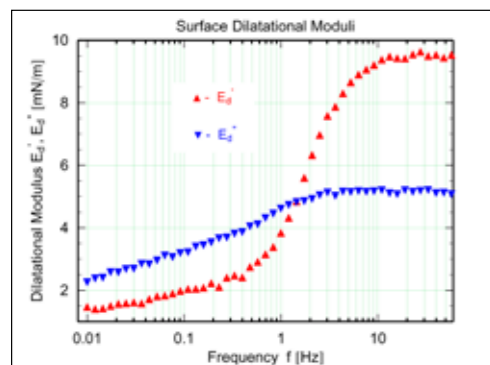# ODG 20
Oscillating Drop Generator

dataphysics

Surface dilatational modulus measured by an frequency sweep

Interfacial rheology

Measurements of surface elasticities and relaxational studies, at phase boundaries, have been of interest to surface chemists for more than thirty years.

Since the publication of the classical works by *Lucassen* and *van den Tempel* the number of scientific publications in this field have grown constantly and interesting applications have been described in foam stability and the behavior of biomolecules at phase boundaries. 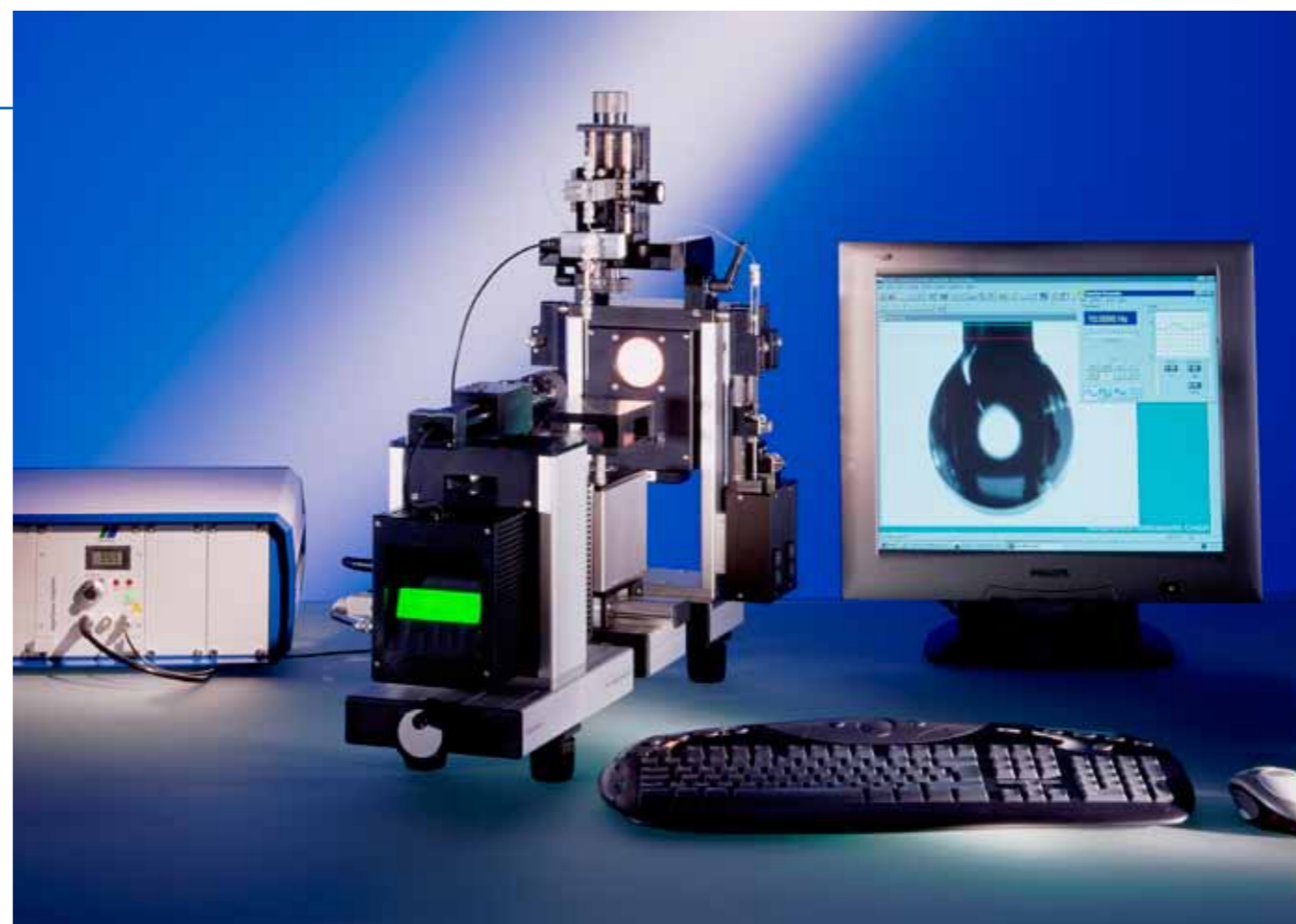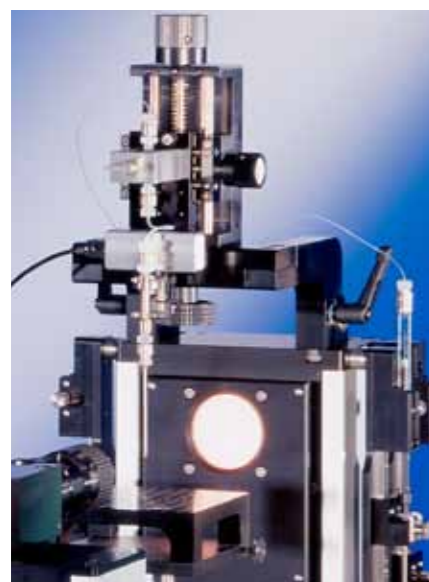To address these applications, DataPhysics has developed the ODG 20 oscillating drop generator for determining the interfacial rheological properties.

