

Tweez 305

A complete turn-key laser tweezers system

Tweez – the art of optical manipulation



What is tweez?

Tweez 305 combines powerful optical tweezing manipulation with microscopy techniques delivered by standard microscopes. Tweez fits Nikon Ti 2 A/E and Ti U/E microscopes and is designed for zero maintenance to let you focus on your application.

Compact

Tweez 305 acousto-optic laser beam steering is the only commercially available technology capable of sub-nanometer optical trap positioning resolution and trap-to-trap switching rates up to 200 kHz. A unique and compact optical setup is designed to pack all components into a single ultra-stable unit. With its multi-watt IR laser, Tweez 305 can simultaneously control 1000+ trapped objects.

Versatile

Based on acousto-optic (AO) laser beam deflection technology, Tweez 305 enables you to create complex trapping patterns. Manipulation of trapped objects is possible through flexible control of trapping sites with exceptional positional and time accuracy.

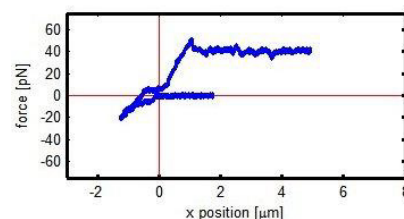
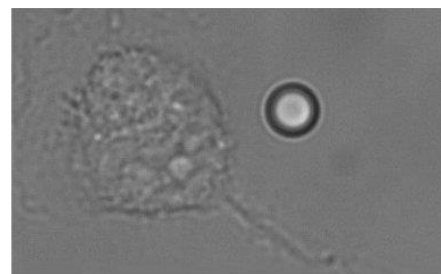
Superior control

To facilitate precise control of complex trapping patterns, Tweez 305 relies on a fast multicore ARM and FPGA processing unit and fast USB communication with a PC-based software. On-board memory can store several million trap positions which can be selectively applied within a microsecond to provide flexible control over the experimental setup. External control is supported via several standard software interfaces.

Optical trapping

Tweez 305 enables you to create complex optical trapping patterns by using acousto-optic deflection (AOD) of the laser beam. The technology provides flexible control of multiple trapping sites and manipulation of trapped objects with exceptional positional and temporal accuracy.

- Sub-nanometer trap positioning resolution.
- Independent trap strength control.
- Up to 4 million user-preloaded trapping site patterns.
- AOD field compensation and response linearization.
- Motorized Z-trap positioning independent of microscope focus stage.
- Real-time dynamic trapping pattern morphing.



Tweez 305

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Tweez 305 – Full version specifications

Tweez 305 integrated laser tweezers system with AOD laser trap control.

Optical traps	2500 time multiplexed
Trap to trap switching rate	100 kHz
Working field	100 μm x 100 μm (with 60x microscope objective)
Camera	Fast, high sensitivity 4 Megapixel (2048 x 2048) monochrome/color image sensor with pixel size 5.5 μm .
Laser	5 W CW, 1064 nm
Power requirements	100 – 230 V, 50 – 60 Hz

User software for PC - controlled multiple trap manipulation and imaging. External control possible via TCP/IP or automation.

Minimum microscope requirements

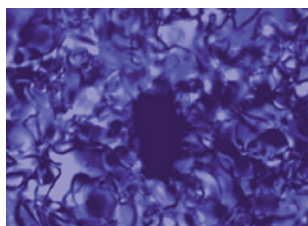
Nikon Ti 2 A/E or Ti U/E microscope	1 x
Filter cassette	1 x
NIR 60x W NA 1.0 microscope objective	1 x
Free camera port	1 x

Force measurement add-ons

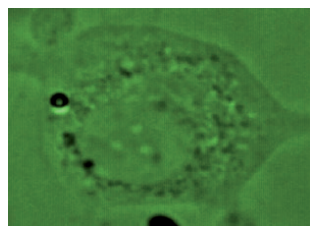
Complete camera based force measurement data acquisition and analysis solution. Simultaneous particle tracking and force measurement data analysis of up to four traps.

Quadrant photodiode (QPD) force measurement hardware module.

Range of applications



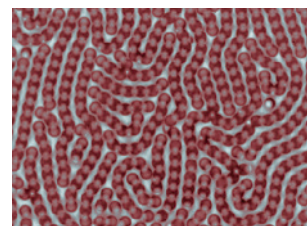
Liquid crystals



Biophysics – biology



Micro fluidics



Colloidal physics