FastGene®
NanoViewPlus

MICROVOLUME & CUVETTE PHOTOMETER

Catalog #: FG-NP03

Manual version: 1.0

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1. General Information

1.1 Introduction

Thank you for purchasing the FastGene NanoView Plus, a microvolume and cuvette spectrophotometer designed for the fast and reliable measurement of nucleic acids (DNA, RNA), proteins, and cell density (OD600).
The NanoView Plus combines a compact design with an intuitive touchscreen interface, allowing accurate measurements with minimal sample volume and without the need for an external computer.

1.2 Safety instructions

Before operating the NanoView Plus, please read the following safety instructions carefully to ensure safe and reliable use:

General safety
The instrument should only be used by trained laboratory personnel. Always follow standard laboratory safety procedures when handling samples, especially biological or hazardous materials.

Electrical safety
Ensure that the power supply matches the specifications of the instrument. Proper grounding is essential to prevent electrical hazards and to ensure stable operation. Do not modify or damage the power cable, and avoid placing heavy objects on it.

Operational safety
Always wear appropriate personal protective equipment such as gloves when handling samples. Do not use flammable sprays or volatile chemicals near the instrument. During startup, do not open the sample arm or interfere with the measurement area.

1.3 Installation precautions

Install the NanoView Plus on a stable laboratory bench with sufficient space and ventilation.

- Ensure the bench can safely support the instrument (approx. 3 kg).
- Recommended minimum bench depth: 350 mm.
- Avoid installation in areas with excessive dust, humidity, vibration, or corrosive gases.
- When working with hazardous samples, use the instrument in a well-ventilated environment or under a fume hood

1.4 Typical use cases

The NanoView Plus supports a wide range of applications in molecular biology and life science laboratories.

Molecular biology
- DNA and RNA quantification after extraction
- Sample quality control before PCR, qPCR, or sequencing

Protein analysis
- Protein concentration determination (e.g., BSA, antibodies, enzymes)
- Monitoring purification processes

Microbiology
- Measurement of bacterial growth using OD600

General laboratory use
- Fast concentration checks with minimal sample consumption (1–2 µL)

1.5 Technical specifications

Specification	Value
Display	7" LCD touch display (glove compatible)
Absorbance Accuracy	3% (at 0.97A at 302 nm), 23 ± 2C°
Photometric Range	0.04 - 30 A (10mm equivalent)
Spectral Bandwidth	≤1.8 nm (FWHM at Hg 254 nm)
Pathlength	0.75 mm (fixed)
Absorbance Precision	SD 0.002 or 2% CV
Weight	3.0 kg
Footprint (W*D)	216*290 mm
CPU	Octa Core ARM® CortexTM-A53 Processor
Storage	32 GB Internal Storage
Connectivity	4 × USB ports, Ethernet, RS-232
Measurement time	< 1 sec
Wavelengths	Microvolume: 230 / 260 / 280 nm | Cuvette: 600 nm (OD600)
Sample volume	1–2 µL (microvolume)
Wavelength accuracy	± 1 nm
Light source	Xenon flash lamp
Detector	CMOS linear image sensor (2048 pixels)
Detection limit	dsDNA: 2.0 ng/µL | RNA: 1.6 ng/µL | BSA: 0.06 mg/mL | IgG: 0.03 mg/mL
Maximum concentration	dsDNA: 1,500 ng/µL | RNA: 1,200 ng/µL | BSA: 45 mg/mL | IgG: 21 mg/mL

1.6 Connectivity

USB connections
The NanoView Plus provides a total of 4x USB ports. For transferring measurement data using a USB storage device, please use the two USB-A ports located on the right side of the instrument.

Additional interfaces (rear panel)
The rear panel of the NanoView Plus includes the following additional connections:

- 1 × USB-A port
- 1 × USB-B port
- 1 × RS-232 interface
- 1 × Ethernet (LAN) port
- 1 × Power inlet

These interfaces allow integration with external systems, service access, or further connectivity options.

External printer compatibility
The NanoView Plus is compatible with the following external printer:

- Thermal Printer for FastGene® Photometer YJ-360T(S)

This printer can be used to generate hard copies of measurement results directly from the instrument.

