# User Guide
## High Sensitivity Kilo Base (N3) Cartridge Kit (C105153/C105253)

## A. Specifications

| Specification | Description |
|---|---|
| **DNA Sizing Range** | 10-60,000 bp |
| **DNA Detection Range** | 10-165,000 bp |
| **L.O.D** | 20 pg/μL |
| **Best Resolution*** | 10-50 bp |
| **Sample Number** | 100 runs |
| **Shelf Life** | 4 months |

* Best resolution is determined by the 15-622 DNA Size Marker (C109200).

## B. Kit Components and Storage Conditions

| Item | Storage Condition |
|---|---|
| **High Sensitivity Kilo Base Cartridge** (C105153/C105253) | 4-30°C (Do Not Freeze) |
| **20-1,000 bp Alignment Marker** (C109100-100A, 100 μL) | Short-Term (≤ 3 months): 4-30°C<br>Long-Term (> 3 months): -20°C |
| **Separation Buffer** (C104406, 50 mL) | 4-30°C |
| **Dilution Buffer** (C104405, 15 mL) | 4-30°C |
| **Mineral Oil** (C104404, 8 mL) | 4-30°C |

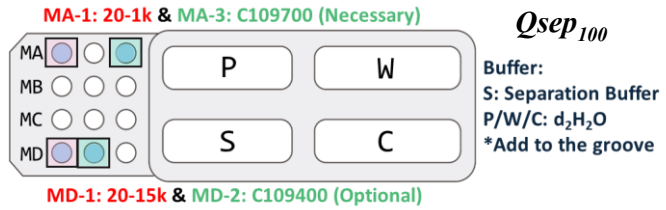
⚠ **Please always store cartridges in a light-proof bag, and then store in the cartridge box after analysis.**
⚠ **To maintain marker stability, avoid repeated freeze-thaw cycles.**

## C. Cartridge Unpacking Preparation

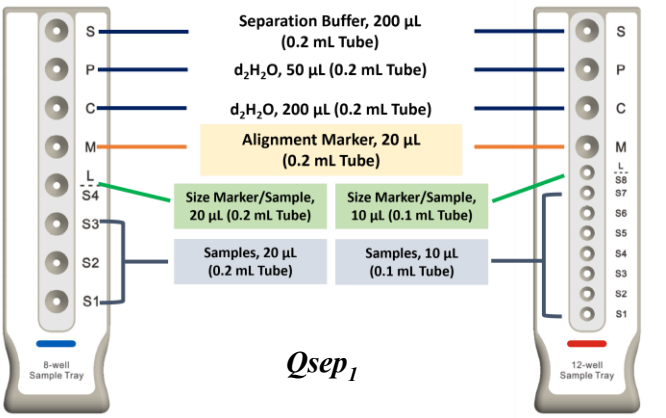
The new cartridge must undergo HV check and calibration. Please follow the instructions provided in the unpacking guide and calibrate using C109100 Alignment Marker.

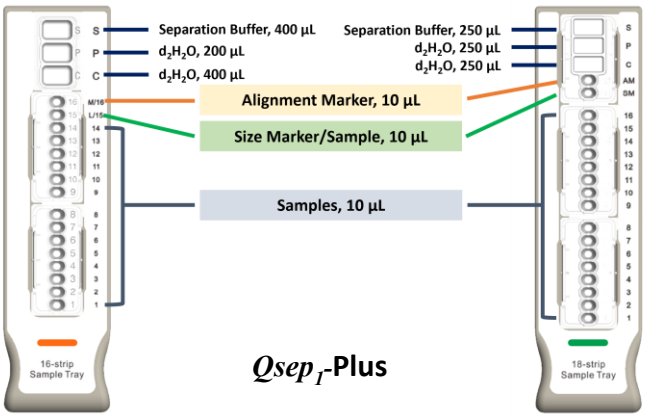
⚠ **CAUTION: To prevent cartridge lockout after 10 failed calibration attempts, please contact your local distributor or BiOptic if the issue persists after following the troubleshooting steps in the cartridge unpacking guide.**

## D. Buffer, Marker, and Sample Preparation




⚠ **Hold the holder steady and press the alignment marker tube firmly into the well with your thumb.**




⚠ **Ensure the buffer tray is pushed to the end until the color bar aligns with the edge of the holder.**

