

“Metrology Inspection, Mission Impossible!”

Providing Disruptive Innovations in High-Yield Metrology Platforms
for Next-Generation AI-Era 3D-Nano Advanced Manufacturing

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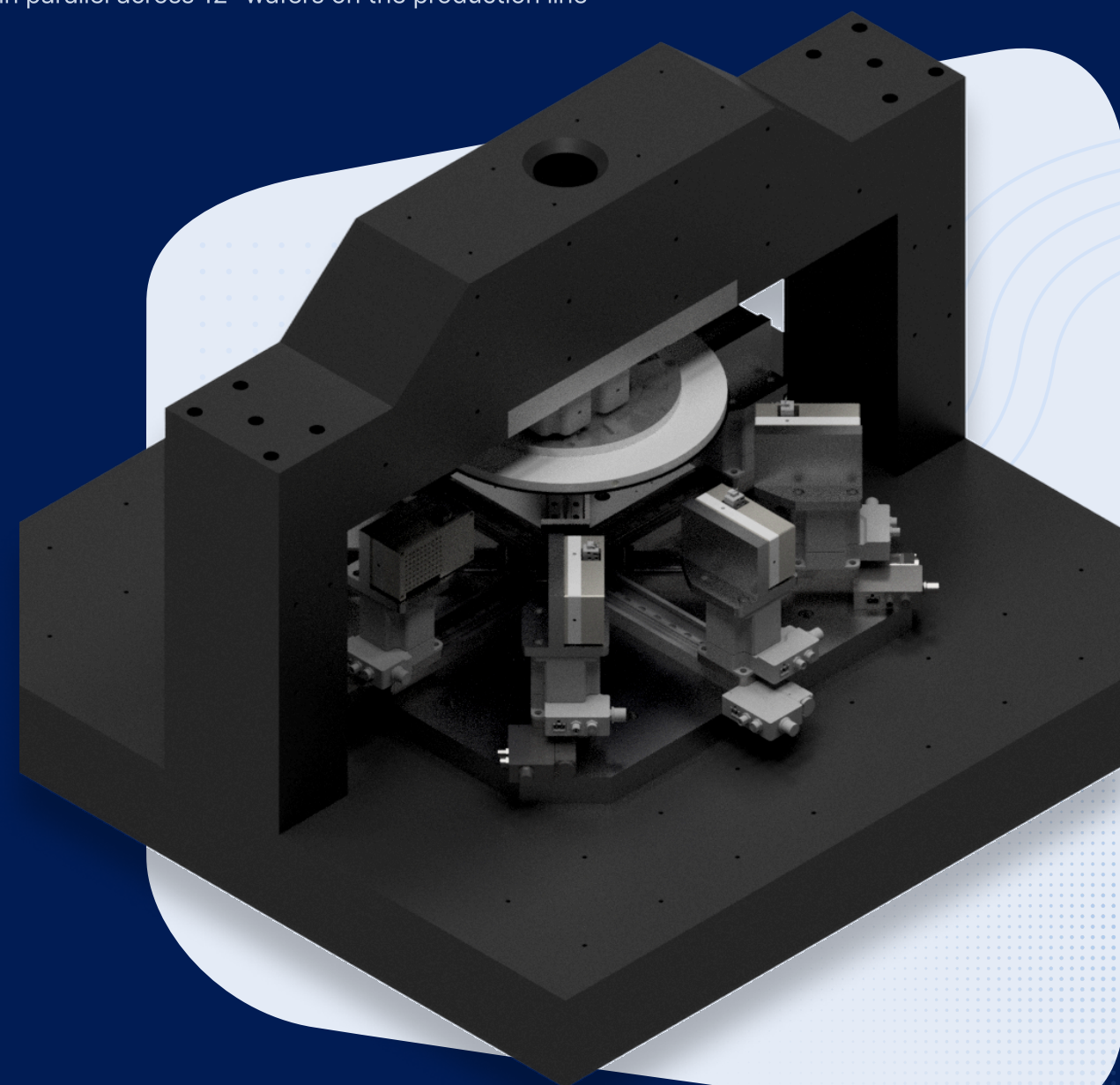
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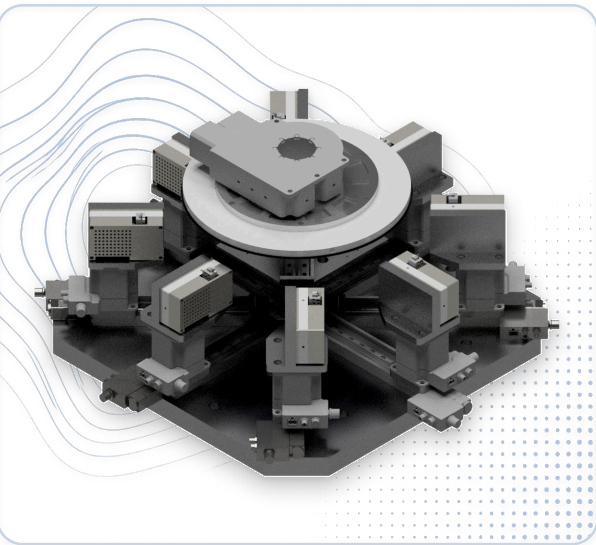
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MSI Chronos V8™

