

Lambda 265 Peltier Controlled Single Cell, With Peltier Controller Installation Instructions

This instruction sheet describes the installation of this accessory which is used with the Lambda 265 Spectrophotometer.

NOTE: *Read these instructions before you install this accessory.*

Contacting PerkinElmer

Supplies, replacement parts, and accessories can be ordered directly from PerkinElmer, using the part numbers.

See our website:

<http://perkinelmer.com>

PerkinElmer's catalog service offers a full selection of high-quality supplies.

To place an order for supplies and many replacement parts, request a free catalog, or ask for information:

If you are located within the U.S., call toll free 1-800-762-4000, 8 a.m. to 8 p.m. EST. Your order will be shipped promptly, usually within 24 hours.

If you are located outside of the U.S., call your local PerkinElmer sales or service office.

Features

- Easy to install
- Full software control
- Liquid cooling system
- N2 gas available



Figure 1. Lambda 265 Peltier control Single Cell [P/N: N4103005] and peltier temperature controller [P/N: 4100040]



PerkinElmer, 710 Bridgeport Avenue,
Shelton, CT 06484-4794, U.S.A

Produced in the USA.

Dimensions and Specifications

Dimensions of Peltier Controller

Physical Characteristic	Specification
Power	100-240 VAC, 50/60 Hz, 300W, Free Voltage
Temperature Range	-5 to 100°C (Maximum Internal Temperature)
Maximum Ambient Operating Temperature	40°C
Dimensions	310(W) x 410(D) x 275(H) mm
Weight	20.0 Kg
Coolant Volume	2 L
N ₂ Gas Pressure Limit	100 psi (6.9 bar)
Liquid Cooling System	
Magnetic Stirrer Control Available	
Emergency Power Off Switch Available	

Specifications of Peltier Controlled Single Cell

Physical Characteristic	Specification
Dimensions	65(W)x240(D)x114(H)mm
Weight	1.4 Kg
Temperature Accuracy	±0.15°C
Temperature Precision	±0.1°C
Temperature Stability	±0.1°C
Ramping Time (from 25 to 100°C)	4 minutes

Safety Warnings

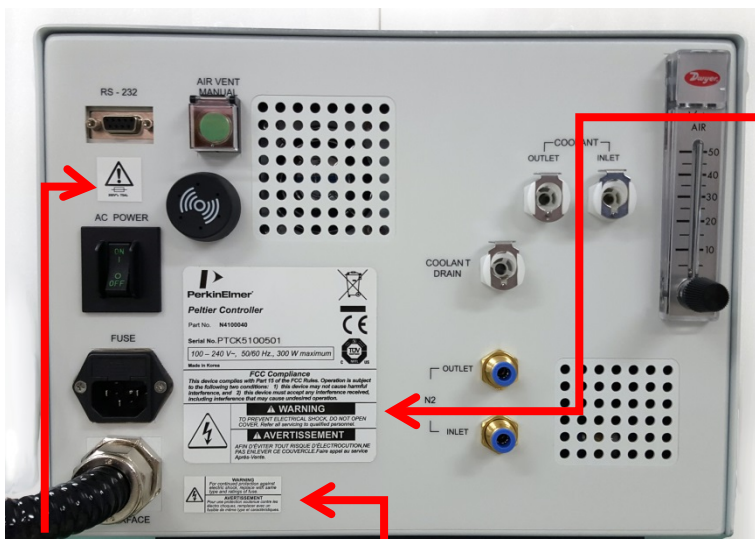


WARNING

When this label is attached to an instrument it means refer to the manual.

Lorsque cette étiquette est attachée à un instrument, il est nécessaire de voir le manuel.

See the following figure for the location of warning labels on the back of the instrument:



Warning

To prevent electrical shock, do not open cover. Refer all servicing to qualified personnel.

Avertissement

Afin d'éviter tout risque d'électrocution ne pas enlever ce couvercle. Faire appel au service Après-Vente.

Warning

FUSE

Avertissement

FUSE

Warning

For continued protection against electrical shock, replace with same type and ratings of fuse

Avertissement

Pour assurer la protection contre le risque de choc électrique, remplacez le fusible seulement avec le même type et la même valeur nominale.

Description

Peltier Controlled Single Cell



Figure 1 Lambda 265 Peltier Controlled Single Cell

- a. Interface connector between Peltier Controlled Single Cell and Peltier Controller
- b. Coolant Inlet/Outlet Quick Coupler
- c. N₂ Gas fitting
- d. Interface slot for Temperature Probe
- e. Cell Lifting knob
- f. Temperature Probe



Figure 2 Temperature probe Accessory

Front View of Peltier Controller



Figure 3 Front view of Peltier Controller

- a. **Manual touch pad with Display:** Temperature Control Unit (Heating/Cooling Block)
- b. **LED Indicators**

Display the status of the operation of Coolant Circulation, Fan, Pump, etc. (If there is any problem in the components, Red LED will flash with a beep alarm.).

