Dynamica

HALO DNAmaster

Bio-spectrophotometer

Operation Manual

Model HALO DNAmaster Bio-spectrophotometer

Revision : D01-201203

IMPORTANT

Precautions on Electromagnetic Wave Interference

1. Possible Electromagnetic Wave Interference Caused by This Instrument

When this instrument is used in a residential area or an adjacent area thereto, it may cause interference to radio and television reception.
To prevent this, use the specified system connection cables in strict accordance with the instruction manual. The instrument is designed to minimize possible electromagnetic wave interference caused by it if the specified cables are connected properly.
However, there is no guarantee that electromagnetic wave interference will not be caused by the instrument. If the instrument does cause interference to radio or television reception, which can be determined by turning off and on the instrument, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase separation between the instrument and radio/TV receiver.
- Connect the instrument to an outlet on a circuit different from that to which the radio/TV receiver is connected.

2. Possible Electromagnetic Wave Interference Affecting This Instrument

If this instrument is used near an intense electromagnetic source, interference noise may be given to the instrument to incur an adverse effect on its performance or functionality.
To prevent this, use the specified system connection cables in strict accordance with the instruction manual. The instrument is designed to minimize possible electromagnetic wave interference affecting it if the specified cables are connected properly.
However, there is no guarantee that electromagnetic wave interference will not occur in this instrument. If the instrument does incur electromagnetic wave interference, which can be determined by turning on and off possible sources of electromagnetic wave interference nearby, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the instrument.
- Increase separation between the instrument and possible sources of electromagnetic wave interference.
- Increase separation between the power cable of the instrument and possible sources of electromagnetic wave interference.
- Connect the instrument to an outlet on a circuit different from that to which possible sources of electromagnetic wave interference are connected.
- Confirm that any other device connected with the instrument is not affected by electromagnetic wave interference.

Warranty on Product

The Model HALO DNAmaster Series Spectrophotometer is warranted to operate according to the specifications given in the instruction manual, provided it is used in accordance with the instructions described in the manual.

(1) Scope of Warranty

(a) Any parts which prove to be defective in design or workmanship during the warranty period will be repaired without charge.

(b) A substitute part may be used for repair, or replacement with an equivalent product may be made instead of repair.

(c) Such system components as a personal computer and printer to be updated frequently for improvement may not be available in original versions at the time of replacement.

(2) Warranty Period

One year from the date of initial installation.

(3) Availability of Technical Support Service

Technical support service for this instrument is available within regular working hours on workdays predetermined by us.

(4) Limitations and Exclusions on Warranty

Note that this warranty is void in the following cases, even if they occur within the warranty period.

(a) Failure due to operation at a place not meeting the installation requirements specified by us

(b) Failure due to power supply voltage/frequency other than specified by us or due to abnormality in power supply

(c) Corrosion or deterioration of the tubing due to impurities contained in reagent, gas, air or cooling water supplied by the user

(d) Corrosion of the electric circuits or deterioration of the optical elements due to highly corrosive atmospheric gas

(e) Failure due to use of hardware, software or spare parts other than supplied by us

(f) Failure due to improper handling or maintenance by the user

(g) Failure due to maintenance or repair by a service agent not approved or authorized by us

(h) After disposal of this instrument, or after its resale without our approval

(i) Failure due to relocation or transport after initial installation

(j) Failure due to disassembly, modification or relocation not approved by us

(k) Consumables, and failure of parts that have reached the end of specified useful life

(l) Failure of parts excluded from the warranty in the instruction manual or other documents

(m) Failure due to acts of God, including fire, earthquake, storm, lightning, social disturbance, riot, crime, insurrection, war (declared or undeclared), radioactive pollution, contamination with harmful substances, etc.

(n) Failure of the hardware, or damage to the system software, application software, data or hard disk due to computer virus infection

(o) Failure of the personal computer connected with the instrument, or damage to the system software, application software, data or hard disk due to power interruption or momentary power voltage drop caused by lightning or the like

(p) Failure of the personal computer connected with the instrument, or damage to the system software, application software, data or hard disk due to disconnection of main power to the personal computer without taking the specified normal shutdown procedure

(5) Disclaimer of Warranty

(a) Any express warranties other than the explicit conditions indicated in (1) are excluded from this warranty.
Any other implied warranties of merchantability and fitness for a particular purpose are not included in this warranty. No liability is assumed for direct or indirect damages arising out of explicit or implied warranties.

(b) Oral or written information or advice given by our dealers, distributors, agents or employees without our express permission shall not create a warranty or in any way increase the scope of this warranty.

Technical Service

Installation of this instrument shall be carried out by or under supervision of qualified service personnel of Dynamica or its authorized service agent. Before installation of the instrument, the user shall make preparations for satisfying the installation requirements in accordance with the instruction manual.
If relocation of the instrument becomes necessary after initial installation (delivery), please notify your local sales representative or nearest service office of Dynamica.

Disposal this instrument

When you discard equipment, please check and discard a related statute etc. or ask the service section of Dynamica.

Other Precautions

1. Handling of Chemicals and Samples

(1) The user is responsible for following relevant legal standards and regulations in handling, storage and discarding of chemicals and samples used in analytical operations of this instrument.

(2) Reagents, standard solutions and accuracy-control samples shall be handled, stored and discarded as instructed by the respective suppliers.

2. Notice on Instruction Manuals

(1) Information contained in the instruction manuals furnished with the instrument is subjected to change without notice for product improvement.

(2) This manual is copyrighted by Dynamica with all rights reserved.

(3) No part of this manual may be reproduced or transmitted in any form or by any means without our express written permission.

3. Trademark Acknowledgments

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SAFETY SUMMARY

For your safety please read the following precautions carefully before using the DNAmaster Spectrophotometer.

General Safety Guidelines

- For safe handling of this product, please follow the instruction procedure in the manual for this product.
- Pay special attention to follow all the hazard warnings on the product and in the manual. Failure to do so can cause injury to you or damage to the product.
- After installation, please do not move the equipment. A vibration might affect the adjustment of the product.
- The hazard warnings, which appear on the warning labels on the product or in the manual, have one of the following alert headings consisting of an alert symbol and a signal word, DANGER, WARNING, or CAUTION.

DANGER:	**Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. (It does not apply to this equipment.)**
WARNING:	**Indicates a potentially hazardous situation that, if not avoided, can result in death or series injury.**
CAUTION:	**Indicates a hazardous situation that, if not avoided, will or can result in minor to moderate injury, or serious damage to the product.**
:	**The alert symbol shown precedes every signal word for hazard warnings, and appears in safety related descriptions in the manual.**

SAFETY SUMMARY (Continued)

General Safety Guidelines (Continued)

In addition, the following "**Attention**" and "**Note**" are not directly related to the safety of a person:

Attention:	**It is used to present warnings, which are not directly related to personal injury hazards. It is used to indicate prevention against damage to the equipment.**
Note:	**This is used to indicate instructions that enable you to operate the equipment accurately and perform accurate measurements.**

SAFETY SUMMARY (Continued)

General Safety Guidelines (Continued)

Before Using

- Before using this product, please make sure you read and understand the instructions.
- Please keep this manual in a safe and easily accessible place so that you can use it when necessary.
- Please make sure to use this product properly and follow the instructions as specified in this manual.
- Please make sure to understand and follow the instructions regarding safety in this manual.
- If you do not follow the instructions in this manual, an inaccurate analysis may result or bodily injury may occur.
- Because of danger, please make sure not to modify or alter the product, make sure not to use unspecified parts, and make sure not to operate the equipment by removing/defeating the safety device(s).
- When using chemicals, please make sure to ventilate the room well. If there is not enough ventilation, it may be hazardous to your health.
- Although we have carefully considered the instructions written on the products and manuals, it is possible for an unexpected event to occur. When operating the equipment, aside from following the instructions, be very cautious.

