User Guide
High Sensitivity (N1) Cartridge Kit (C105105/C105205)

A. Specifications

Specification	Description
DNA Sizing Range	10-5,000 bp
L.O.D	5 pg/µL
Best Resolution*	4-10 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 Cartridge (C105105/C105205)	4-30°C (Do Not Freeze)
20-1,000 bp Alignment Marker (C109100-100A, 100 µL)	Short-Term (≤ 3 months): 4-30°C 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

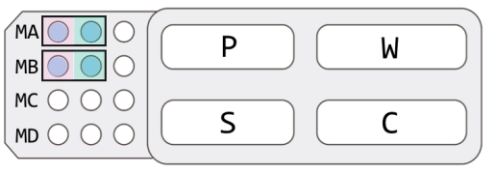
The new cartridge must undergo **HV check** and **calibration**. Please follow the instructions provided in the unpacking guide and calibrate using C109100 Alignment Marker.

⚠ **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

MA-1: 20-1k & MA-2: C109200 (Optional)

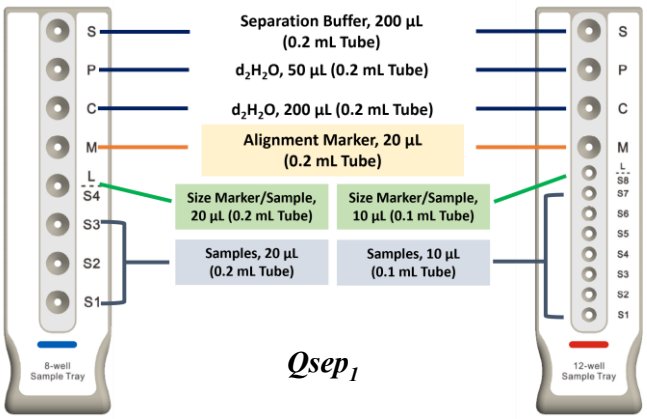
Qsep$_{100}$



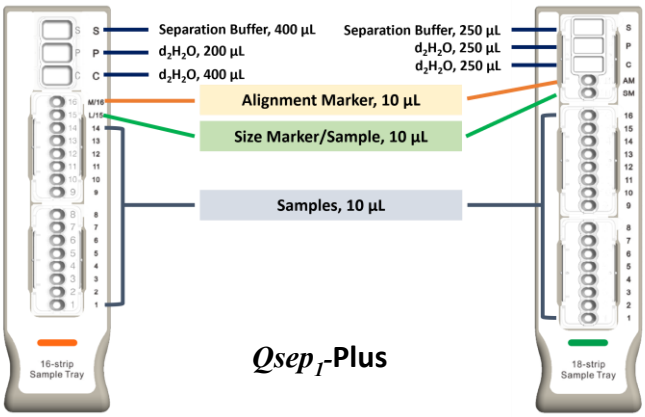
Buffer:
S: Separation Buffer
P/W/C: d_2H_2O
***Add to the groove**

MB-1: 20-5k & MB-2: C109301 (Optional)

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



Qsep$_1$



Qsep$_1$**-Plus**

⚠ **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
Qsep$_{100}$ / 8-well Sample Tray	Micro Vial	C104250	≥ 2 µL	
	0.1 mL PCR Tube	-	≥ 10 µL	
	0.2 mL PCR Tube	-	≥ 20 µL	
**Qsep*$_{100\ 2.0}$	0.2 mL PCR Tube	-	≥ 10 µL ☑ 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

- For Sample Size Range from 20 bp to 1,000 bp:
  - 20 bp-1,000 bp Alignment Marker (C109100)
  - **20X diluted** 15-622 bp Size Marker (C109200)
- For Sample Size Range from 20 bp to 5,000 bp:
  - 20 bp-5,000 bp Alignment Marker (C109102)
  - **10X diluted** 50 bp-3,000 bp Size Marker (C109301)

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

3. Recommended Sample Concentration

Fragmented sample: 10-200 pg/µL

ℹ If the fragment sample concentration exceeds 200 pg/µL, dilute the sample 10X using 0.5X dilution buffer.

