

OCA 15EC

Video-based optical contact
angle measuring instrument





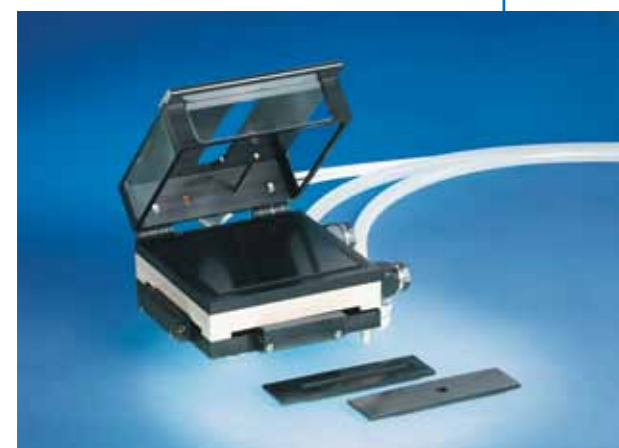
OCAS with standard drop contours

Features of the OCA 15EC

The video-based optical contact angle measuring system OCA 15EC is the instrument for the budget-priced starting into the contact angle measuring technique and drop shape analysis. The single direct dosing system SD-DM in combination with one electronic syringe unit ES –included in the OCA 15EC Package– allows the comfortable and reproducible handling and dosing of liquids. For transportation in the optional case the OCA 15EC is dismountable without the slightest effort.

Components and accessories

- sample table manual movable (magnetic slide system) in horizontal and precise adjustable in vertical (z-axis) direction via hand wheel
- high performance 6x parfocal zoom lens with integrated continuous fine focus, and adjustable observation and camera tilt angle
- video measuring system with USB camera (87 images/s sample rate), easily upgradable with the high-speed option UpUSB87H (max. 311 images/s sample rate) or the high-speed video system UpOCAH (max. 1000 images/s sample rate)



Liquid temperature control unit TFC 100



OCA 15EC with SD-DM single direct dosing system and ES/2-D electronic dosing unit

- lighting with continuously adjustable intensity without hysteresis
- single direct dosing system SD-DM for use with standard and disposable syringes and needles
- one electronic syringe unit ES, software controlled adjustable dosing volume (min. 50 nl) and dosing rate (0.06 µl/s ... 26.4 µl/s)
- up to four manual syringe units MS with a manual multiple dosing system MD/4
- temperature and environmental control systems (-30...160 °C)
- wide range of sample holding and positioning units like holders for foils or papers FSH 30 and FSC 80/150, or the suction plate SP 100 for holding thin flexible samples flat on the stage with an adjustable suction area

- electro wetting platform EWP 100 for the analysis of sessile and pendant drops under a well definable electrical field

Software for efficient work

DataPhysics is specialised in the development of high-precise and reliable methods for evaluating drop contours in combination with statistical error analysis. The SCA software assists you in the intuitive use of the video-based optical contact angle measuring instrument OCA 15EC by specifying measurement procedures and in collecting, assessing, and evaluating the measured data. The SCA software is designed as a modular program for all OCA instruments. Under Windows 7® and Windows Vista® it works in 32- and also in 64-bit mode; under Windows XP® /SP3 only in 32-bit mode.

The available software modules for the OCA 15EC are:

SCA 20 — contact angle

- video based measurement and presentation of the static and dynamic contact angle on plane, convex, and concave surfaces
- automatic measurement of the contact angle hysteresis
- record/store of image sequences
- statistics and measurement error analysis
- Liquids and solids database with currently more than 170 records for all surface energy analysis methods including related citations

SCA 21 — surface free energy

- analysis of the surface free energy of solids as well as their components (e.g. dispersive, polar and hydrogen bond parts,



FSC 80 film sample holder

acid and base portions) according to nine different theories

- representation of wetting envelopes and work of adhesion/contact angle diagrams

