

## PRODUCT BROCHURE

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### IR Light Wafer Inspection Microscope

Silicon is highly transparent to infrared (IR) light. The idonus IR light wafer inspection microscope (IRM) illuminates the silicon-based substrate from the back side and captures the light that passes through it.

## IR Light Wafer Inspection Microscope

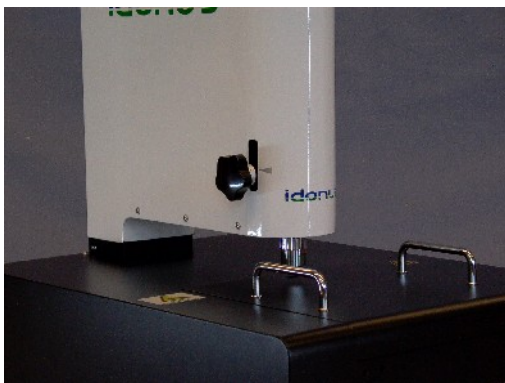
### General Information

Silicon is transparent for infrared light. Our IR light wafer inspection microscope illuminates the silicon substrate from the back-side and captures the light that permeates the substrate. Therefore, it becomes possible to inspect phenomena inside the silicon substrate, which are not visible with a conventional microscope.

The microscope is equipped with a long working distance objective. A three step zoom allows the user to choose the right field of view and magnification. An IR sensitive camera displays the image of the inspected device via USB on your computer. The resolution is better than 3  $\mu\text{m}$  with a 5x objective.

Additionally, a top side illumination is available. This allows the use of the microscope in a conventional mode and the inspection of the top side of the wafer.

The IR microscope is equipped with a xy-table, which accommodates 8" or smaller wafers. The table is motor driven and can be controlled with a joystick. For laboratory environment the IR-microscope can be equipped with a cost effective manual XY-translation table instead of the fully automated device. Please contact us for further details!



IR wafer inspection microscope equipped with top- and back-side illumination, which enables the inspection of phenomena inside the silicon substrate as well as the usage as a conventional microscope.

### Features of the IR microscope:

- Back-side IR illumination
- Top-side illumination
- xy-table for 8" wafers or smaller
- Long working distance objective
- 3 step zoom
- IR-sensitive camera
- Inspection on computer



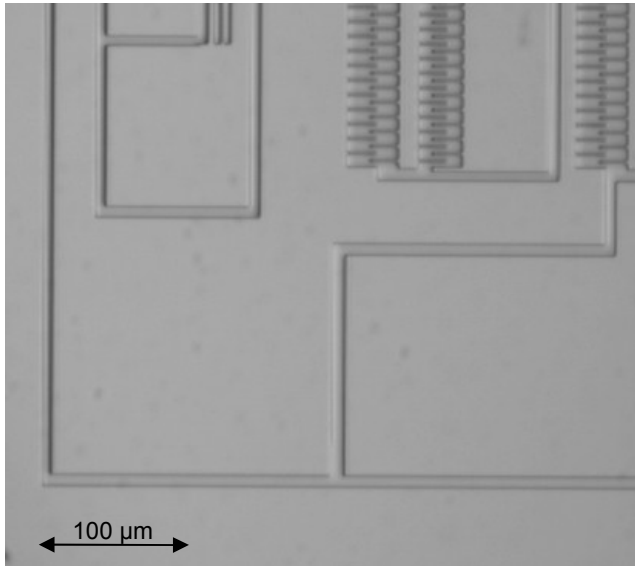
Control of IR and visible illumination intensity: The microscope can be used for Infrared imaging as well as a regular microscope with visual light illumination from the top-side.

# IR Light Wafer Inspection Microscope

## Applications & Benefits

### Applications:

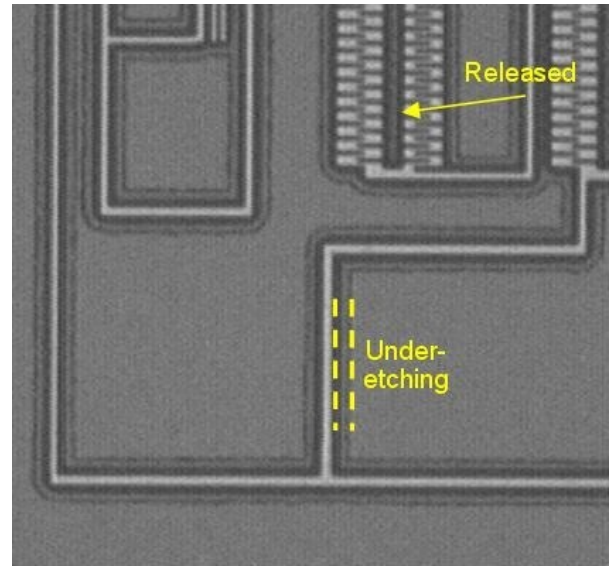
- Inspection of released MEMS devices
- Measurement of etching speed of buried materials (e.g. SOI wafers)
- Inspection of fusion bonding
- Back-side alignment of silicon wafers/chips
- Quality control



