

MALDI Application Overview

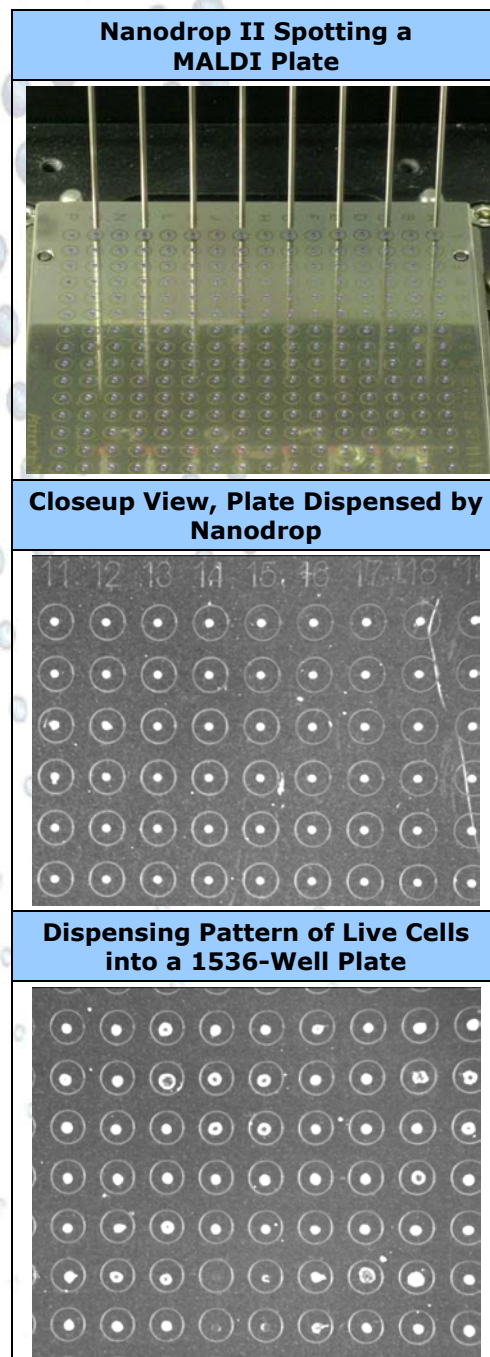
For protein characterization and quality control of synthetic oligonucleotides, MALDI-TOF has become the method of choice. To perform MALDI-TOF mass spectrometry, compounds must be spotted on a flat, metal MALDI target plate. Positional accuracy and precise deposition of the spots is critical. Classical liquid handlers using contact methods are prone to failure due to plate and tip irregularities and poor positional accuracy (typically > 100 µm/axis). Innovadyne's platforms reliably fulfill critical MALDI spotting requirements with precisely manufactured motion control (<20 µm return to spot accuracy) and high-precision non-contact solenoid dispensing. The aspirate/dispense capabilities of the platform enable rigorous washing to be performed between samples.

The Nanodrop II is an ideal benchtop solution for use in spotting MALDI plates for protein characterization and quality control of synthetic oligos, as well as analysis of laser capture microdissection (LCM) cells. It includes two plate nests for source and MALDI plates. Single tip dispensing can be performed for rare compounds, and independent channel spotting enables spotting of unique plate maps.

In the application note "Improved Liquid Handling for MALDI Plate Spotting," developed in conjunction with Biosearch Technologies (Novato, CA), MALDI spotting performance for oligo QC was compared between a Nanodrop II and a BioMek FX from Beckman-Coulter under actual manufacturing use. It was determined that the Nanodrop generated higher quality spots (no missed or doughnut-shaped spots) and better spectra using 1/5 the volume of matrix and 1/10 the volume of oligo required by the Biomek. Laser desorption in five different positions was required for each Biomek spot, whereas one position was sufficient for a Nanodrop spot.

	Nanodrop	Biomek FX
Matrix spot volume	100 nL	500 nL
Oligo spot volume	50 nL	500 nL
Laser desorption shots per spot	1	5

	Biomek FX	Nanodrop	Platemaker (estimated)
Process time (minutes)	325	231	165



Application Notes

- **Improved Liquid Handling for MALDI Plate Spotting (M064)**

Technology Briefings

- **High Precision, Non-Contact Dispensing (M002)**
- **Low-Volume Dispensing with the Nanodrop (M021)**

Features (all platforms)

- Two plate nests for source plates and MALDI plates
- Single tip access for rare compounds
- Independent channel spotting enables spotting of unique plate maps
- SBS plate adapters for MALDI plates
- Easy to maintain and clean
- Simple integration with plate handlers
- Environmental control for proteins and oligonucleotides
- Flexible aspirate and dispense settings
- User defined syringe speeds and pressure set points
- Ability to clean nozzles between runs
- Low-dead volumes
- Large dynamic volume range: 100 nL-40 μ L
- 96, 384, 1536, 3456 plates (including low-profile and deep well)
- User-friendly software
- Simple to integrate with drivers available from most integrators

Platforms

Item	Description	Plate Positions	8-Tip Head	16-Tip Head	96-Tip Head	Syringe Channels	1,4, or 8-Tip Additions to all Wells
11638	Nanodrop II stage and fluidics	2	Yes	-	-	8	Yes
11164	Screenmaker 96+8	5	Yes	-	Yes	16	Yes
12027	Platemaker HTS	5	Yes	-	Yes	104	Yes

Software

Item	Description
11727	Nanobuilder
10591	Nanodrop GUI (for Nanodrop only)

Accessories

Item	Description
11193	Reagent refill system (Nanodrop)
11731	Orbital shaker (all platforms)
	Wide-bore tip set (200 μ m) (all platforms)

Specifications (all platforms)

Return-To-Spot Accuracy	0.1 mm
Aspiration Range, 8-Tip Head	0.1-500 μ L
Dispensing Range (8-Tip Non-Contact)	0.1-40 μ L
Dispensing Range (96-Tip)	Screenmaker: 0.1-125 μ L Platemaker: 0.1-80 μ L
Dispensing Precision, 8-Tip Head	CV<10% at 100nL, CV<7% at 200nL, CV<5% at 1 μ L
Dispensing Precision, 96-Tip Head	CV<15% at 100nL, CV<10% at 200nL, CV<5% at 1 μ L
Dispensing Accuracy, 8-Tip Head	\pm 10% at 100nL, \pm 7% at 200nL, \pm 5% at >1 μ L
Dispensing Accuracy, 96-Tip Head	Screenmaker: \pm 10% at 100-500nL, \pm 5% at >1 500nL Platemaker: \pm 10% at 100nL, \pm 7% at 200nL, \pm 5% at >1 μ L
Dead Volume, 8-Tip head	1.5 μ L/channel at 1 μ L across 384-well plate
Dead Volume, 96-Tip head	<1 μ L/channel
Syringe Capacity	500, 1000 μ L