IMAGE SCIENCE

X-ray Inspection System

μB1600

NEW

Digital X-ray Microscope

μB®1600

High performance in a Compact Body

Matsusada Precision

World's smallest Micro-focus

X-ray Microscope μB®1600

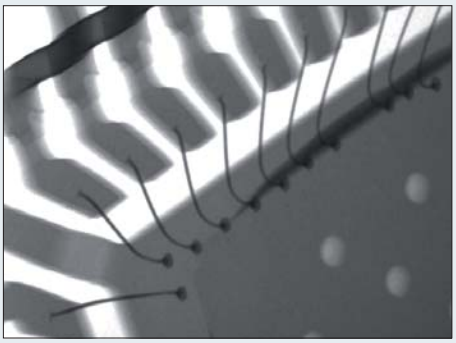
Matsusada Precision Inc.

As a leading manufacturer of high-voltage power supplies that has supported the cutting-edge area of X-ray inspection systems, semiconductor manufacturing and medical devices. We are proud to introduce the μB1600, a micromini model of micro-focus X-ray inspection system.
The μB1600 has an internal micro-focus X-ray source and high-resolution X-ray camera, and can perform transmission imaging and measurements regardless of installation locations.

1 *Futuristic Technology Integration*

The best images produced by state-of-the-art technology of X-ray and FPD

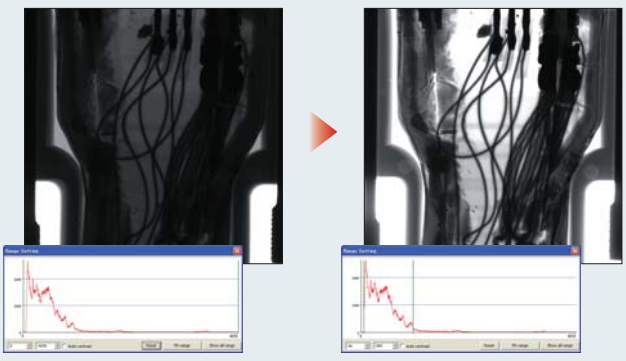
Matsusada's original technology detects the subtlest contrasting density of specimen that can not be detected by conventional devices. Additionally, the FPD built in the μB1600 provides even images with no distortion.



2 *Anyone can master the μB1600 quickly !*

Optimal conditions are automatically set

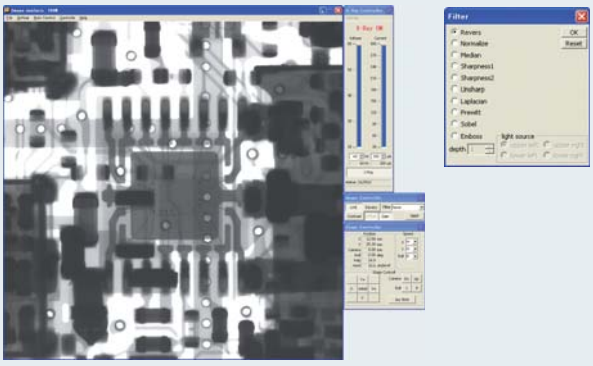
All an operator has to do is set a specimen and emit the X-ray. The μB1600 adjusts the contrast automatically and shoots the specimen under optimal conditions.



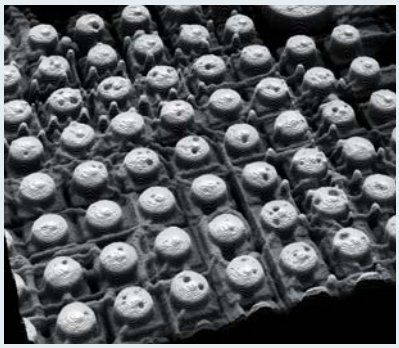
3 *Multifunctional but easy to operate*

Various image processing and measurement software are included as standard equipment

The μB1600 has massive functions that can be used as an analytical device, a matter of course, also as an inspection machine.
The μB1600 is easy to use. Even a first-timer can operate μB1600 smoothly.



▼ **3D display** (Density level)