- c. **Manual ON/OFF button**

As the Manual ON/OFF button is ON, the temperature can be controlled manually by **a) Manual touch pad with Display**.

NOTE: *Manual operation is used only for the manufacturing process so it should be turned off during the measurement.*

- d. **N₂ gas ON/OFF button:** It is used for using N₂ gas to remove the frost from the heating and cooling.
- e. **Stirrer ON/OFF button:** It is used for controlling of the stirring.
- f. **Stirrer Speed Controlling Knob:** Control the stirring speed (rpm).
- g. **Emergency switch:** Stop all operations in the emergent situation.

NOTE: *During the operation, Emergency switch should be turned off.*

- h. **Coolant Inlet**

Rear View of Peltier Controller



Figure 4 Rear view of the Peltier Controller

- a. **RS-232 port**
 - b. **AC POWER:** Main Power ON/OFF
 - c. **Fuse:** AC socket + Fuse Holder
 - d. **Interface:** Interface cable for connecting with Peltier controlled Single Cell
 - e. **Air Vent Manual button:** Used for removing the air in the coolant hose.
 - f. **Buzzer:** It makes an alarm sound. If there is any problem before the measurement, the buzzer beeps 6 times at every 10 sec. If the malfunction occurs during the operation, the buzzer beeps twice at every 10 sec.
 - g. **Quick Coupler of Coolant Inlet/Outlet**
 - h. **Quick Coupler of Coolant Drain**
 - i. **N₂ Gas Inlet/Outlet ports**
- NOTE:** *N₂ gas is not always required [Tube for N₂ gas is not supplied with the accessory].*
- j. **Flow Gauge:** Indicator of the flow rate of **N₂** gas.

Configuration of the equipment

- Peltier controlled Single Cell
- Peltier Controller
- Power Cord, 3ea
- Interface Cable (RS-232 and USB to RS-232), 1each
- Coolant, 2ea
- Coolant Hose, 1ea
- Magnetic Stirrer, 1ea

Spare Fuse (AC 250V T5AL), 2ea

Temperature Probe, 1ea

Waste Basket for Coolant, 1ea

Waste Hose for Coolant, 1ea

Installation

CAUTION *Make sure the instrument is turned off while installing this accessory.*

ATTENTION *Assurez-vous que l'instrument est éteint lors de l'installation de cet accessoire.*

1. Place the Lambda 265, Peltier controller and Peltier controlled single cell in a location that is compatible with the required environmental conditions for the operation.
2. Open the lid of the coolant inlet on top of the Peltier controller.



Figure 5 Lid of coolant inlet

3. Fill up the liquid coolant using the funnel.

CAUTION

*The liquid coolant must be used as refrigerant. **Do not use any water (tap water, DI, etc).** In case that the water is used as refrigerant, Peltier Controller's components might be corroded and its performance may be deteriorated.*

Use any kind of liquid coolant in normal grade as is available (e.g. liquid coolant including Distilled Water 70 wt%, Propylene Glycol 27 wt%, Additives 3 wt%).

ATTENTION

*Le liquide de refroidissement doit être utilisé comme réfrigérant. **N'utilisez jamais d'eau (eau du robinet, eau déminéralisée, etc.)** L'eau risque en effet de corroder les composants du contrôleur Peltier et de réduire les performances de ce dernier.*

Utilisez un liquide de refroidissement du commerce de qualité normale (par exemple, un liquide de refroidissement à base d'eau distillée à 70 % M/V, de propylène glycol à 27 % M/V et d'additifs à 3 % M/V).

NOTE: *Keep the amount of liquid coolant to the level where the indicator is located between the L (low) and H (high) mark in the scale on the left side of the Peltier Controller. When the coolant is running short for the operation, LED of low water level is changed to red with an alarm sounding.*

