



Automated Nucleic Acid Quantification with the eviFluor Duo Fluorometer on Biomek i-Series Workstations

Ian Shoemaker and Crystal Girod

Integrated Sample Analysis with the eviFluor Duo Fluorometer

Nucleic acid quantification using fluorescent intercalating dyes has solidified itself as a standard method of next-generation sequencing (NGS) library quantification. The method is more sensitive than UV-Vis quantification, providing a lower limit of detection (LoD), and less prone to overestimation of libraries by specifically targeting intact double-stranded DNA (dsDNA) in the presence of salts, proteins and free nucleotides. When compared to quantitative PCR, fluorescent quantification is simpler, faster and less costly per data point, requiring only single-step mixing, simple optical systems and short dye incubation times measured in minutes.

In contrast, many fluorescent quantification solutions require extensive manual pipetting, use simple but low-throughput optical readers, and are not immediately amenable to standard ANSI-SLAS automation microplate standards. Here, we present an automation-first solution for fluorescent nucleic acid quantification on Biomek i-Series Automated Workstations that seamlessly enables on-deck measurement at run time using the HSE•AG eviFluor Duo Fluorometer without the need for expanded integration space, or manual handling. The data is available immediately for just-in-time, data-driven decision-making, plate normalization and library pooling.

Benefits of eviFluor Duo devices include:



- A compact, automation-first integration design on an ANSI-SLAS deck position
- Real-time data for in-method process checks
- Automated endpoint normalization
- Enhanced efficiency and cost control through custom dye-dilution ratios
- Increased walk-away time for methods