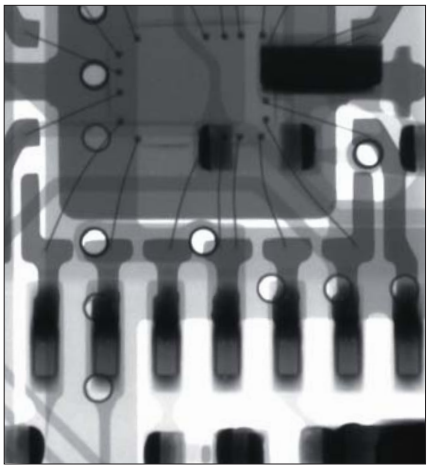


Leading Edge Technology in compact body

The world-first device

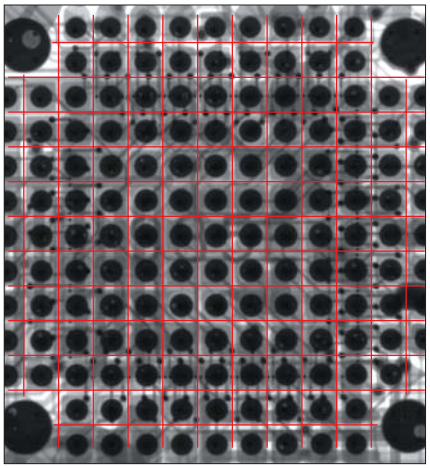
Micro-focus X-ray

The μB1600 has an internal micro-focus X-ray source creating ultra-high image quality in spite of its compact size. The integration of 60kV and 18W X-ray tube and Matsusada's high-voltage technique has succeeded in developing small-sized and high-performance X-ray generator.



Digital X-ray camera

A digital X-ray camera with a flat panel is used in the imaging part. The high-resolution camera with one million pixels of 1024 ×1024 clearly detects an object aimed at. Images with no distortion in every detail can be obtained.

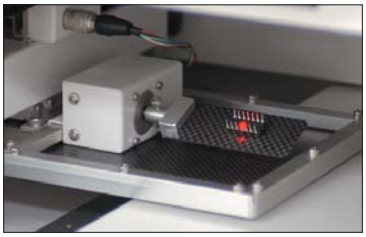


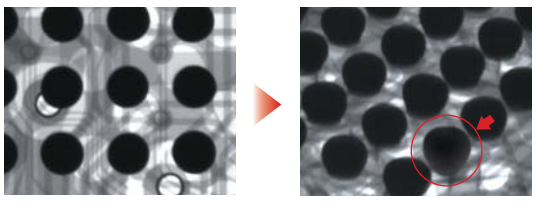
12bit digital data

High-definition data with one million pixels are imported by 12bit. The images can be processed and analyzed flexibly afterwards.

High-precision stage

A rotary stage is mounted in addition to the two axes of X, Y and variable magnification. Fluoroscopic observations from all angles are possible. The μB1600 meets the need of smaller parts that have to be analyzed in more detail. The μB1600 also detects the floating of BGA.



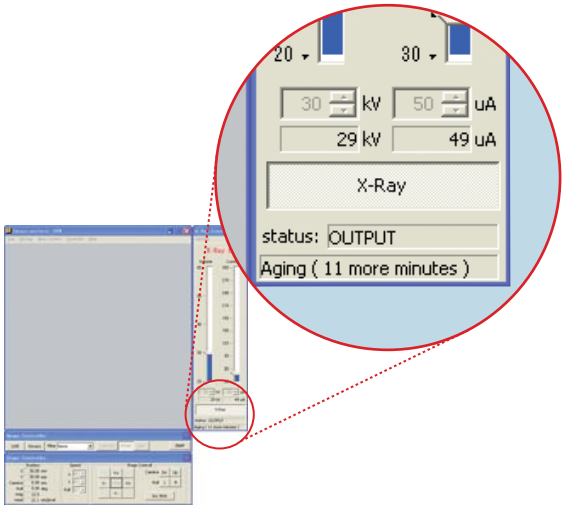


Floating of BGA can be recognized.

Ultimate Operability

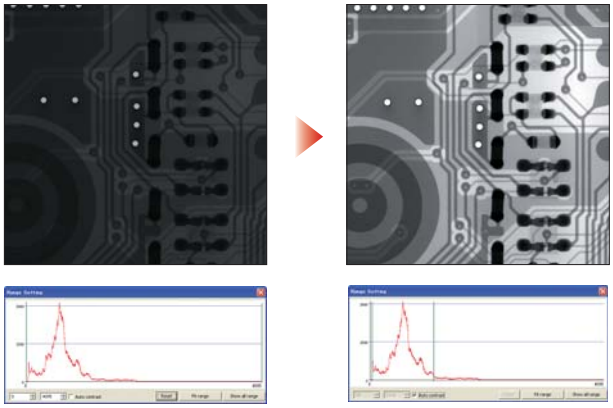
Autoaging function

Dates when the μB1600 were used are memorized. The aging time is selected automatically depending on the hours elapsed from the dates used allowing optimal aging.



Autocontrast adjustment function

Images shot by 12bit are displayed in optimal gradation sequence. Variations by photographers (e.g., dark images, whitish images, etc) can be eliminated to always display optimally. Even a first-timer does not miss the points that he or she wants to observe. It is also possible to display any given tonal ranges.

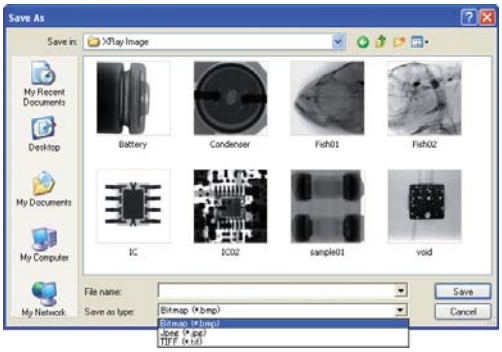


Automatic shutoff function

In some cases, people apply themselves for analyzing images and forget to turn off the X-ray. The automatic shutoff function turns off the X-ray automatically by setting time in advance. This function is also convenient in case an operator leave the device.