4. Disassemble the existing cell holder.



Figure 6 Removing the existing cell holder

5. Install the Peltier controlled single cell.

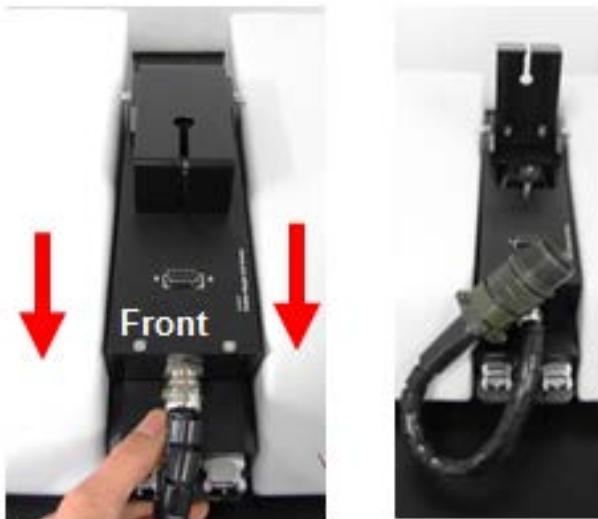


Figure 7 Installing the Peltier Controlled Single Cell

6. Connect the accessory interface cable of the Peltier controller to the interface connector of the Peltier controlled single cell.

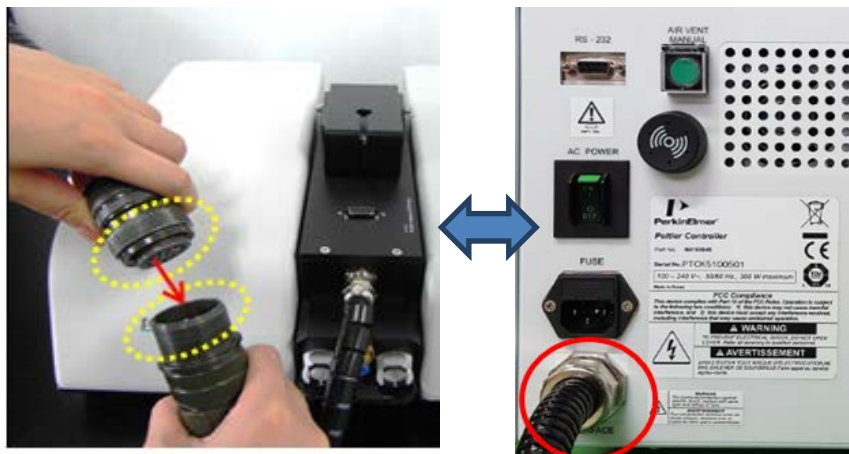


Figure 8 Connecting the accessory interface cable of the Peltier Controller to the interface connector

7. Connect the coolant inlet/outlet and N_2 gas tube between the Peltier controller and the Peltier controlled single cell.

Note: N_2 gas is not always required [Tube for N_2 gas is not supplied].



Figure 9 Connecting the coolant inlet/outlet and N_2 gas tube

8. Connect the power cord and communication cable to the ports located at the rear of the Lambda 265.

9. Connect the temperature probe to the interface slot of the Peltier controlled single cell.

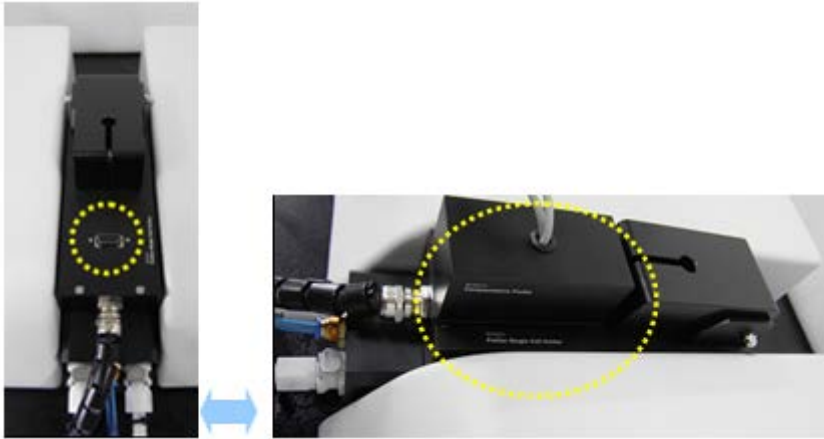


Figure 10 Connecting the temperature Probe to the interface slot of the Peltier Controlled Single Cell

10. Connect the Peltier controller with the PC via the RS-232 or USB to RS-232 cable. See *Setting the USB to RS-232 Port* on page 15 for port settings when you use the USB to RS-232.