2. Get started

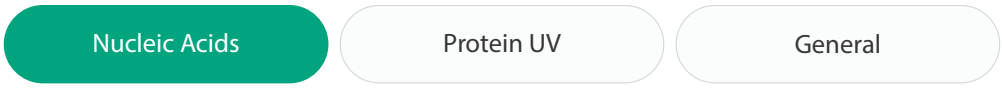
2.1 Startup and main screen

To switch on the NanoView Plus, first connect the power cable to the power inlet on the rear side of the instrument. Then connect the other end of the cable to a suitable power socket.

Once the instrument is connected to the power supply, use the ON/OFF switch located on the back of the instrument, directly above the power inlet, to turn the system on. The loading screen will appear first while the system starts up and initializes.

After the startup process is complete, the main screen will appear. From here, you can access the three main measurement tabs:

- Nucleic Acids
- Protein UV
- General



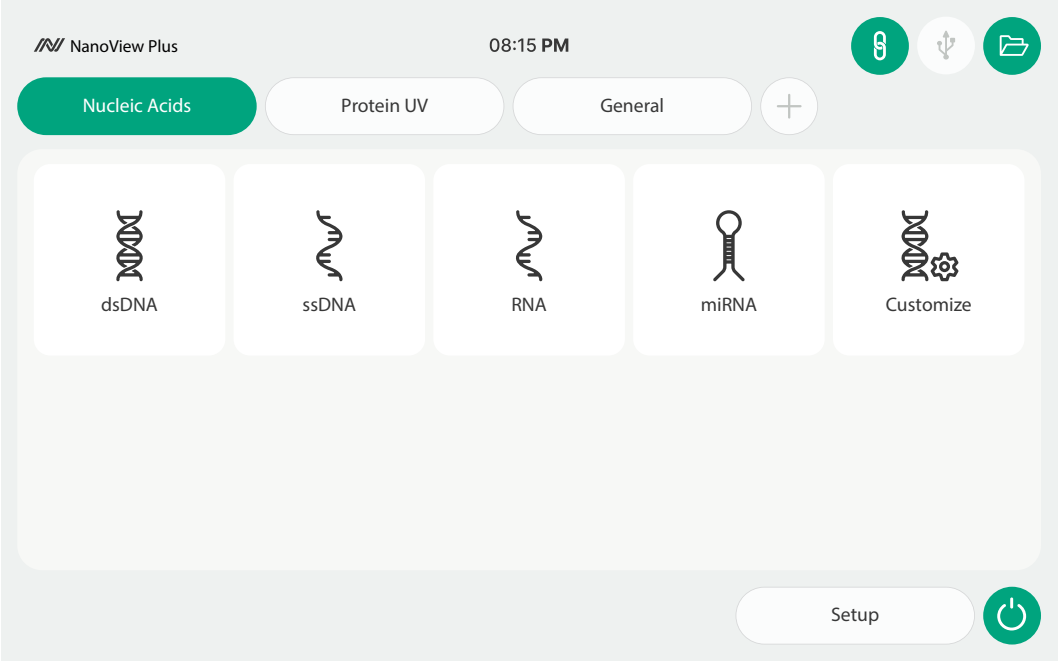
The main screen is the starting point for all measurements and settings.

The “+” button allows creation of customized tabs with frequently used methods.

- Up to 2 custom tabs can be created
- Tabs can be named individually
- Tabs can be deleted using „Delete Tab“ → Confirm (Yes)

2.2 Nucleic acids tab

Nucleic acids such as DNA and RNA absorb ultraviolet (UV) light at a wavelength of 260 nm. This property is used by the NanoView Plus to determine the concentration of nucleic acid samples quickly and accurately.



The NanoView Plus allows the measurement of different types of nucleic acids using predefined conversion factors, which are based on the specific extinction coefficients of each molecule.

Sample	Wavelength	Factor
dsDNA	260 nm	50
ssDNA	260 nm	37
RNA	260 nm	40
miRNA	260 nm	33
Customize	260 nm	15–150

The factor represents the extinction coefficient of the respective nucleic acid type and is used to convert absorbance into concentration. Different nucleic acids absorb UV light differently, which is why specific factors are required for accurate quantification.