Data storage (bmp, jpg, tif)

Images both before and after analyses can be easily saved. Extensions including bmp, jpg, and tif can be selected depending on the extendability. Once saved data can be read out and analyzed repeatedly by the analysis software.



Smooth & Easy Operation

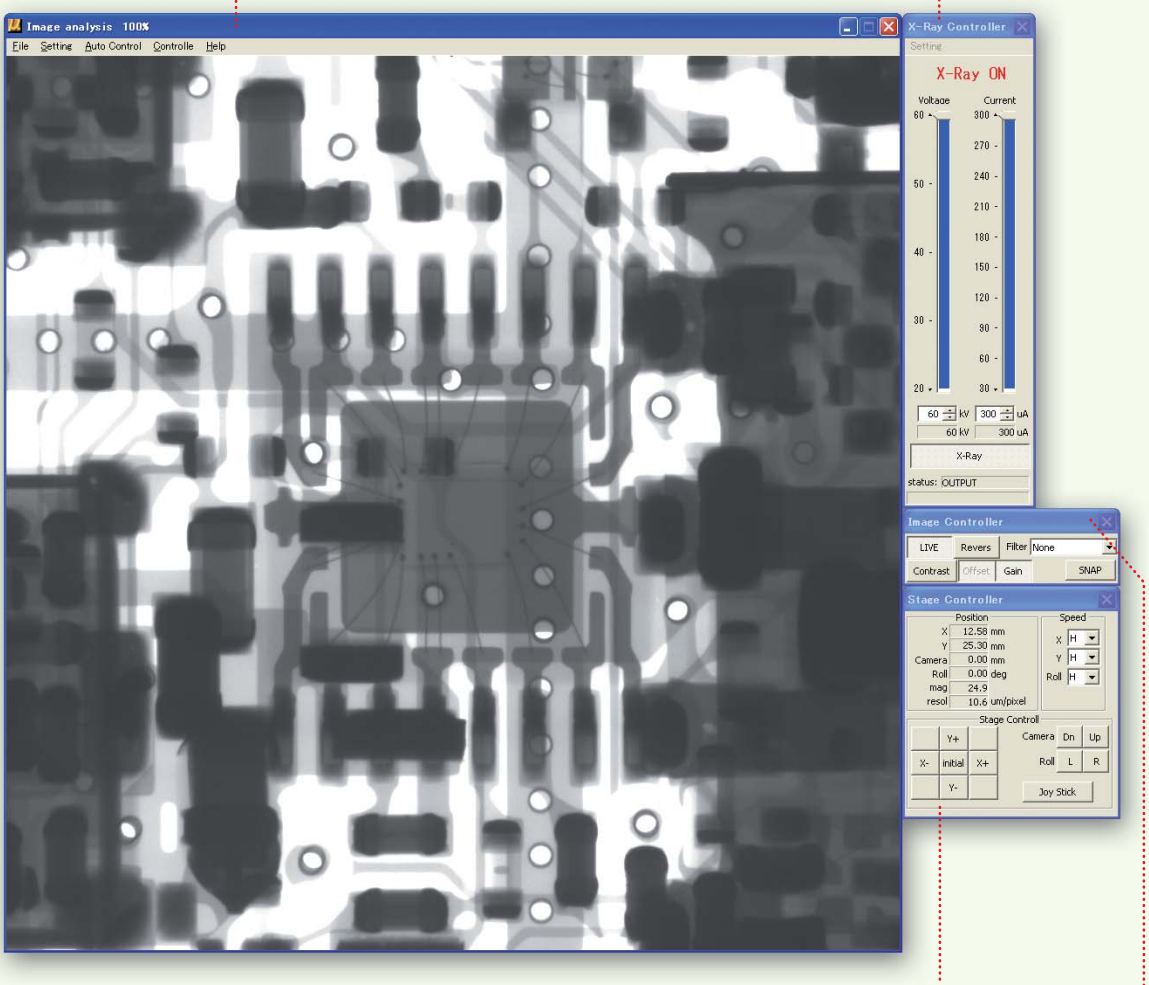
even for first-timers

Image analysis

The brand new image analysis software dedicated for our x-ray inspection system can controls the stage and X-ray with easily operations and is equipped with various image processing and measurement functions.