Figure 11 Connecting Peltier controller with the PC

11. Connect the power cord to the Peltier Controller.



Figure 12 Connecting the power cord to the Peltier controller

12. Turn on the power of the Lambda 265 and the Peltier Controller.



Figure 13 Back of the instrument connections

CAUTION *The Air vent manual button should be off before turning on the main power of the Peltier Controller and also during the operation since it could make a trouble for the communication between Lambda 265 and Peltier Controller.*

ATTENTION *Le bouton d'actionnement manuel de la ventilation doit être désactivé avant que le contrôleur Peltier ne soit mis sous tension et pendant le fonctionnement de ce dernier afin d'éviter qu'une erreur de communication entre le Lambda 265 et le contrôleur Peltier ne se produise.*

13. Check that the Power LED is on as a blue light.



Figure 14 Power LED is on

Peltier controller auto tuning setup

Peltier controller can be compatible with various peltier cell holders (Single or Multi) so whenever you exchange the existing peltier cell holder to the other one, you should proceed "AUTO TUNING" set up to minimize the temperature fluctuation at the target temperature

1. Push the Manual button on the control panel of the peltier controller then button light is on.



2. Set any SP temperature between 30~37°C using the \wedge \vee button.




3. Press and hold the SET/ENT button until shown "G.AT".



4. Push the SET/ENT button again.



5. Push the  button (OFF → ON).



6. Press the SET/ENT button, MAN LED will blink.



7. MAN LED will be off after few minutes.



8. Push Manual Button (Stop) and then light is off.



CAUTION

If you hear the alarm sound during the operation, push the emergency switch to stop all functions immediately and check the status of Peltier Controller carefully. Then, turn the switch to the right again when everything is solved properly and the functions will be on again.

ATTENTION

Si l'alarme se déclenche en cours de fonctionnement, appuyez sur l'interrupteur d'urgence pour arrêter immédiatement toutes les fonctions et contrôlez soigneusement l'état du contrôleur Peltier. Ensuite, tournez à nouveau l'interrupteur vers la droite une fois la situation rétablie afin de restaurer les fonctions.



Figure 15 Emergency switch

14. Turn off the power after the experiment.

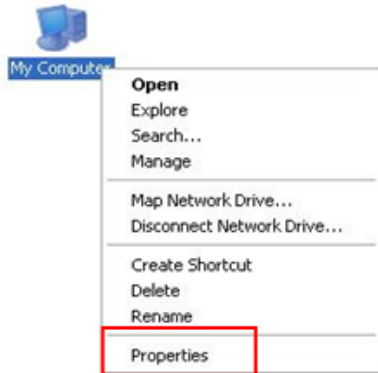
How to Drain the Coolant from the Peltier Controller

- a. Push the **Air Vent Manual** button to be switched on the rear panel of Peltier Controller before operation.
- b. Connect the wastehose to the Coolant Drain port on the rear panel and prepare a waste bucket.
- c. Turn on the power of Peltier Controller, and then coolant will be drained automatically.
- d. Once draining is complete, turn off the power of Peltier Controller.

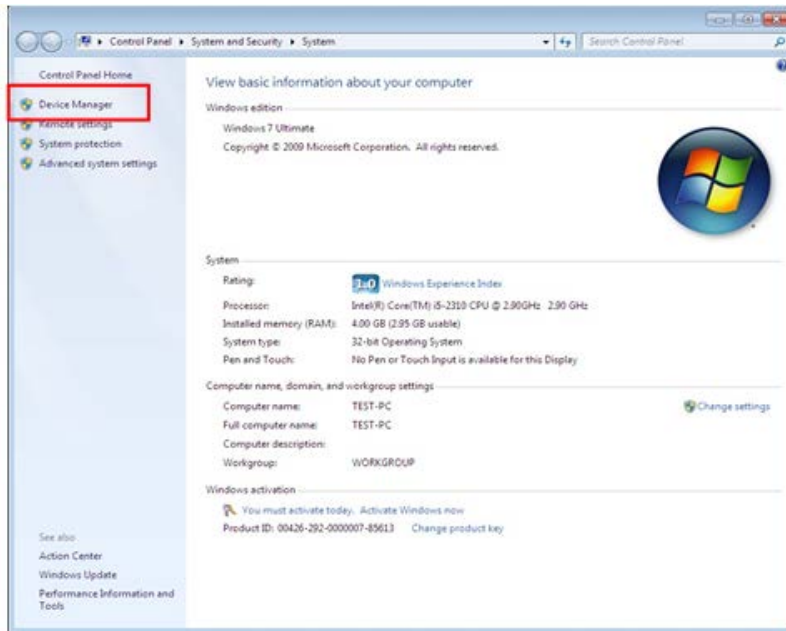
Setting USB to RS-232 Port

Use the following procedure to change the port setting when communication is not connected by using USB to RS-232 convert.

