a process control tool for real-time and history statistics.

Features and Benefits

- Combined Transmission X-Ray & 3D Technology
- Transmission: up to 5-6 images/sec (5 sq. inch/sec)
- 130 kV x-ray tube (sealed)
- Flexible Off-Axis Technology with modular detector setup
- 5-axes progr. motion
- Automatic grey-level & geometrical calibration
- In-line board handling with automatic width adjust.
- Barcode scanner 1D/2D for serial number and product type selection

Inspection & Process Software

MIPS Hardware

- PC-Station with multi-core processor setup
- Windows 7 or Windows 10 platform

MIPS Inspection Platform

- Advanced algorithm library for solder-joint and component inspection
- 3D reconstruction software(SART)
- Automatic Tree Classifcation (ATC) for Auto-Rule-Generation
- Off-line programming with test-coverage display & auto program generation
- Real-time SPC

Verifcation & process control

- MIPS_Verify link with closed loop repair
- MIPS_Process with real time SPC

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Applications

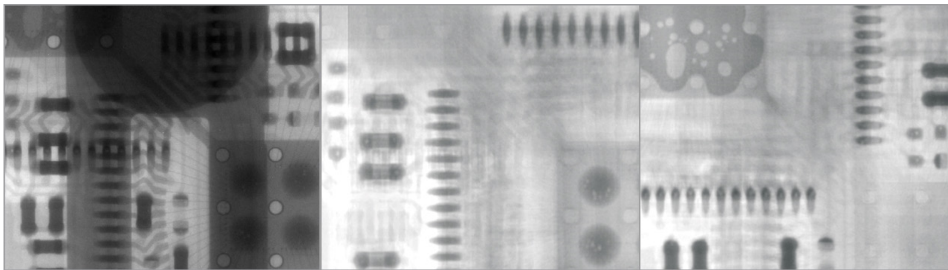
ELECTRONIC COMPONENTS AND SOLDER-JOINT

A unique advanced algorithm library is available for electronic applications, specifcally for component and solder-joint inspection on PCB, hybrid or chip level assembly processes.

- All standard SMD and THT/PTH components
- Specifc BGA and QFN algorithm
- Cooling plates/heatsink void inspection

ALGEBRAIC 3D RECONSTRUCTION

The newly developed algebraic reconstruction algorithm for 3D analysis is the highlight of the inline 3D system X3. It requires only few projections for gene-ration of detailed, high resolution slice images. In addition the algorithm is independent of geometries and therefore offers optimum fexibility with respect to the acquisition setup.



Specifications

Facilities

Dimensions:
1650 mm (H) x 1800 mm (W) x 1600 mm (D)

Adjustable conveyor height:
(SMEMA): 700 mm to 800mm

Weight: 3.500 kg

Safe Operating Temperature: 15° - 32 °C

Power Consumption: max. 6 kW

Line Voltage: 400 VAC, 50/60 Hz 3 phase, 16 A
208 VAC, 50/60 Hz 3 phase, 25 A

Air: 5-7 Bar, < 2 l/min, filtered (30μ), dry, oil free

Part Handling / Motion

High-speed sample table with linear drives

Driving distance X,Y: 510 x 410 mm

Position repeatability: +/-5 µm

Z-drive: x-ray tube

Angle shot cap. up to 45

Y1: for detector 1

X-ray Source (sealed tube)

Energy: 130 kV/40 W

Focal Spot Size: 5 - 7 microns

X-Ray Tube Orientation: End window tube

X-ray Imaging

Grey value resolution: 14 bit

Video output: Camera link interface

Detector Type A: CMOS Detector (1,5 k x 1,5 k)

Active inspection area: 115 x 115 mm

Detector Type B: CMOS Detector (2 k x 2 k)

Active inspection area: 115 x 115 mm

Inspection features

Angle shot capability: 0 – 45 dgr

(A) Standard FoV high-speed setup

Transmission FoV: 10 mm to 30 mm

Object resolution (@min. FoV): 8-10 µm

(B) high-resolution setup

Transmission FoV: 7,5 mm to 25 mm

Object resolution (@min. FoV): 3-5 µ

Sample Inspection Parameter

Max. board size: 18”x 14” (460 x 360 mm)

Min. board size: 100 x 80 mm

Max. inspection area: 460 x 360mm

Max board weight: 2,5kg

Board thickness: 0,8-5 mm

Assembly clearance

Topside: (incl. board thickness): 30 mm

Bottom side: (excl. board thickness): 30 mm

For more information, speak with your MatriX representative.

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