This extension to the optical contact angle measuring and drop contour analysis systems of the OCA series – based on a piezoelectric transducer – excites oscillating drops with a wide range of fre-

Oscillating drop actuator ODG 20 with dosing unit for longitudinal oscillations

OCA 30 with oscillating drop generator ODG 20

quencies and amplitudes. Periodic variations in the drop volume, or alternatively in the drop shape, with constant volume, can be performed. In addition, the drop surface area can be kept constant while the drop volume is varied.

The excitation frequency ranges up to 25 Hz, depending on the density and viscosity of the fluid. The amplitude of the, axis-symmetric, oscillations varies from just a few micrometers to millimeters.

Trend-setting measurements

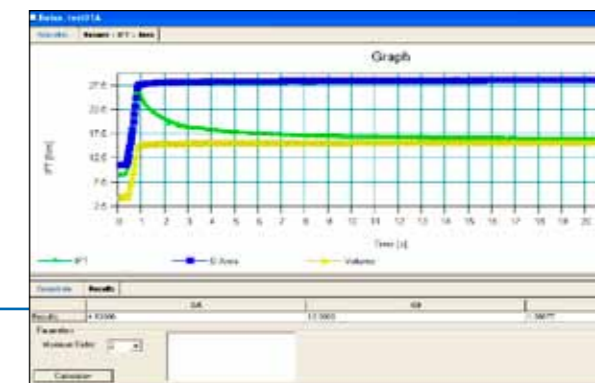The ODG 20 offers the following measurement modes:

- Constant volume mode with axis-symmetric drop shape oscillations

- Harmonic volume mode with the following wave forms: sinusoidal, saw tooth, rectangular, triangular, or arbitrary waveforms

- Relaxational mode following the instant increase/decrease of the drop volume

Technical highlights

- High-performance piezoelectric actuator

- Software controlled amplifier for pre-defined (sinusoidal, saw tooth, rectangular, triangular or arbitrary) waveforms

- Optional high-speed image processing system UpOCAH (up to 1000 images per second), UpHSC 1000 (up to 1600 images per second), or alternatively UpHSC 2000 (up to 2200 images per second)

- Optional thermal and environmental chambers

- High-precision software controlled dosing systems

Software for efficient work

The software module SCA 26 developed for Windows XP® and Vista® features all

measuring methods known in interfacial rheology analysis. It also features simple and intuitive usability and control of all hardware components.

