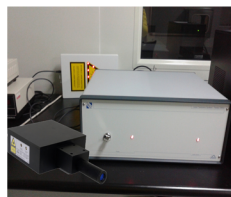# Tweez 250 si

A complete turn-key laser tweezers system
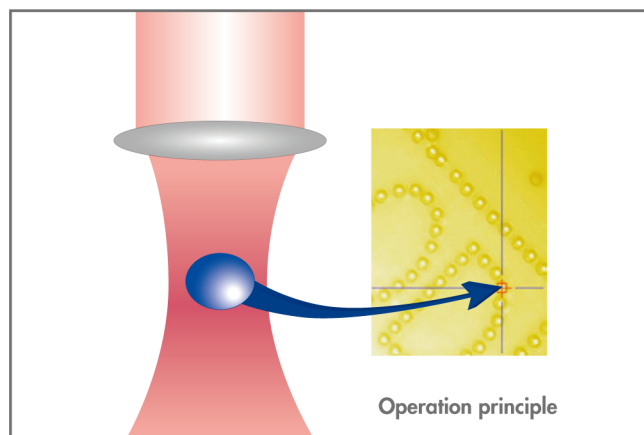
Tweez – the art of optical manipulation

Compact and robust system design
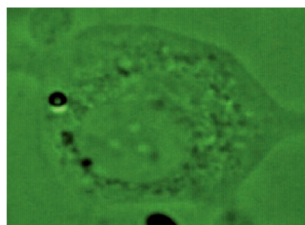

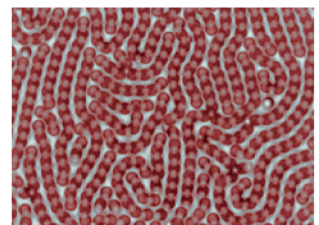Tweez250si without microscope

Operation principle

What is tweez?

A complete turn-key laser tweezers system.
Designed to fit on Ti-U/E microscopes Tweez combines its powerful laser tweezing manipulation capabilites with microscopy techniques delivered by the microscope. Tweez is designed for zero maintanance and let you focus on your application.

Compact

Tweez AO laser beam steering - the only technology capable of sub nanometer optical trap positioning and trap-to-trap switching rates of up to 100 kHz. Unique optics topology is used to pack all optical components into a single ultra stable unit. With multiwatt IR fiber laser Tweez can achieve a simultaneous control of 1000+ trapped objects.

Versatile

Designed to serve variety of applications Tweez finds its use ranging from physics to biology, from fundamental research to industrial applications. The precision and ease-of-use let you maintain the focus on your project. Advanced I/O and synchronization capabilities along with open software architecture provide a custom control for the most demanding setups.

Trapping

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

- 2500 time multiplexed optical traps
- Computer controlled movement of simple traps and complex trap patterns.
- Up to 4 million user preloaded trapping site patterns for simultaneous control of over 1000 particles.
- AOD based XY trap position and strength control with sub nm positioning resolution, flat field compensation and AOD response linearization.
- Independent trap strength control.
- Motorized Z trapping independent of focus stage.
- Real-time dynamic trapping pattern morphing.

Range of applications

Liquid crystals

Biophysics – biology

Micro fluidics

Colloidal physics

Tweez 250Si Full version specifications

Tweez 250 integrated laser tweezers system with AOD laser trap control.	
Optical traps	2500 time multiplexed
Trap to trap switching rate	100 kHz
Working field	typical 120 µm x 120 µm
Camera	Fast, high sensitivity 2.2 Megapixel (2048 x 1088) Monochrome CMOSIS image sensor. Pixel size 5.5 µm camera
Laser	5 W CW, 1064 nm
Hardware synchronization with external equipment	via BNC I/O
Power requirements	100 – 230 V, 50 – 60 Hz
User software for computer controlled multiple trap manipulation and imaging	
Filter cube with preinstalled dicroics and filters	
Cables and laser warning sign	

Minimum requirements for use with a standard microscope

Nikon Eclipse Ti E or Ti Eclipse Ti U microscope	1 x
Filter casette	1 x
NIR 60x W NA 1.0 microscope objective	1 x
Free camera port	1 x

Superior control

To facilitate a precise control over complex trapping patterns Tweez relies on an ultrafast on-board processing connected via fast USB communication to a PC based software. Several million trap positions can be stored in an on-board memory and selectively applied within a microsecond – a flexibility providing control over the experimental setup.

Tweez system

Camera upgrade

Camera with 4 Megapixel (2048 x 2048) monochrome CMOSIS image sensor. Pixel size 5.5 µm

Force measurement package

Complete force measurement data acquisition and analysis solution
Simultaneous particle tracking and force measurement data analysis on up to four traps

Tweez 250Si options selction matrix	2500 traps	2 traps	1 trap	Computer controlled trap movement	Manual trap movement	I/O support	TCP
Full version	✔	✔	✔	✔	✔	✔	✔
Dual trap version (Only one laser trap without computer controlled path, no TCP interface)(		✔	✔	✔	✔	✔	
Single trap version (Only one laser trap without computer controlled path, no TCP interface)			✔	✔	✔		
Single trap manual version (Only one laser trap without computer controlled path, no TCP interface, no Input/Output and camera sychronization interface)			✔		✔		