



Demo Method Automation on Biomek NGeniusS Next Generation Library Prep System

Introduction

Sequencing of DNA is used to identify variations in individual genes, regions and entire organisms. Over the past 40 years, massively parallel sequencing has revolutionized DNA sequencing by drastically reducing the cost of sequencing. As a result, whole genome sequencing has become a common laboratory practice. The Demo Method App Template on the Biomek NGeniusS instrument is designed to provide a quick method that can be used to teach the customer how to set up a run on the instrument.

There are 5 sections to this protocol as seen below. Sections 1 & 2 are used to teach customers how to use the system. Sections 3, 4, & 5 may be used by manufacturing and service engineers.

Sections		
Start at section		
1. Section 1		
#	Section	Status
1	Section 1	—
2	Section 2	—
3	Microtip Check	—
4	Militip Check	—
5	Carousel Check	—

Figure 1a. Demo Method workflow with the Biomek NGeniusS system.

Figure 1b. Biomek NGeniusS next generation library prep system.



Biomek NGeniusS Highlights

- **Reduce errors**
 - Dynamic DeckOptix System reduces deck setup errors
 - Automated Reagent ID and aliquoting prevents manual reagent pipetting errors
- **Minimize Hands-on time**
 - Input carousel and temperature-controlled reagent storage zones reduce manual pipetting of reagents
 - Standard on-deck thermocycler reduces hands-on time
 - Selective Tip Type pipetting head handles both 96 and 384 tips
- **Ease of Use**
 - Portal Software allows you to set up batches and monitor the system virtually
 - Batch Set Up process requires no programming skills
 - Work Aid generates a simple checklist for reagent preparation and labware selection
 - Input Dial simplifies instrument programming
- **Flexibility**
 - Run any number of samples from 4-24
 - Complimentary library of demonstrated NGS applications
 - Ability to use partial tip boxes



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Experimental design

4 different samples of a “sample” were set up in the customer portal for processing on the system as a demo only. The cloud-based Biomek NGeniusS portal software was used for setting up the automated processes virtually (Figure 2). Then the method was run on the Biomek NGeniusS instrument using the user-friendly instrument user interface (Figure 3).

The screenshot shows the 'Batches' main page of the Biomek NGeniusS Portal Software. The page is divided into three columns: 'Needs Input', 'Ready to Run', and 'At Instrument'. The 'Needs Input' column has a '+ CREATE' button and a message: 'Use the + button to create a batch.' The 'Ready to Run' column shows a batch named '04182022 KKL' with 'DemoMethod' and '4 samples'. It includes a 'DOWNLOAD WORK AID' button and a note 'Last edited by About a minute ago'. The 'At Instrument' column shows a batch named 'XGen_18APR2022_3Musket eers_JLW_2' with 'xGenGen™ cfDNA & FFPE DNA - CO', '4 samples', and '3 Musketeers'. It includes a 'SAMPLES READY AT' timestamp.

Figure 2a. Biomek NGeniusS Portal Software: Biomek NGeniusS Portal Software is used for setting up the automated processes to be executed on the instrument. The Batches main page provides an at-a-glance status of all batches.

The screenshot shows the 'View Configured Run' configuration screen. The screen is divided into several sections: 'Batch name: 04182022 KKL', '# of samples: 4', 'Settings' (PCR Amplification Cycles: 4, Confirm Reagent Volumes), 'Sections' (1. Section 1, 2. Section 2, 3. Microtip Check, 4. Milltip Check, 5. Carousel Check), and 'Sample Data' (UPLOAD, DOWNLOAD SAMPLE DATA TEMPLATE, Well, Sample_ID, Index).

Figure 2b. Configuration Run Screen: Configuration Run screen allows users to define settings (e.g., number of samples, volumes, input concentrations) for a batch run. Sample data can be entered in .csv format.