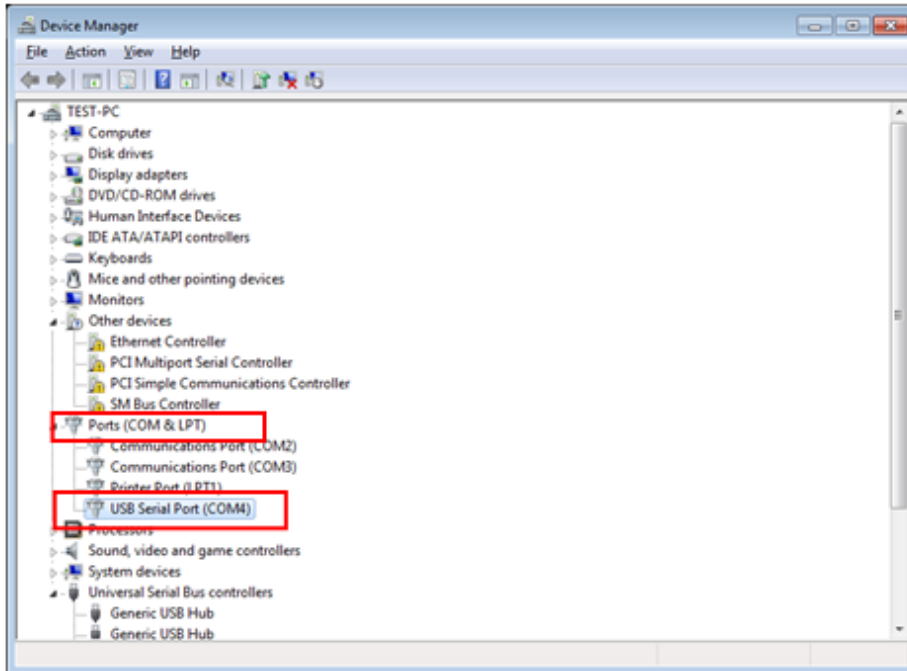
1. Select **My Computer -> Properties**.



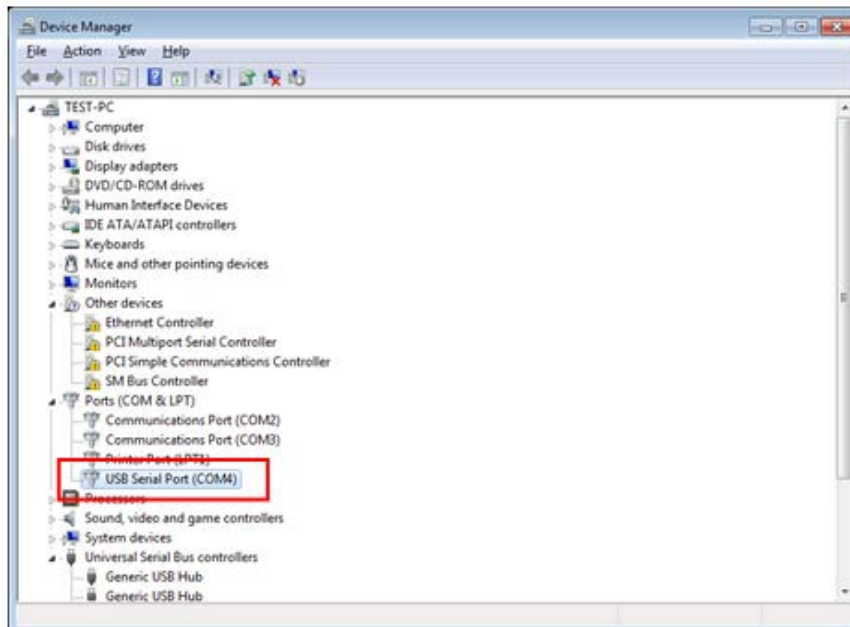
2. Select **Device Manager**.



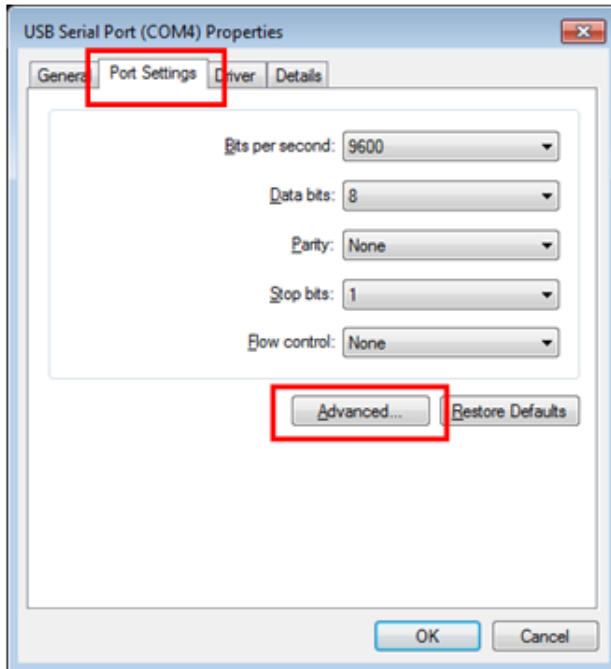
3. Select **Ports (COM & LPT)** to expand the listing. These are the devices currently connected to the COM ports. USB Serial Port (COMx) is visible when the driver installation is completed successfully.