## 1. Compatible Sample Tubes

| | Name | Cat. No. | Volume | Image |
|---|---|---|---|---|
| Qsep100 / 8-well Sample Tray | Micro Vial | C104250 | ≥ 2 μL | |
| | 0.1 mL PCR Tube | - | ≥ 10 μL | |
| | 0.2 mL PCR Tube | - | ≥ 20 μL | |
| *Qsep100 2.0 | 0.2 mL PCR Tube | - | ≥ 10 μL<br>☑ 10 μL Mode Only | |
| 12-well Sample Tray | 0.1 mL Strip Tube | C104252 | ≥ 10 μL | |
| 16-strip Sample Tray | 16-strip Sample Tube | C104254 | ≥ 10 μL | |
| 18-strip Sample Tray | 18-strip Sample Tube | C104257 | ≥ 10 μL | |

## 2. Markers Required for Different Size Ranges

[Recommended]

- For Sample Size Range from 20 bp to 60,000 bp:
  - 20 bp-1,000 bp Alignment Marker (C109100)
  - **5X diluted** 500 bp-23,000 bp Size Marker (C109700)
- For Sample Size Range from 20 bp to 15,000 bp:
  - 20 bp-15,000 bp Alignment Marker (C109110)
  - **2X diluted** 100-10,000 bp Size Marker (C109400)

ℹ **Running with the C109700 Size Marker is required.** Running the C109400 Size Marker is optional. Using a size marker generated under the same running conditions can improve sizing accuracy.

## 3. Recommended Sample Concentration

Genomic DNA: 0.5-5 ng/μL

ℹ If the sample concentration exceeds 5 ng/μL, dilute the sample 10X using 0.1X dilution buffer.

ℹ If the sample is eluted in water, add dilution buffer to achieve a sample concentration of either 0.2X or 0.1X dilution buffer condition.

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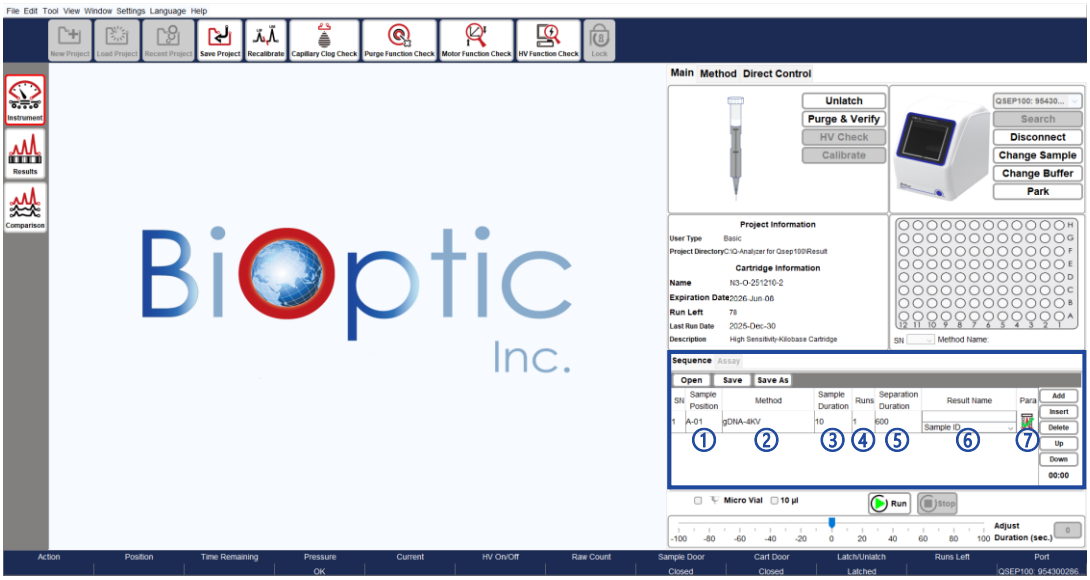
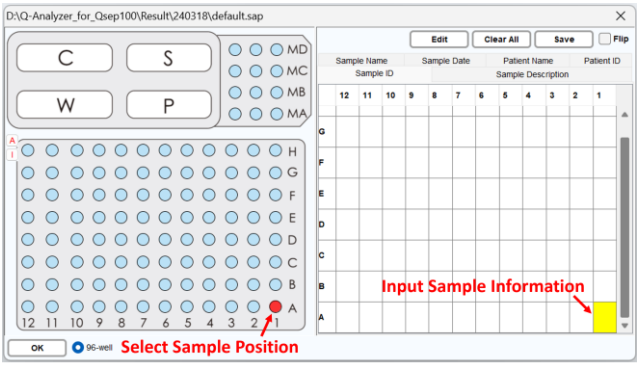
## I. Software Operation Guide