The calculation, analysis and presentation of the real and imaginary part of the interfacial dilatational modulus could be obtained by oscillational and relaxational studies.

The results can be derived from liquid/gas or liquid/liquid systems.
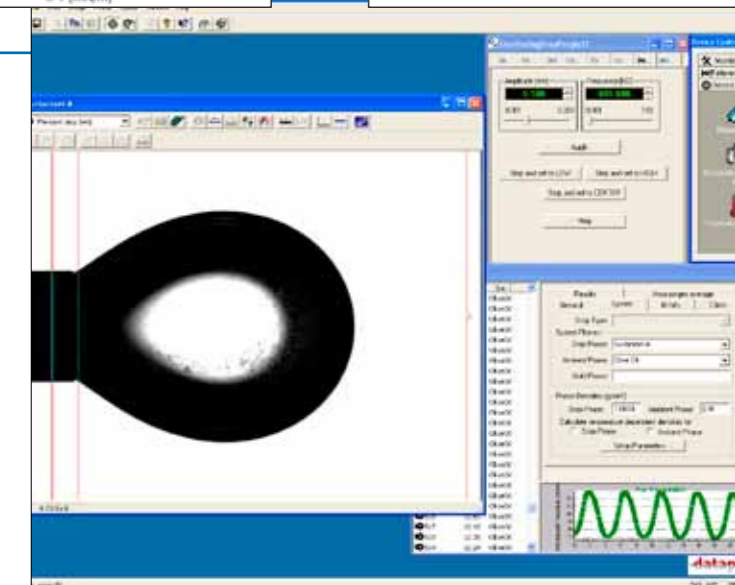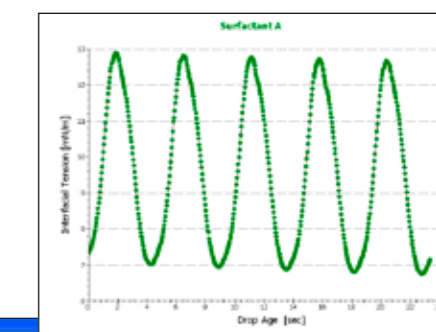
Intuitively programmable sequences

allow the automatic analysis and presentation of frequency and amplitude sweeps without user interaction.

Software module SCA 26
Analysis of relaxational effects of an expanded drop

Surface area vs. Interfacial tension
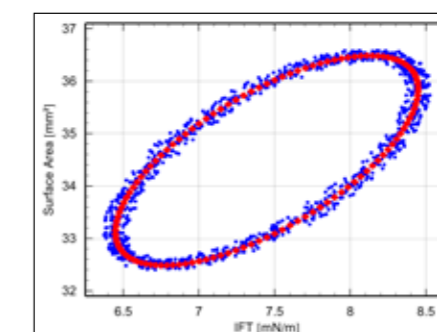
Oscillating Interfacial tension

Software modules SCA 20 and SCA 26
Measurement and analysis of oscillating drops

Technical data

|	
Constant volume (area) mode:	• 0 … 600 µm axis-symetric drop shape oscillations
Harmonic volume (area) mode:	• 0 … 20 µl
Relaxational mode (expanding drop method):	• 0 … 20 µl
Programmable wave forms:	• sinusoidal wave (for drop oscillations)
	• step function (for drop relaxations)
	• saw tooth
	• triangular
	• arbitrary wave
Viscosity range:	• up to 50 mPas
Dynamic interfacial tension measuring range:	• 0.05 … 2000 mN/m
Frequency range:	• 0 … 25 Hz
Dimensions (L x W x H):	• ODG 20 Actuator: 210 x 140 x 240 mm
	• ODG 20 Amplifier: 350 x 360 x 150 mm
Weight:	• ODG 20 Actuator: 2 kg
	• ODG 20 Amplifier: 8.7 kg
Power supply:	• 100…240 VAC; 50…60 Hz; 350 VA