SAFETY SUMMARY (Continued)

General Safety Guidelines (Continued)

Precautions for Installation • Maintenance • Relocation and After Sale Technical Service

- **Before installation, confirm that there are no missing items or standard accessories. If there is something missing or damaged, or you have noticed any problems, please contact our nearest representative.**
- **Operating the equipment without a standard part can damage the equipment and cause safety concerns. If that occurs, please follow the instruction of the installer.**
- **Installation of this instrument shall be carried out by or under supervisions of qualified service personnel of Dynamica or its authorized service agent.**
- **When relocation of this instrument becomes necessary after initial installation (delivery), please notify your local Dynamica sales representative or nearest Dynamica service office. Technical support service for this instrument is available from s service agent approved or authorized by Dynamica within regular working hours or workdays.**
- **Please do not perform any other operations that are not included in the manual. If any problem occurs with the equipment, please contact the agent from whom you purchased it or the service department of Dynamica.**

SAFETY SUMMARY (Continued)

WARNING: Poisoning from Organic Solvent Gas

Handling Organic Solvents

- **The organic solvent vapor may be harmful to your health.**

WARNING: Eye Injury from Organic Solvents

Handling Organic Solvents

- **Please wear protective glasses when using organic solvents. If the organic solvent should get into your eye, flush your eye immediately under running water for at least 5 minutes while keeping your eyelids open. See a physician for appropriate treatment.**

SAFETY SUMMARY (Continued)

WARNING: Electrical Shocks from Improper Grounding

Electrical Shock from Improper Grounding

- **When wiring the personal computer, power supply for the thermostatic cell holder and the like, please make sure to use the 3-prong wire (with ground) provided.**
-

WARNING: Electrical Shock

Electrical Shock from Contact

- **High voltage is used inside of the equipment. Never remove the cover except by a service person or as instructed in the section for lamp replacement.**
- **When cleaning the inside of the cell compartment, be sure to turn off the unit.**

CAUTION: High Temperature

Burns from high temperatures

- **The lamp will become very hot during operation, please make sure that the D2 lamp and the tungsten lamp is cooled off when replacing the lamp.**

SAFETY SUMMARY (Continued)

CAUTION: Injury from incidental contact with the unit.

Handling the sample compartment cover

- **When you open and close the sample compartment cover, please be careful not to get your hand or hair caught. Please assure your safety before operation.**

CAUTION: Fatigue due to Prolonged Work

Data Processing

- **Viewing the display in your work can cause eye and physical fatigue if you continue to work in the same posture for extended periods.**
- **When working with the display for a prolonged period, for your health, make sure to take breaks for 10 to 15 minutes every hour in order to rest your eyes and body.**

NOTE

Precautions regarding Accuracy and Precision of Measurements

- **Do a routine check prior to taking measurements. In order to obtain accurate measuring results, please perform tests as instructed, following the instructions in Chapter 3.**

Electricity

- **The voltage for the Spectrophotometer system and personal computer must be a single-phase AC 100V to 200V; Variations in the voltage and noise generated in the power line will cause adverse effects on the spectrophotometer and may also cause accidents.**

- **Please make sure that grounding is provided together with the power supply wires, and make sure that it is connected with a grounding resistance of less than 10 Ω. Defective grounding may not only cause lower resistance against noise from the outside but it can also cause the Mass Spectrometer and personal computer to generate static electricity, which may involve the danger of electrical shocks.**

- **A high voltage circuit is used inside the Spectrophotometer. Do not open the covers when this circuit is operational because of the danger from electrical shock.**

Fire Extinguishers

- **Do not smoke or use fire within 3 meters of the Spectrophotometer**

- **Make sure to keep a fire extinguisher near the Spectrophotometer at all times. Obtain an ABC Powder extinguisher that can be used for normal fires, oil fires, and electrical fires.**

Installation conditions

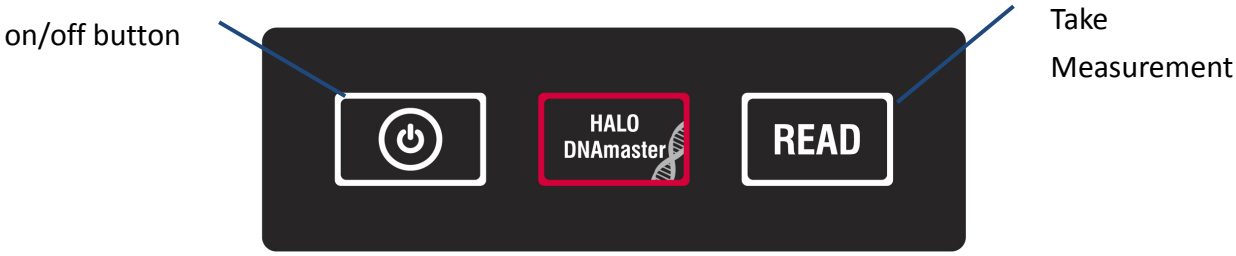
Power requirements

Power supply voltage:	AC100, 115, 220, 230 or 240V Allowable fluctuation is within ±10% of rated voltage.
Frequency:	50 or 60 Hz Allowable fluctuation is within ±4% of rated frequency.
Power capacity:	200VA or more. A capacity of more than 500VA may be required for use with other accessory devices.
Grounding line:	Grounding line resistance of 100Ω or less is required.

Installation Environment

(1) Operating temperature: 5~35 deg C.
In order to perform a measurement under the most stable condition, we recommend that the instrument is used in an air conditioned room of 20 ~ 25 Deg C.
(2) Operating humidity: 45% ~ 85%.
(3) Storage temperature: -20~ 60 Deg C.
(4) Atmospheric environment:
   a) Free from acid gas or alkaline gas and other gases which may corrode metals significantly.
   b) Free from gases which may dissolve paint such as from organic solvents (particularly benzene, thinner etc).
(5) Other general notes:
   a) Avoid direct sunlight (otherwise optical performance might deteriorate or the housing might become discolored). Avoid installation by a window if at all possible.
   b) Vibrations or shocks strong enough to be felt by the human body must not be transmitted to the instrument (otherwise the fine adjustment mechanism might malfunction).
   c) Avoid installation in near heat generating apparatus such as a gas burner, electric heater or oven in order to prevent the mainframe cover being heated beyond 70 Deg C.
   d) Avoid installation near instruments which generate a strong electric field (such as an electric welding machine, high frequency furnace or pole transformer).
   e) Avoid a dusty environment (otherwise optical performance might deteriorate).
   f) The line voltage must be stable and free from a rapid fluctuation (otherwise noise might increase).
   g) Do not frequently turn on and off electric instruments (stirrer, vibrator, etc) which are connected to the same power line

The Instrument



On/Off button
Blue backlight- Standby mode
Green backlight- Operating

Read button
The Read button on the unit can use as an alternative way to take the data during measurement.

Touch screen
DNAmaster's LCD display is pressure sensing which can be used even with gloves on. For best performance, fingertip or stylus is preferable.

Specification

DNAmaster Specifications	
Lamp source	Long life Xenon Flash Lamp
Detector Device	CCD
Wavelength range:	200-900nm
Measuring range:	0-4.0 OD
Wavelength accuracy:	+/-1nm
Slit width:	4nm
Noise:	~0.005 OD (RMS)
Drift:	~0.005 OD
Photometric Accuracy:	+/-0.01 OD
Photometric Repeatability:	+/-0.005 OD
Stray light:	0.5%T
DNA detection limit :	20ng/μl
Minimum sample volume with Ultramicro Cell: (Depends on the cap used)	0.5μl
Start up melodies	Selectable from 7 types and mute
Energy save mode	Yes
Memory storage	Internal or SD card
Data storage number	40,000 (internal) Unlimited (external)
Manual program storage number	10 for each function
Dimension W x D x H (mm)	300 x 300 x 115 300 x 300 x 155 (TC model)
Weight (kg)	3.5kg 4.5kg (TC model)
Power Requirement	110 - 220 V, 50/60Hz

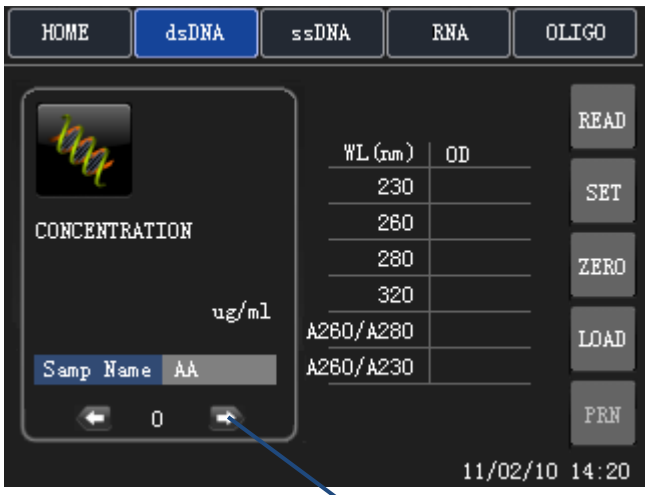
The Display Screen

Main menu

Touch the icon for go to next screen

DNA/RNA: Nuclei acid analysis
DNA/RNA DYE: Dye incorporation
PROTEIN: Protein determination
PROTEIN UV: Protein UV & UV dye method
OD600: Bacterial cell culture measurement
SPECTRO: Traditional spectrophotometer function
FILE: Saved method and data
SETTINGS: User parameter setting

