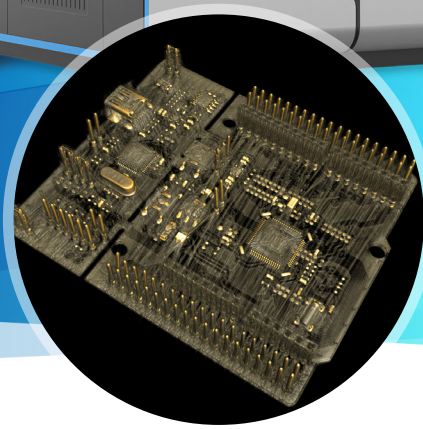


MQX.tracE CT

3D CT Inspection for PCB,
Electronics & Semiconductor
Assemblies



Move from visual guesses to measurable certainty. MQX.tracE CT combines high-clarity 2D X-ray with 3D CT slicing/reconstruction to reveal hidden defects, validate internal layers, and generate traceable inspection reports for production QA, R&D and failure analysis.



Detect internal defects early (before rework or field failures)



Separate overlaps using 3D CT slicing for confident decisions



Standardize inspection with manual, semi-automatic or automatic workflows



Generate evidence-ready inspection reports for traceability

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2D gives answers. CT gives certainty.

As PCB assemblies become denser and more layered, 2D views can hide defects due to overlap. Computed Tomography (CT) reconstructs the internal volume, letting teams inspect layer-by-layer, confirm the true root cause, and document results consistently.



Acquire (2D)

Fast screening and navigation



Slice (CT)

3D reconstruction and slicing to separate overlaps



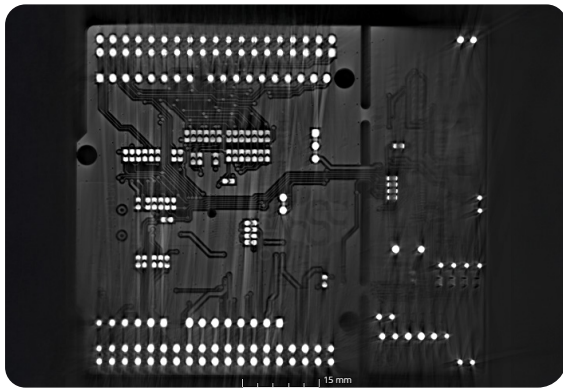
Analyze

measurement & defect evaluation tools for electronics

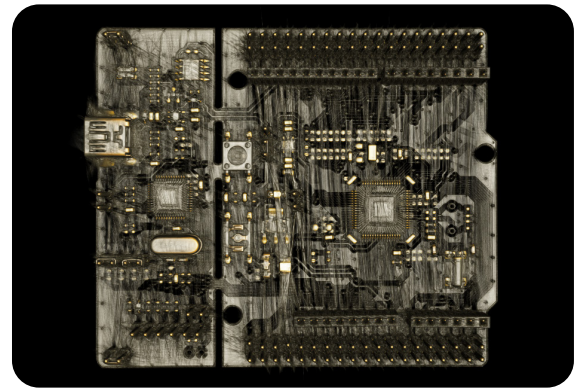


Report

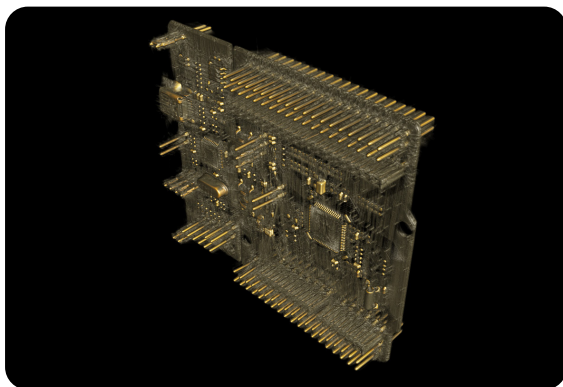
Automatic inspection reporting for traceability



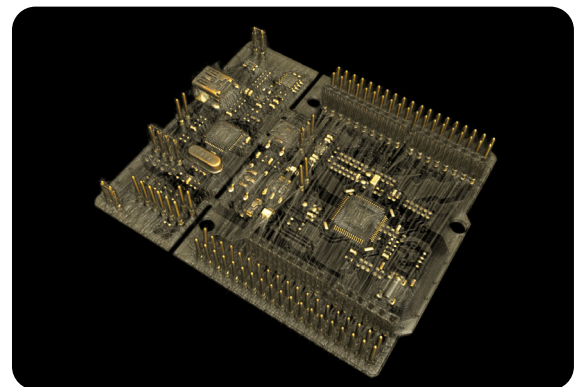
2D X-ray acquisition (screening)