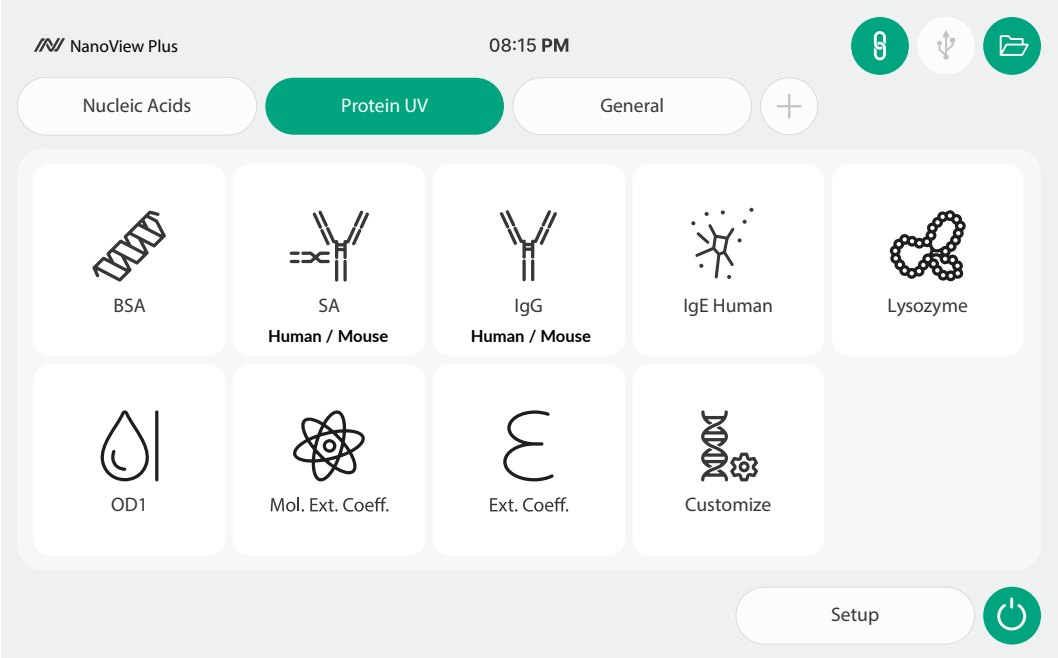
The NanoView Plus calculates nucleic acid concentration using the Lambert-Beer law:

$$C = (A_{260} - A_b) \times e \times D$$

C = concentration (ng/µL)
A_{260} = absorbance at 260 nm
A_b = absorbance of the blank
e = extinction coefficient (factor)
D = dilution factor

2.3 Protein UV tab

Proteins absorb UV light at a wavelength of 280 nm, primarily due to the presence of aromatic amino acids such as tryptophan and tyrosine. This absorbance is used to determine protein concentration.



The NanoView Plus provides several predefined protein measurement modes, as well as options for custom calculations using extinction coefficients.

Sample	Wavelength	Factor / coefficient	Molecular Weight (Da)
BSA	280 nm	1.5	66400
SA (Human)	280 nm	1.72	69365
SA (Mouse)	280 nm	1.49	66000
IgG (Human)	280 nm	0.74	150000
IgG (Mouse)	280 nm	0.71	160000
IgE (Human)	280 nm	0.65	190000
Lysozyme	280 nm	0.38	143000
OD1	280 nm	1	–
Mol. Ext. Coeff.	280 nm	user-defined	user-defined
Ext. Coeff.	280 nm	user-defined	user-defined
Customize	280 nm	user-defined	–

The factor used in protein measurements represents the extinction coefficient of the selected protein and is used to convert absorbance into concentration.

Different proteins absorb UV light at 280 nm to varying degrees depending on their amino acid composition, particularly the presence of tryptophan, tyrosine, and cysteine residues. Therefore, specific factors are required for accurate quantification of different protein types.

For common proteins such as BSA, antibodies, or lysozyme, predefined factors are available. For other proteins, user-defined extinction coefficients can be applied to improve accuracy.