Smear sample (NGS library/cfDNA): 50-1,000 pg/µL

ℹ If the smear sample concentration exceeds 1,000 pg/µL, dilute the sample 10X using 0.5X 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

User Guide
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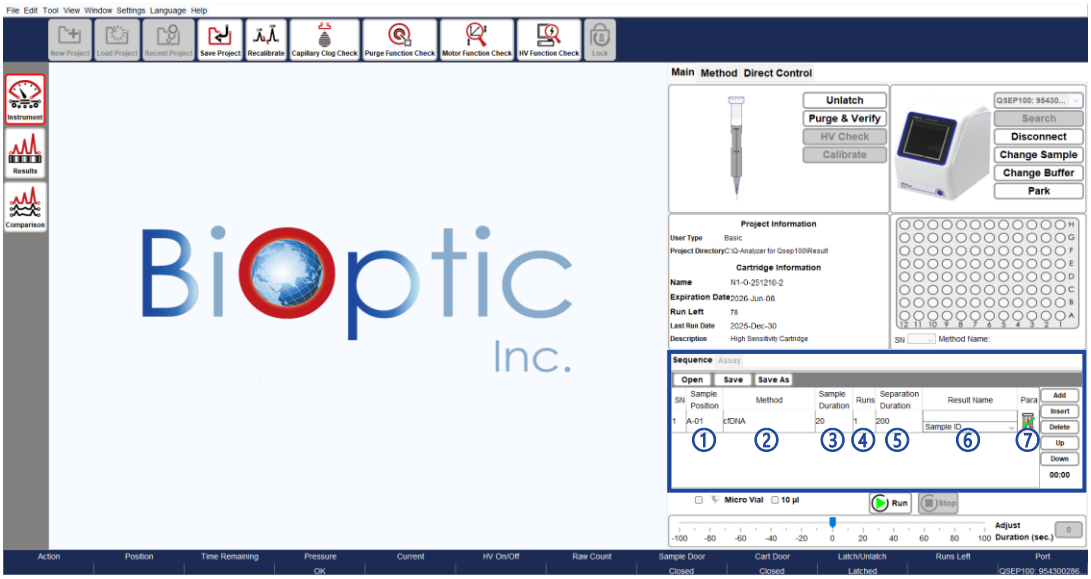
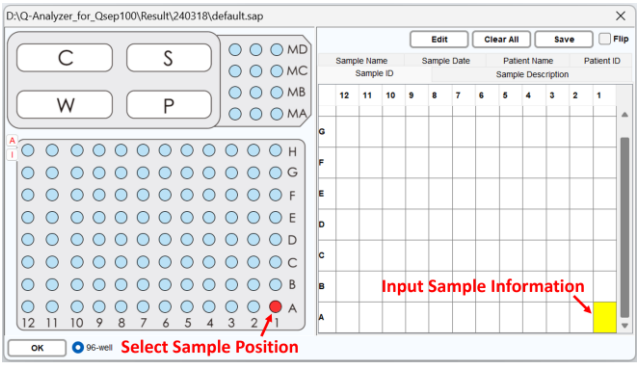
I. Software Operation Guide

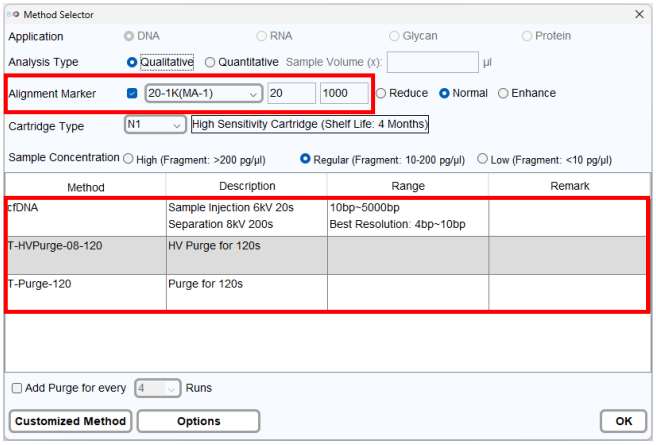
Qsep100



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)
Fragmented DNA	> 200 pg/μL	10-200 pg/μL	< 5 pg/μL
Smear DNA	> 1000 pg/μL	50-1000 pg/μL	< 50 pg/μL

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

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

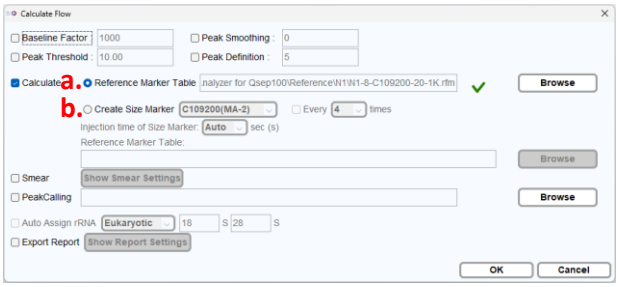
④ Runs: Set the repetition time.