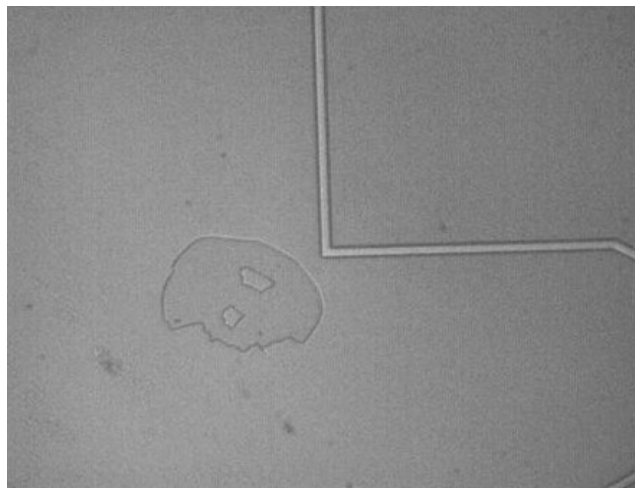
Top view of a part of a microstructure fabricated on a silicon-on-insulator (SOI) wafer.

### Benefits:

- Reliable fabrication of smaller anchors for MEMS yields higher fill factors
- Top- & back-side illumination
- High resolution (< 3 μm with 5x objective)
- Small footprint
- Easy to use, immediate results



Infrared image of the same area after 60 minutes of HF vapor phase etching. The under-etching of the buried SiO<sub>2</sub> becomes visible, which enables the determination of released and non released parts.



Inspection of silicon fusion bonding: In this case, a DRIE-structured wafer was fusion bonded to another wafer. Any failures such as voids or alignments can be visualized by IR-light.