The 'modular' design Philosophy

The contact angle measuring instruments from the OCA series share a common feature – the successful *OCA accessories construction kit*, designed to help solving your interfacial problem. This extensive range of accessories consists of various dosing systems, temperature and environment control systems, turn and tilting tables, sample positioning systems, and tilting base units.

The ODG 20 illustrates the proven OCA design philosophy. It enables the interfacial measurement, by an unique measurement device, of viscoelastic properties (e.g. real and imaginary part of the interfacial dilatational modulus) of liquid/gas or liquid/liquid interfaces in several different excitation modes, independantly controllable for drop volume or drop area.

This is possible by the software control of a piezoelectric device, which generates oscillating and relaxing liquid drops.

For a solution to your specific application the modular design of the OCA family, developed in cooperation with our customers, provides a multitude of system configurations, which guarante a comfortable and effective solution.
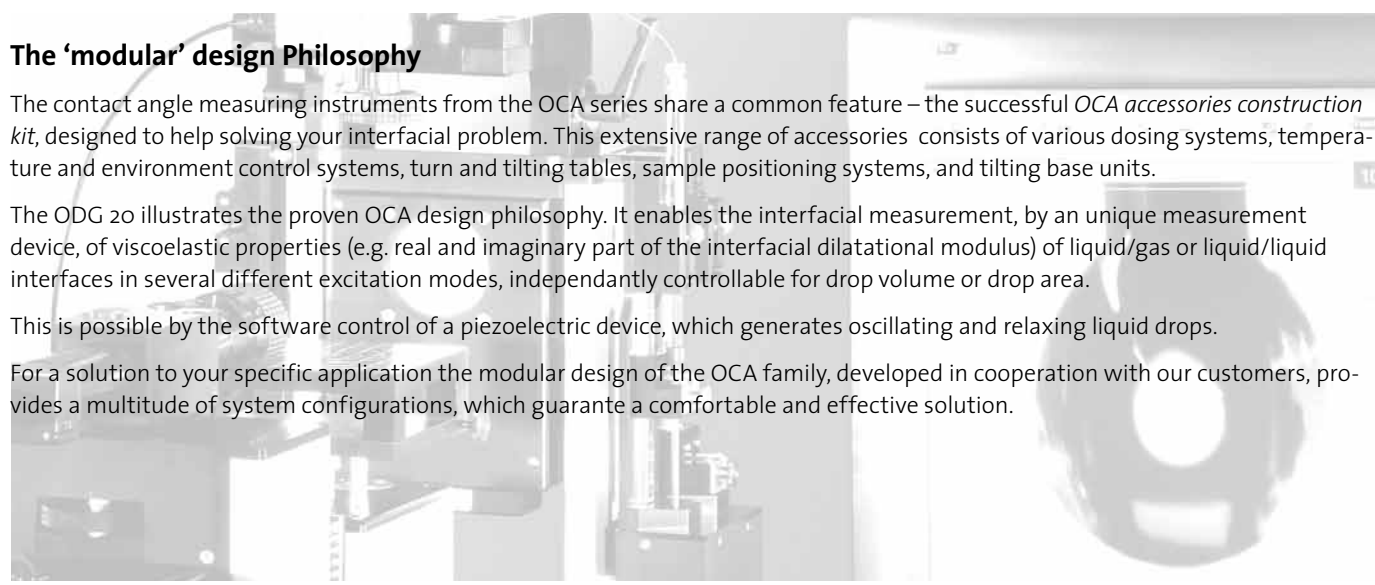
For more information about a tailor made solution to your surface chemistry requirements, please contact us. We will be pleased to provide a quotation, obligation free, for your instrument system.

Your sales partner: