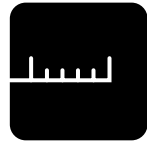


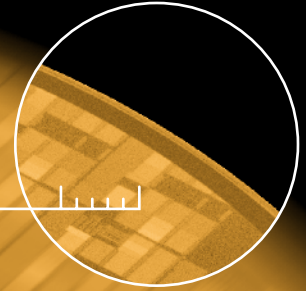


Surface Profiler



P-16+

PARAMETRIC



## SPECIFICATIONS

The KLA-Tencor P-16+ and P-16 OF+ (open frame) Surface Profiler provides leading edge surface measurement and analysis performance capability on a Windows® XP operating system. The P-16+ platform is available in three different measurement head configurations:

- (1) Microhead 5 SR measurement head offers classical stylus control with programmable force and vertical ranges.
- (2) Microhead 5 LF low-force measurement head offers precision measurements on soft surfaces.
- (3) Microhead 5 XR measurement head offers extended vertical range.

The P-16+ Surface Profiler uses a diamond stylus for reliable profiling applications. All Microhead 5 options offer dual-view optics, allowing the operator to automatically switch between a top-down view for fast stylus positioning and an angled view for easy monitoring of the stylus as it scans over desired features.

### Classical Long-Scan Contact Mode

Long-scan profiling in contact mode is used on profiler measurement heads.

Maximum scan length: 80 mm or 200 mm

Lateral resolution<sup>1</sup>: X = 25 nm, Y = 1 µm

Microhead 5 SR: Vertical range 327 µm  
 Stylus force 1 - 50 mg  
 13 µm, resolution < 0.01 Å  
 64 µm, resolution < 0.04 Å  
 327 µm, resolution < 0.20 Å

Microhead 5 LF: Vertical range 130 µm  
 Stylus force 0.05 - 50 mg  
 6.5 µm, resolution < 0.01 Å  
 26 µm, resolution < 0.02 Å  
 130 µm, resolution < 0.10 Å

Microhead 5 XR: Vertical range 1000 µm  
 Stylus force 0.5 - 50 mg  
 13 µm, resolution < 0.01 Å  
 130 µm, resolution < 0.08 Å  
 1000 µm, resolution < 0.60 Å

Vertical linearity<sup>2</sup>: ± 0.5% above 2000 Å, 10 Å below 2000 Å

Repeatability: 7.5 Å or 0.1% (1 σ), whichever is greater

Reproducibility: 15.0 Å or 0.25% (1 σ), whichever is greater

Scan speed<sup>3</sup>: 2 µm/sec to 25 mm/sec

Sampling rate: 5, 10, 20, 50, 100, 200, 500, 1000 Hz

Stylus control: Electromagnetic force compensation

Stylus: 4 different radii for long-scan applications—2.0 µm, 5.0 µm, 12.5 µm, 25 µm (coarse). Submicron radius (0.1 - 0.8 µm) for micro surface analysis (fine)

Dual view optics (field of view):

Side view: 1750 x 1750 µm

Top view: 1400 by 1040 µm or optional 900 by 650 µm

Camera: Optional digital color camera

### Sample Stage Configurations (for P-16 OF+)

XLS stage provides full access to a 9.5 in. x 9.5 in. area and can accommodate substrates up to 19 in. in length. Or an optional 300 mm stage provides full access to a 300 mm diameter substrate.

### Productivity Package with Pattern Recognition (Optional)

Three procedures are possible for pattern recognition: single deskew, double deskew, and site-by-site

Repeatability: 2 µm (1 σ)

Surface Profiler  
**P-16+**

#### Data Analysis and Display

The following software tools aid in data analysis and display:

- 2D scans
- 3D imaging (optional)
- Correlation scans
- Filtering algorithms
- Automated 2D/3D leveling algorithms
- Automated 2D/3D depth algorithms
- Roughness and waviness algorithms
- Sequence summaries
- Data and graphical export
- Apex 2D and 3D software

#### Security/Password Protection

A multi-level security system protects data, recipes and calibration files from accidental corruption. The tool administrator can select from over 15 functional groups to customize access for each individual user.

#### Standards Compliance

##### CE Compliance

- EC directives
- Harmonized safety standards
- Harmonized Electromagnetic standards
- Semi S2-0703 and S8-0705 Compliance
- RoHS Compliance for computer and peripherals

#### Computing

Microprocessor:	Pentium®4 2.8 GHz or greater
Operating system:	Windows® XP-based operating system
RAM:	1 GB or greater
Disk storage:	80 GB or greater
Removable storage:	
-	3.5 inch, 1.4 MB floppy disk drive
-	DVD/CDRW combo drive
Monitor:	17-inch flat panel LCD
Network:	PCI ethernet card

#### Physical Dimensions P-16+

Height:	17.0 in. (43cm)
Width:	22.0 in. (56 cm)
Depth:	38.0 in. (97 cm)
System weight:	219 lbs. (100 kg)
Total shipping weight:	404 lbs. (184 kg)

#### Physical Dimensions P-16 OF+

Height:	17.0 in. (43cm)
Width:	29.0 in (74 cm)
Depth:	38.0 in (97 cm)
System weight:	240 lbs. (109 kg)
Total shipping weight:	460 lbs (209 kg)

#### Installation/Operations Requirements

Relative humidity:	30 - 40% (non-condensing) recommended
Temperature:	16° - 25° C, rate of change $\leq 2^\circ$ C/h
Electrical:	90 - 110 V, 50 - 60 Hz 110 - 130V, 50 - 60 Hz 208 - 260V, 50 - 60 Hz
Power requirements:	430 VA
Vacuum:	500 mm Hg @ 27 liters/min
Floor vibration:	$\leq 250 \mu$ inch/ $\sigma$ (6.4 $\mu$ m/ $\sigma$ ) RMS, 1-100 Hz
Audio noise:	$\leq 80$ dB (C weighting scale)
Laminar airflow:	$\leq 100$ ft/min (30 m/min) down blowing recommended

1. Represents ultimate resolution; actual resolution is a function of stylus radius.
2. Vertical linearity is measured by the maximum non-linearity component divided by the vertical range.
3. Choice of scan speed is a function of stylus geometry and application.