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.

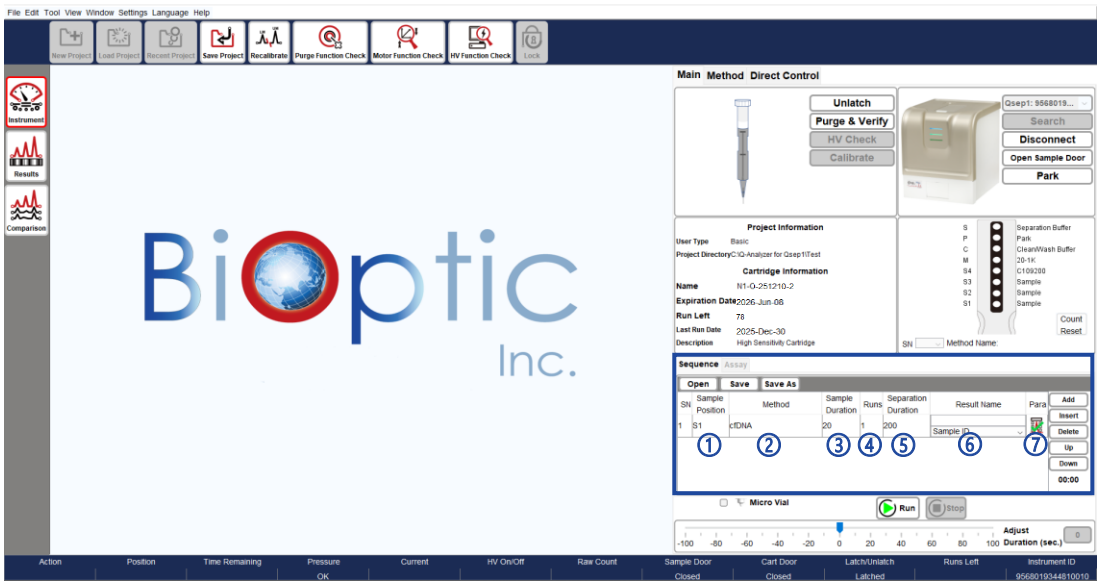


- **When using "Create Size Marker" function, select the appropriate size marker you use. For example, "20-1k" is paired with C109200, "20-5k" is paired with C109301.**

8. Click "Run" to start the sequence analysis.

User Guide
High Sensitivity (N1) Cartridge Kit (C105105/C105205)

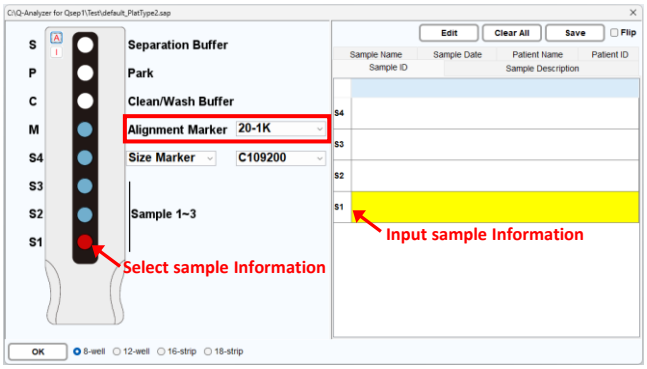
Qsep$_1$



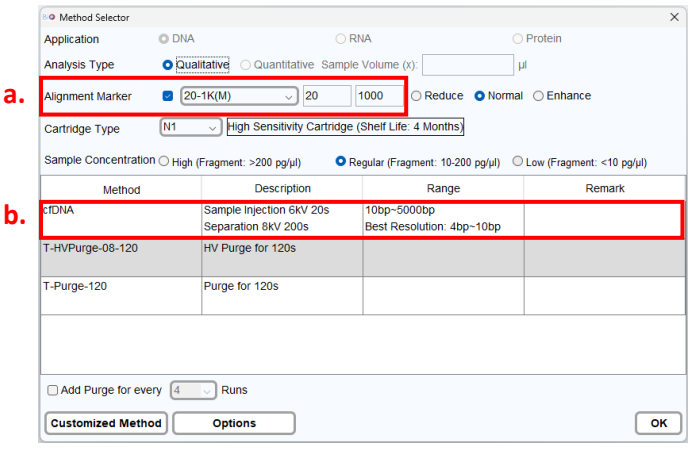
- Click "Open Sample Door" and insert the desired sample tray
- Click "Park" to move the sample tray into position.