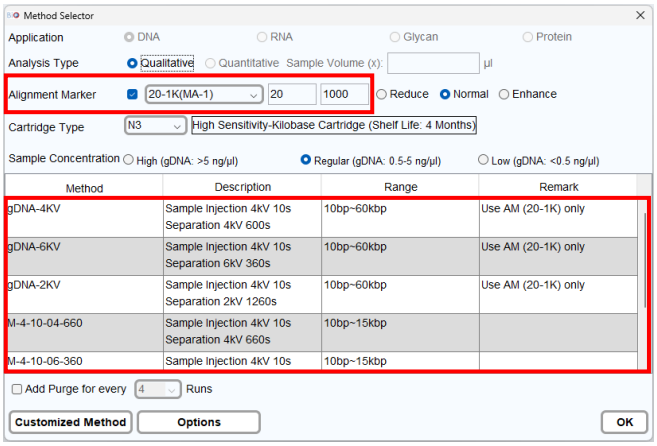
Qsep100




① Sample Position: Place the sample and select the corresponding position. Input sample information if necessary.




② Method:
(a) Select Alignment Marker.
(b) Select Analytic Method in the Method Selector.




- **Adjust injection conditions based on sample concentration.**

| Sample Concentration | High (2kV, 10s) | Regular (4kV, 10s) | Low (8kV, 10s) |
|---|---|---|---|
| Genomic DNA | > 5 ng/µL | 0.5-5 ng/µL | 0.1-0.5 ng/µL |

③ Sample Duration: Adjust the sample injection time to increase/decrease injection amount.

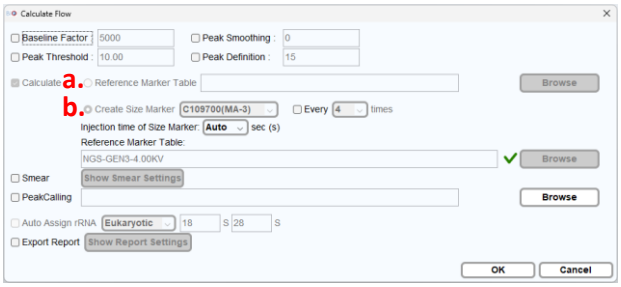
- **Modify injection conditions based on sample concentration.**

④ Runs: Set the repetition time.

⑤ Separation Duration: Adjust the duration to extend/reduce the separation time. **(Optional)**

⑥ Result Name: Input the result name for the result file.

⑦ Para: Choose between (a) Reference Marker Table and (b) Create Size Marker for calculation.




- **C109700 size marker must be run every 24 hours when using the "gDNA-" methods to obtain sizing results up to 60 kb. If a size marker is created within this timeframe, you have the option to choose "Reference Marker Table" for calculation.**

