

ICI:MICROSCOPY

Simultaneous 2D & 3D Inline Microscopy

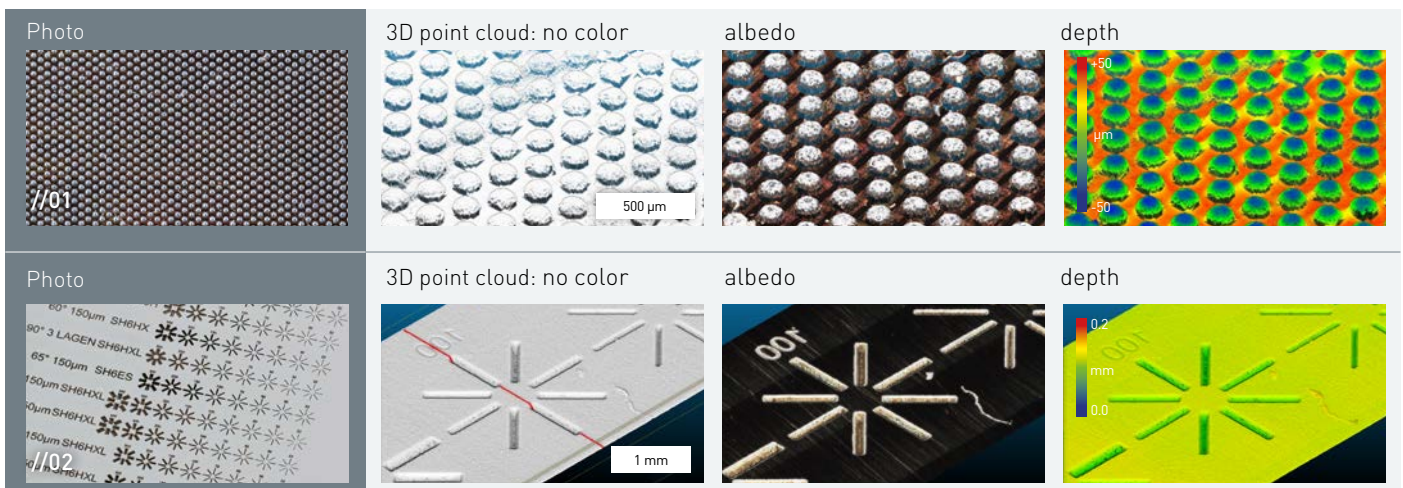
ici:microscopy is a novel high speed 3D microscope designed for industrial inline inspection. It works largely independent from the object's surface properties and meets the industrial requirements for speed, accuracy, reliability and adaptability.

HIGH-PERFORMANCE QUALITY INSPECTION

The **ici:microscopy** was developed by AIT Austrian Institute of Technology and is the latest development within AIT's Inline Computational Imaging (ICI) which enables for simultaneous 2D & 3D inspection of moving parts. ICI combines light field (LF) and photometric stereo imaging techniques (PS) into a single sensor solution and works largely independent from surface properties of the inspected matter. This makes precise quality control in numerous industrial applications possible.

Application Example | BGA Inspection

//01 Ball Grid Array (BGA)



TECHNICAL SPECIFICATIONS

ici:microscopy is a high-speed 2D & 3D imaging setup using parallax effect and photometry for precise 3D reconstructions. Our demonstration setup provides following specifications:

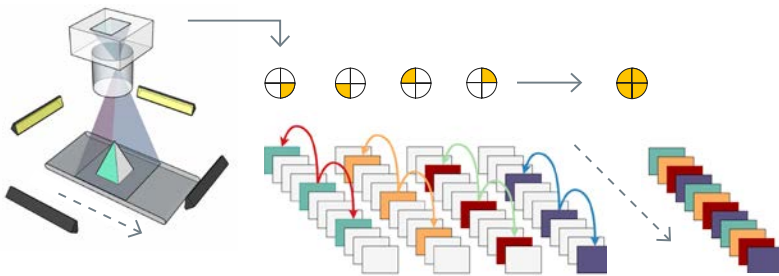
- 700 nm/pixel sampling
- 2,8 µm depth resolution
- 40 Mio 3D points / second
- 12 mm/s scanning speed

Application Example | Print Plate Inspection

//02 Print plate (provided by OEBS)

HOW IT WORKS

The **ici:microscopy** sensor setup consists of one high-speed area scan camera, a special and patented projection optics to generate a parallax effect and typically four to six high power LED light sources with individual illumination directions. The object is captured periodically while it moves underneath the sensor setup. This gives an image stack showing the inspected object from various observation angles along the transport direction (light field information) and different illumination directions - one for each LED light source (photometric information). Together with the ICI processing pipeline, it delivers high-resolution 2D & 3D images at high speeds.



//03 ici:microscopy working principle



//04 ici:microscopy setup at AIT

LARGE VOLUME SCANNING

For large area and extended depth range **ici:microscopy** supports multi lane and multi depth scanning. Single lane results are combined into one rectified large volume 3D point cloud without compromising accuracy or point to point distance.

APPLICATION FIELDS

ici:microscopy can be used for a wide range of applications such as inspection of:

- printed electronics & micro electronics
- tactile features on printed matter e.g. braille embossing
- metallurgical 3D microscopy

ICI:MICROSCOPY IN A NUTSHELL

- High-performance inline 3D microscope
- Simultaneous 2D and 3D data at 700 nm sampling rate
- 40 Mio. 3D points per second
- Single camera solution
- Easy to install and maintain
- Broad range of applications
- Largely independent from surface properties



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