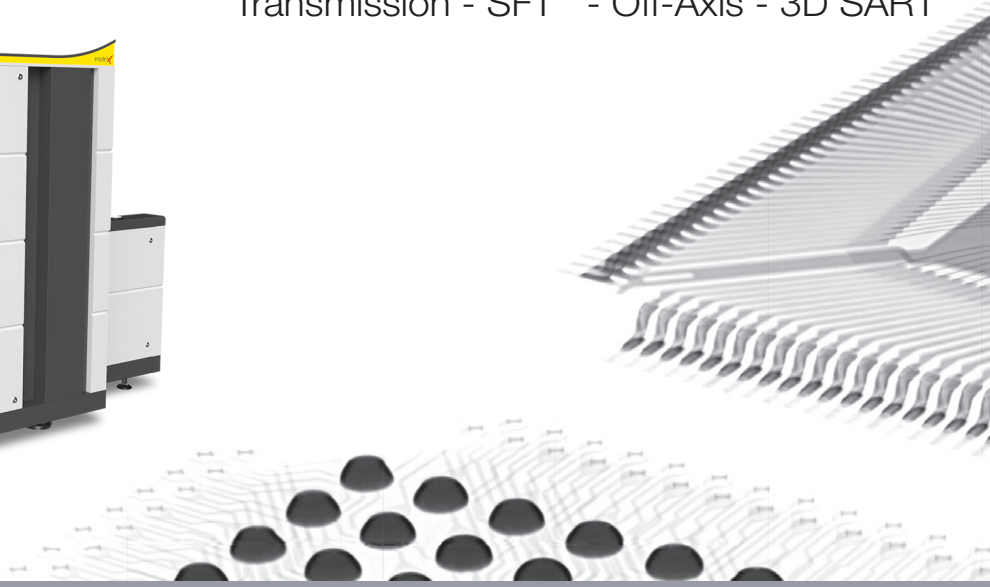
Automated X-ray Inspection System

Transmission - SFT™ - Off-Axis - 3D SART



X3# High resolution setup / Semi-Backend

The MatriX **X3#** is an automated inspection system designed for sophisticated high-speed inspection in SMT production. Transmission X-ray Technology with patented Slice-Filter-Technique (SFT) and Off-Axis technology present a reliable solution for the in-line inspection of double-sided PCB assemblies. The X3# movable detector axes allow high-speed off-axis image acquisition from different angles and directions with maximum image quality and resolution. A newly developed 3D reconstruction software generates slice images for 3D analysis of solder joints.

MIPS_Tune is an off-line programming software package for test program generation with automatic CAD import and for graphical application parameter tuning. It features an automatic inspection list generation based on an advanced algorithm library for transmission and off-axis joint inspection. Proprietary **Tree-Classification** technique with integrated automatic rule generation, graphical measurement & yield display for program optimization. The verification software module **MIPS_Verify** with its closed-loop repair concept is capable of in-line or off-line verification using a graphical board layout display and X-ray image with defect marking. Support of multiple inspection modes with parallel viewing of transmission oblique view and optical images of the same defect for easy and reliable defect verification.

Features and Benefits

- High Speed AXI System for In-line and Off-Line setups
- Microfocus X-RAY tube: 100kV/20W sealed tube / maintanence free
- 5-axes programmable motion system with servo drives (X-Y sample table, Z-axes x-ray tube, U,V detector axes)
- Digital CMOS Flatpanel Detector (14 bit, 2,3k x 2,3k, 50 µm)
- Automatic grey-level and geometrical calibration
- In-line pass through board handling with automatic width adjust
- Barcode scanner (1D/2D) for serial number and product type selection
- Full product traceability via customized MES-Interface
- Optional: Combination with substrate magazine or stack handler
- Optional: handling setup for ceramic samples
- Defect marking system

Inspection & Process Software

- PC-Station with multi-core processor setup
- Windows 7 or Windows 10 platform
- CAD Import for automatic inspection list generation
- Advanced Algorithm Inspection Library for chip-packages with wire-bond positions
- Slice-Filter-Technique (SFT) for double-sided board inspection
- 3D SART for 100% test coverage
- Automatic-Tree Classification (ATC) for Auto-Rule-Generatio
- Off-line programming for AXI program generation & simulation, tuning and defect reference catalogue
- MIPS_Verify link with closed-loop repair
- MIPS_SPC for real-time process control

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Applications

ELECTRONIC COMPONENTS AND SOLDER-JOINT

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

- All standard SMD and THT/PTH components
- Specific bond-wire algorithm library
- Off-axis imaging for wire-sweep analysis
- Advanced die-attach & voiding algorithm
- Epoxy overlap detection
- Wafer-Bump Algorithm

ALGEBRAIC 3D RECONSTRUCTION

The newly developed **S**imultanous **A**lgebraic **R**econstruction **T**echnology for 3D analysis is the highlight of the inline 3D system X3#. It requires only few projections for generation of detailed, high resolution slice images. In addition the algorithm is independent of geometries and therefore offers optimum flexibility with respect to the acquisition setup.

Specifications

Facilities

Dimensions:
1.670 mm (H) x 3.100 mm (W) x 1.760 mm (D)

Adjustable conveyor height (SMEMA):
890 – 980 mm

Weight: 3.000 kg

Safe Operating Temperature:
15° - 32 °C optimal 20° - 25° 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

Driving distance X,Y: 510 x 410 mm
X-Ray tube (Z): 0 - 150 mm
Detector Axes (U,V): 220 x 200 mm

X-ray source (sealed tube):

Energy: 100 kV/20 W
Focal Spot Size: 4-5 microns
X-Ray Tube Orientation: End window tube

X-ray Imaging

Grey value resolution: 14 bit
Video output: Camera link interface
Detector: CMOS Detector (2.3 k x 2.3 k)
Active inspection area: 115 x 115 mm

Inspection features

Angle shot capability (100kV): 0 – 25 dgr
Wide Beam Setup (130kV): 0-45 dgr
Transmission FoV: 5 mm to 30 mm
Object resolution (@min. FoV): 2-3µm

Standard SMT setup

Max. board size: 20”x 14” (510 x 350 mm)
Max. inspection area: 19”x 16” (480 x 410 mm)

Common PCB-Sample Spec’s

Min. board size: 3” x 1.5” (80 x 40 mm)
Max board weight: 7 lbs (3 kg)
Board thickness: 0.008” – 0.2” (0,2-5 mm)

Assembly clearance

Topside: (incl. board thickness): 30mm
Bottom side: (excl. board thickness): 30mm
Edge clearance for clamping: 1-2 mm

For more information, speak with your MatriX representative.

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