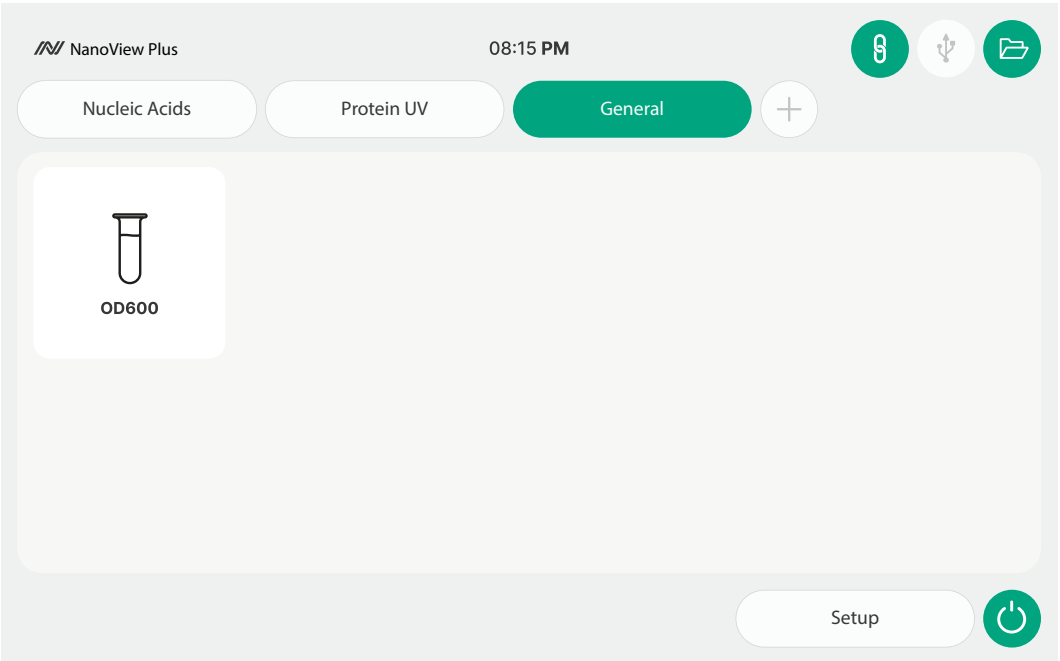
The NanoView Plus calculates nucleic acid concentration using the Lambert-Beer law:

C = concentration (ng/µL)
A_{280} = absorbance at 280 nm
A_b = absorbance of the blank
e = extinction coefficient (factor)
D = dilution factor

$$C = (A_{280} - A_b) \times e \times D$$

2.4 General tab (OD600)

The NanoView Plus provides an OD600 measurement mode for determining the optical density of bacterial or cell cultures. This method is commonly used to estimate cell concentration in microbiology applications. OD600 measures the absorbance of light at 600 nm, which correlates with the turbidity of a culture and therefore its cell density.



2.5 Data management

The NanoView Plus allows easy access, organization, and transfer of measurement data through the integrated file management system.

Accessing data
Measurement data can be accessed by pressing the Data button located in the top right corner of the screen. This opens the File Browser, where all stored data is displayed.

All measurement results can be saved in the internal storage of the NanoView Plus, which provides 32 GB of capacity.

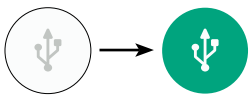
File management functions
Within the File Browser, the following functions are available:

- New Folder – Create new folders to organize data
- Copy – Copy selected files or folders
- Paste – Paste copied files into a selected location
- Delete – Remove selected files or folders

These functions allow efficient organization and management of measurement data directly on the device.

Transferring data to USB
Only USB drives formatted in FAT32 are supported. To transfer data to an external USB device:

1. Connect a USB drive to one of the two USB-A ports on the right side of the instrument
2. The USB icon on the top right of the screen will indicate that the device is connected



3. Open the File Browser using the Data button

4. Select the desired files from the internal storage
5. Copy and paste them to the USB drive (select drive on top left selection button)

Direct saving to USB
When working in the measurement screen, data can also be saved directly to a connected USB drive. This allows immediate export of results without the need to transfer files later.