DNA/RNA measurement



Select between different sample

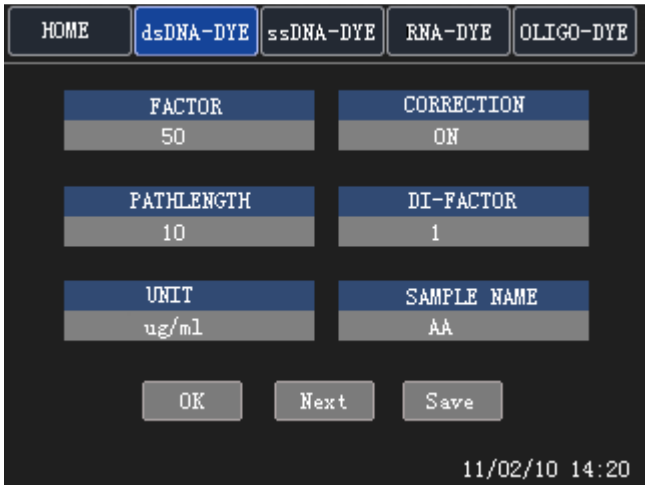
DNA/RNA

Select measurement from dsDNA, ssDNA, RNA, Oligonucleotides

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



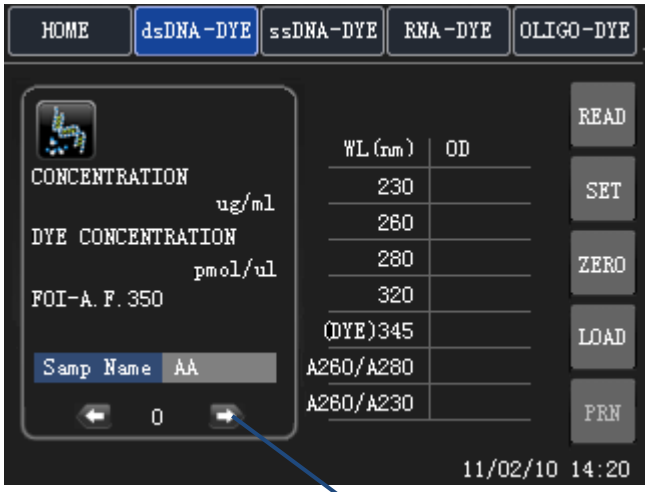
SET

Parameter setting

Input

1. Factor
2. 320nm background correction on/off,
3. Pathlength
4. Dilution Factor
5. Unit
6. Sample Name

Press OK to next step or Save to store the parameters



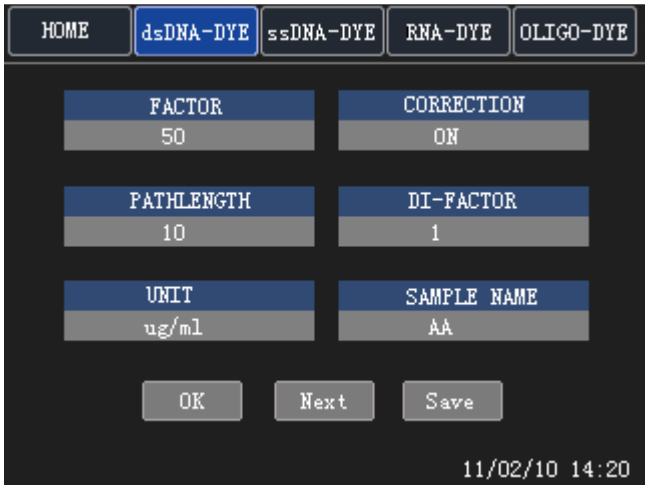
Select between different sample

Dye incorporation

Select dye incorporation method from dsDNA, ssDNA, RNA, Oligonucleotides

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank before measurement
4. READ for measurement
5. PRN for result printing



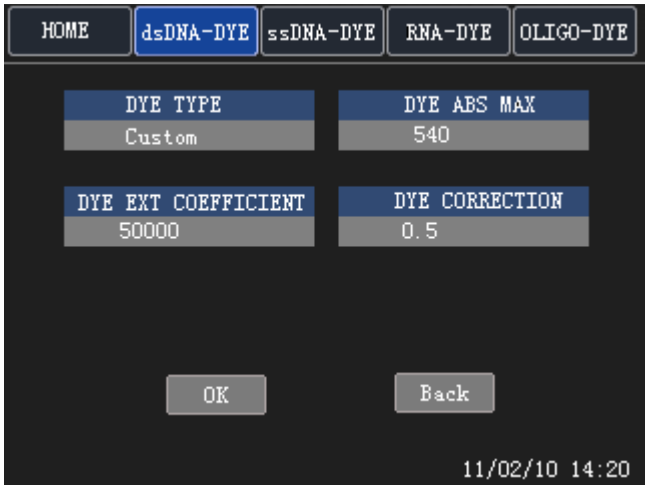
SET

Parameter setting

Input

1. Factor
2. background correction (on/off)
3. Pathlength
4. Dilution Factor
5. Unit
6. Sample Name

Press OK to next step or Save to store the parameters



Dye type selection

For selected preset/ custom dye type

Input

1. Dye Type

For custom dye

Input

1. Dye Abs Max for maximum absorbance wavelength of the custom dye
2. Dye Ext Coefficient for dye-dependent extinction coefficient
3. Dye Correction for dye-dependent correction factor at 280 nm

Press OK to next step or Back for return to previous screen

Protein measurement

PROTEIN

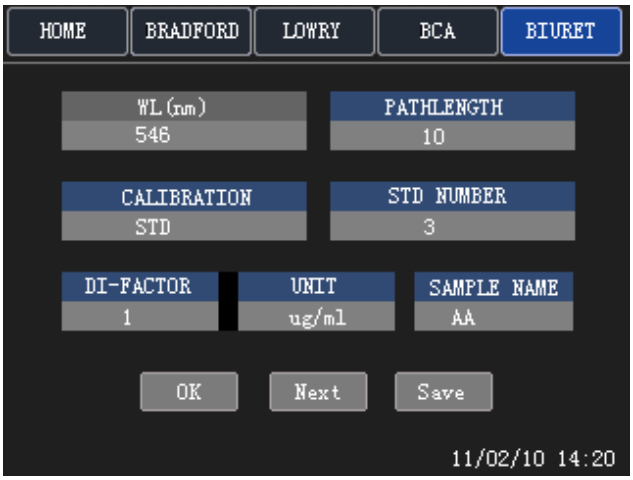
Select measurement from Bradford, Lowry, BCA and Biuret

Standard curve setup

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



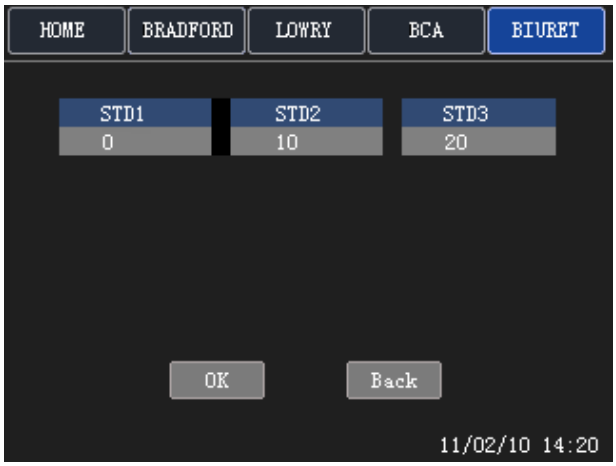
SET

Parameter setting

Input

1. Pathlength
2. Calibration mode- Standard concentration or input K-factor
3. Number of standards
4. Dilution factor
5. Unit selection
6. Sample Name