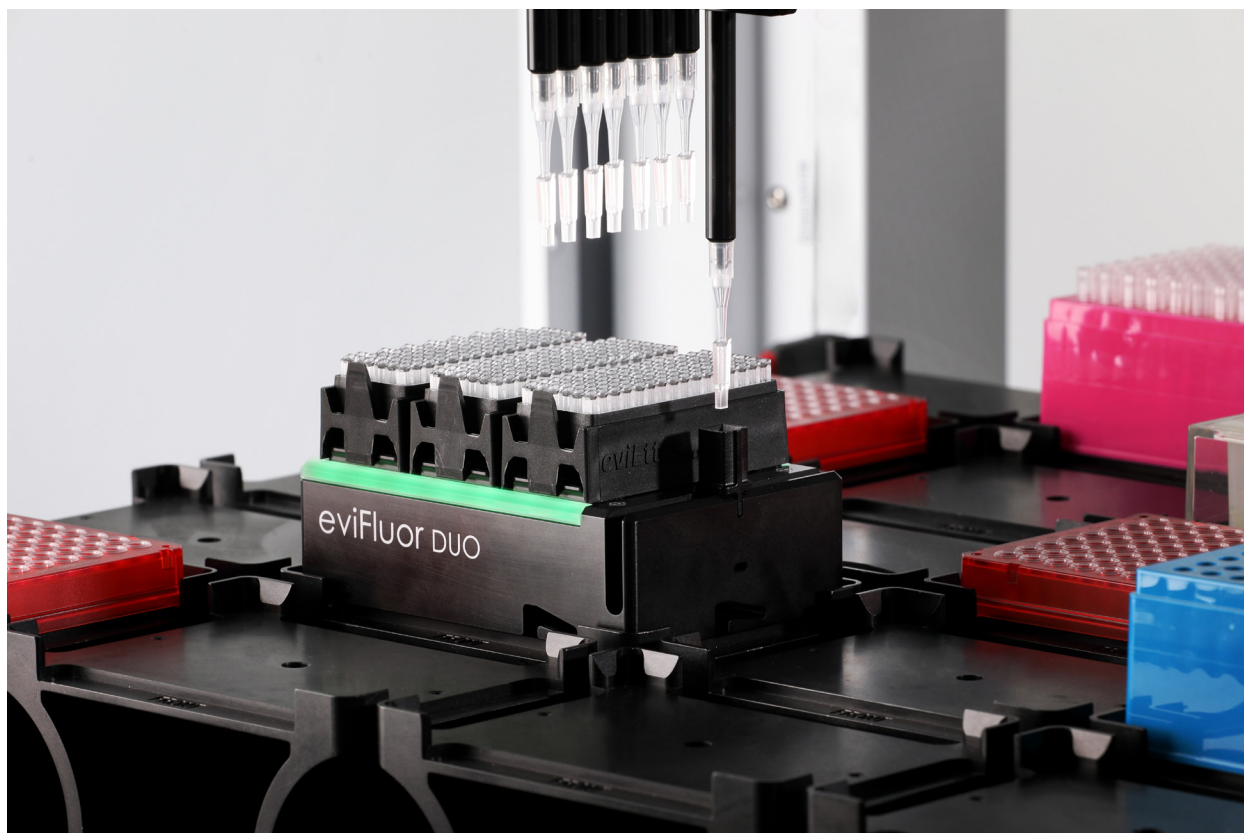


Figure 1. Image of the eviFluor Duo Fluorometer.

Solution Description

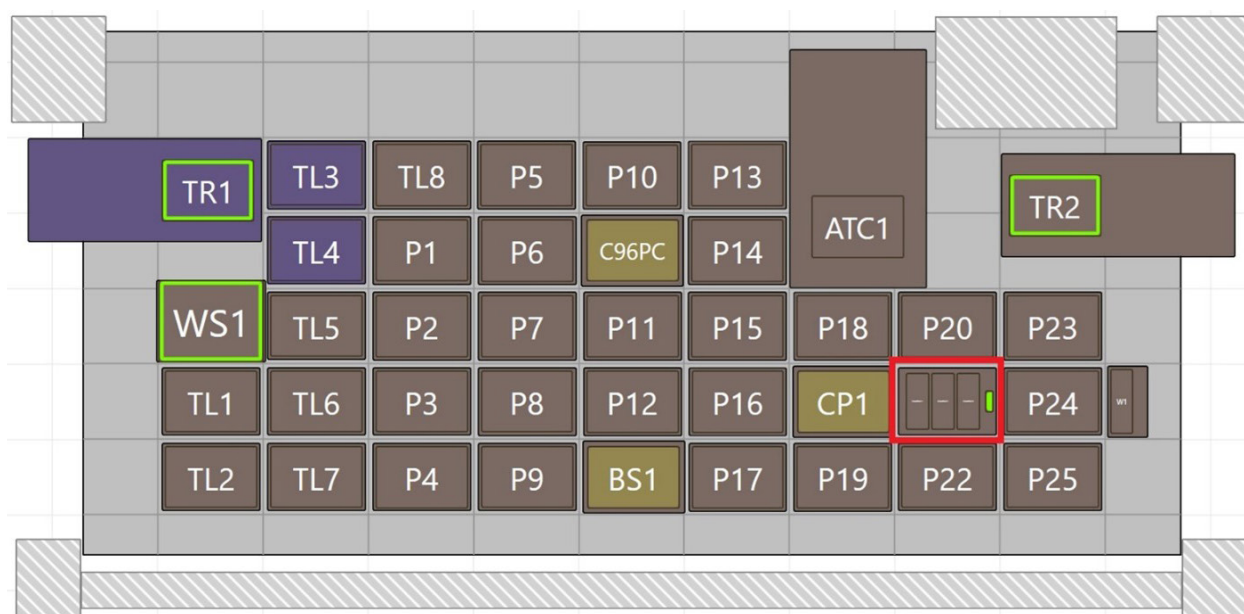


Figure 2. Biomek i7 Hybrid Workstation deck layout tailored for NGS applications with integrated eviFluor Duo Fluorometer and three eviEtte Micro Cuvette rack positions (outlined in red) in the footprint of a single microtiter.

The eviFluor Duo Fluorometer rests on a single ALP position on the Biomek i-Series Workstation deck (**Figure 2**) and is seamlessly integrated into Biomek i-Series software. It can be installed and incorporated into methods for Biomek i5 or i7 Hybrid Workstations equipped with a Span-8 pipetting pod.