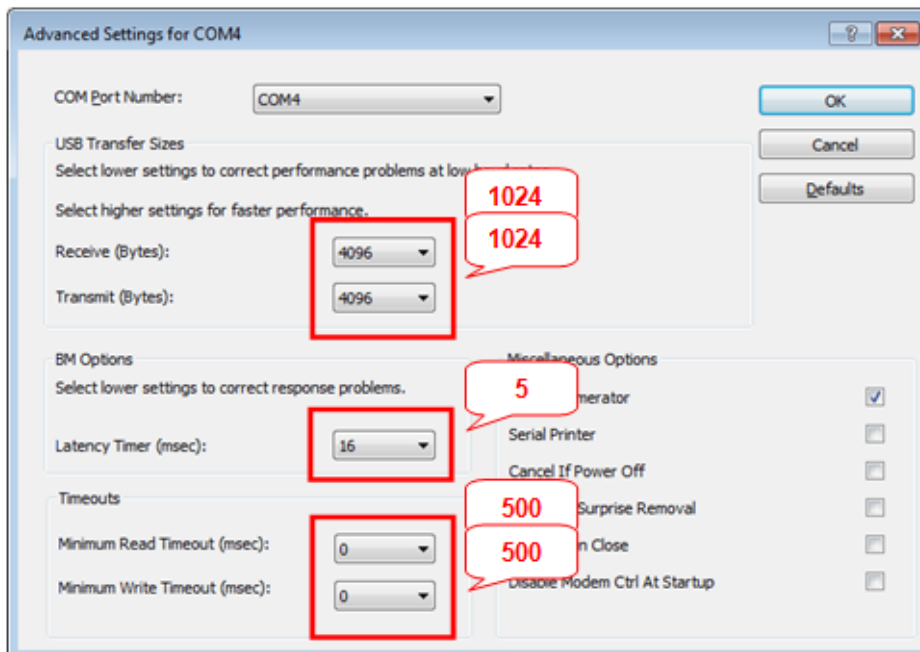
4. Double click on **USB Serial Port (COMx)** of the **Ports (COM & LPT)** section.



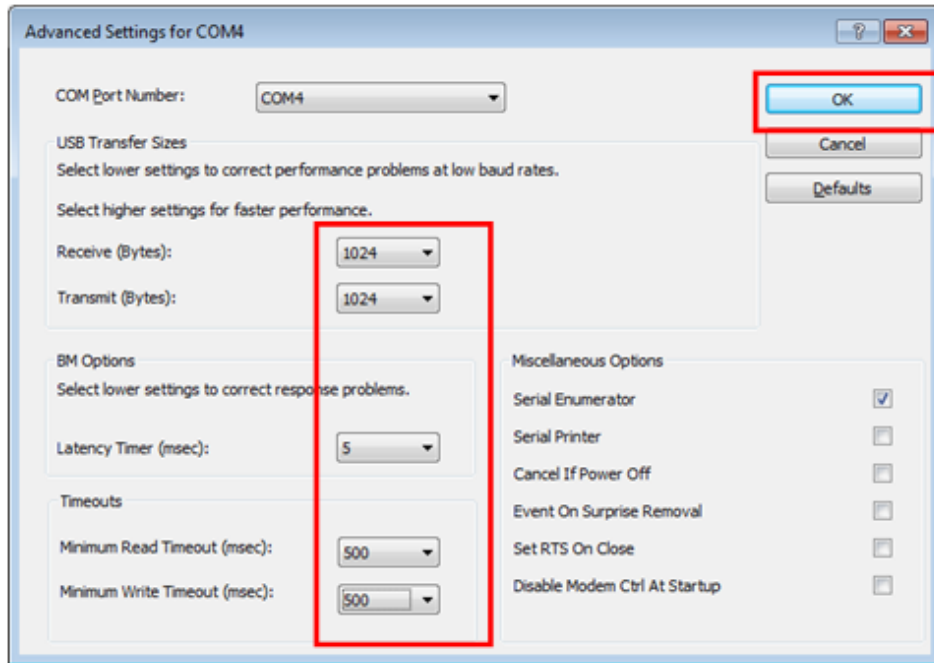
5. Select the **Port Settings** tab and click on the **Advanced...** button.