1 High resolution by one million pixels
Displays transfer imaging in real time.

2 X-ray controller
Controls switching ON/OFF of X-ray, X-ray tube voltage and tube current.



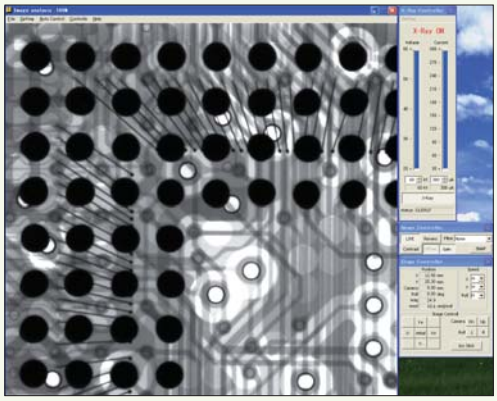
4 Stage controller
Controls the stage with the click of the mouse.

3 Image controller
Sets reading methods including the moving image filter and display range setting, etc.

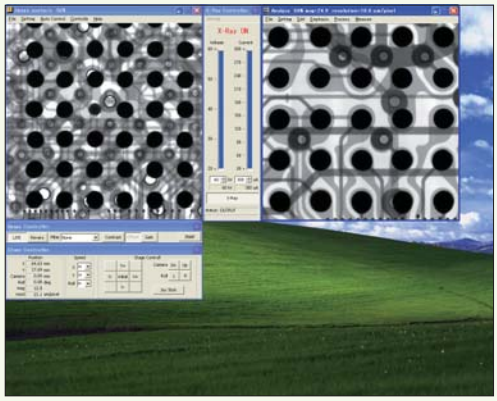
Reduced display function

The moving image window displays not only high-resolution images with one million pixels but also reduced images allowing specimen to be inspected comparing with the images on the static image window.

[High-resolution image]

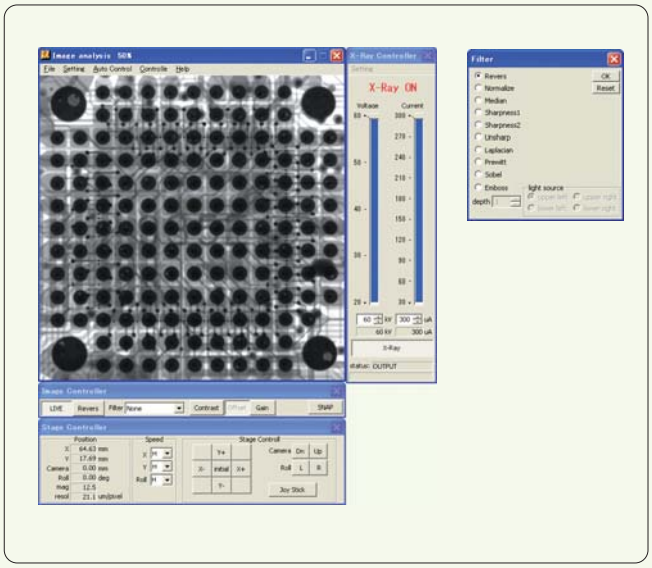


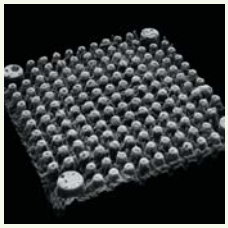
[Reduced image]



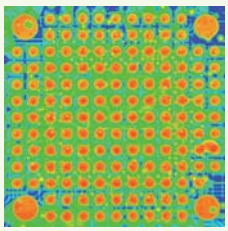
Filter function

The µB1600 supports 10 or more types of filtering and image processing allowing detailed image analyses. Images can be analyzed in real time by performing appropriate filtering for displaying moving images.

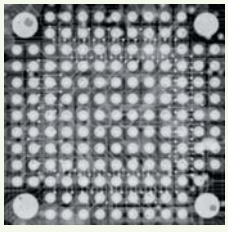




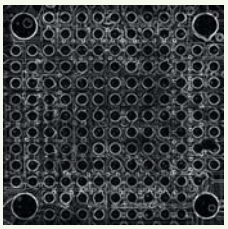
3D



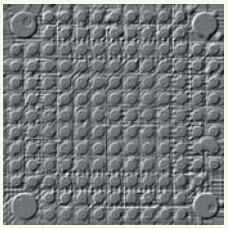
Color



Revers



Sobel

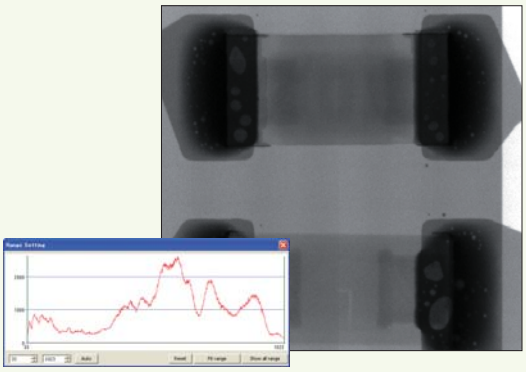


Emboss

Image analyze window function variety

Display range window

The contrast can be enhanced manually by setting any given densities based on the histogram of shot images.

