



**Automated X-ray inspection system**

- Transmission
- Line scan
- Off axis



The MatriX **X2.5L** is an automatic inspection system designed for high-speed final inspection of printed circuit boards. The X2.5L is based on the well-established MatriX X-2.5 series systems. It is configured with a new generation of TDI X-ray cameras providing high speed, high sensitivity and high resolution. The configuration of the X2.5L allows the inspection of complete PCBs with only a few scans. In addition the MatriX X2.5L is equipped with one additional CMOS x-ray detector on an independent U/V stage. This allows 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 or alternatively without CAD data. The software supports automatic inspection list generation based on an advanced algorithm library for transmission and off-axis joint inspection.

The integrated rule generation feature allows manual and automatic creation of reliable rules.

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.

**MIPS\_Verify** supports parallel display of off-axis, transmission and optical images of the same defect for easy and reliable defect verification.

**FEATURES**

**SYSTEM FEATURES**

- High-speed AXI System up to 400 mm/sec (Line Scan)
- Wide angle microfocus X-ray (sealed), 130 kV/40 W
- High-speed readout TDI camera (Line Scanner)
- Scan width up to 100 mm
- Additional CMOS detector (14 bit, 2k x 2k)
- 5-axes programmable motion system
- Automatic grey-level and geometrical calibration
- Barcode scanner (1D/2D) for serial number and product type selection

**MATRIX INSPECTION & PROCESS SOFTWARE**

**MIPS Hardware**

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

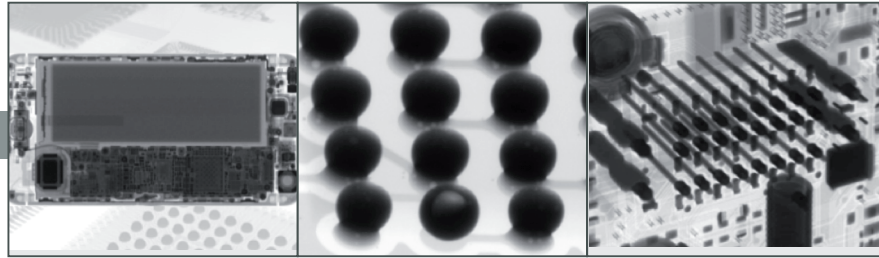
**MIPS Inspection Platform**

- CAD Import for automatic inspection list generation
- Advanced algorithm library for solder-joint and component inspection
- Slice-Filter-Technique for double-sided boards
- Automatic Tree Classification (ATC) for Auto-Rule-Generation
- Off-line programming for AXI program generation & simulation, tuning and defect reference catalogue

**Verification & process control**

- MIPS\_Verify link with closed loop repair
- MIPS\_Process with real time SPC

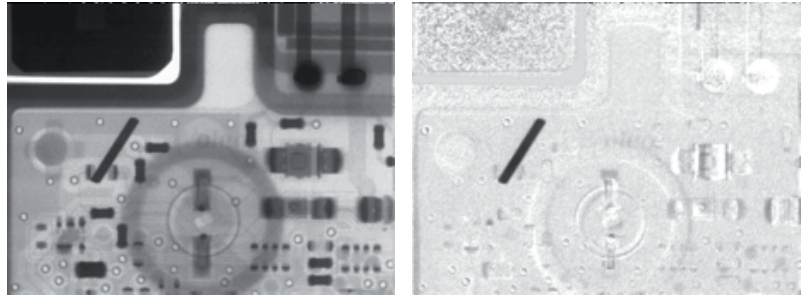
## APPLICATIONS



### ELECTRONIC COMPONENTS AND SOLDER-JOINTS

A unique advanced algorithm library is available for electronic applications specifically for component and solder-joint inspection on complete PCB assemblies.

- All standard SMDs and THT/PTH components
- Specific BGA and QFN algorithm
- Off-axis image analysis of e.g. BGA, THT
- Cooling plates/heatsink void inspection
- Assembly completion test



MatriX SFT golden master technology for automated detection of additional objects

## SPECIFICATIONS

### Physical Dimension

Dimensions .....	2370mm (W) x 1982mm (H) x 1572mm (D) (with integrated in- and output conveyor)
Weight .....	2800 kg
Conveyor Height .....	750 – 850 mm
Front Rail Distance .....	338,5 mm
Safe Operating Temperature .....	15° - 32 °C
Relative Humidity .....	40 – 70%
Power Consumption.....	max. 6 kW
Line Voltage .....	400VAC, 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

### Motion System

High-speed sample table with linear drives (X,Y)	
Driving distance X,Y.....	510 x 405 mm
Position Repeatability .....	+/- 5 µm
X-ray tube (Z) .....	0 – 250 mm
Detector Axes (U,V) .....	250 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

### Image Detector

Detector Type 1 .....	Line Scan TDI Camera
Grey value resolution .....	12 bit
Detector Type 2 .....	CMOS Detector (2k x 2k)
Active inspection area .....	48 x 48 mm
Grey value resolution .....	14 bit
Video Output .....	Camera Link Interface

### Image Performance

FOV & Resolution (typical)	
Object resolution TDI (@70mm FOV).....	15 µm
Object resolution Flat Panel (@min. FOV) .....	3,5-7 µm
Angle shot capability.....	0 – 45 dgr

### Sample Inspection Parameter

Fix tray size (X) x (Y) .....	450 mm x 350mm
Sample/tray weight .....	up to 5kg
Assembly Clearance (standard)	
Topside (incl. board thickness).....	15 mm
Bottom side (excl. board thickness).....	10 mm
Edge clearance for clamping .....	≥ 5 mm

### Safety / Regulatory

Full safe, interlocked enclosure. Complies with all U.S. and International standards for cabinet radiography systems. CDRH directives / CE compliant.