The companion Biomek i-Series Workstation method supports P40F or P190F tip families and the Span-8 pipettor in two basic modalities—read-by-sample count and read-by-pattern—with flexibility to modify as needed. The eviFluor Duo Fluorometer uses eviEtte Micro Cuvettes that are contained within an eviEtte Micro Cuvette rack, which can hold up to 96 cuvettes. The device's built-in positions can hold up to three eviEtte Micro Cuvette racks for a total of 286 sample reads and two standards. The device requires no additional mounting hardware, connects directly to the Biomek tower USB ports, and is framed automatically using the on-board Accuframe positioning device.

Biomek software has been designed for the eviFluor Duo Fluorometer device integration to enable easy incorporation of an automated method into workflows.

Associated steps include:

These steps pictured below are then combined within Biomek software procedures to provide flexible access to configuration options, with default values reflecting common workflow practices. The included companion method provides both standalone reading and bolt-on NGS example use cases.



Figure 3. Biomek integration software steps for eviFluor Duo Fluorometer.

Data

Comparison of eviFluor Duo Fluorometer to reference device with manual sample preparation:

To compare eviFluor Duo Fluorometer quantification with other fluorescent quantification techniques, a single-read manual system consisting of a reader device, ready-to-use dye mixture, optical tubes and quantification standards was chosen as a reference. Quantification standards were prepared according to the manufacturer's instructions for use (IFU). Samples were prepared using the kit quantification standard as a seven-point, two-fold dilution series from 10 ng/μL nominal concentration to 0.152 ng/μL. The final sample consisted of a TE-only negative sample for a total of eight samples.

To prepare dye mixes for reading, 2.5 μL of each sample dilution was added to 247.5 μL of ready-to-use dye in the reference system's optical tube and mixed thoroughly for a total of 250 μL of sample-to-dye mixture at 1:100 dye-dilution ratio, as suggested by the reference IFU. Then, 50 μL was removed and plated separately on a standard 96-well PCR plate, leaving the reference IFU-required 200 μL in the reference system's optical tube. A modified version of the Biomek standalone companion method was run to provide five replicate measurements of the entire dilution series, proceeding through each sample in the series before repeating. As each sample was measured in the eviFluor Duo Fluorometer on deck, the matching tube was measured in the reference device, taking care not to warm the tube in the hand and to limit stray light exposure. Results are summarized in **Figure 4** below.