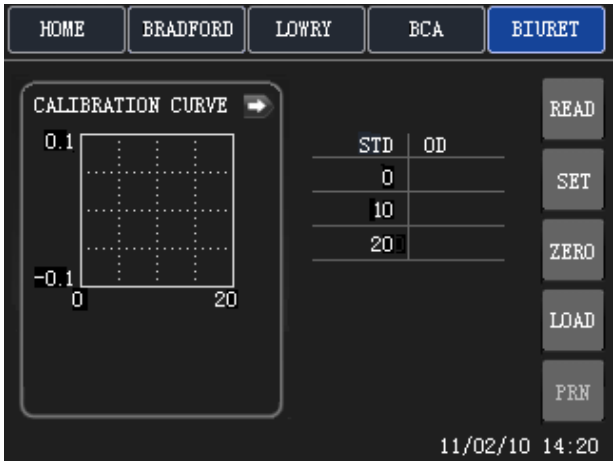
Press NEXT for Standard concentration or K-factor input, OK to next step or Save to store the parameters



For standard concentration setting

Input the concentration of standard used

Press OK to next step or Back to previous screen



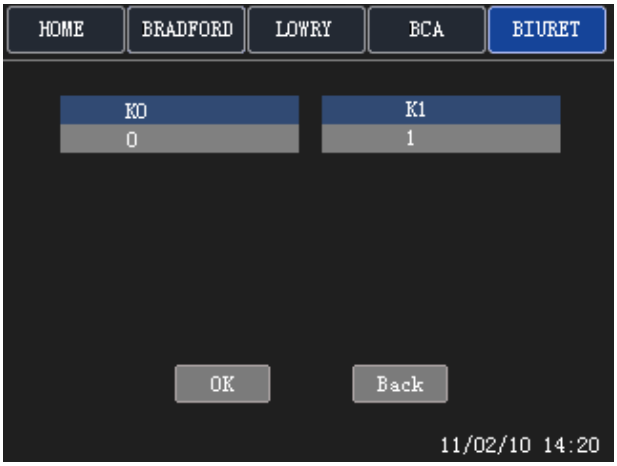
For standard measurement

For Standard curve setup

Press

1. ZERO for blank before measurement
2. READ for measurement
3. PRN for result printing

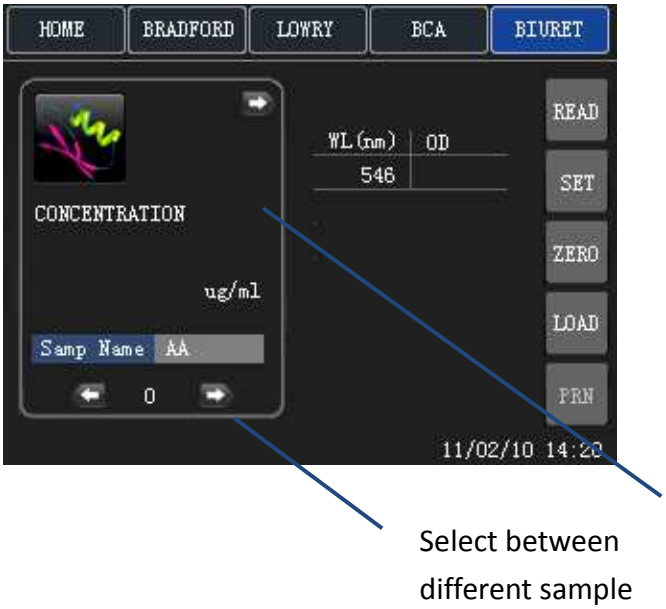
Note: Press ZERO key after new setting, this will be used for all subsequent samples



For K-factor setting

Input the K-factor

Press OK to next step or Back to return to previous screen



Select between different sample

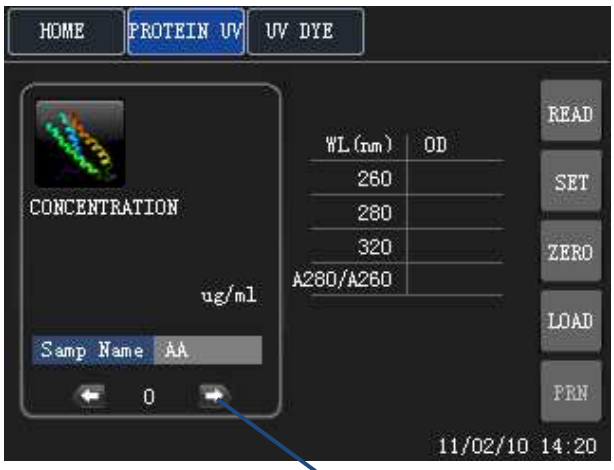
Change to standard curve display

PROTEIN SAMPLE MEASUREMENT

Press

1. ZERO for blank or reference sample before measurement
2. READ for measurement
3. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



Select between different sample

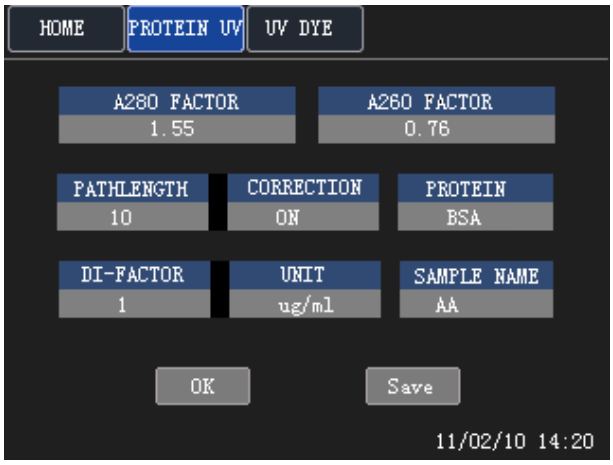
PROTEIN UV

Select measurement from Protein UV and Protein UV Dye

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



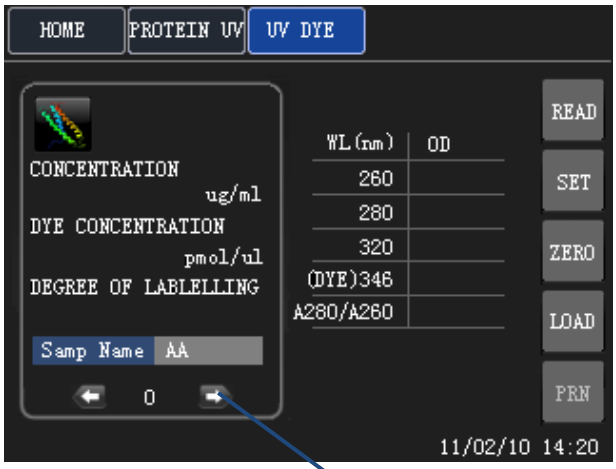
SET

Parameter setting

Input

1. A280 Factor
2. A260 Factor
3. Pathlength
4. 320nm background correction on/off
5. Protein type
6. Dilution Factor
7. Unit
8. Sample Name

Press OK to next step or Save to store the parameters



Select between different sample

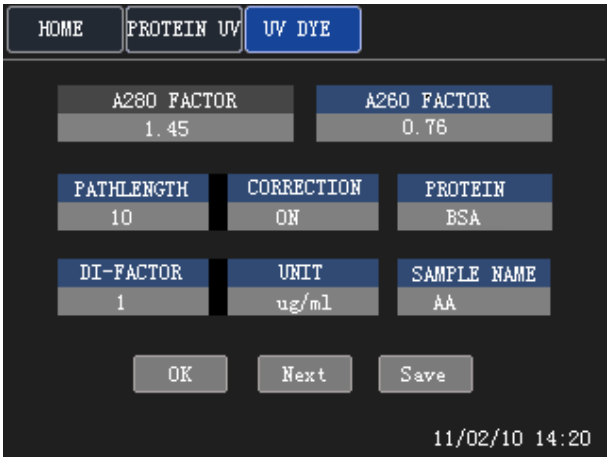
PROTEIN UV DYE

Select measurement from Protein UV and Protein UV Dye

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



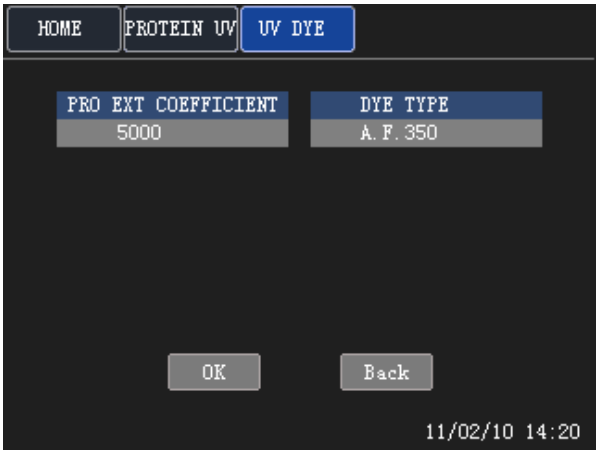
SET

Parameter setting

Input

1. A280 Factor
2. A260 Factor
3. Pathlength
4. 320nm background correction on/off
5. Protein type
6. Dilution Factor
7. Unit
8. Sample Name