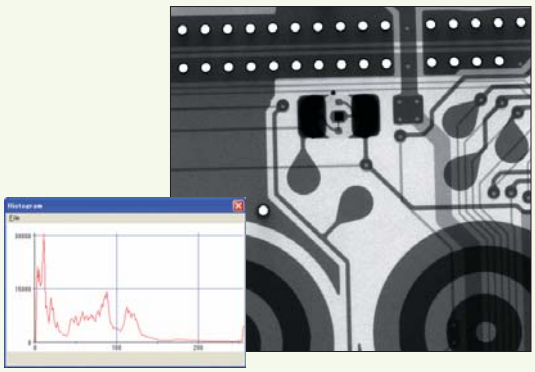


Brightness adjustment

Brightness values of shot images can be adjusted freely by adjusting gain, contrast and gamma values individually.

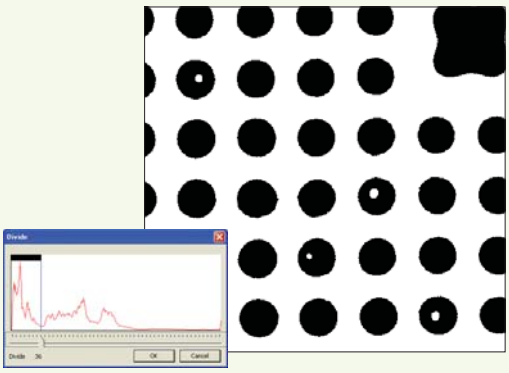
Histogram display

The μB1600 displays a histogram to indicate the distribution of brightness of shot images.



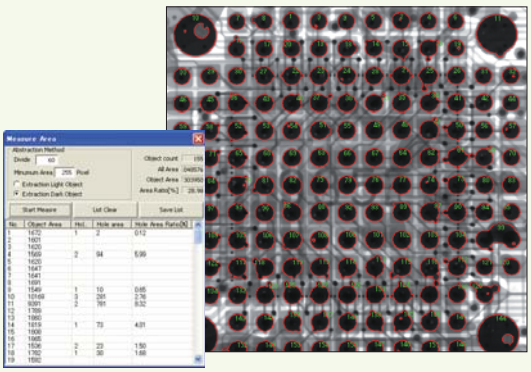
Binarizing processing

A shot image can be displayed in a binary manner by contrast by setting a threshold and binarizing the image.



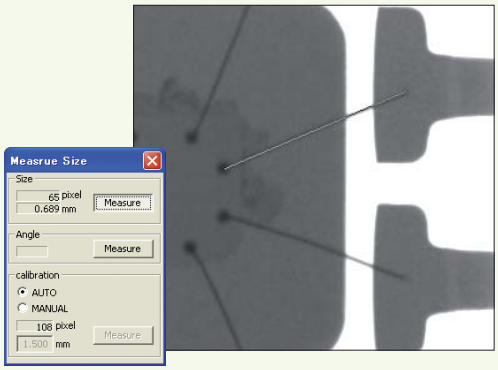
Area calculating

The μB1600 can measure the areas, number of holes, area of holes and area ratio of an object in a shot image.



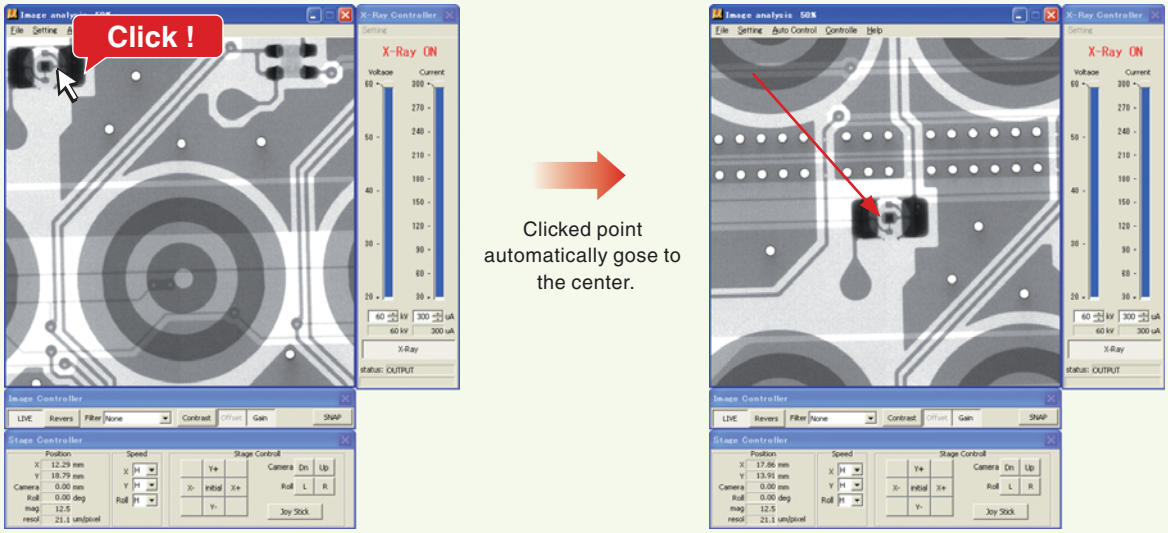
Size measurement

Sizes in a captured image can be measured by drawing measurement lines on the shot image.