3. Perform a measurement

3.1 Microvolume and cuvette reader

The FastGene NanoView Plus is equipped with two measurement systems:

A microvolume reader (pedestal) for fast measurements of small sample volumes (1–2 µL), used for:

- Nucleic acids (260 nm)
- Proteins (280 nm)
- Contamination assessment (230 nm)

A cuvette reader, used for:

- OD600 measurements at 600 nm (e.g., bacterial cultures)

3.2 Measurement screen

Selecting a measurement
The measurement screen is displayed immediately after selecting a measurement mode (e.g., dsDNA, BSA, or OD600) from the main menu.

This screen is the central interface for performing measurements, viewing results, and accessing measurement-specific settings.

Controls and buttons
The measurement screen includes several buttons for controlling the measurement process and managing data.

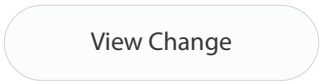
The following table provides an overview of all available functions:

Button	Function
Settings/Option	Opens the measurement settings menu (parameters, coefficient, dilution factor, baseline correction)
Settings/Load	Loads previously saved measurement data
Settings/Save	Saves the current measurement results
Blank	Measures the blank sample to set the baseline
Sample	Starts the measurement of the sample
Auto/Manual	Switches between automatic and manual measurement modes. Auto mode measures as soon as the microvolume pedestal is closed.
View Change	Changes how measurement results are displayed (extended parameter view)
Report	Displays results in a report format
Delete	Deletes last measurement from the list

Screen layout
The measurement screen provides all relevant information for the selected experiment at a glance.

Displayed information includes:
- Measurement mode (e.g. dsDNA, BSA) and coefficient
- Sample name (editable at the top of the screen)
- Date and Time
- Concentration (ng/µL for nucleic acids, mg/mL for proteins)
- Absorbance values (A260, A280 and A230)
- Purity ratios:
    - A260/A230
    - A260/A280

View change

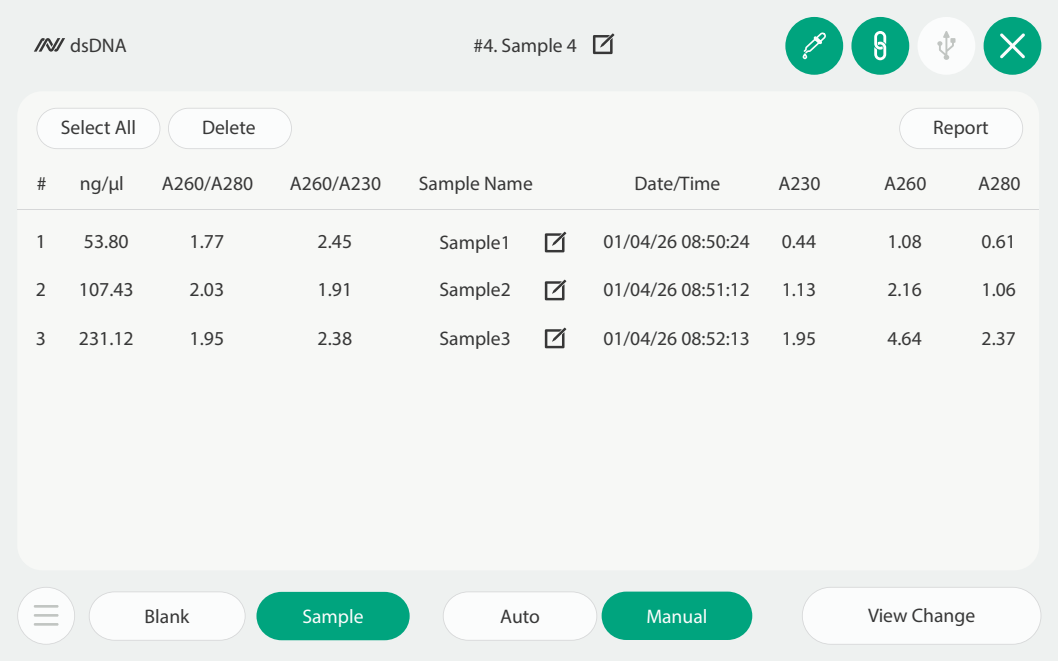


The View Change function switches the result display from the standard single-sample view to a table view. In this format, all measured samples are shown together in a structured table, making it easier to review, compare, and manage multiple results at once. This view is particularly useful for documentation and comparison of multiple measurements.