Press OK to next step or Save to store the parameters

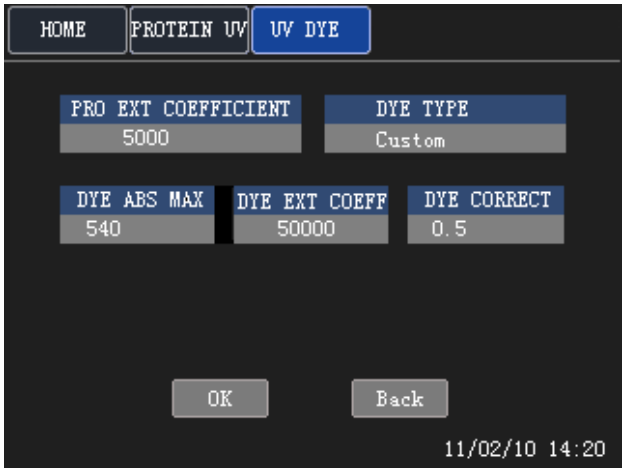


Dye type selection

Input

1. PRO EXT COEFFICIENT
2. DYE TYPE for dye selection

Press OK to next step or BACK to return to previous screen



Custom dye type selection

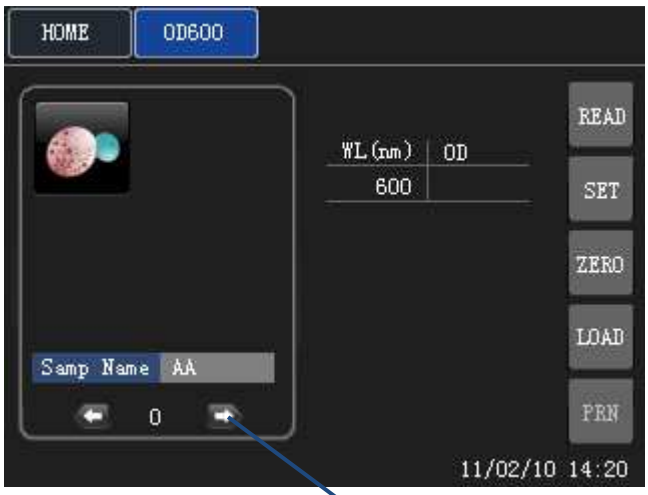
For selected custom dye type

Input

1. PRO EXT COEFFICIENT
2. Dye Abs Max for maximum absorbance wavelength of the custom dye
3. Dye Ext Coefficient for dye-dependent extinction coefficient
4. Dye Correction for dye-dependent correction factor at 280 nm

Press OK to next step or Save to store the parameters

Analysis of Bacterial Growth



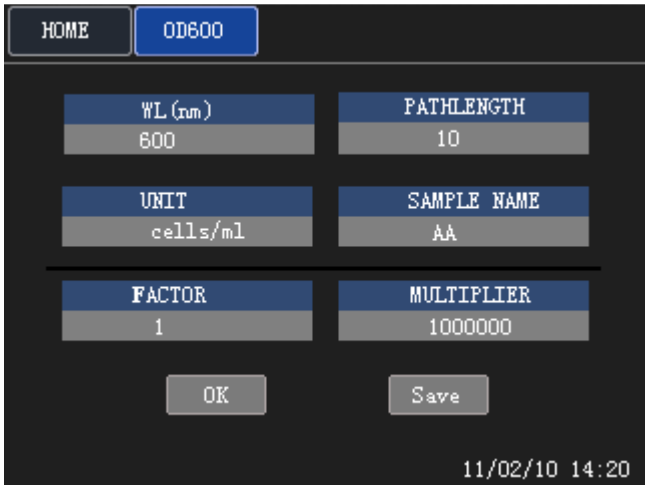
Select between different sample

OD600

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



SET

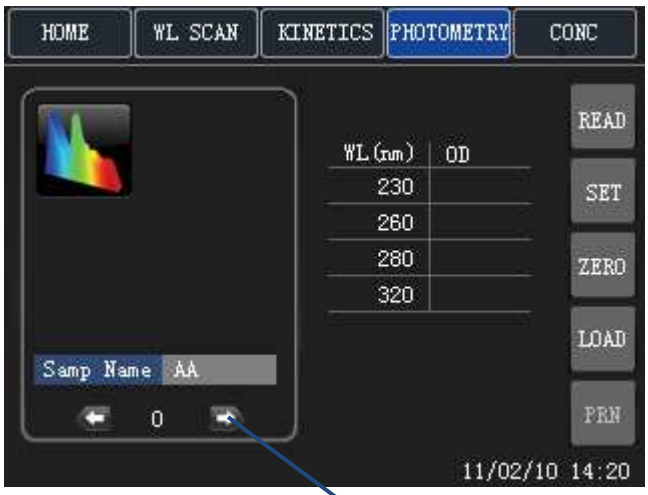
Parameter setting

Input

1. Wavelength
2. Cell Pathlength
3. Unit
4. Sample name
5. Dilution Factor
6. Multiplier (from 1000 or 1,000,000)

Press OK to next step or Save to store the parameters

Spectrophotometer function



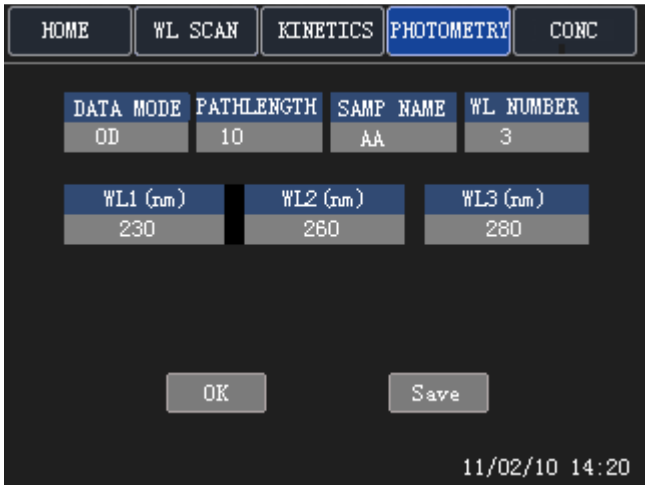
Select between different sample

Photometry

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



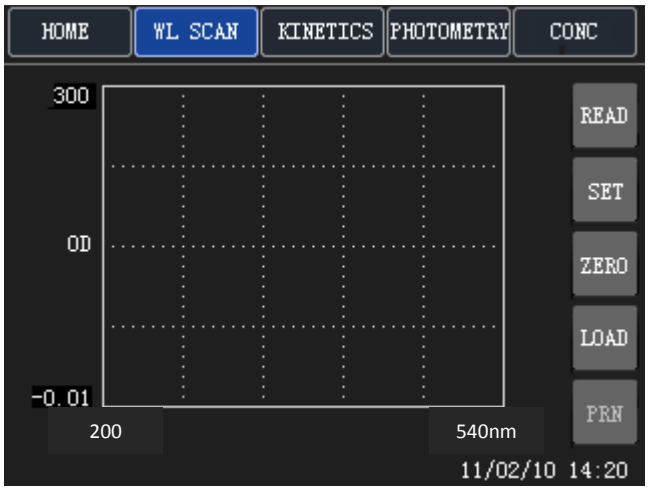
SET

Parameter setting

Input

1. Data mode from OD (Absorbance) or %T (Transmittance)
2. Pathlength
3. Sample Name
4. Select number of wavelength (from 1 to 6)
5. Wavelength (nm) need to measure

