



# TIRF Technologies

*Sensing Biomolecular Interactions*



## Fluidics System *SmartFlow* TF1005



### *SmartFlow* TF1005 Fluidics System

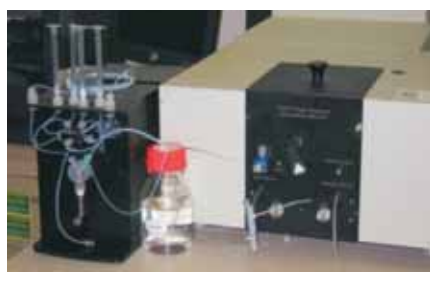
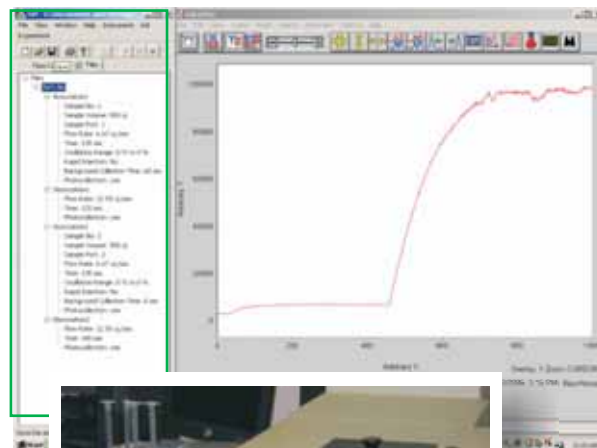
The **SmartFlow TF1005** is a compact stand-alone fluidics, which facilitates measurements of kinetics and analysis of biomolecular interactions. SmartFlow is equipped with a precision syringe digital pump and computer-controlled valves. It is designed for use with TIRF spectroscopy, TIRF microscopy, SPR, SERS, electrochemical, and other real-time analytical techniques that employ flow cells, where one partner of the interactions (receptor or “capture” molecule) is immobilized at the surface of a sensor chip, and the other partner (ligand or “target” molecule) is present in the solution phase. When the bioanalyte solution is injected into the flow cell, there is a transient time, during which the interactions are limited by mass transfer, rather than by the kinetics of receptor-ligand interactions. In traditional fluidic systems, the transient time is large. If the rate constant is fast, one needs large amount of bioanalyte solution to resolve the kinetics. SmartFlow TF1005 allows for minimizing the amount of solution necessary for measurements of fast rate constants. Typically, 100  $\mu\text{L}$  or less of bioanalyte solution is sufficient to record a sensorgram and determine association and dissociation rate constants. In contrast to traditional fluidic systems, SmartFlow provides profiled flow rate, which is fast at the beginning and slower or oscillating at the equilibrium. The flow profile is precisely reproducible from sample to sample. User-friendly software guides the experimenter through all preparation stages and allows for creating custom-designed protocols. The fluidics operates automatically, once launched by the user. SmartFlow handles up to 4 bioanalyte solutions (up to 8 in “stair-case” experiments), a buffer and regeneration solutions. Additionally, easy-to-use FlowControl feature enables the user to operate fluidics components separately or intervene with manual manipulation, if necessary.

### Features

- Facilitates recording TIRF sensorgrams to derive  $k_{\text{on}}$  and  $k_{\text{off}}$  constants
- Designed to minimize mass transfer time and dead volumes
- Automated processing of 4 bioanalyte solutions and 2 buffers
- Automated sample loading/injection process
- Profiled flow rate extends association stage for small-volume samples
- USB communication port interfaces SmartFlow with computer

### Specifications

- Precision digital syringe pump 3,000 steps
- Computer-controlled valves
- Default syringe volume: 2500  $\mu\text{L}$   
*Optional syringes of smaller/greater volumes 50 $\mu\text{L}$ -5mL*
- Flow rates: 0.0001  $\mu\text{L}/\text{sec}$  - 5000  $\mu\text{L}/\text{sec}$
- Minimum sample volume - 50  $\mu\text{L}$
- Maximum sample volume - 2500  $\mu\text{L}$



SmartFlow fluidics is recommended for use with TIRF Accessory TA1004, and TIRF microscopy flow systems lightguide- and prism-based TIRFM. SmartFlow application window can be conveniently open in one screen with your fluorometer application or microscopy imaging software.

Analysis of Biomolecular Interactions