CT slice / internal layer separation



Analysis view
(measurement / defect review)



3D reconstruction
(evidence-ready view)

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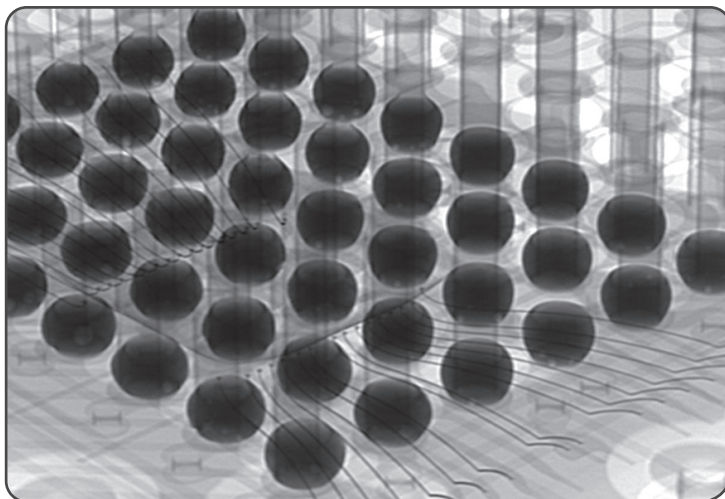
SMT inspection for dense assemblies - faster decisions, fewer escapes

MQX.tracE CT supports real-time and automated & semi-automated workflows for SMT production and advanced QA. Evaluate solder joints, voiding, geometry and common SMT failures, then confirm uncertain regions with CT slicing.

BGA / QFN / QFP checks

- › BGA & pad array void analysis; package void analysis
- › Ball diameter and circularity; missing BGA; ball mount
- › Head-in-pillow; bridging; solder connection issues
- › Pass/Fail detection support for consistent decisions

High-magnification inspection of BGA solder joints and internal connections



Oblique-angle BGA inspection showing hidden solder joints and internal interconnections



SMT inspection: BGA/QFN evaluation with CT confirmation

SMT inspection: BGA/QFN evaluation with CT confirmation



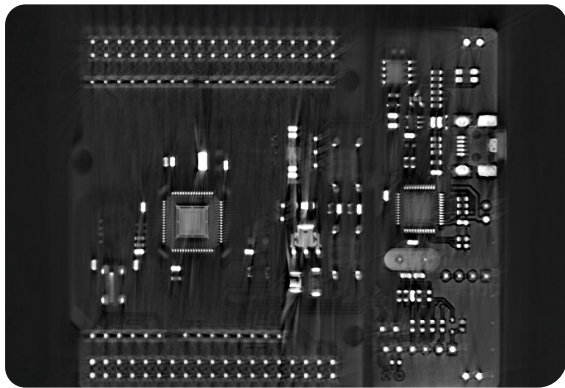
Beyond SMT - through-hole inspection & advanced measurement tools

PTH Inspection

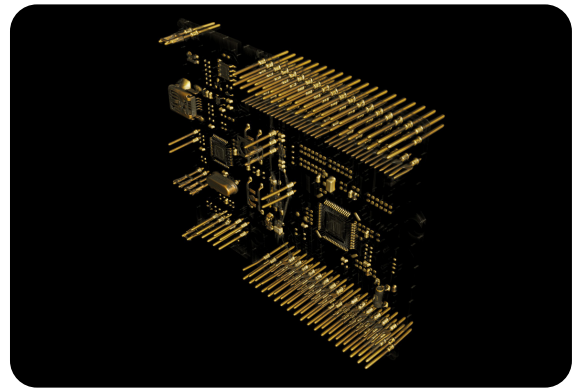
- › Through-hole and pin-level inspection
- › Measurement tools for package / semicon analysis
- › Supporting analysis view