High-throughput Multi-head AFM Platform

Proprietary 8-independent AFM heads working
in parallel across 12" wafers on the production line





MSI Chronos V8™

High-throughput Multi-head AFM Platform

MSI Chronos V8™ is a modular quartz resonator-based atomic force microscopy (QR-AFM) platform designed for next-generation semiconductor metrology.

Optics Free AFM

Self-actuating & self-sensing quartz resonator

True Parallel Multi-head

Independent IFS & FPGA architecture

High-speed & High-resolution

High-frequency operation with tunable Q-control

Modular & Reconfigurable

Flexible scalability for diverse applications

**IFS: Integrated Flexure Scanner*

Technical Specifications

XY Scanner

Scan Range (XY)
Up to 30 μm
Resolution
< 0.05 nm

Z Scanner

Scan Range (Z)
Up to 15 μm
Resolution
< 0.01 nm

FPGA Architecture

QTF (ADC/DAC)
14-bits
Sampling Rate
125 MSPS

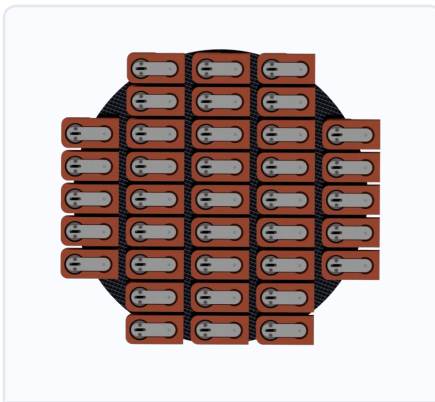
Piezo (ADC/DAC)
24 / 20 bits
Sampling Rate
500 kSPS / 1 MSPS

Single Platform. Multiple Configurations.

Chronos V8™ supports configurable multi-head architectures, from compact research systems to large-scale wafer inspection. Independent IFS modules scale freely to meet application-specific throughput and measurement needs.