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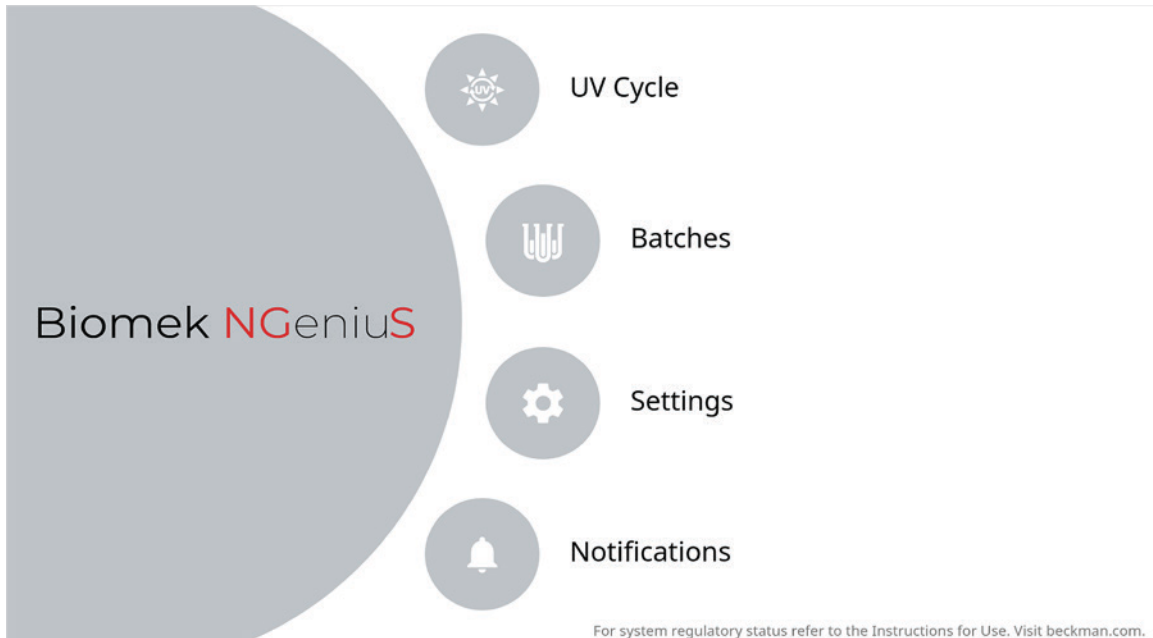


Figure 3a. Instrument User Interface: The intuitive instrument User Interface allows interaction with the instrument by turning and pressing the navigation dial.

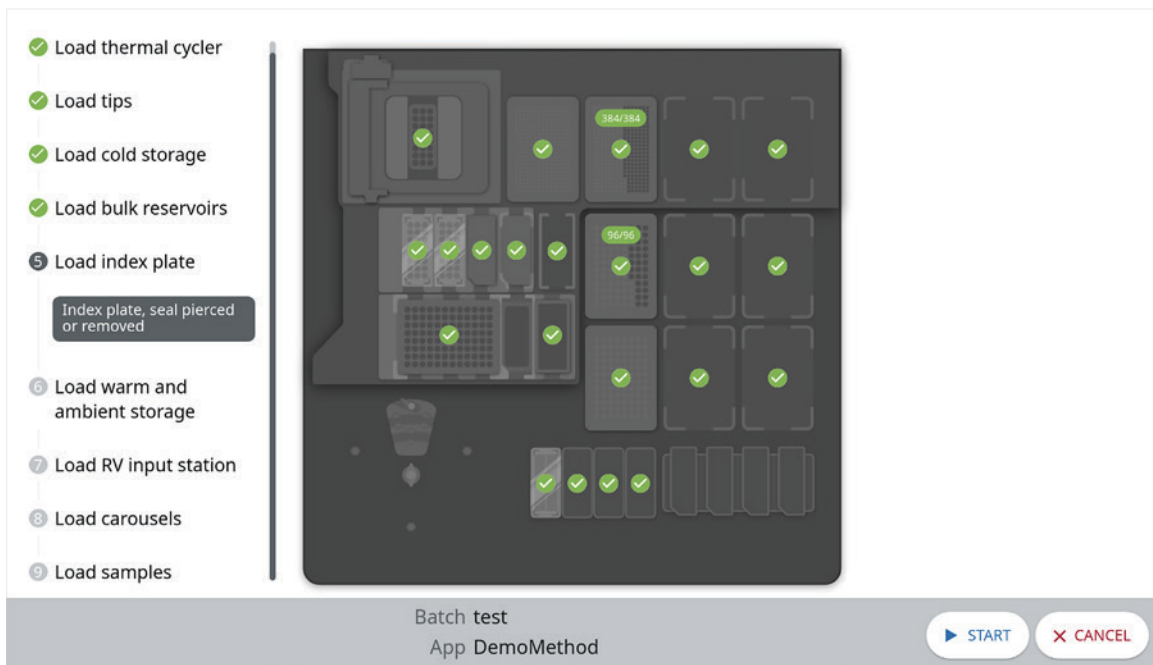


Figure 3b. Deck Setup: A step-by-step series of prompts is directed by the application with the Dynamic DeckOptix system confirming correct labware placement while advancing steps through to completion in real-time.



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Results

The Biomek NGeniuS system Demo Method App template can be used to show new users how to use the system through a quick method (Sections 1 and 2 run approximately 15 minutes).

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