

## Tensiometry

BPA-1P

BPA-1S

DVA-1

PAT-1

PAT-2P

STA-1

STA-2

DPA-1

## 2D-Rheology

ODBA-1

ISR-1

## Foams

FA-1S

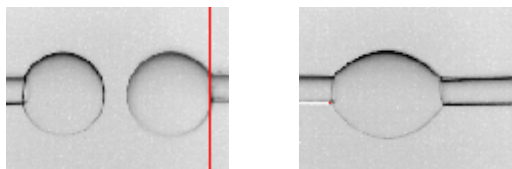
TFA-1

## Emulsions

DBMM-1

## Fluid Dynamics

### Drop and Bubble Micro Manipulator DBMM-1



This special equipment is dedicated to studies of the direct interaction between droplets or bubbles.

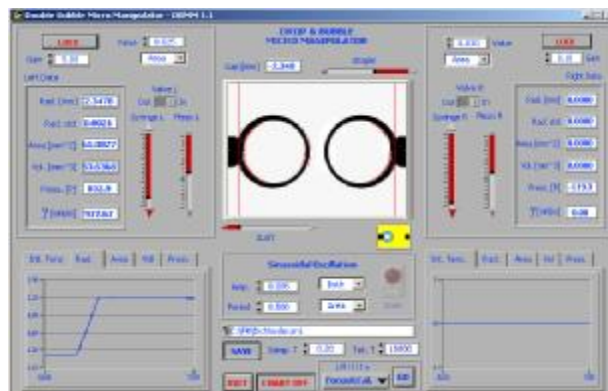
Systems like emulsions or foams or foamed emulsions consist of ensembles of drops or bubbles or mixed drops and bubbles. The direct interaction of these entities yields information on the stability of the liquid disperse systems.

#### The drop and bubble micro manipulator

- fits as accessory into the profile analysis tensiometer PAT-1
- gives access to the capillary pressure inside the individual drops or bubbles
- allows to manipulate the size of the two entities
- allows to move the entities against each other to bring into interaction
- measures the time of coalescence

## The instrument allows the following measurements

- surface and interfacial tension of liquids (also of iso-dense systems)
- coalescence of drop-drop, bubble-bubble, and drop-bubble systems
- dynamic interfacial tensions in the short time range (0.01 - 100 s)
- available needles allow to form drops or bubble on a scale between 50  $\mu\text{m}$  and 1 mm or more
- drops or bubbles can be manipulated by a very fine piezo dosing system
- entities of different size can be used on the two sides



## Main features of the software:

- on-line registration of capillary pressure in both sides
- control of fine dosing systems for definite changes of a drop or bubble
- fast capillary pressure registration for dynamic interfacial tension measurements according to a maximum drop pressure routine

## Technical Data

Range of surface and interfacial tension	1 to 1000 mN/m; resolution: $\pm 0.1$ mN/m
Optics	fixed objective with high magnification CCD-camera, max. resolution of 768 x 576 pixels optical distortion: < 0.05 % (in PAT-1)
Frame grabber	NI high-quality digitising board (in PAT-1) transfer rate: 25 images per second
Input-Output Board	NI data acquisition board, 16 bit, 200 kS/s
Software	Windows software (free update over 1 years after purchase)
Measuring options:	
- single drop/bubble	surface / interfacial tension oscillations up to 100 Hz
- pair wise drop/bubble for coalescence	
Size of device (L x W x H)	200 x 200 x 150 mm (standard)
Weight	2 kg
Power supply	100 ... 240 AC; 50 ... 60 Hz; 60 W
Extra accessories	special needles (Eppendorf) with diameter between 50 $\mu\text{m}$ and 1 mm