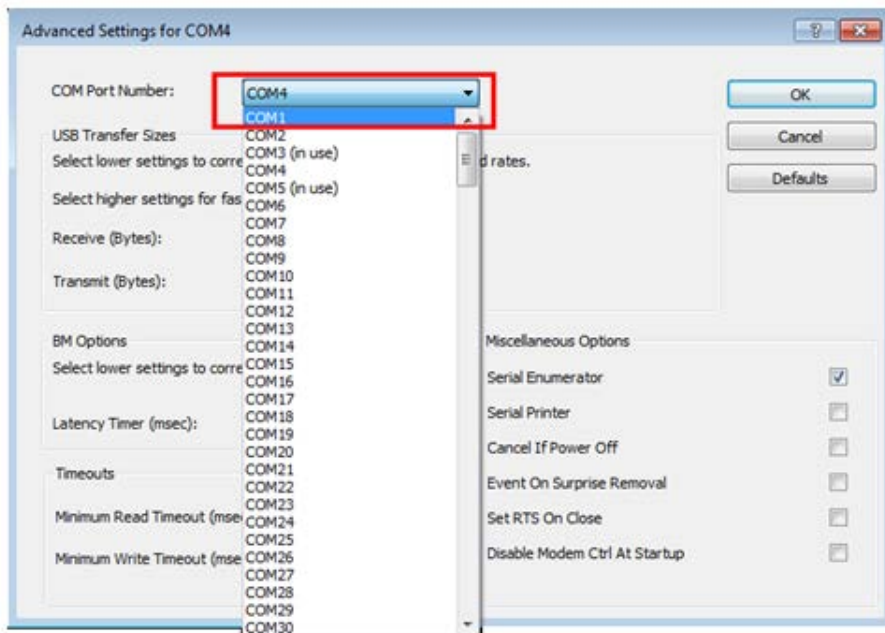
6. Change the parameter values as shown below.



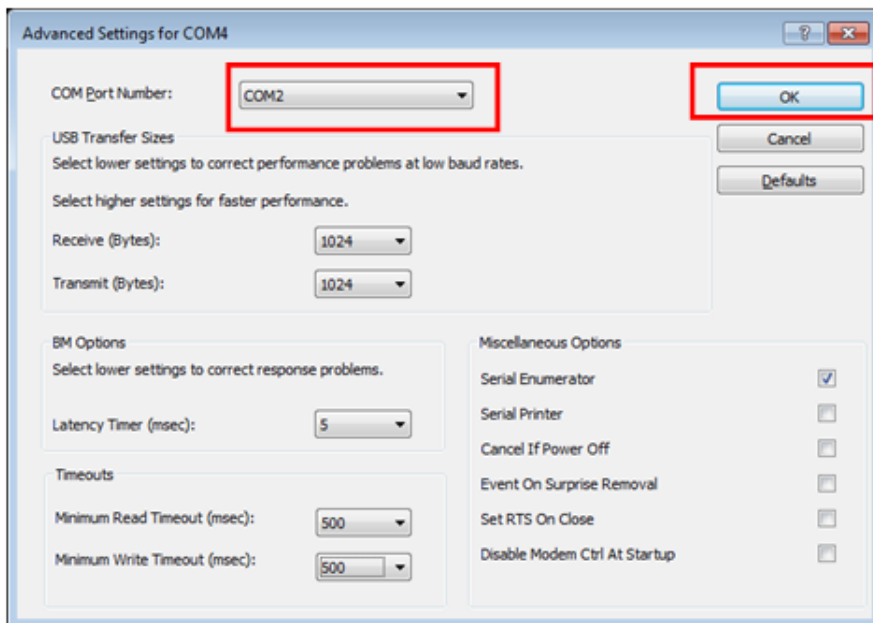
7. Select **OK** after checking the changed parameter values.



8. If the Peltier controller fails to communicate with the PC, change the COM Port Number in the following steps.
9. Open **Advanced Setting for COMx** window following steps 1 to 6 in this procedure.
10. Select the COM Port number list to expand it and change the COM port number another one which is **not** in use from COM 1 to COM 10.



11. Make sure that the changed COM Port Number is applied, and select **OK**.



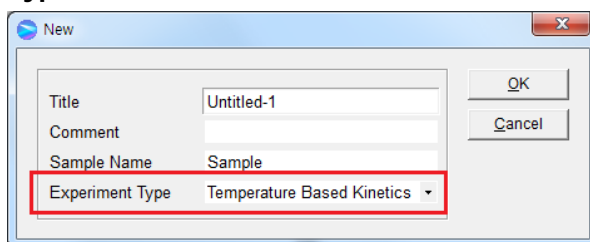
12. After the port setting is changed, restart the computer.