Qsep1	*Qsep1*-Plus
• 8-well Sample Tray • 12-well Sample Tray	• 8-well Sample Tray • 12-well Sample Tray • 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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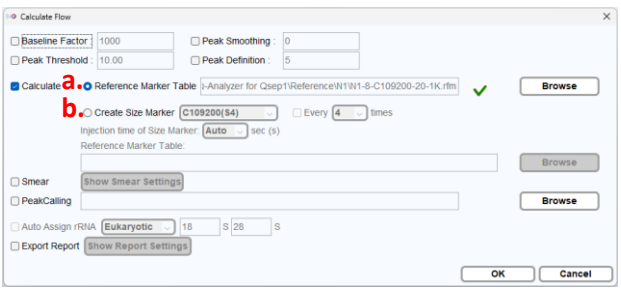

- **When using "Create Size Marker" function, select the appropriate size marker you use. For example, "20-1k" is paired with C109200, "20-5k" is paired with C109301.**

8. Click "Run" to start the sequence analysis.

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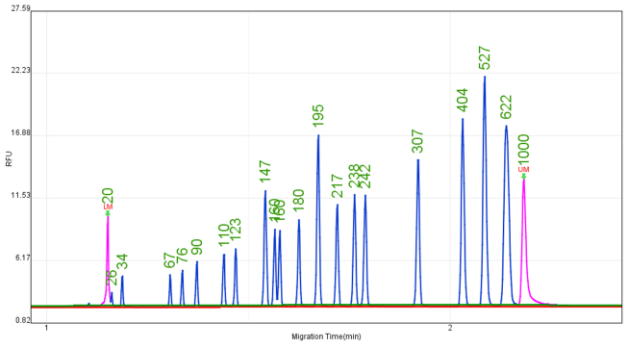
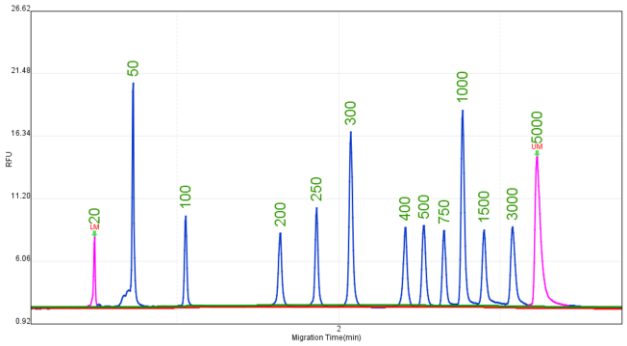
F. Result & Application

- **Alignment Marker & Size Marker Result**

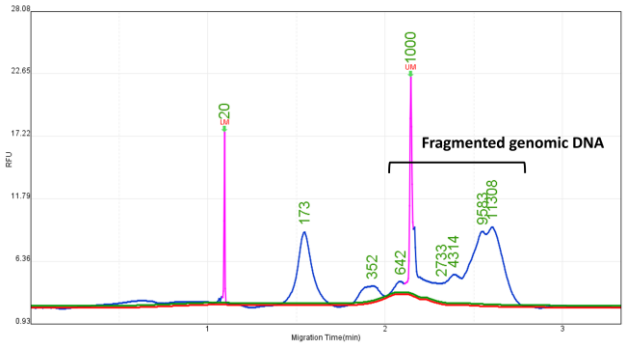
20-1K & C109200 15-622 bp Size Marker



20-5K & C109301 50-3000 bp Size Marker



- **Cell-Free DNA Validation**

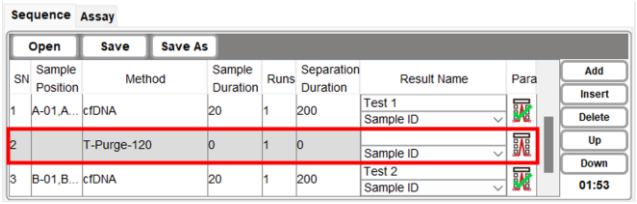


G. Troubleshooting

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 unknown substances in PCR reagent buffer or other kit buffers, 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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