Press OK to next step or Save to store the parameters

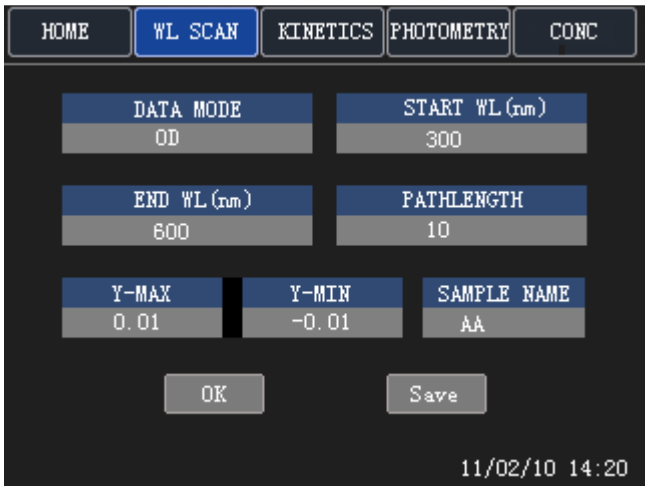


Wavelength scan

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



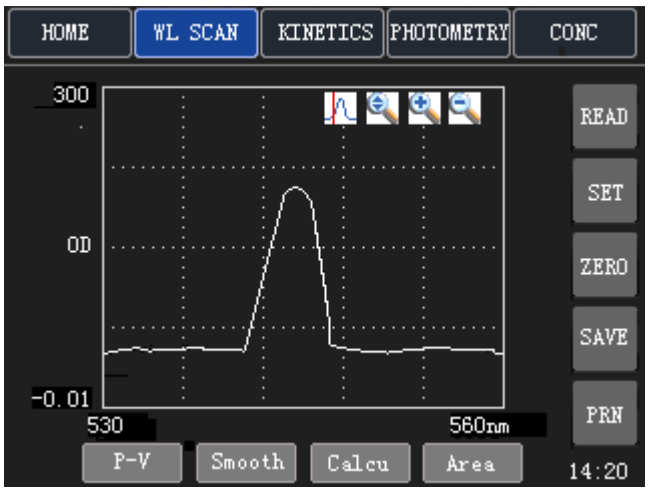
SET

Parameter setting

Input

1. Data mode from OD (Absorbance) , %T (Transmittance) or E(S) (Energy)
2. Start wavelength
3. End wavelength
4. Y-Axis maximum to be shown
5. Y-Axis minimum to be shown
6. Sample name

Press OK to next step or Save to store the parameters



Wavelength scan

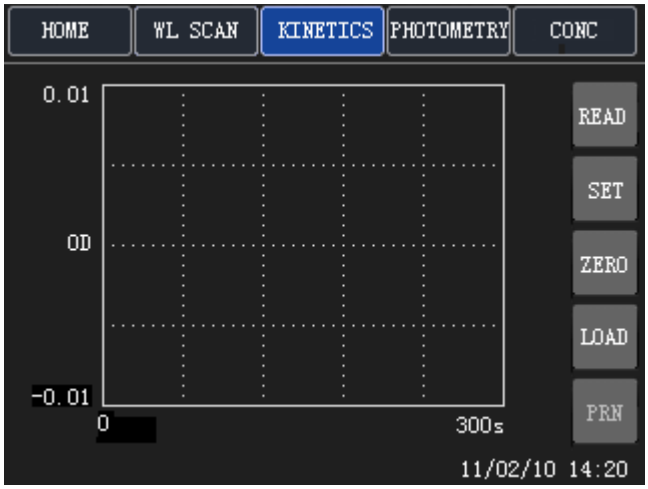
Press

1. ZERO for blank or reference sample before measurement
2. READ for measurement
3. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples

Data Process

1. P-V- Peak- Valley function display the peak and valley
2. Smooth -The smooth function employs a data-smoothing algorithm to smooth the noise. Selection of this function causes the spectral graph screen to change.
3. Calculation - +K (or * K) option performs addition (multiplication) of constant (K) on the spectral plot
4. Area- for area calculation.

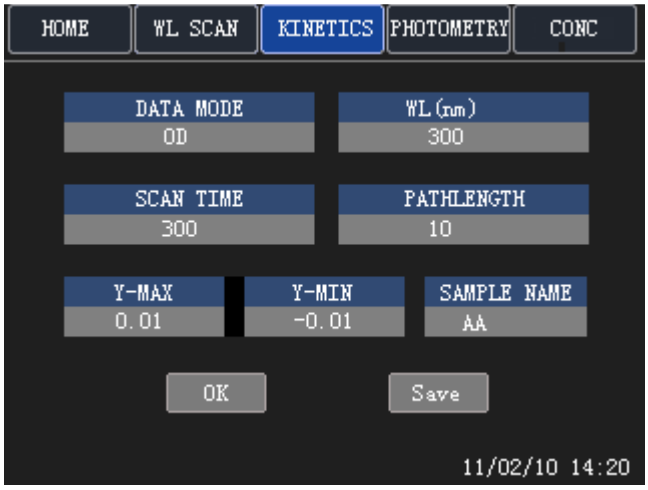


Kinetics

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



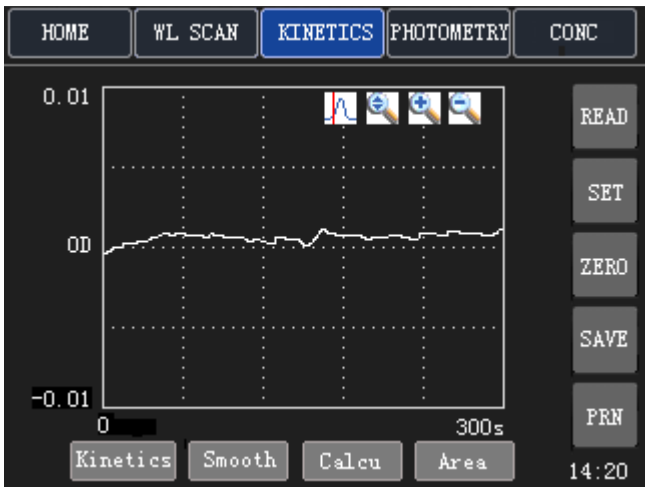
SET

Parameter setting

Input

1. Data mode from OD (Absorbance) , %T (Transmittance) or E(S) (Energy)
2. Scan wavelength (nm)
3. Scan time period
4. Pathlength of the cuvette
5. Y-Axis maximum to be shown
6. Y-Axis minimum to be shown
7. Sample name

Press OK to next step or Save to store the parameters



Kinetics

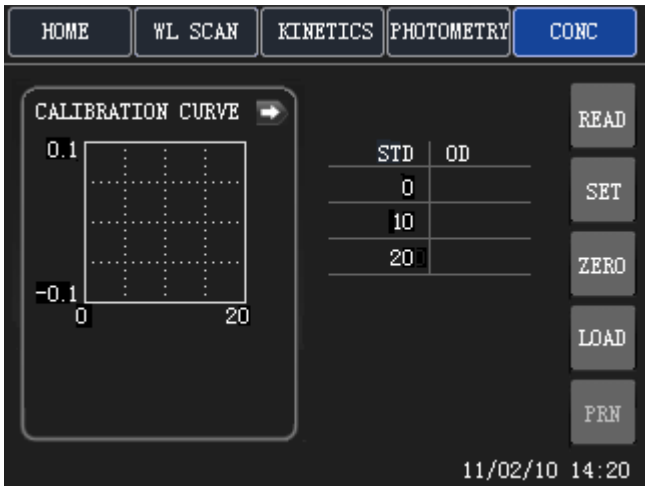
Press

1. ZERO for blank or reference sample before measurement
2. READ for measurement
3. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples

Data Process

5. Kinetics- Recalculate the kinetics by adjust the time period
6. Smooth -The smooth function employs a data-smoothing algorithm to smooth the noise.
7. Calculation - +K (or * K) option performs addition (multiplication) of constant (K) on the spectral plot
8. Area- for area calculation.