The table includes the following parameters for each measured sample:

- Sample name (can be edited directly in the table)
- Concentration (ng/µL or mg/mL)
- A260/A280 ratio
- A260/A230 ratio
- Date and time
- A230, A260, A280

Individual measurements can be renamed using the button. Single measurements can be selected and deleted individually. To select all displayed measurements at once, use the „Select All“ button.



Report

Report

Pressing Report in the measurement screen opens a report view for the current measurement series. The NanoView Plus creates a report file that includes the general measurement information in table format as well as the results for each individual sample.

The report can be saved as a separate report file using the „Save“ button.

Save

If a compatible printer is connected, the report can also be printed directly using the „Print“ button.

Print

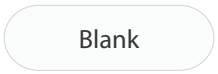
3.3 Nucleic acid measurement

Mode selection
From the main screen, select the “Nucleic Acids” tab and choose the appropriate measurement type depending on your sample.

Nucleic acid measurements are performed using the microvolume drop reader, utilizing absorbance at 260 nm.

Measurement procedure

1. Prepare the Blank
   Pipette 1–2 µL of the blank solution (e.g., water or buffer used for your sample).
2. Apply Blank to Pedestal
   Carefully place the droplet onto the measurement pedestal.
3. Perform Blank Measurement
   Press the “Blank” button to set the baseline.

4. Clean the Pedestal
   Wipe the pedestal gently using a lint-free laboratory tissue.
5. Apply Sample
   Pipette 1–2 µL of your sample onto the pedestal.
6. Start Measurement
   Press the “Sample” button.
   The measurement is completed in less than one second.

7. Measure next sample
   Clean the pedestal after each measurement before proceeding with the next sample.

Measurement screen overview
After measurement, the screen displays the key results for each sample:

- Measurement mode (e.g. dsDNA, RNA, etc.) and coefficient
- Sample name (editable at the top of the screen) ☑
- Date and Time
- Concentration (ng/µL for nucleic acids)
- Absorbance values (A260, A280 and A230)
- Purity ratios:
  - A260/A230
  - A260/A280

These values allow both quantification and quality assessment of the sample.

Nucleic acid purity ratios
The NanoView Plus automatically calculates two important ratios for evaluating sample purity:

A260/A230 Ratio:

Indicates contamination from:
- Salts
- Phenol
- Carbohydrates

Typical values: 2.0 – 2.2
Lower values indicate impurities affecting sample quality

A260/A280 Ratio:

Indicates protein contamination
Typical values:
~1.8 for DNA
~2.0 for RNA
Lower values suggest protein or phenol contamination

These ratios are essential for determining whether the sample is suitable for downstream applications such as PCR, sequencing, or enzymatic reactions.

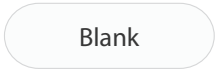
3.4 Protein UV measurement

Mode selection
From the main screen, select the “Protein UV” tab and choose the appropriate measurement mode depending on your sample and application.

Protein measurements are performed using the microvolume drop reader, utilizing absorbance at 280 nm.

Measurement procedure

1. Prepare the Blank
   Pipette 1–2 µL of the blank solution (e.g., buffer used for your protein sample).
2. Apply Blank to Pedestal
   Carefully place the droplet onto the measurement pedestal.
3. Perform Blank Measurement
   Press the “Blank” button to set the baseline.

4. Clean the Pedestal
   Wipe the pedestal gently using a lint-free laboratory tissue.
5. Apply Sample
   Pipette 1–2 µL of your sample onto the pedestal.
6. Start Measurement
   Press the “Sample” button.
   The measurement is completed in less than one second.