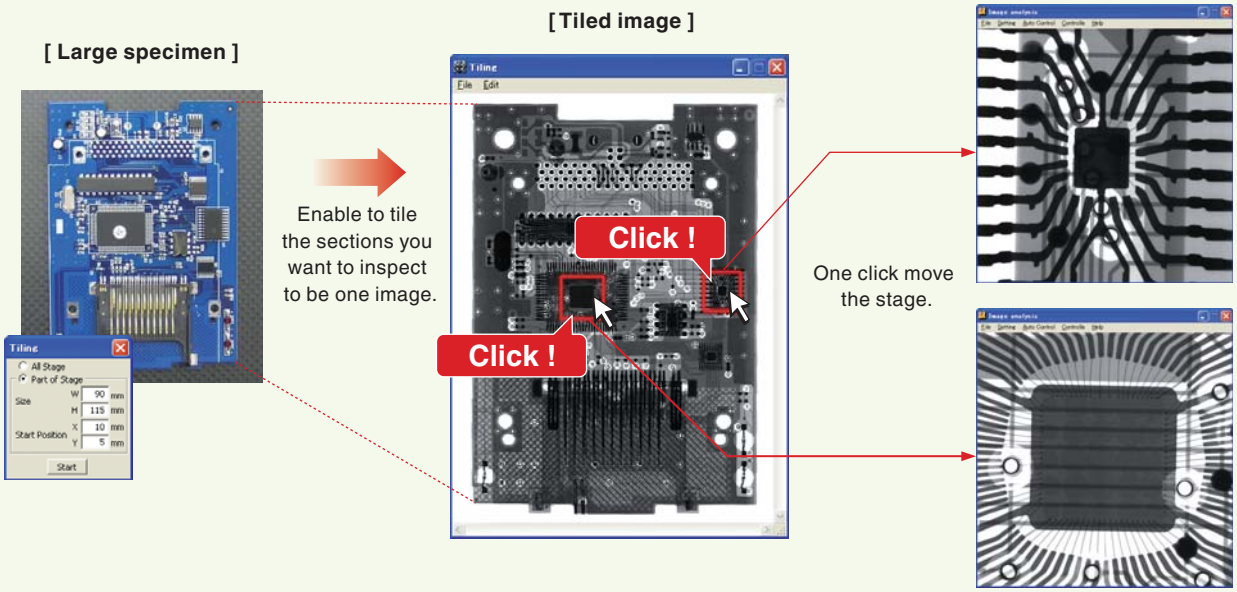
Shift by click

In addition to normal stage operation, clicked section becomes centered.