8. Click “Run” to start the sequence analysis.

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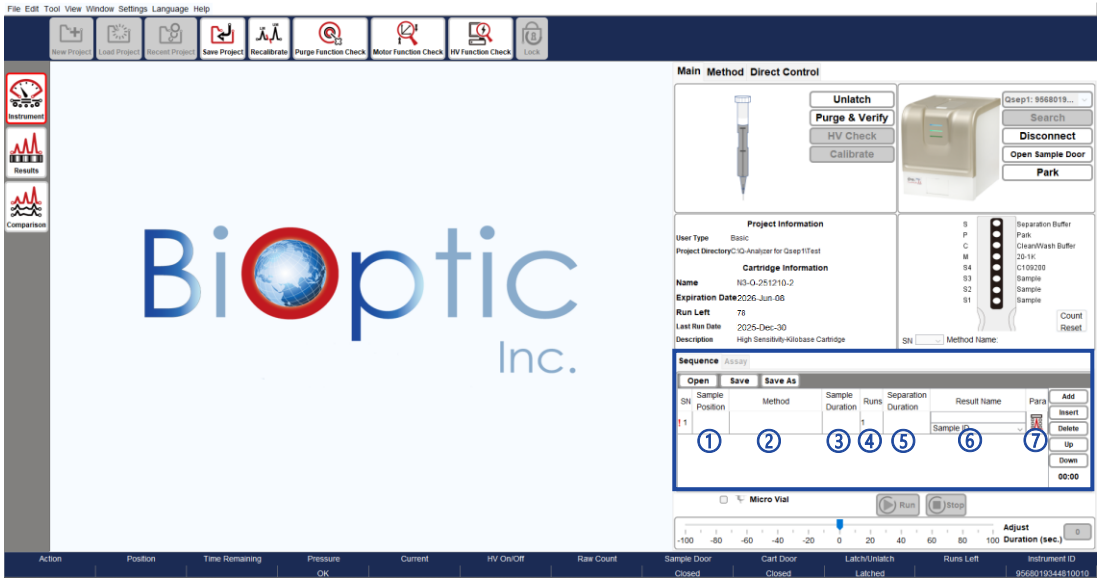
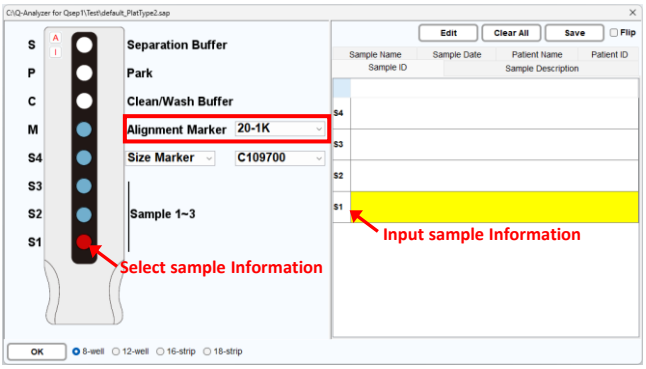
*Qsep*$_1$



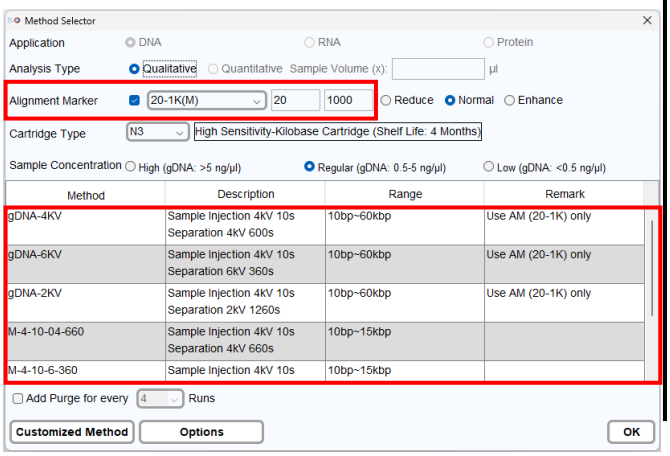

- Click “Open Sample Door” and insert the desired sample tray
- Click “Park” to move the sample tray into position.

| *Qsep1* | *Qsep1*-Plus |
|---|---|
| • 8-well Sample Tray<br>• 12-well Sample Tray | • 8-well Sample Tray<br>• 12-well Sample Tray<br>• 18-strip Sample Tray |

① Sample Position:
- Choose Alignment Marker type.
- Position the Alignment Marker at M, place the paired Size Marker at S4 if required, and input the sample information if necessary.




② Method:
(a) Check Alignment Marker is ticked.
(b) Select Analytic Method in the Method Selector.




