Hardware Specifications

X-ray Tube	
Tube-type	Micro-focus Open Tube
Focal Spot Size	1um
Max. Tube Voltage	160kV
Max. Tube Current	200uA
X-ray Imaging	
Detector	4/6" or 2/4" Dual-fold Image Intensifier
CCD Camera	1.4Mega Pixel (Option – 2.0Mega Pixel)
System Magnification	Max. 4,800x (2/4" Image Intensifier)
Manipulator	
Table Size	460mm x 510mm
Max. Sample Loading	5Kg
Stroke - X axis	400mm
Stroke - Y axis	450mm
Stroke - Z axis	200mm
Detector Tilt	Max. 60°
Table Rotation	Max. 360°
Workstation	
Monitor	24 inch LCD
CPU	Intel® Pentium i5 Process
Memory	4GB
HDD	250GB x 2EA Rack Type
General	
Dimension / Weight	1,550 x 1,750 x 1,850 mm / 2,200Kg
Power	220 VAC Single Phase 50/60Hz
X-ray Safety	Leakage Dose less than 1uSv/hr

Optional Configuration:

X-eye SF160SL - Enlarged Table Size of 550mm x 650mm
- Working table size: 500mm x 600mm
- Dimension: 1,650 x 1,860 x 1,850 mm

Software Features

- **User-friendly Interface**
  - Intuitive, flexible workspace
- **Easy-to-use Mouse Manipulation and Navigation**
  - "Click & Center" on X-ray image or Jog-stick control
  - Navigation Panel shows actual table Images
- **Auto BGA Inspection Module**
  - Auto calculation of BGA diameter, Void percentage
  - Auto Pass/Fail determination
- **Inspection Mode Selection**
  - Database management of X-ray and image adjustment parameters
- **Image Processing**
  - Averaging, Contrast/Brightness, Binarization, Inverse
  - Histogram Adjustment
  - Image Filtering: Sharpening, Enhanced Focus
- **Various Measurement & Annotation Tool**
  - Measuring: Line, Point to Point, Center to Center
  - Annotation & Reporting

3D CT Module Specifications

Workstation for 3D CT	
Monitor	24 inch LCD x 2EA (Dual Monitor)
CPU	Intel® Pentium i7 Process
Memory	12GB
HDD	500GB + 250GB(SSD)
3D Reconstruction & Viewer Software	
Recon. Algorithm	Feldkamp Cone-Beam Algorithm
Scan Mode	Normal Scan (Full, Half), Oblique Scan
3D Recon. Matrix.	Max. 2048^3
Recon. Time	< 10 sec.
CT Manipulation Hardware	
'Quick Exchange' CT Manipulator for Cone-beam CT Scanning. High-precision rotation motor mounted perpendicular to X-ray tube & Detector direction. Oblique CT does not require any table switching .	

3D CT Module is an option for X-eye SF160 Series System

3D CT Software Features

- **VR (Volume Rendering) for 3D**
- **Visualization from any angle**
- **DICOM 3.0 standard compatible**
- **3D Sync.**
- **Unlimited Oblique Slice / Unlimited level Oblique View**
- **VR with cut plane, MIP, MPR**
- **3D Measurement with Analysis Features**
- **3D Zoom**
- **Report Function**

DJK Europe GmbH

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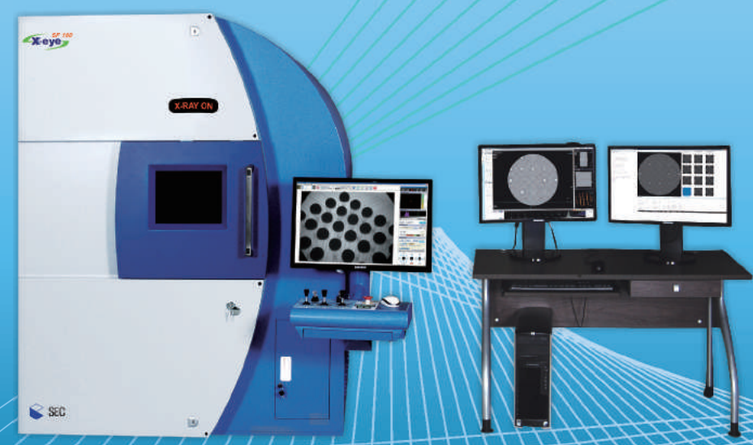
X-eye SF160ACT

The Ultimate Solution for X-ray 3D CT Analysis



- **160kV Micro-focus X-ray Open Tube with 1 micron focal spot size**
- **460mm x 510mm Table Size with full enhanced stroke axis (X,Y,Z,T,R)**
- **Max. magnification up to 4,800x**
- **Unparallel User Interface with various software tools**
- **Micro-CT Module & Oblique CT Scanning**