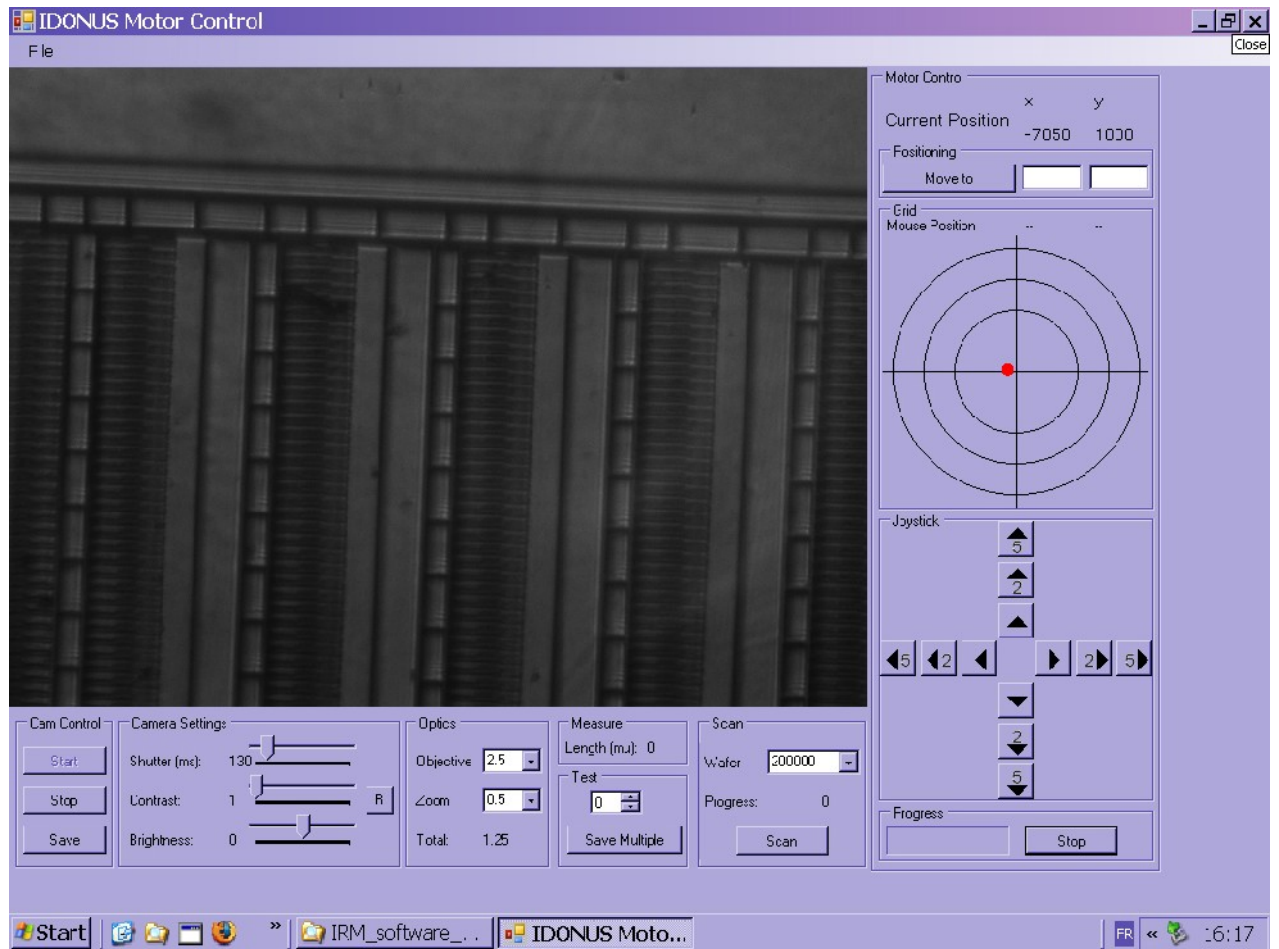


IR-Microscope with cost effective manual XY-translation table for laboratory use.