Radial Layout
circular wafer inspection

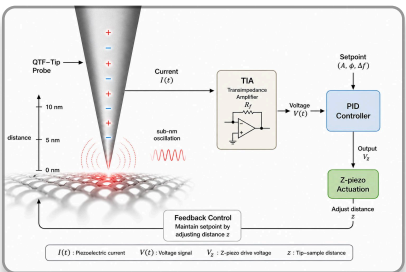


High Density Array
display panel metrology



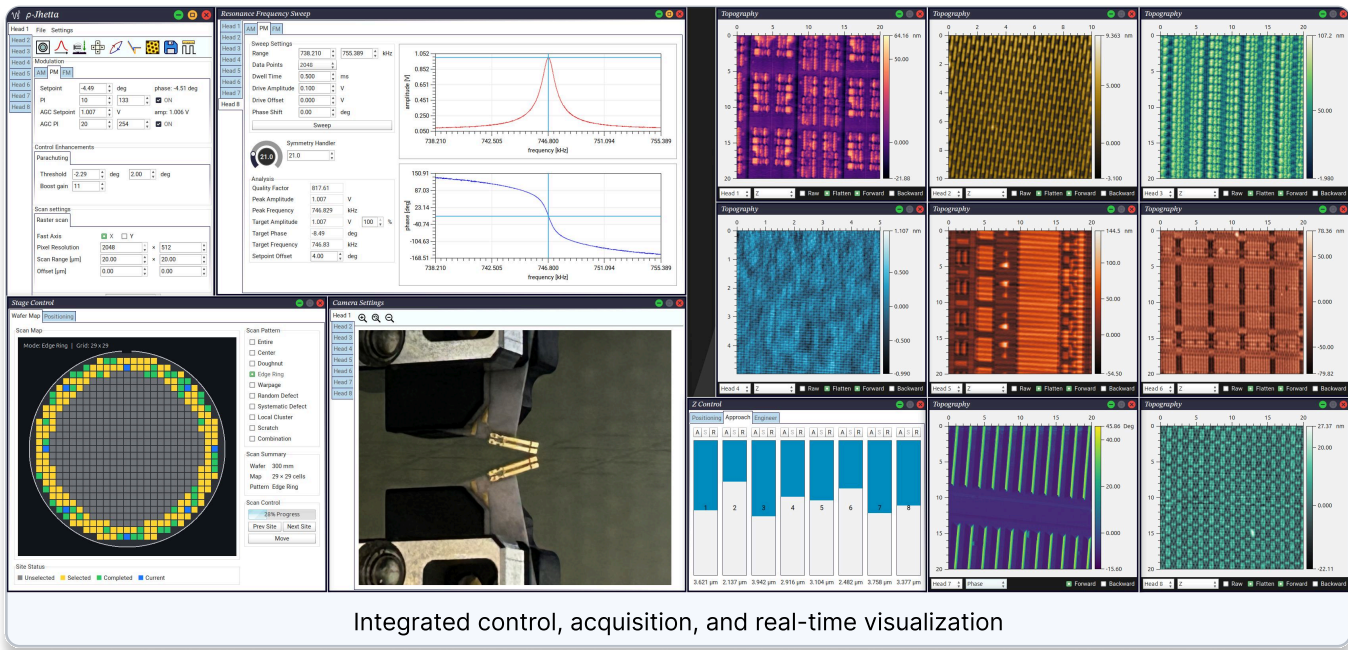
Custom Architecture
application-specific configuration

Quartz-based Resonator Technology



The quartz-based resonator oscillates with sub-nanometer amplitude. A transimpedance amplifier (TIA) and PID controller process the signal in real time to maintain a constant tip-sample interaction, enabling stable, high-resolution AFM imaging.

p-Jhetta Software Interface



Integrated control, acquisition, and real-time visualization

Software & Control

Core Infrastructure

- Proprietary Linux-based measurement and analysis software
- FPGA-based integrated control and data acquisition
- Independent FPGA controller for each IFS module
- Ethernet-based communication interface

Measurement & Control

- Integrated XY-control and Z-control
- Standard AM and PM modulation, with optional FM, KPFM, EFM, and other advanced modes available on request
- Real-time resonance tracking and feedback control
- Independent multi-head synchronization

Application Fields

Semiconductors

- Metrology and inspection for yield enhancement
- Process control

Nanomaterials

- Nanoscale structure and advanced material analysis
- Thin-film characterization

Aerospace & Defense

- Precision surface roughness
- Functional material evaluation

Electronics & Display

- Inspection and characterization of PCBs
- Display metrology