7. Measure next sample
   Clean the pedestal after each measurement before proceeding with the next sample.

Measurement screen overview
After measurement, the screen displays the key results for each sample:

- Measurement mode (e.g. BSA, IgG, etc.) and coefficient
- Sample name (editable at the top of the screen)
- Date and Time
- Concentration (mg/mL for proteins)
- Absorbance values (A260, A280 and A230)
- Purity ratios:
  - A260/A230
  - A260/A280

Notes on protein measurements

- The accuracy of protein measurements depends on selecting the correct extinction coefficient. If the exact protein properties are known, using custom or molecular extinction coefficient modes will provide more accurate results.
- Ensure that the buffer used for blanking matches the sample buffer to avoid baseline errors.
- In protein measurements, additional absorbance ratios such as A260/A280 and A260/A230 are also displayed. These values can provide supportive information about possible contamination from nucleic acids, salts, or buffer components. However, unlike nucleic acid analysis, these ratios are not universally accepted purity criteria for proteins and should therefore be interpreted with caution.

3.5 OD600 measurement

Mode selection

From the main screen, select the “General” tab and choose OD600. This mode is used to measure the optical density of bacterial or cell cultures at 600 nm.

OD600 measurements are performed using the cuvette drop reader, utilizing absorbance at 600 nm.

Cuvette requirements

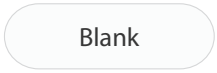
- Use standard 10 mm pathlength cuvette.
- Ensure the cuvette is:
  - Clean and free of scratches
  - Free of bubbles or residues
- The NanoView Plus measures at a light path height of 8.5 mm from the bottom, so ensure the cuvette is filled sufficiently.

Proper cuvette positioning

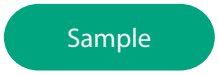
- Insert the cuvette fully into the holder
- Ensure that the transparent sides of the cuvette align with the optical path (indicated by small arrow ▼)
- It is normal if the cuvette slightly protrudes from the holder

Measurement procedure

1. Prepare the Blank
   Fill the cuvette with the blank solution (e.g., culture medium).
2. Insert the Cuvette
   Place the cuvette into the holder, ensuring correct orientation (optical path indicated by ▼).
3. Perform Blank Measurement
   Press the “Blank” button.

4. Prepare the Sample
   Remove the cuvette, empty it, and fill it with the sample (e.g., bacterial culture).
5. Insert Sample Cuvette
   Place it back into the holder.
6. Start Measurement
   Press the “Sample” button.
   The OD600 value will be displayed immediately.

7. Measure next sample
   Remove the cuvette, empty it, and fill it with the next sample if needed.

Measurement screen overview

After measurement, the screen displays the key results for each sample:

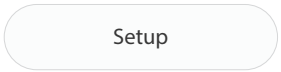
- Measurement mode (OD600)
- Sample name (editable at the top of the screen) ☑
- Date and Time
- Correction factor, dilution factor
- OD600
- Absorbance value (A600)

Notes on OD600 measurements

- Ensure consistent cuvette positioning for reproducible results
- Avoid bubbles, as they can significantly affect optical density readings
- Clean the cuvette thoroughly between measurements

4. System settings

System settings allow you to configure the general behavior and properties of the instrument. To access, click “Setup” from the main screen.



General tab

The General tab allows adjustment of basic system parameters:

- Language – Select the preferred display language
- Brightness – Adjust screen brightness for optimal visibility
- Date & Time – Set system date and time
- Precision – Define display precision for measurement results
- Screensaver Mode – Set standby time before screen saver activates
- Thermal printer – Activate use of thermal printer

Sound tab

The Sound tab allow the adjustment of system sound:

- Enable or disable system sounds
- Enable or disable system voice
- Adjust volume level

Information

The Information tab provides system details, including:

- Application version
- Firmware version
- Operating system version
- Model name
- Kernel version
- MAC
- Product Key (serial number)

This information may be required for troubleshooting or support requests.

Calibration and validation

The NanoView Plus supports both system validation and instrument calibration using the:

- FastGene Photometer Calibration Solution (FG-NPSV01):
    - FG-NPSV01 should be used only within the expiration date.
    - The container of FG-NPSV01 ampoule is glass and the safety opener should be used when opening the container.
    - The FG-NPSV01 must be used within the shortest possible time after opening, and results cannot be guaranteed after 30 minutes.
    - The FG-NPSV01 cannot be reused.
    - When measuring a blank using distilled water, be sure to wash the pedestal 2-3 times with distilled water before measuring.
    - FG-NPSV01 can be used for both:
      Validation (system check)
      Calibration (reset and recalibration)

Please refer to the seperate „Validation and Calibration“ manual. When starting a validation or calibration process, the NanoView Plus will guide you through the procedure step by step.