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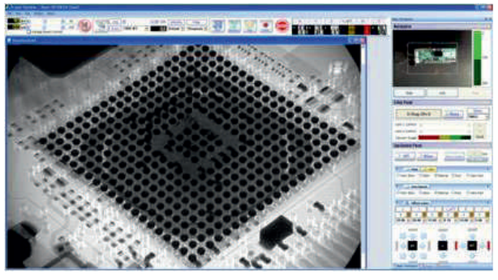
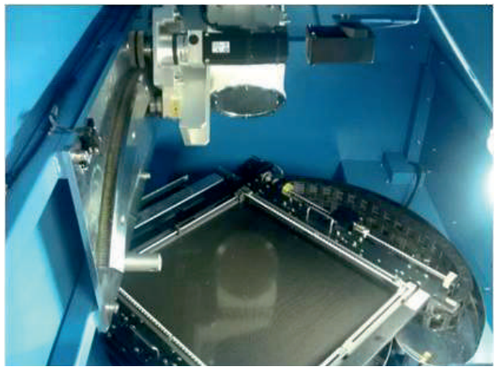
Contributing to your global success

The Ultimate Solution for 3D CT Analysis

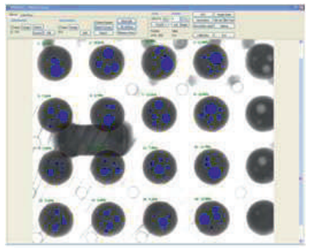
SF160ACT is a high-resolution micro-focus X-ray system for the inspection of semiconductor, PCB assembly and electronic component. With its superior X-ray imaging, micro-scale hidden defects can be detected in high resolution.
SF160ACT equips 160kV micro-focus open tube with 1um spot size. The system can magnify the object up to 4,800x and display the X-ray image at any angle using 6-axis manipulator configuration.

3D CT (Computed Tomography) visualizes all hidden structure and even micro-scale defects inside the object.
SEC unique oblique CT technology realizes high-magnified 3D CT visualization of large sample. Generally, it is known that CT scanning is limited by the object size, but oblique CT technology overcomes the size limitation and can be adapted to PCB assemblies, large-size multilayer boards and even to semiconductor wafers.

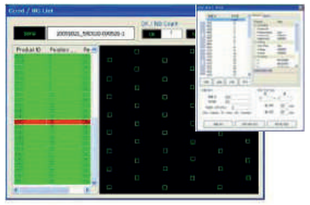




Unparalleled User-friendly Environment

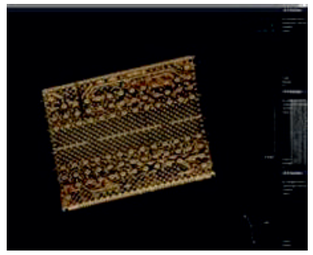


Auto BGA Inspection Module



Auto Teaching (CNC Programming)

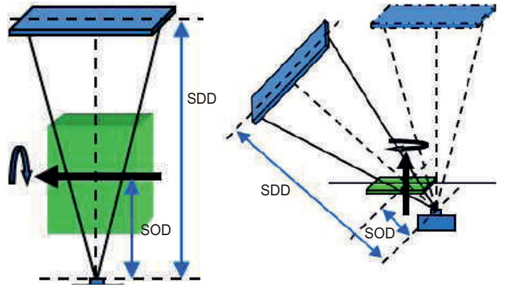
Jog-sticks & One-click Teaching Buttons



3D CT Rendering Software

- **Intuitive and Flexible User Interface**
- **No Complicated Jog-stick or Mouse Control**
- **Real-time Image Acquisition**
- **Auto Focus Tracing – Never lose your point of view**
- **Auto Teaching – Maximize Inspection Throughput**
- **GPU Based Ultra-fast 3D CT Reconstruction**
- **Easy Click-in Change Filament Replacement**

Oblique CT Scanning Technology



Cone Beam CT **Oblique CT**

· SDD : Source to Detector Distance
· SOD : Source to Object Distance

Cone Beam CT is generally used for 3D CT analysis of small electronic components. For analysis of flat and large size components such as PCB, Cone Beam CT is restricted to provide high magnified 3D images due to long source-to-object distance (SOD).

Oblique CT scans from an oblique direction while the object is rotating horizontally. This unique technology provides high magnified 3D images of flat and large components by horizontal object rotation without geometric interferences, and this realizes short source-to-object distance (SOD).

While inspecting the object in 2D, simply click the Oblique-CT scan button with no table switching, and the system will provide you the 3D CT images within minutes. GPU-based CT Reconstruction Engine will improve your throughput tremendously.

X-ray Images by Application

- **SMT (Surface Mount Technology) Assembly**
  - BGA / CSP - Open, Crack, Cold Soldering
  - General Solder Joint – Bridging, Void
  - Auto Voiding Area Calculation
- **Semiconductor Packaging / LED**
  - Wire Bonding – Broken Wire, Lifted Wire, Sweeping
  - Bump / Pattern Delamination, Void, Crack
  - 3D Packaging – MCP, TSV, FCB micro defect
- **Multilayer PCB (Printed Circuit Board)**
  - Multilayer Pattern Open/Short Inspection / Analysis
  - Via-Hole Alignment, Copper Wall Plate
  - FPCB (Flexible PCB) – Blind Via Hole (Laser Via)
- **Electronic Components**
  - Connector – Internal Wire Connection
  - Camera Module – Component Attachment
  - General Pattern Open / Short, Hidden Contamination