

- ***Sub Wavelength Resolution***
- ***True 3D Topography***
- ***In all Optical Microscopes***

***DME DS 95 AFM Objective  
for Optical Microscopes***



Danish Micro Engineering A/S  
DME NanoTechnologie GmbH

# The Tool for Fast and Reliable SPM Results

## DME DS 95 SPM Scanner Series

With the DS 95 SPM scanner series we provide the ultimate unification of ease of use and performance! Decade lasting experience in the field of SPM application and manufacturing are united in the DS 95 SPM scanners to help the user achieve the best and most reliable results in the shortest possible period of time.

The **compact design** of the DS 95 SPM scanner guarantees outstanding stability and scan rates.

The unique **plug and play cantilever exchange** secures fast and safe operation of the instrument.

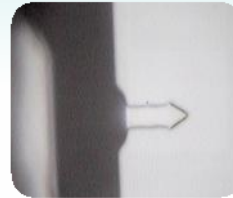
An **integrated optical axis** in the SPM scanner provides total visual control during approach and positioning.

The DS 95 SPM scanner provides the facilities for **all common and advanced SPM modes**.

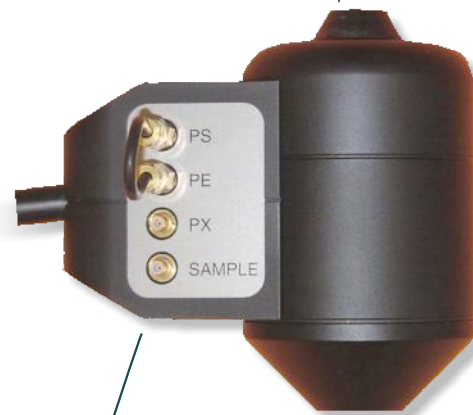
**Integrated electronics** in the scan head guarantees lowest noise values in electrical SPM modes.

**DS 95 multi mount** allows installation of the DS 95 SPM scanner into DME Stages and other facilities like nanoindenters, optical microscopes, etc.

**Integrated Optical Axis**



**Multi Mount for the Installation in DME Stages and Wherever Needed**

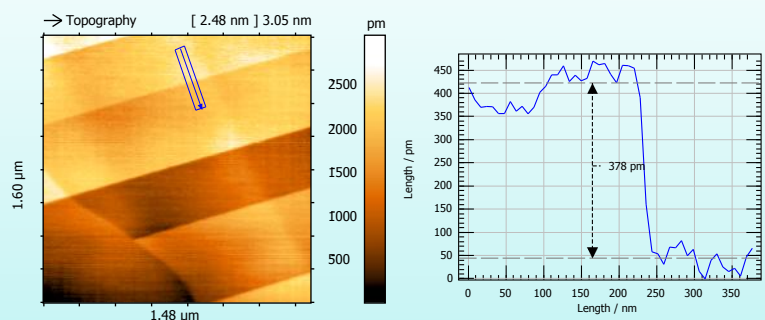


95mm

**Highest Stability by Compact Design**

**On-Side Amplifier Electronics and Contacts**

**Easy Plug and Play Cantilever Exchange**



**Superior stability and ease of use: Atomic layers on HOPG in less than 1 min from switching on the system.**

# DualScope 95 AFM Objective

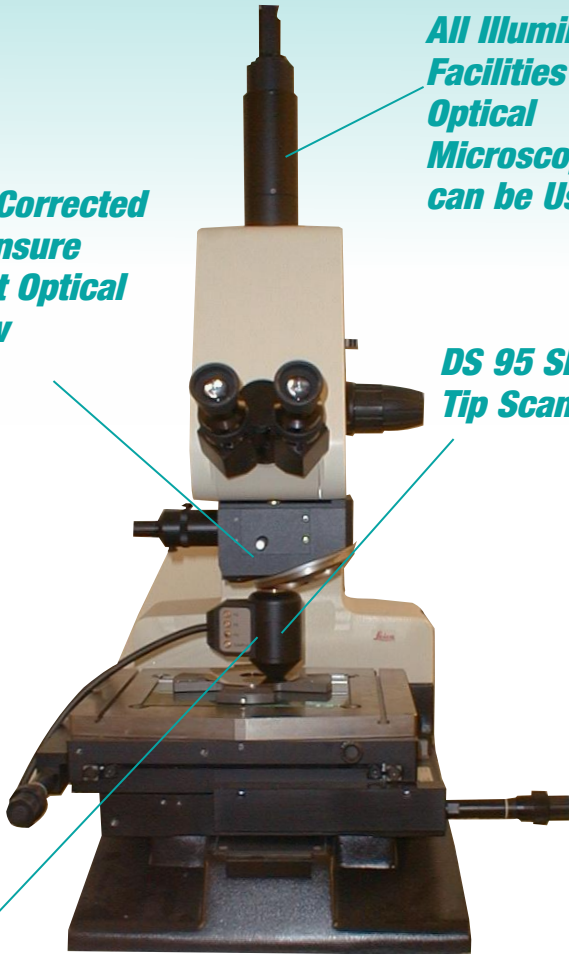
# The 15X Objective which delivers nanometer resolution and 3D topography

