

Automated X-ray Inspection System Transmission - SFT™ - Off-Axis



X2.5# SMT Setup

The MatriX **X2.5#** 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 X2.5# movable detector axes allow high-speed off-axis image acquisition from different angles and directions with maximum image quality and resolution.

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
Transmission: 3-4 images/sec
Off-axis: 2-3 images/sec
- Microfocus X-RAY tube: 130kV/40W (wide beam) sealed tube / maintenance free
- 5-axes programmable motion system with servo drives (X-Y sample table, Z-axes xray tube, U,V detector axes)
- Digital CMOS flatpanel detector (14 bit digital output) standard & hi-res setup
- 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 MatriX AOI module (high-speed line scan with SIM technology)

Inspection & Process Software

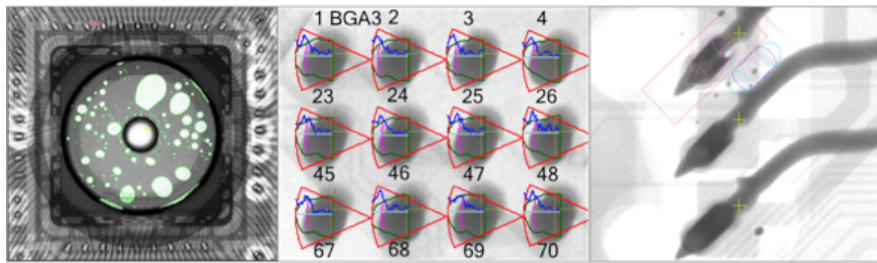
- PC-Station with multi-core processor setup
- Windows 7 or Windows 10 platform
- CAD Import for automatic inspection list generation
- Advanced Algorithm Inspection Library for solder joint and component inspection
- Slice-Filter-Technique (SFT) for double-sided board inspection
- Automatic-Tree Classification (ATC) for Auto-Rule-Generation
- 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

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
- PTH/THT Barrel Fill Measurement
- Specific BGA and QFN algorithm
- Advanced cooling plates/ heatsink
- Off-axis image analysis of BGA (HIP)
- Void inspection



Specifications

Facilities

Dimensions:

1670 mm (H) x 3100 mm (W) x 1760 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: 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 (2.3 k x 2.3 k)

Active inspection area: 115 x 115 mm

Inspection features

Angle shot capability: 0 – 45 dgr

Standard FoV setup

Transmission FoV: 10 mm to 40 mm

Object resolution (@min. FoV): 4-5 µm

High-resolution setup

Transmission FoV: 5 mm to 25 mm

Object resolution (@min. FoV): 2-3 µm

Sample Inspection Parameter

Standard SMT setup

Max. board size: 20"x 16" (510 x 410 mm)

Max. inspection area: 19"x 16" (480 x 410 mm)

XL SMT setup

Min. board size: 4" x 3" (100 x 80 mm)

Max board weight: 11 lbs (5 kg)

Board thickness: 0.03" – 0.2" (0,8-5 mm)

Assembly clearance

Topside: (incl. board thickness): 45 mm

Bottom side: (excl. board thickness): 50 mm

X2#: identical configuration except U, V axes for detector

MatriX Technologies GmbH
Dornacher Str. 5
85622 Feldkirchen (Munich)
Germany

+49.(0)89.189.4140.0 **Phone**
+49.(0)89.189.4140.99 **Fax**
info@m-xt.com
m-xt.com

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For more information, speak with your MatriX representative.

Germany

Feldkirchen (Munich)
+49.(0)89.189.4140.0 **Phone**
+49.(0)89.189.4140.98 **Fax**
info@m-xt.com **Mail**

Hildesheim

+49.(0)5121.875.8428 **Phone**
info@m-xt.com **Mail**

Hungary

Budapest
+36.(0)30.876.5038 **Phone**
hungary@m-xt.com **Mail**

USA

San Diego
+1.858.536.5050 **Phone**
+1.858.536.50.50 **Fax**
sales@focalspot.com **Mail**

Singapore

Singapore
+65.6513.5766 **Phone**
+65.6425.5231 **Fax**
singapore@m-xt.com **Mail**

China

Suzhou
+86.136.5620.3952 **Phone**
china@m-xt.com **Mail**

Japan

Kagoshima
+81.9954.38876 **Phone**
japan@m-xt.com **Mail**

Brazil

Vinhedo-SP
+55.1938.7605.35 **Phone**
info@m-xt.com **Mail**