XT V 160 PRODUCT DESCRIPTION

The XT V 160 is a cabinet based X-ray system ideally suited for use in the electronics industry for real-time radiography of individual components and loaded PCB boards. The software comes complete with a suite of tools for analysis and measurement of common problems in electronics such as voiding, wire sweep etc. The system can also be used for examining small industrial parts and for academic projects using real-time radiography.

The system can operate at energies up to 160 kV with up to 20 W of X-ray into a transmission target which leads to a small X-ray spot size and thus high resolution in the images. The image intensifier and high quality CCD camera converts these images into high contrast images for image processing. We can easily achieve 500 nm feature recognition and smaller features can be seen if the contrast is sufficient.

The manipulator is designed to allow viewing of the sample at tilts of up to 75 degrees and to rotate the sample, with 75 degree tilted viewing angle and keep the same region of interest in view.

The lead lined cabinet shields the system to better than 1 μSv/hr of leakage making the system safe for operation in any environment and by any users. The cabinet and system are fully compliant with international safety regulations and feature dual safety interlocks on the door as well as visual and audio warnings of X-ray status. There is a lead glass window in the door to allow user viewing of the sample region, this window also acts as the entry port for samples into the system.

The Inspect-X software makes system set-up for interactive and automated inspection straightforward. Captured images can be analyzed interactively both on-line and in postprocessing.

The optional validation station runs an off-line version of Inspect-X ideal for off-line analysis on stored data and report writing.

The standard system is delivered ready to be fitted with the optional CT arm enabling Computer Tomography (CT) data acquisition for detailed 3D analysis.

KEY FEATURES AND BENEFITS

HIGH QUALITY IMAGES

- In-house NanoTech™ source with submicron focal spot size

- Maximum magnification (36000x) at unrivalled angles

- Large set of image enhancement tools

- True 75° tilting angle for easy optimal inspection of internal features

INTUITIVE TO USE

- Short learning curve – operational within 3 days

- Interactive joystick navigation

- True concentric imaging

- Dual screen for detailed and overview views

- Bar code reader to read board serial number

- Local language support facilitates use by local operators

FOCUS AT PRODUCTIVITY

- Large tray to load multiple boards

- Fast automated component inspection

SAFETY AS A DESIGN CRITERION

- Electrostatic shielding for component safety

- Full protective enclosure requires no need for special badges or protective clothing

- Continuous fail-to-safe monitoring

- Lead-lined cabinet fully complies to DIN 54113 radiation safety standards and CE regulation

LOW COST OF OWNERSHIP

- Open X-ray tube allows local maintenance of internal tube components

- Integrated source requires no high voltage cable

- Low system weight avoids special floor treatment

- Compact design easily fits double-door entries

- Easily maneuverable through 3-wheel transportation

TECHNICAL SPECIFICATIONS

System characteristics

Configuration	Vertical X-ray axis
Magnification	>36,000 x system magnification
Defect recognition	500 nm
Computer Tomography	CT ready / in-field update

X-ray source

The X-ray source is an integrated NanoTech source mounted below the tray vertically. It is an open tube design which leads to a low maintenance and low cost of ownership. The consumable filaments can be replaced quickly with minimal downtime.

Type	Nanotech™ Vacuum de-mountable
High voltage	Integral generator (maintenance free)
Max. electron beam power	20W
Max. voltage	160 kV
Target type	Nanotech™ Transmission
Target material	Tungsten
Control	Inspect-X™ software control

Imaging system

The standard imaging chain consists of a dual field X-ray image intensifier coupled to a CCD camera. The image is displayed in one of the two 19" monitors leaving the other monitor free for control software.

Imaging chain	Digital
X-ray detector	Dual field image intensifier
Digital camera	Megapixel Impix 1 / Impix 2
Image processing	16 bit (65,000 levels of grey)

Optional imaging: digital flat panels available

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X-ray cabinet

The cabinet is shielded to better than 1.0 µSv/hour, fully compliant with international radiation safety regulations. The cabinet features dual, independent safety interlocks on the door as well as visual and audio warnings of X-ray status

The XT V 160 system is supplied with a shelf for the keyboard and joystick controls and an arm for mounting of the monitors, with other shelves depending on the options chosen.

Safety standards	CFR 1 020.40, IRR 1 999, 96/29 EURATOM
Radiation safety	<1 uSv/hr at 5cm from cabinet surface or <0.1mR/hr at 2" from cabinet surface
Weight	1,935kg / 4,266lbs

Manipulator

The manipulator has 5 axes of travel, these axes can be driven either via the software user interface (where positions can be stored and axes can be locked) or via the integrated joysticks for intuitive and easy viewing.

The system can display images with a tilt of up to 75 degrees and can then rotate keeping the same region of interest in view for a full 360 degree rotation (or more).

The manipulator is programmed to avoid collisions for samples which are within the tray.

Type	Manual / Programmable, collision free*
Manipulator axes	5-axis (X, Y, Z, R, T)
Weight capacity	5kg (11 lbs)
X-axis travel	510mm (20")
Y-axis travel	510mm (20")
Tilt angle	0 – 75 degrees
Rotate	Continuous
Max sample size within tray	406mm x 406mm (16" x 16") 711mm x 762mm (28" x 30")

*Collision free when sample is within the confines of the carbon fiber tray

Control system

PC specs	Dual core processor, DVD burner, network ready, USB ports
Operating system	Windows XP
Programmable functions	Automated Inspection, fully programmable X-ray source, manipulator and image processing
Programming language	InspectionsTM, Simple teach and learn

Image processing

The following imaging features are available from within the control software

- Live image
- Averaged image
- Save image
- Load image
- Various image filters
- Contrast and brightness adjustment
- Wire sweep analysis
- BGA analysis
- Measurement tools
- Pseudo Color
- Binarise
- Background subtract
- Programming interface

A manual detailing all features is available upon request.

Also included are programmable Inspections, where a repeated task can be preprogrammed and run repeatedly.