The system provides clear on-screen instructions, ensuring that the process can be completed easily and correctly without additional tools or calculations.

5. Cleaning and maintenance

Routine cleaning

After each measurement, clean the pedestal and measurement surface with distilled water and wipe them carefully with a soft, lint-free laboratory tissue.

This should be done after every sample to prevent carryover between measurements.

If the instrument has not been cleaned for a longer period, or if highly concentrated samples have been measured, a more thorough cleaning is recommended.

Apply approximately 2 µL of distilled water to the pedestal and quartz surface and leave it in place for 2–3 minutes. This helps loosen dried residues and improves cleaning efficiency. Afterwards, wipe the surface carefully with a laboratory tissue.

If necessary, repeat this procedure until the surface is clean.

Maintenance

The NanoView Plus does not require extensive routine maintenance during normal operation. However, keeping the optical measurement surfaces clean is essential for reliable performance.

For instrument validation and calibration, use the FastGene Photometer Calibration Solution FG-NPSV01 and follow the guided procedure in the system settings.

If the instrument shows unusual behavior that cannot be resolved by cleaning, validation, or recalibration, contact NIPPON Genetics EUROPE for support.

6. Troubleshooting

If unexpected results or operational issues occur, first check the common causes listed below. In many cases, problems can be resolved by cleaning the measurement surface, repeating the blank measurement, or checking the sample handling and settings.

Problem	Possible Causes	Recommended Action
Inconsistent or unstable results	Residues on the pedestal or quartz surface; inconsistent pipetting; air bubbles in the sample droplet; sample volume outside the recommended range	Clean the pedestal thoroughly with distilled water; use a fresh sample droplet; ensure a sample volume of 1–2 µL; repeat the blank measurement before measuring again
Low absorbance or no measurable signal	Sample concentration too low; incorrect blank solution; improper sample placement on the pedestal	Check that the blank matches the sample buffer; apply the droplet carefully to the center of the pedestal; repeat the measurement with a fresh sample; if necessary, concentrate the sample before remeasurement
Unexpected purity ratios	Protein contamination; salts, phenol, or buffer residues; incomplete blank measurement; dirty pedestal	Repeat the blank measurement with the correct blank solution; clean the pedestal and measure again; review the sample preparation method; if necessary, purify the sample again before further use
Results appear too high or too low	Wrong measurement mode selected; incorrect dilution factor entered; sample concentration outside the recommended measuring range	Confirm that the correct application and sample type were selected; check the entered dilution factor; dilute highly concentrated samples or concentrate very dilute samples; repeat the measurement after adjusting the sample
Problems during blank measurement	Blank solution does not match the sample buffer; measurement surface is not clean; too little or too much blank volume applied	Use the same buffer or solvent as used for the sample; apply 1–2 µL of blank; clean the pedestal before blanking again
USB drive is not recognized	USB drive connected to the wrong port; USB drive not formatted correctly; USB device not inserted properly	Use one of the two USB-A ports on the side of the instrument; ensure the USB drive is formatted as FAT32; reinsert the USB drive and check whether the USB symbol appears on the screen
OD600 measurement issues	Dirty or scratched cuvette; air bubbles in the cuvette; cuvette inserted in the wrong orientation; blank and sample measured in different cuvettes with different optical properties	Use a clean 10 mm cuvette; remove air bubbles before measurement; ensure the transparent sides are aligned with the optical path; for best consistency, use matched cuvettes whenever possible

Instrument does not start properly	Power cable not connected correctly; power switch is off; power supply issue	Check that the power cable is connected securely at the rear of the instrument; verify that the other end is connected to a suitable power socket; make sure the ON/OFF switch above the power inlet is in the ON position
Mol. Ext. Coeff.	280 nm	user-defined
Ext. Coeff.	280 nm	user-defined
Customize	280 nm	user-defined

Contact details

Please contact us for additional information: **info@nippongenetics.de**
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