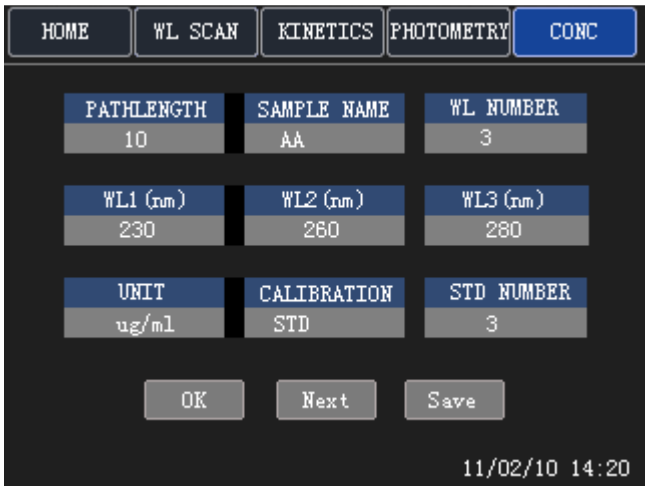


Concentration

Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



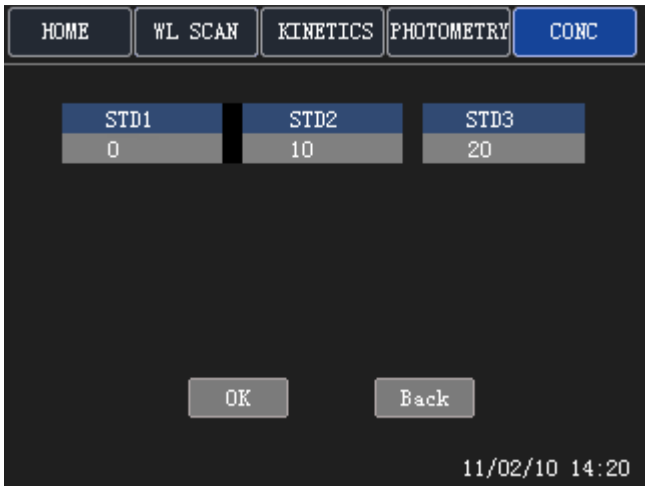
SET

Parameter setting

Input

1. Pathlength
2. Sample name
3. Select number of wavelength (from 1 to 3)
4. Wavelength (nm) need to measure
5. Unit
6. Calibration mode- Standard concentration or input K-factor
7. Number of standard

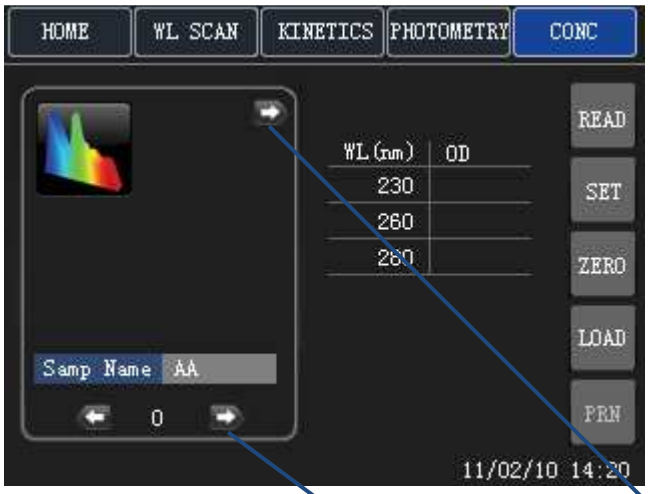
Press NEXT for Standard concentration or K-factor input, OK to next step or Save to store the parameters



For standard concentration setting

Input the concentration of standard used

Press OK to next step or Back to previous screen



Concentration measurement

After setting calibration curve

Press

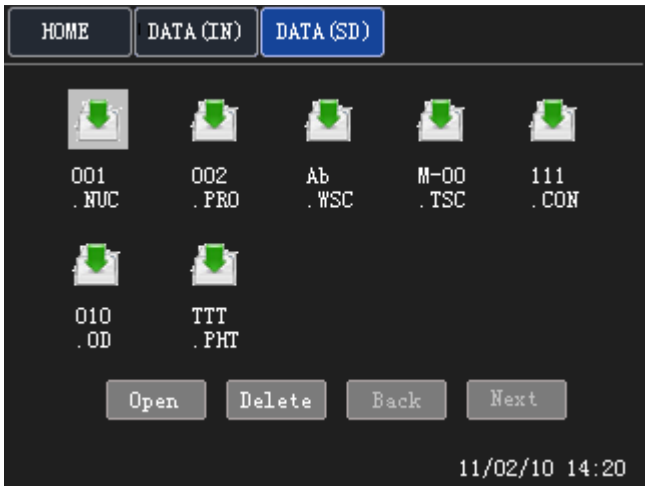
1. ZERO for blank or reference sample before measurement
2. READ for measurement
3. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples

Change to standard curve display

Select between different sample

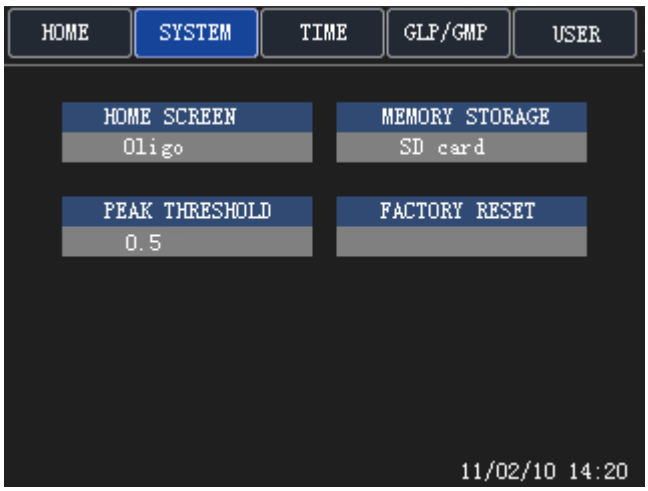
File



Data (IN/SD)

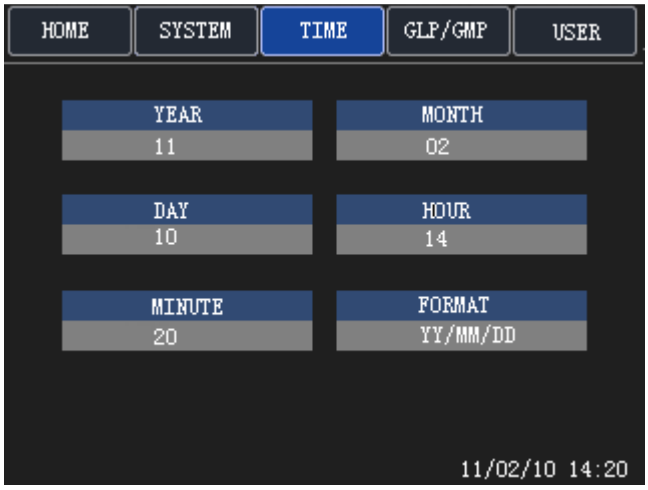
1. Select between data stored in internal memory or SD card
2. Open/Delete the method or data stored

System setting



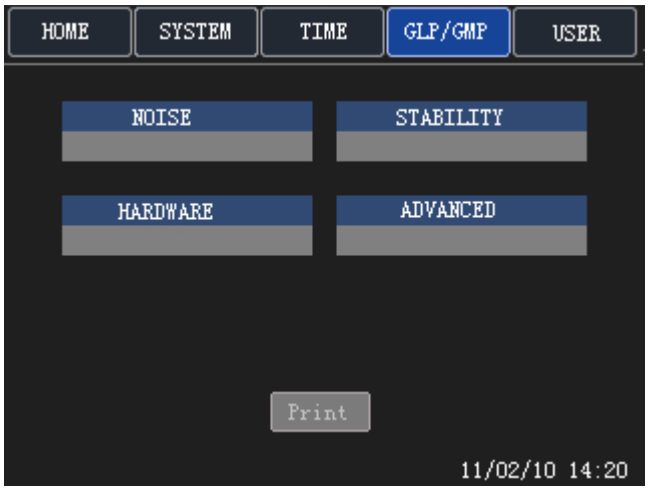
System

1. Home screen- Select the function show on startup
2. Memory Storage- Select storage by SD-card or internal memory
3. Peak Threshold- Select the threshold for automatic peak picking function
4. Factory reset- reset back to factory default setting



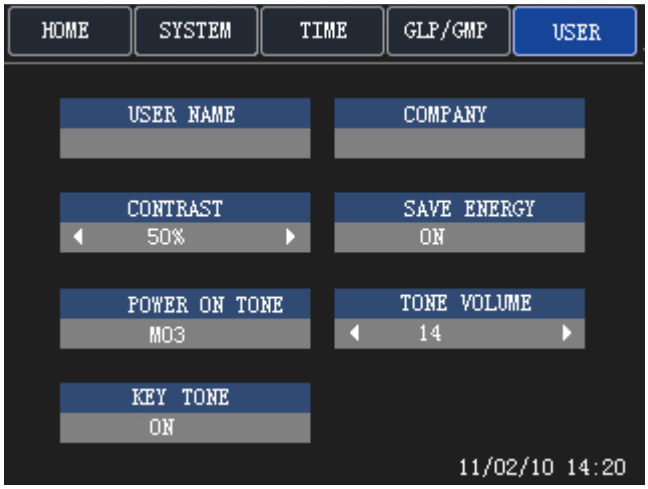
Time

Time and Date setting



GLP/GMP

Perform checking self diagnostic function
Additional service tools may required
(please contact your local distributor for
further assistance)