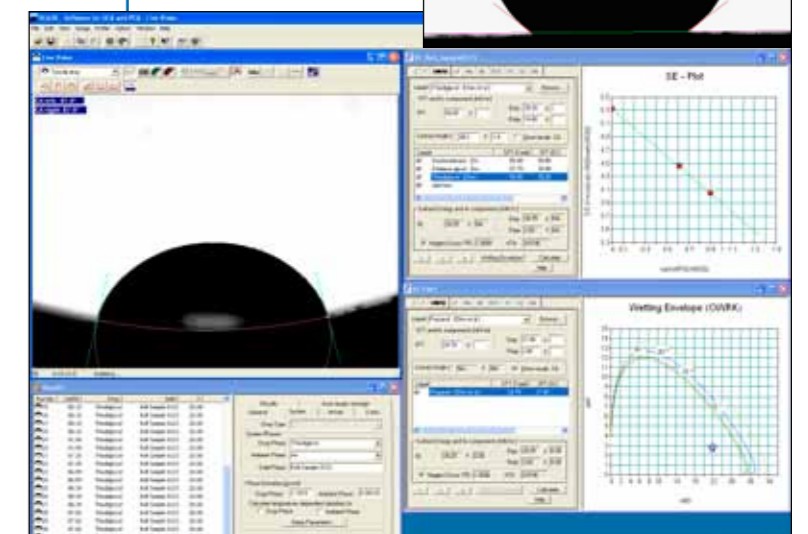
SCA 22 — pendant drop

- analysis of the surface and interfacial tension, as well as their polar and dispersive contributions, based on the analysis of the drop shape of pendant drops

SCA 23 — lamella contour

- analysis of the surface and interfacial tension based on the evaluation of the lamella contour

Water drop on an ultrahydrophobic substrate



SCA 20 and SCA 21 – measuring and evaluating the wetting properties of solids

Technical data

Max. sample dimensions (L x W x H):	• 220 x ∞ x 70 mm
Sample table dimensions:	• 100 x 100 mm
Max. sample weight:	• 15.0 kg
Measuring range for contact angles:	• 0...180°; ± 0.1° measuring precision of the video system
Measuring range for surface and interfacial tensions:	• 1·10 ⁻² ...2·10 ³ mN/m resolution: ± 0.01 mN/m
Optics:	• 6-fold zoom lens (0.7 ... 4.5 magnification) with integrated fine focus (± 6 mm) • Lighting with continuously adjustable intensity without hysteresis
Video system:	• USB-Wide-VGA camera, max. resolution 752 x 480 pixel, max. sample rate 87 images/s, field of view 1.05 x 0.66... 6.72 x 4.25 mm • Image distortion < 0.05%
Measuring techniques:	• Sessile and captive drop method, tilting table method • Pendant drop method • Lamella method on test spheres and rods
Software SCA 20:	• Video based measurement of static and dynamic contact angles according to the sessile and captive drop as well as tilting table methods, measurement of drop and lamella contours. • Operation of one ES electronic dosing unit
Software SCA 21:	• Calculation of surface free energies on solids and their contributions with error limits based on measured contact angles, evaluation according to Fowkes (geometric mean), Wu (harmonic mean), extended Fowkes (including H bonds), Zisman (critical surface tension), Owens-Wendt (dispersive and polar), van Oss and Good (acid-base theory), Schultz I + II (two-liquid method), Neumann's Equation of State (EOS), calculation of dispersive and polar contributions of liquids based on measured surface and interfacial tensions as well as contact angles with error limits, calculation of wetting envelopes, work of adhesion, and other diagrams
Software SCA 22:	• Calculation of surface and interfacial tensions based on pendant drop contours and rising bubbles
Software SCA 23:	• Calculation of surface tensions of liquids based on liquid lamella on test spheres and rods
Dimensions (L x W x H):	• 590 x 160 x 360 mm
Weight:	• 14 kg
Power supply:	• 100...240VAC; 50...60Hz; 55 W

Accessories

The OCA 15EC shares a common feature with all the other contact angle measuring instruments from the OCA series – the *OCA accessories construction kit*.

- high-speed option for 1/3" USB-camera (max. 311 images/s) **UpUSB 87H** • liquid temperature control unit **TFC 100** • syringe heating device **SHD** • peltier temperature control unit **TPC 150** • minute droplet kit **MDK 15** • film or paper sample holder **FSC 80** • film sample holder **FSH 30** • holder for single fibers and hairs **FHO 40 plus** • suction plate **SP 100** • optical contact angle and drop shape standards **OCAS** • dispersive solid reference surface **SFE-DS** • electrowetting platform **EWP 100** • dosing syringes **DS xx** • dosing needles for sessile drop measurements **SNS xx** • dosing needles for pendant drop measurements **SNP xx** • hydrophobization kit for dosing needles **HY-Kit** • dosing needles for captive bubble measurements **SNC xx** • glass cuvettes for captive bubble measurements **GC xx**
- Transport case **TBO** • PC systems or notebooks.

For more information about a tailor made solution to your surface chemistry requirements, please contact us. We will be pleased to provide a quotation, obligation free, for your instrument system.

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