Measurement & Analysis Tools

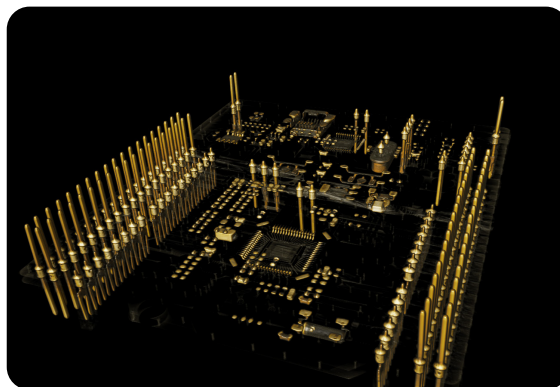
- › Semiconductor measurement tools: bond wire sweep, die attach void measurement, pass / fail analysis
- › Package measurement tools (e.g., gull-wing QFP/SOIC): joint area measurement, percent void, pass / fail analysis
- › Drill offset measurement: centre-to-centre offset (X,Y)



Through-hole and pin-level inspection



Measurement tools for package / semicon analysis



Supporting analysis view

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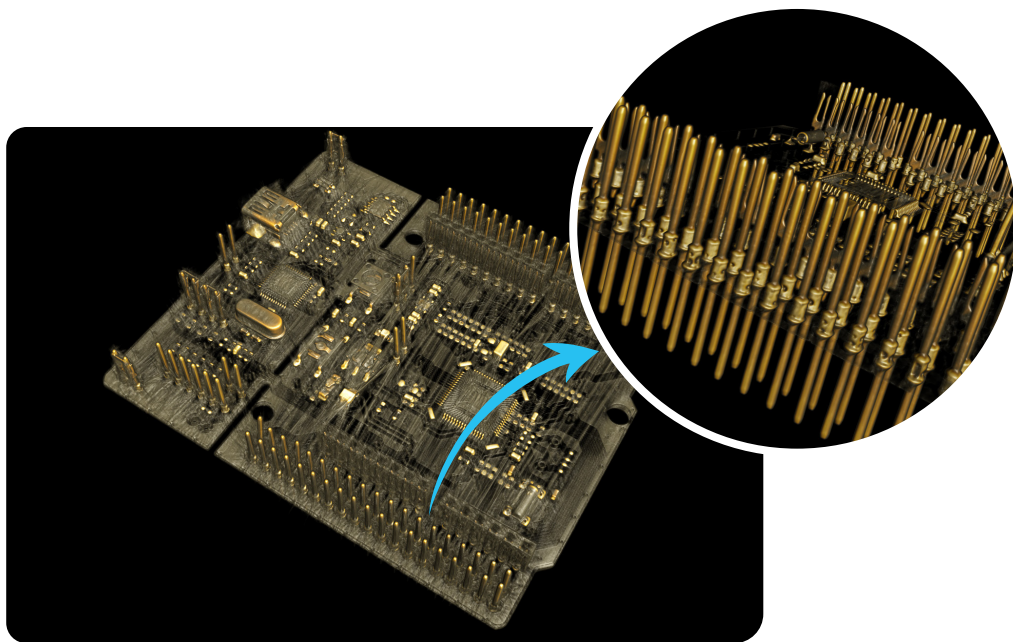


Failure analysis without destructive sectioning

For complex electronics, 2D views can be ambiguous. 3D CT reconstructs the internal volume so teams can isolate layers, verify internal geometry, and accelerate root-cause analysis—without physical sectioning.

CT benefits

- › Layer-by-layer visibility for complex stacked features
- › Earlier detection of hidden variations and internal anomalies
- › Faster R&D and FA cycles with evidence-ready slices
- › Better cross-team communication (QA ↔ R&D ↔ Supplier)



CT slice view for internal layer separation

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Software & controls that standardize inspection and reporting

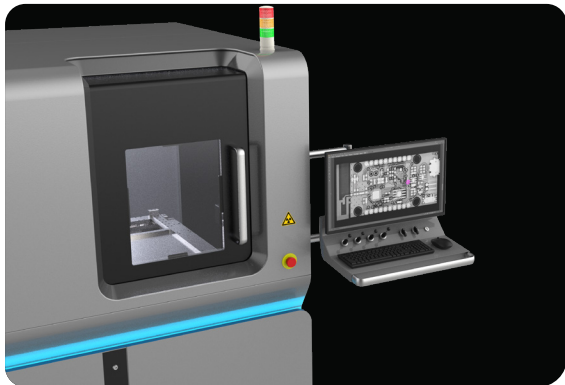
MQX.tracE CT helps operators reach consistent decisions quickly; using analysis tools, repeatable routines, and printable reporting.