Interlink function

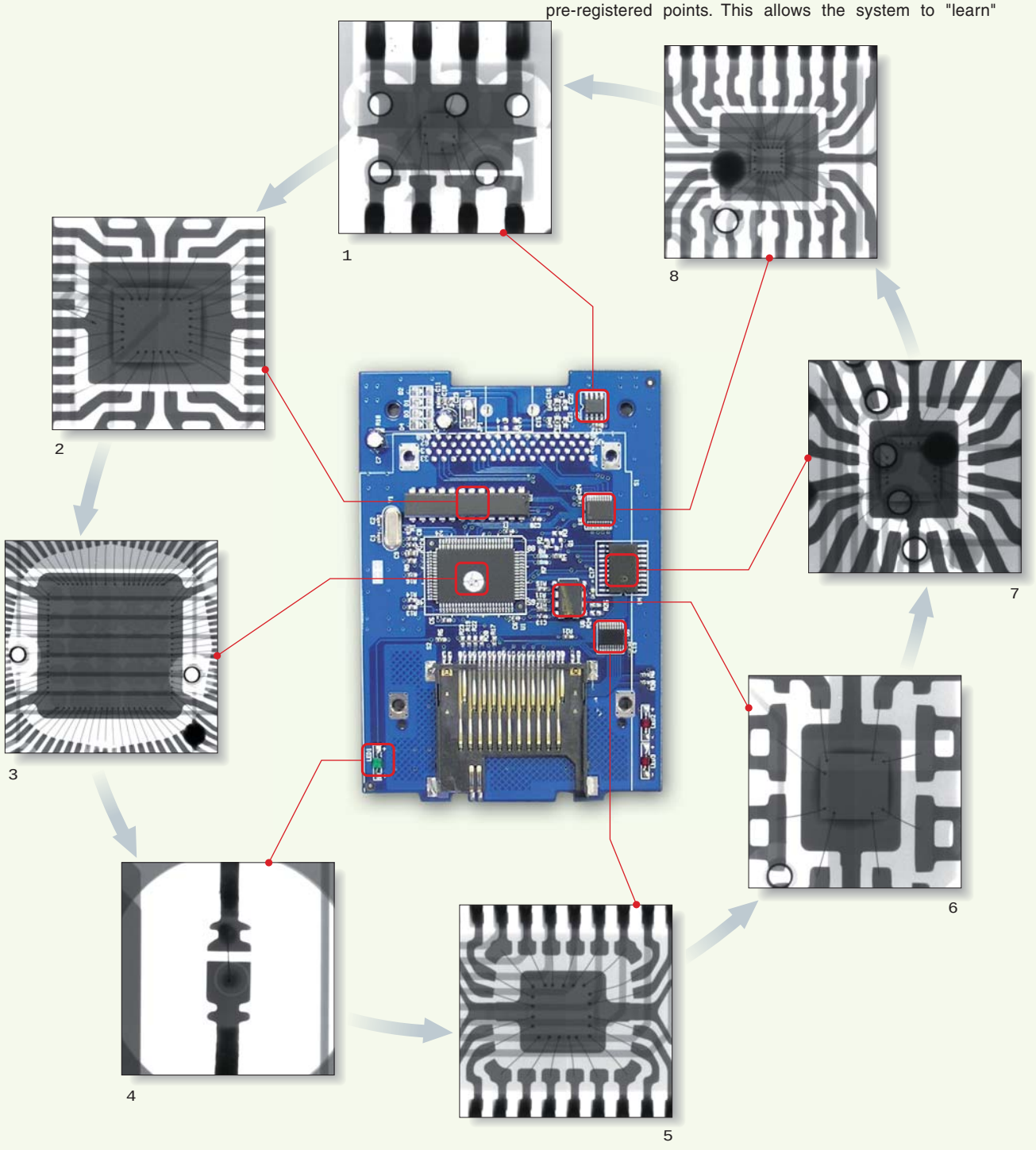
Interlink function realizes a piece of fluoroscopic image at maximum 4.72"×4.72" for a large-sized specimen that can't be captured with one shot. Interlink function can also make a piece of fluoroscopic image of a large-sized specimen by specifying points. By shooting and saving an interlinked image once, you can use automatic transfer function to move the stage to the clicked position from interlinked fluoroscopic images by just reading-in an image. Interlink function realizes



Teaching function

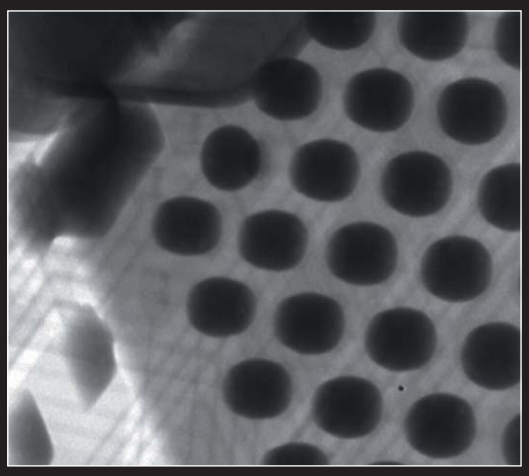
The teaching function moves the stage automatically to the pre-registered points. This allows the system to "learn" problem areas and capture on an X-ray image automatically. Setting X-ray output, enlargement factor and stop time, etc for each point supports various test objectives.

The teaching function moves the stage automatically to the pre-registered points. This allows the system to "learn"