# IR Light Wafer Inspection Microscope

## Graphical User Interface

innovations for microsystem fabrication

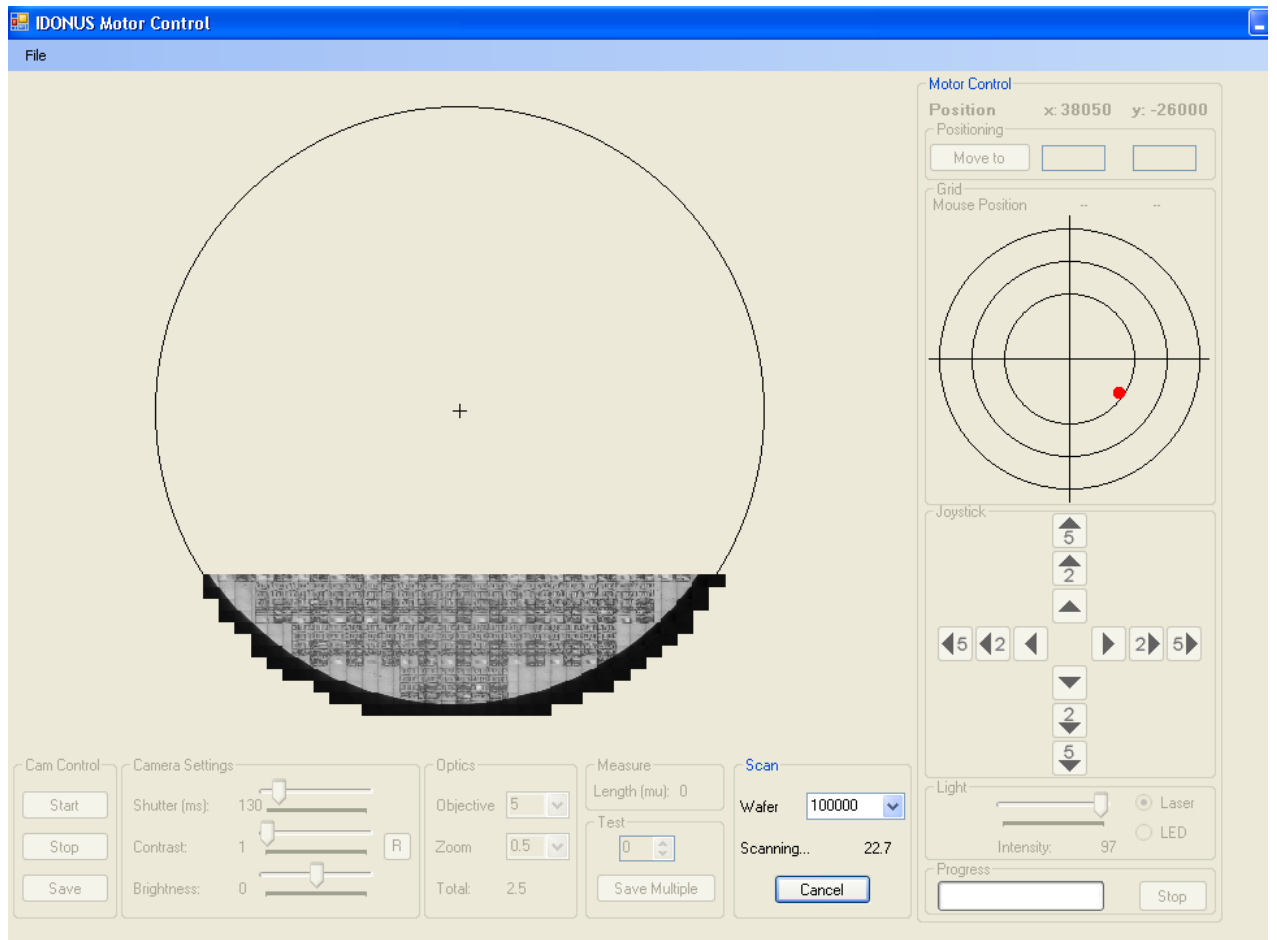


A graphical user interface for Windows allows the user to operate the microscope with a PC. It enables complete control of the microscope as well as an automated acquisition of images on a user defined grid on the wafer.

# IR Light Wafer Inspection Microscope

## Graphical User Interface

innovations for microsystem fabrication



The high resolution image of a complete wafer can be acquired automatically taking multiple pictures of the wafer. The images are stitched to a large image and stored to your disk drive.

**idonus**

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## IR Light Wafer Inspection Microscope

### Technical Specifications – automated version

<b>Product Code</b>	<b>IRM 200 – auto</b>
<b>Wafer sizes</b> <b>xy-table displacement</b> <b>xy-table</b>	200 mm (8"); 100 mm / 150 mm can also be inspected 200 x 200 mm Motor driven, controlled with joystick
<b>Optical resolution</b> <b>Working distance</b> <b>Magnification</b> <b>FOV</b> <b>Zoom</b>	Better then 3 µm with 5x objective 32 mm 2.5x; 5x; 10x (with 5x objective) 2.5 mm x 2.0 mm (2.5x magnification) 3 step zoom: 0.5x / 1x / 2x
<b>Camera</b> <b>Resolution</b>	B&W with USB 2 output 1.4 Megapixel
<b>IR light source wavelength</b>	1 µm
<b>Power</b> <b>Power consumption</b>	110 to 230 VAC, 50 to 60 Hz 160 VA
<b>Dimensions (l x w x h)</b> <b>Weight</b> <b>Footprint</b>	700 x 470 x 650 mm <sup>3</sup> 40 kg 700 x 470 mm <sup>2</sup>
<b>Software</b>	Driver for Image acquisition Frame grabber
<b>Additional requirements for installation</b>	PC or Laptop with USB 2 interface (Windows XP or 2000)
<b>Optional Objectives</b> <b>Wafer adapter rings</b> <b>Graphical user interface</b> <b>Software for pattern recognition</b>	2.5x / 5x (included) / 10x / 20x For 100 and 150 mm For easy handling and full wafer scan On request available

**Note:** This IR-Microscope can be used for wafers with a diameter of 100, 150 or 200 mm.

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# IR Light Wafer Inspection Microscope

## Technical Specifications – manual version

<b>Product Code</b>	<b>IRM 100 – man</b>
<b>Wafer sizes</b> <b>xy-table displacement</b> <b>xy-table</b>	100 mm (4"); 150 mm / 200 mm can also be inspected 100 x 100 mm manual
<b>Optical resolution</b> <b>Working distance</b> <b>Magnification</b> <b>FOV</b> <b>Zoom</b>	Better then 3 µm with 5x objective 32 mm 2.5x; 5x; 10x (with 5x objective) 2.5 mm x 2.0 mm (2.5x magnification) 3 step zoom: 0.5x / 1x / 2x
<b>Camera</b> <b>Resolution</b>	B&W with USB 2 output 1.4 Megapixel
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**Note:** This IR-Microscope is designed to use for wafers with a diameter of 100 mm or smaller. Wafers with 150 or 200 mm can be inspected but the table translation is limited.

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