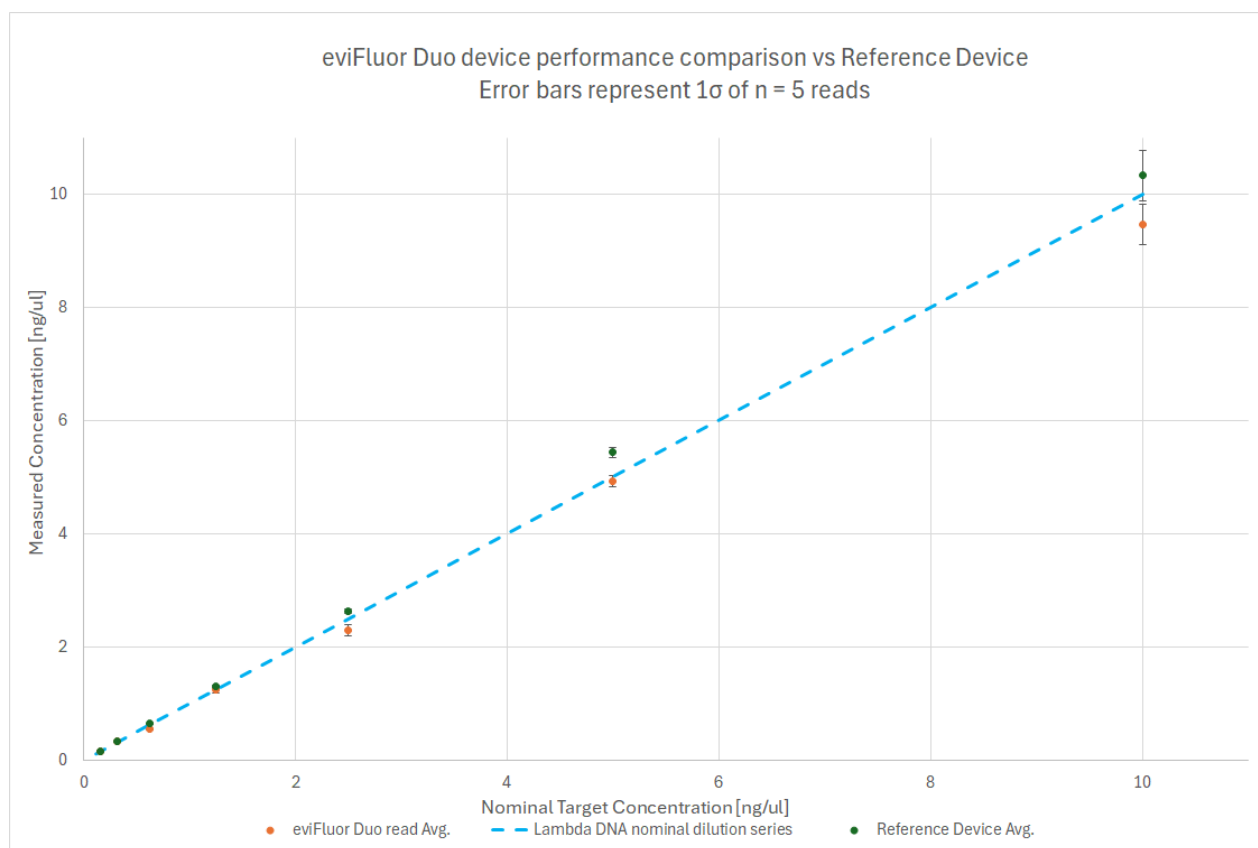


Figure 4. Comparison of eviFluor Duo Fluorometer measured concentrations to reference system shows high concordance for both measured concentration and standard deviation, with clear delineation of sample concentrations down to 0.152 ng/μL using a 1:100 dilution of samples into the ready-to-use dye mixture.

eviFluor Duo Fluorometer performance in endpoint fully automated use case:

To demonstrate the robustness of the eviFluor Duo Fluorometer and companion method, we simulated endpoint quantification following a four-hour NGS library preparation run. Aliquots of the kit standard and ready-to-use dye from the same reference system as above were held at 4° C on the Biomek deck using a QInstruments ColdPlate device and tube adapter. At the 3.5 hour mark, we prepared an eight-point two-fold dilution series from 10 ng/μL to 0.078 ng/μL nominal lambda dsDNA reference standard.

Next, 20 μL of the eight-point sample dilution series was plated in triplicate columns 1, 2 and 3 of a standard 96-well PCR plate to simulate a final elution of a 24-sample NGS library preparation run. After four hours, the Biomek NGS bolt-on companion method was run with the optional sample pre-dilution disabled. This method prepares the standards at a 1:20 standard:dye dilution ratio, reads the standards, prepares the samples at a 1:20 (user-configurable) sample:dye dilution ratio using 2 μL of sample, then reads the samples, and maps the dilution-corrected concentration ratios back to the sample plate without further user input. Results are summarized in **Figure 5** below.

