Microfluidics is the emerging technology that deals with the manipulating and controlling fluids, usually in the range of microlitres to picolitres, in the networks of channels with the lowest dimensions from tens to hundreds micrometers. It has various applications in Biomedical and Chemical Field. The study in this setup can be divided into two categories:

- Digital Microfluidics (DMF)
- Continuous Microfluidics

Digital Microfluidics (DMF)

Digital microfluidics (DMF) is an emerging liquid-handling technology that manipulates liquids in discrete droplets for various applications. Electrowetting on dielectrics (EWOD) is an advance technology in which droplet actions are controlled by electric field. This system provides Electronics system for droplet handling and measurement along with a low cost Printed circuit board (PCB) base electrodes. The post image processing based measurement tools for characterization.

Continuous Microfluidics

In this mode of study the continuous flow action of fluid under small surface and small volume with fixed flow rate is desired. The System provides a platform to analyze low cost soft lithography based PDMS samples under desired flow rate. Mixing, laminar & turbulence behavior, particle tracking can be analyzed.

Features:

- Measurement of contact angle
- Droplet Transporting and Merging
- Calculation of Mixing Efficiency
- Velocity Measurement
- Volume Measurement

Droplet Transporting

Droplet Merging

Applications:

- Micro-mixing of two liquids.
- MEMS based experimental kit.
- Chemical Analysis

Instrument Specification:

- Output Voltage Range(DC):10V to 300V
- Simultaneous control of voltage over 8 Channel
- Magnification Range of camera -25 X ~ 200X (Manually)
- Camera Frame Rate 30 f/s
- White-light LED strip for adjustable illumination of camera.
- XY linear moving stage for sample: Movement range: 76mmX50mm.
- 4 USB ports for interfacing of mouse, Keyboard etc
- Ethernet port

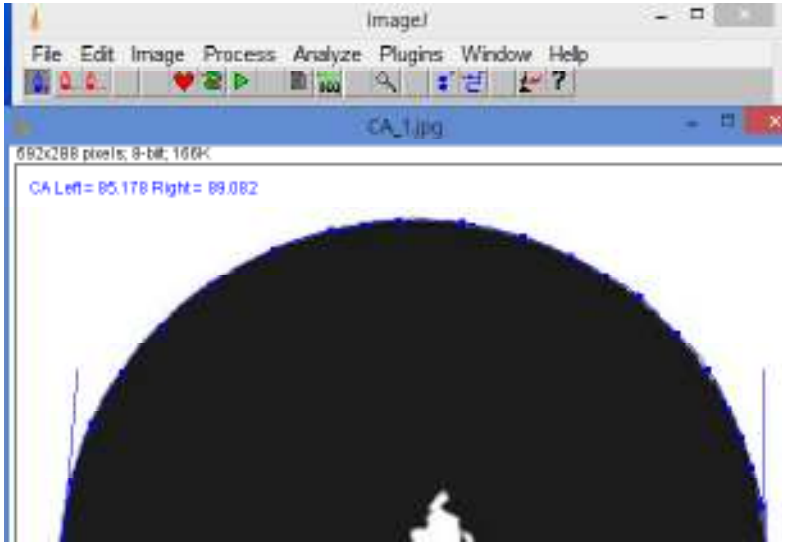
Electronics Control Unit

Electrical Specification:

- Input Power: 190~240 volts AC,50 Hz

User Interface (UI) along with user manual

- User Friendly
- Camera interface
- Control software enables Contact angle measurement and Velocity Measurement using ImageJ , Calculation of Mixing Efficiency Using Scilab



Microfluidic Characterization Setup

MI - CHARs

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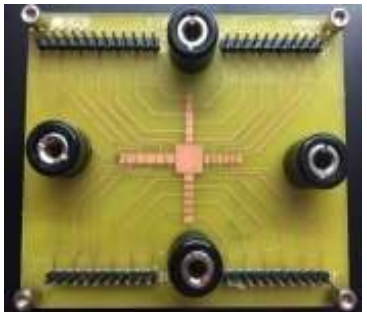
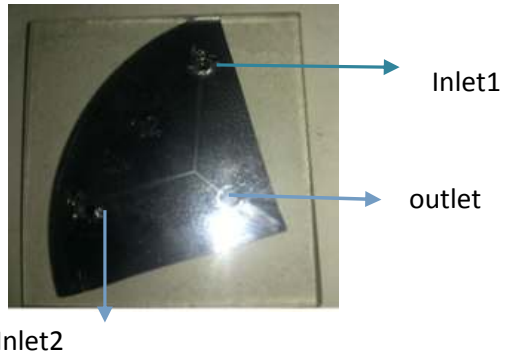


DMF Chip



Microchannel