User

1. User Name input
2. Company name input
3. Display contrast of the screen
4. Energy saving mode for screen turn off after 10 minutes without using
5. Start up tune
6. Tune volume
7. Key Tone on/off when pressing

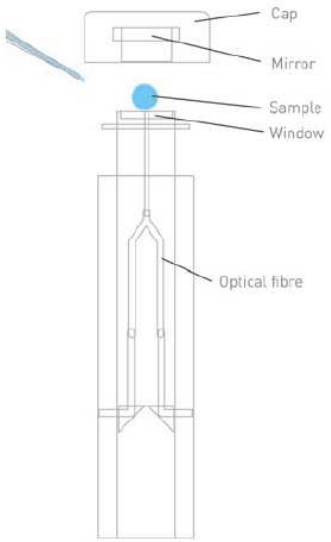
Appendix 1

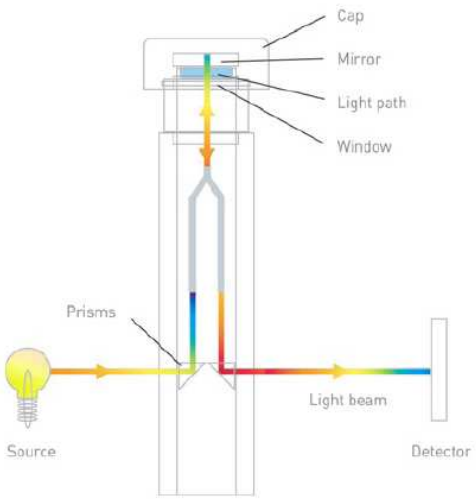
How to use ultramicro cell

The ultramicro cell is a 10mm x 10mm cuvette that fits into the DNAmaster.

A 8.5 mm beam height was setup for DNAmaster. The cell has a system of fiber optics and prisms that will reflect the light beam up to the sampling window and then back to the detector on the instrument. It is supplied with a cap which contains a small mirror and it ensures that the sample is measured at constant pathlength. The pathlength is achieved by a double pass through the sample as controlled by the cap height. DNAmaster can setup the pathlength (shown in the cap).

Just need to pipette a small drop (0.5 – 10µl, depends on cap's pathlength) of sample onto the window and then places the cap on top. And then can start the measurement.





Quantification of Nucleic Acids

For the different types of nucleic acid solutions the average dynamic range of the absorbance relating to the concentration (ng/µl) results and its required sample volume as follows (depending on the lightpath):

	Factor	2 mm Lid (Factor 5) [ng/µl]	1 mm Lid (Factor 10) [ng/µl]	0.2 mm Lid (Factor 50) [ng/µl]	0.1 mm Lid (Factor 100) [ng/µl]	Total Detection Range [ng/µl]
dsDNA	50	6 - 425	13 - 850	63 - 4250	125 - 8500	6 - 8500
ssDNA	37	5 - 315	9 - 629	46 - 3145	93 - 6290	5 - 6290
RNA	40	5 - 340	10 - 680	50 - 3400	100 - 6800	5 - 6800
Oligo	33	4 - 281	8 - 561	41 - 2805	83 - 5610	4 - 5610

Corresponding Absorbance Value Limits for A 260 (Abs)	0.025 to 1.7	0.025 to 1.7	0.025 to 1.7	0.025 to 1.7
Required Sample Volume	6 - 10 µl	3 - 5 µl	0.7 to 4 µl	0.5 to 3 µl

* 1mm and 0.2mm lid come as standard with DYNAM-UM model, for other pathlength's lid, please enquire.

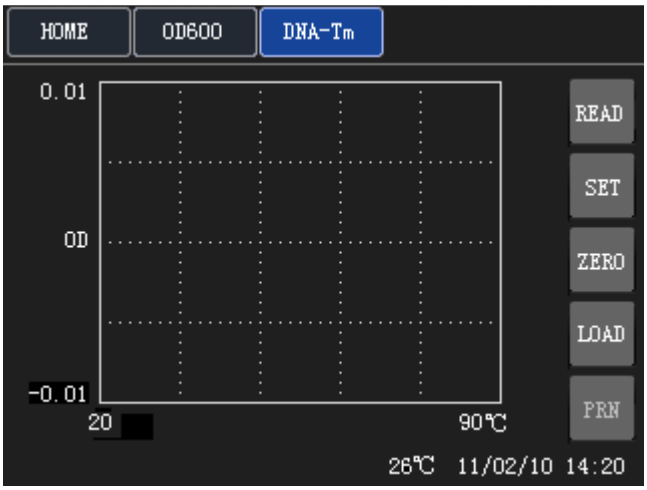
Appendix 2

Temperature control model

The below instruction only applicable for temperature control model. Ultramicro cell is not applicable for temperature control function.

TM function

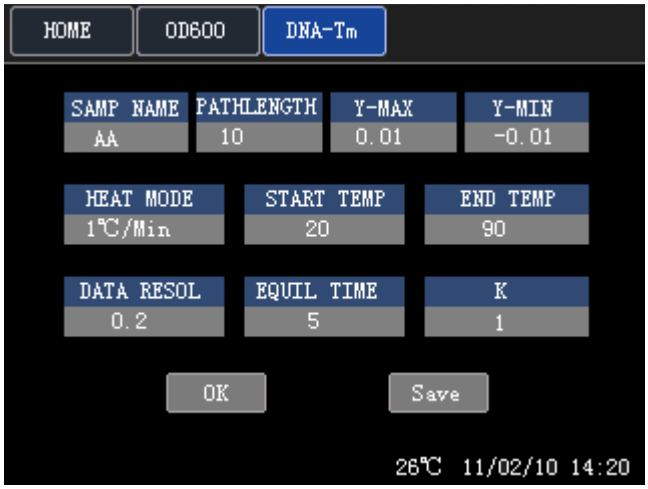
For analyzing DNA melting temperature at 260nm, select the OD600/TM function in the main menu.



Press

1. SET for detail setting
2. LOAD for reload saved parameter
3. ZERO for blank or reference sample before measurement
4. READ for measurement
5. PRN for result printing

Note: Press ZERO key after new setting, this will be used for all subsequent samples



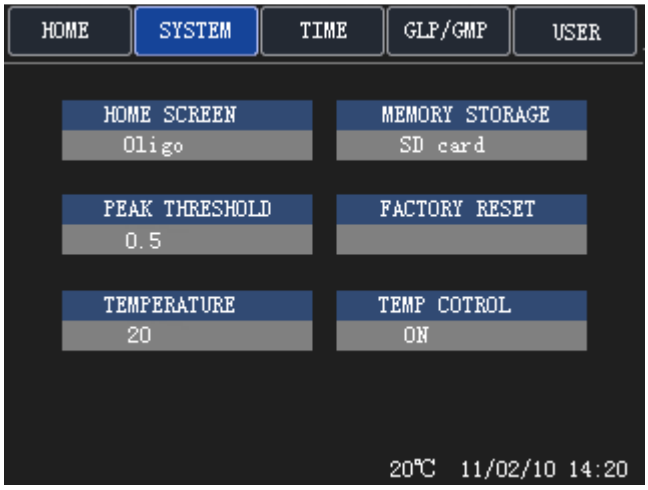
SET

Parameter setting

Input

1. Pathlength
2. Sample name
3. Y-MAX/ Y-MIN for Y-axis limit can be shown in the graph
4. HEAT MODE for different heating profile, selection from 1℃/min, 2℃/min, Fast heating to 50deg.C then 1℃/min or Fast heating to 50deg.C then 2℃/min
5. Starting temperature (minimum 20℃)
6. End temperature (maximum 95℃)
7. Data resolution
8. Set EQUIL TIME for time lag after reaching start temperature before reading start
9. Set K factor (i.e. GC content (%) = K*(Tm -69.3) x 2.44)

Press OK to next step or Save to store the parameters



SYSTEM

The temperature control model can also used for sample incubation or temperature control

In Setting menu input

1. Temperature control on/off
2. Setting temperature (only one temperature setting can be chose).

The HALO Range

DNAmaster

Bio-spectrophotometer

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