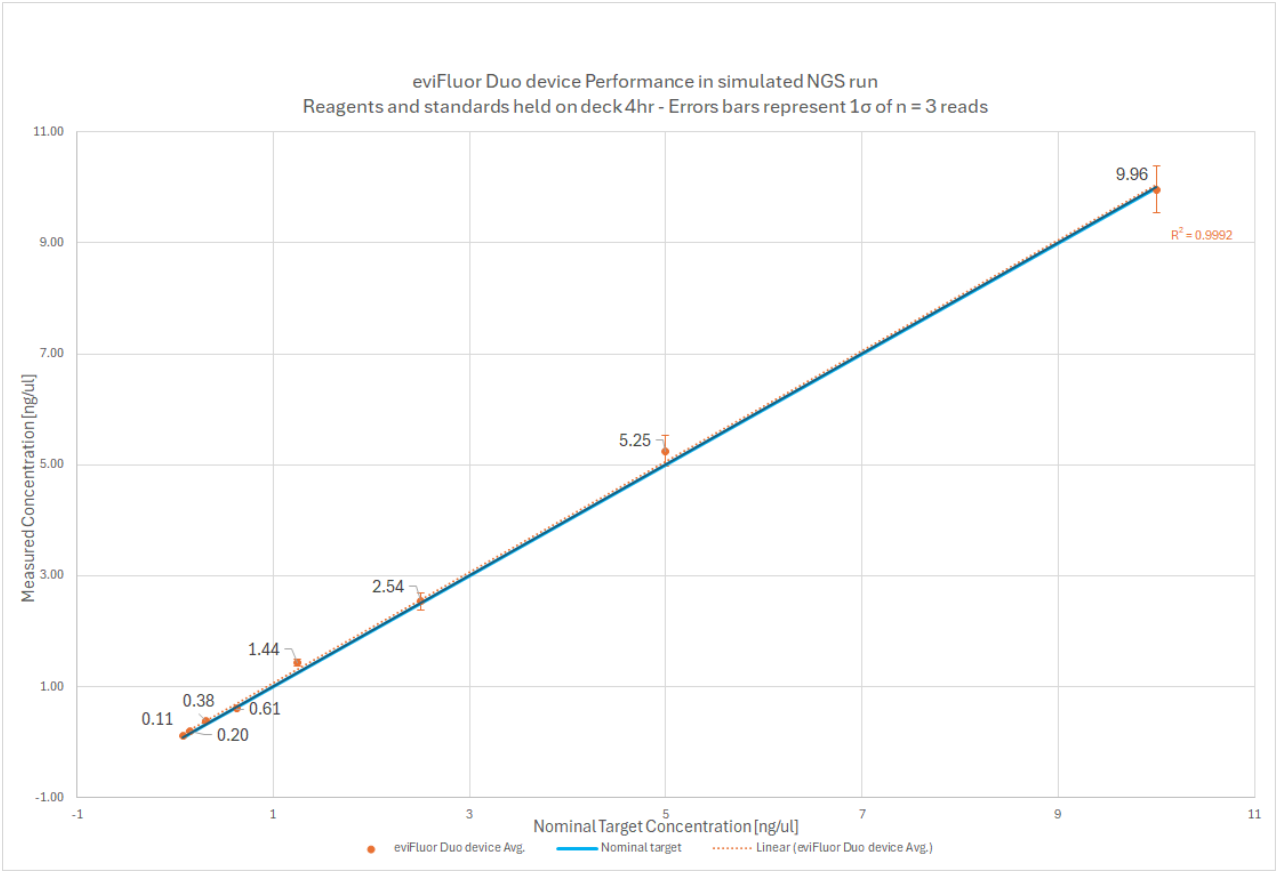


Figure 5. eviFluor Duo Fluorometer performance in simulated bolt-on NGS endpoint run. All reagents were held on deck for four hours, and standards and samples were prepared via automated pipetting.

Conclusion

When integrated with Biomek i-Series Workstations, the eviFluor Duo Fluorometer provides reliable, actionable nucleic acid quantification without laborious manual steps. This solution has the potential to close workflow gaps, increase walk-away time and streamline tedious operations such as input guard-banding and endpoint normalization and pooling steps.

Part number	Description
D27544	eviFluor Duo Fluorometer
969154	eviFluor Duo Integration Kit
C02852	eviFluor Duo Method Support (1-day)

References

1. HSE AG user manuals for the eviDense UV Photometer can be found at <https://www.hseag.com/on-deck-fluorometer>
2. Beckman Coulter Life Sciences references can be found at <https://www.beckman.com/support>

Beckman Coulter makes no warranties of any kind whatsoever express or implied, with respect to this the illustrated applications, including but not limited to warranties of fitness for a particular purpose or merchantability or that these are non-infringing. All warranties are expressly disclaimed. Your use of the method is solely at your own risk, without recourse to Beckman Coulter. These illustrated applications are for demonstration only; and is not validated by Beckman Coulter.

Products not intended or validated for use in the diagnosis of disease or other conditions.

© 2026 Beckman Coulter, Inc. All rights reserved. Beckman Coulter, the stylized logo and the Beckman Coulter product and service marks mentioned herein are trademarks or registered trademarks of Beckman Coulter, Inc. in the United States and other countries. All other trademarks are the property of their respective owners.

For Beckman Coulter's worldwide office locations and phone numbers, please visit Contact Us at beckman.com
2026-GBL-EN-109621-v1