- **Adjust injection conditions based on sample concentration.**

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- **Modify injection conditions based on sample concentration.**

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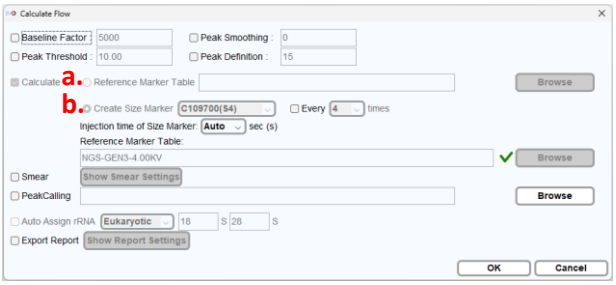


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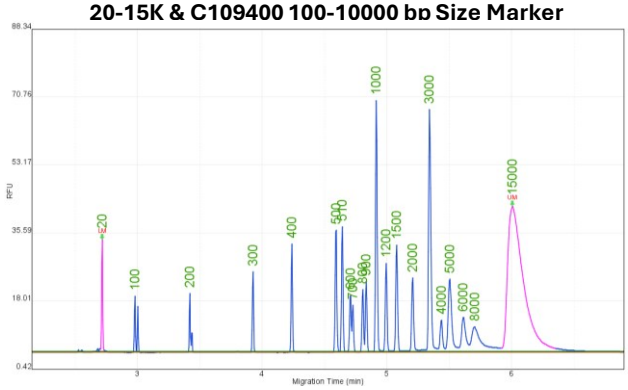
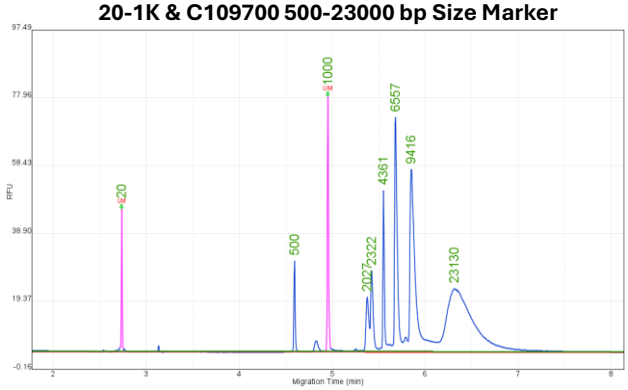
## F. Result & Application

- **Alignment Marker & Size Marker Result**

**20-15K & C109400 100-10000 bp Size Marker**

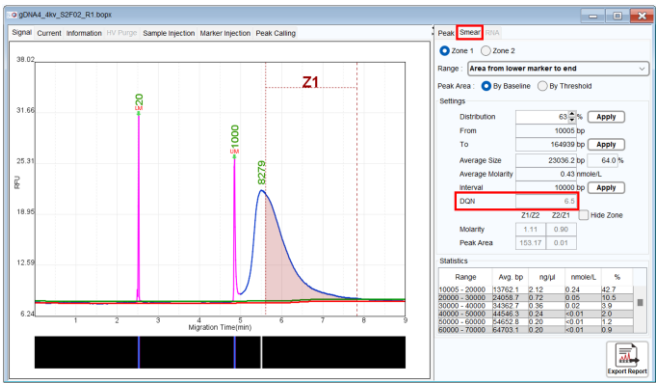



**20-1K & C109700 500-23000 bp Size Marker**




- **Genomic DNA Validation**

Use the smear function to set up a user-defined threshold for DNA Quality Number (DQN) calculation. The DQN, ranging from 1 to 10, can be used as a reference to assess the integrity of genomic DNA.

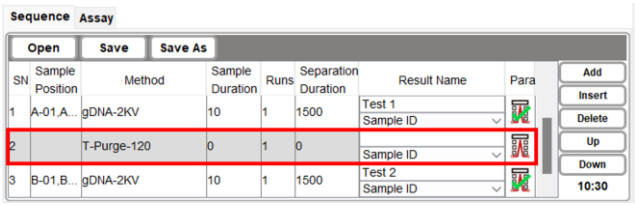



## G. Troubleshooting

Before attempting any troubleshooting, ensure that the system is functioning properly and that all operations are following the instructions.

If encountering unstable current during sample injection or separation steps, which may be caused by residues left in the DNA sample after extraction, consider the following solutions:

1. Dilute the sample using dilution buffer.
2. Centrifuge the sample for a period to allow residues to accumulate at the bottom of the tube.
3. Insert a "T-purge-120" method between several sample runs. For example, insert one run of "T-Purge-120" every 5-10 sample runs.




## H. Cartridge Disposal

Please wear gloves before discarding the cartridge.

1. Bend the cartridge tip.
2. Open the cap on the gel reservoir and remove the inner cap.
3. Pour the gel into the chemical waste container.
4. Dispose of the cartridge in the trash bin.

Contact Information:
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