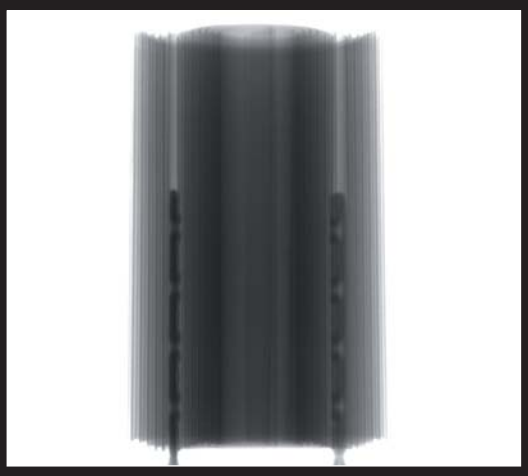


For various applications

Electrical components



BGA



Capacitor

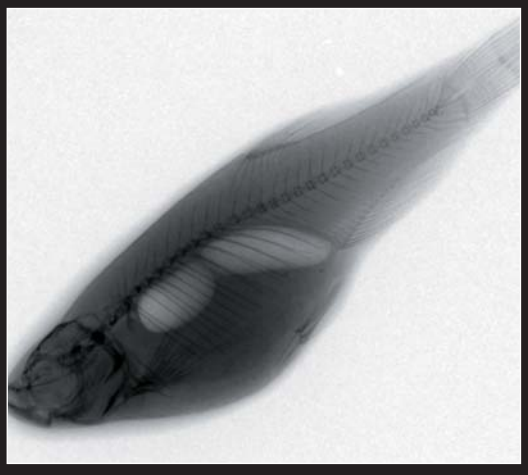
Liquid crystal device

Connector

Metal parts

Holes in Aluminum sample

Biology

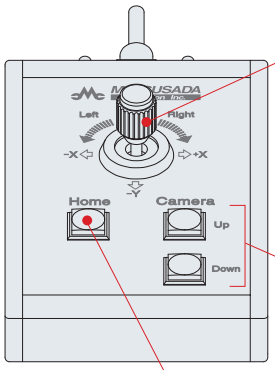


Fish

Various standard functions

Easy operations by joystick

The joystick allows easy movements of the stage along the X and Y axis, 360-degree rotation of the stage, and changes of image magnification.



Stage transfer stick

The stage moves along the X and Y axis by tilting the stick to the right, left, forward and backward. The transfer speed of the stage can be adjusted in three steps (high, medium and low) by the tilting angle of the stick.

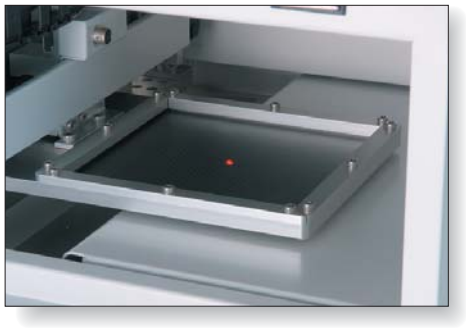
Enlarge / Reduce button

Enlarge or reduce the image.

Homing button

Display the position of observing

The laser pointer indicates the center of displayed image.
It is possible to position by observing the sample.



Safety functions

Low-leakage X-ray dose

The operator needs no special licensing to operate the μB1600.

Emergency Stop Function

Pushing this button stops the x-ray and the stage from operating in an emergency situation.

Interlock Function

The X-ray will shut off the moment the door is opened.

SPECIFICATIONS

X-ray source	Anode voltage		20kV to 60kV
	Anode current		200μA MAX
	Focus size		7μm
Imaging section	Size of visual field		1.96" × 1.96"
	Number of valid pixels		1,040,000 pixcels
	Density resolution		12bit
	Monitor		17inch
	Lower and upper imaging part Stroke		7.87"
Stage	Sample platform	Size	4.7"(X) × 4.7"(Y)
		Load capacity	2.2lb
	XY Stroke		X:4.7", Y:4.7"
	Rotation Stroke		360°
	Shifting operation		Direction indication by mouse. Joystick can be used together.
Input voltage			AC115V 50/60Hz
Dose of X-ray leakage			less than 1μSv/hr
Weight (main unit)			153lb

Imaging section

	Max.	Min.
Geometric image magnification(times)	10	5
Monitor magnification(times)	56	28
Field of view(inch)	0.196"×0.196"	0.4"×0.4"

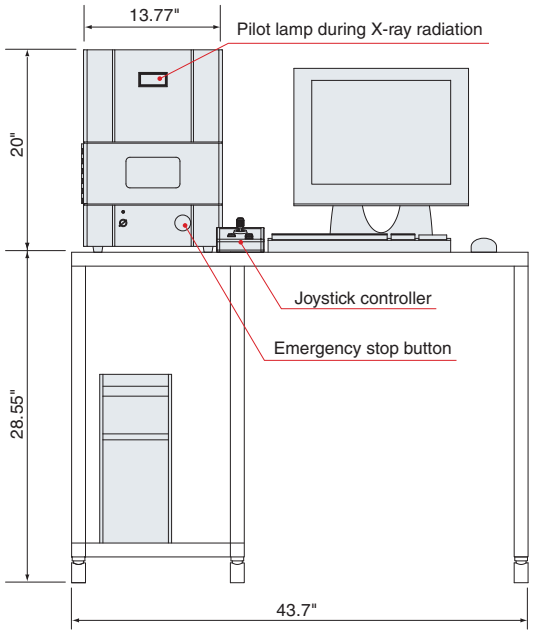
OPTION

1600DSK : Aluminum desk for μB1600

DIMENSIONS / SYSTEM UNITS

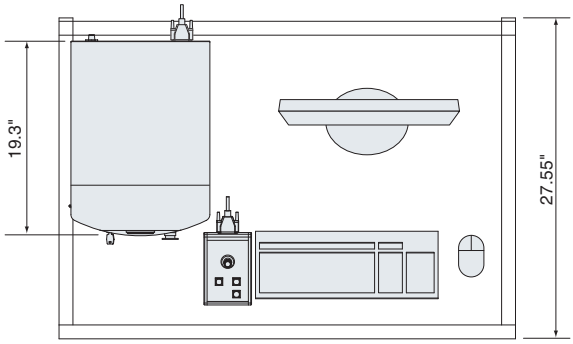
[inch]

FRONT



*Aluminum desk is an option.

TOP



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