Operator control & modes

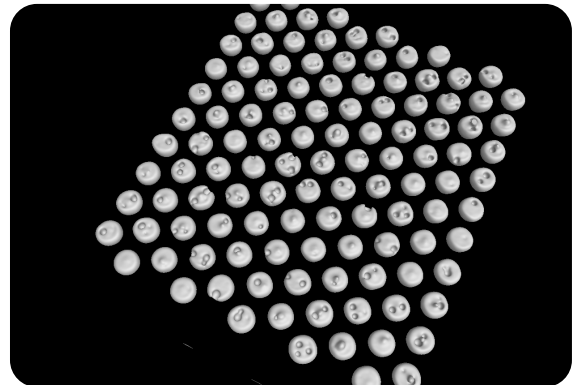
- › Joystick & mouse control for navigation and zoom
- › Manual / semi-automatic / automatic inspection modes; macros/programs for repeatability
- › Automatic homing of all axes for repeatable positioning

Image processing & analysis

- › Image processing filters and enhancement tools (quad view, annotation, point-to-point distance measurement)
- › Post-capture enhancement library (sharpen/smooth/detect/negative/3D grey plot/pseudo colour/histogram)
- › Automatic inspection report + layer image analysis/report generation tools



Intuitive inspection control console



Inspection interface showing detailed analysis of PCB internal structures

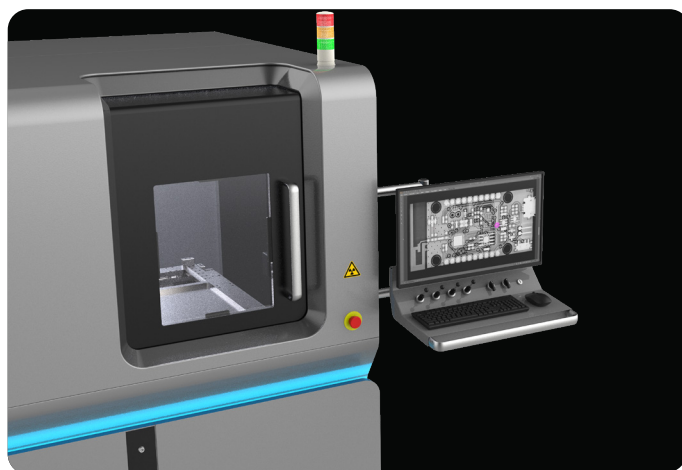
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Key Technical Specifications

Parameter	Value
Power	AC mains 220–230V, 50 Hz, single phase
Anode voltage	30-160 kV
Target power	≤15 W
X-ray source	Open tube, transmission target
Resolution	≤ 0.75 μm (An appropriate kV vs. Focal Spot vs. Resolution chart will be provided)
Magnification	Geometric ≤ 3000 × ; Total ≤7500×
Imaging	>1 MP; 10 FPS; 16-bit ADC processing
Manipulator	Five-Axis Manipulator Rotation: 360° continuous rotation for full circumferential access Tilt: ±70° tilt range for precise component alignment
PCB capacity	Max PCB 440×550 mm; inspection area 310×310 mm; sample weight 5 kg
Inspection modes	Manual, Semi-Automatic, and Automatic; with support for Macros/Programmable Sequences
CT capability	Computed Tomography & 3D slicing/reconstruction
Radiation safety	< 1 μSv/hr at cabinet surface
Image export	RAW / JPEG / TIFF / GIF / BMP
Vibration mitigation	Equipped with standard anti-vibration supports to maintain operational stability and precision.



Intuitive inspection control console

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Safe, compliant, and ready for lifecycle support

Safety & enclosure

- › Full protective enclosure — no protective clothing required
- › Front load door interlock: automatic X-ray OFF with key interlock
- › Anti-collision mechanism to avoid tube touching the sample
- › X-ray ON caution light & emergency stop
- › Radiation safety: < 1 $\mu\text{Sv/hr}$ at cabinet surface

Documents & accessories

- › Calibration certificates (if applicable), technical manual with spares list and wiring diagrams
- › Hard copy operating manual & soft copies (maintenance/operations /programming/spares)
- › X-ray accessories: digital pocket dosimeter, digital gamma area monitor, radiation survey meter

Lifecycle support

- › MRLS for 2 years + spares list for 2-year exploitation period
- › Software support for 10 years (upgrade + maintenance)
- › Installation & commissioning work services at user premises



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