**Infinitiv Corrected Optics Ensure Excellent Optical Overview**

**All Illumination Facilities of the Optical Microscope can be Used**

**DS 95 SPM Tip Scanner**

**Microscope XY Table can be used to Navigate on the Sample.**



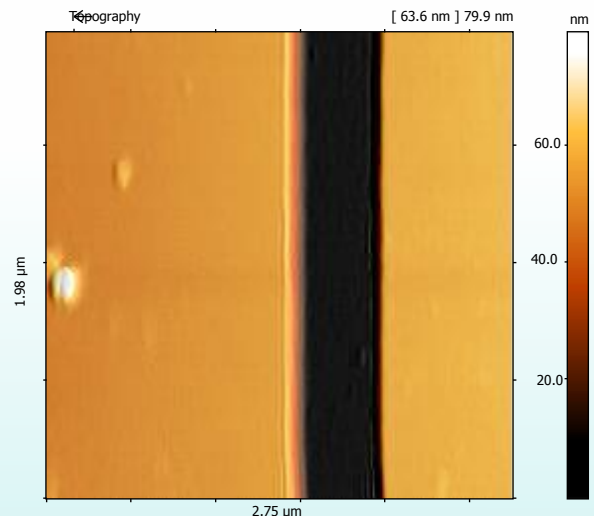
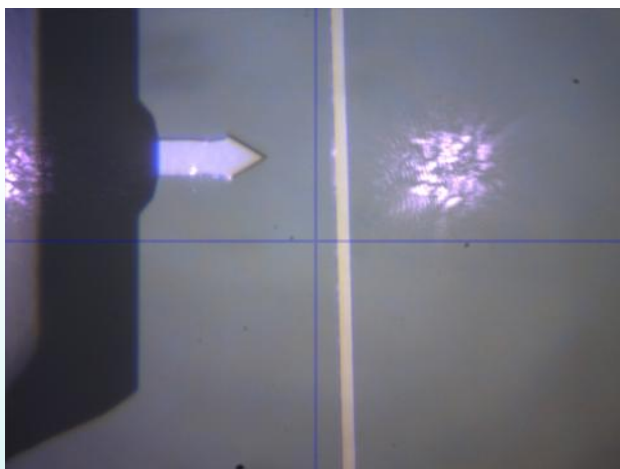
The DS 95 AFM Objective in your optical microscope is **the ticked for the world behind the defraction limit**. The resolution is pushed far below sub-wavelength range to only a few nanometer or less.

Additionally you benefit from the **3D topographical data** with a better resolution than CLSM and STED microscopy. **Nano-manipulation and Nano-lithography** combined with the optical facilities of you microscope build a powerful combination.

Because of the **DME adaptor concept** for the DS 95 objective, the **integration in all known microscope brands** is possible.

Unchanged operation of the light microscope with all its facilities is ensured. Only a small investment for a sample stage is needed to update the SPM to a stand alone instrument.

Application areas are material, biological, microelectronics and many more.



**From contrast to 3D topography: The AFM enables to analyse structures in the nanometer range. The optical microscope is a grat tool to position the AFM tip at the area of interest.**

## for Optical Microscopes

## ***System specifications:***

### **Options:**

DiProWA digital programmable waveform analyzer

Glueing Tool (cantilever assembly)

Thermo stage

Liquid cell

Motorized xy sample tables with or without optical reference

### **SPM Facts:**

Scanner:

Scanrange: DS 95 50 (E) 50  $\mu\text{m}$  x 50  $\mu\text{m}$  x 5  $\mu\text{m}$   
DS 95 200 (E) 200  $\mu\text{m}$  x 200  $\mu\text{m}$  x 15  $\mu\text{m}$

Accuracy and noise:

Hardware linearized scan motion in z direction

Noise Level < 0.05 nm rms in vertical direction (Z)

Scan Speed: up to 100  $\mu\text{m}/\text{s}$  (DS 95 50)  
up to 50  $\mu\text{m}/\text{s}$  (DS 95 200)

Detection:

Self adjusting laser / cantilever deflection system

Min. amplitude setting in AC mode < 1 nm

### **Electronics:**

Triple CPU Design, 1x 32 MHz, 1x16 MHz, 1 FPGA 80 MHz,  
for autonomous scan operation and realtime processing

Feedback:

32 bit internal resolution

Full digital (PID filtered) or digital/analog (filtered P) operation in contact, dynamic and STM modes

Digital Lock-in based AC detection

Fully digital AC signal synthesizer (Q Booster) and demodulator

Built in automatic self test

Flash memory for fast firmware updating

Automatic Z detector gain adjustment

Supported Modes:

Contact mode (DC), intermittent mode (AC), non-contact mode,

frequency modulation mode, lateral force mode, force spectroscopy, EFM, kelvin probe force microscopy, MFM, scanning capacitance microscopy, STM

Microscopes:

Integration in top down microscopes of all brands possible.

The top down microscope only needs more than 100 mm z distance between sample table and objective thread. True for more than 95% of all microscopes

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