Measurement

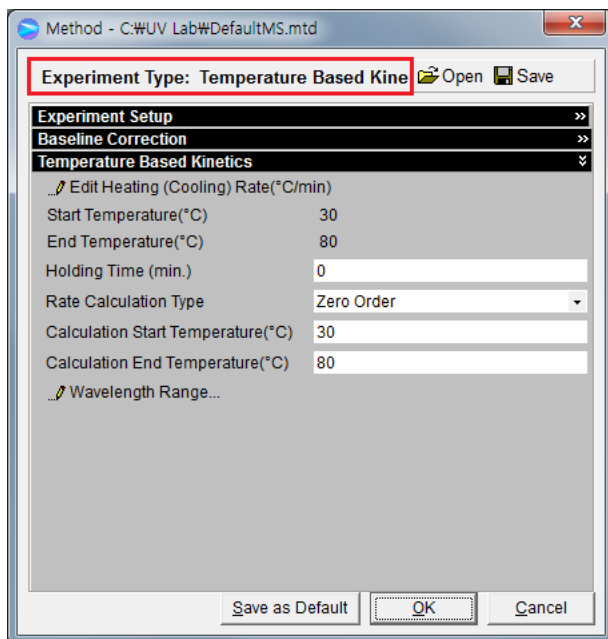
This accessory can be operated in the Temperature Based Kinetics in the Kinetics mode and Thermal Denaturation in the Bio Analysis mode.

Temperature Based Kinetics

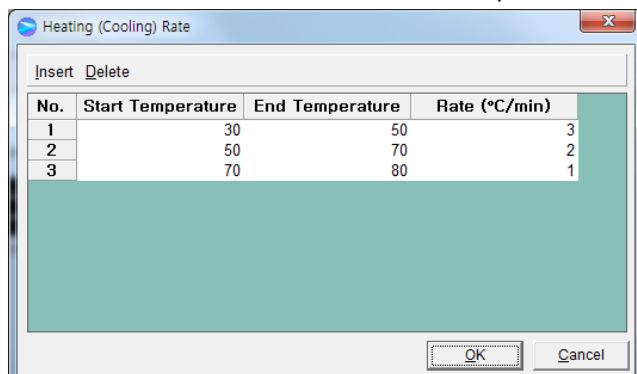
1. Launch the UV Lab software and then, select **Temperature Based Kinetics** in the **Experiment Type**.



2. The following dialog box will be displayed.



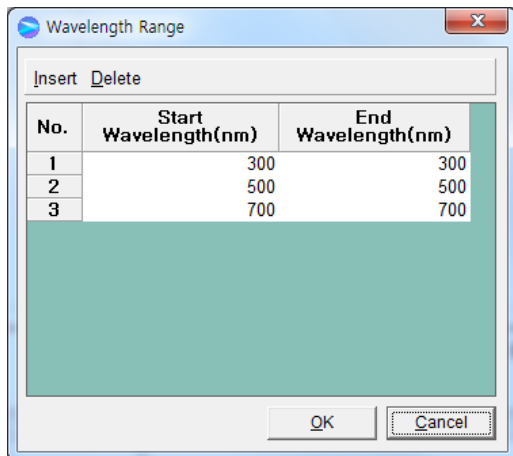
3. Setup test parameters as follows;
- a. **Edit Heating (Cooling) Rate (°C/min):** Set the heating (cooling) temperature rate in each temperature range. Sample is measured whenever it reaches the set temperature by the Rate (°C/min), and the sample is also measured at the Start Temperature and the End Temperature. Click on **Insert** and **Delete** to edit the temperature range and the rate.



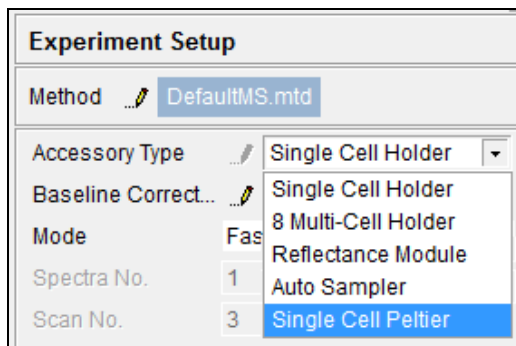
- **Start Temperature:** Enter the start temperature for the measurement.
 - **End Temperature:** Enter the end temperature for the measurement.
 - **Rate (°C/min):** Enter the heating (cooling) rate.
- b. **Holding Time:** Enter the holding time before sample measurement after it reaches the each set temperature.
- c. **Rate calculation Type:** Select the rate calculation type. See V-3. Kinetics Mode of Lambda 265 UV Lab Software Users Guide for more information.
- d. **Calculation Start Temperature:** Enter the start temperature for the calculation.
- e. **Calculation End Temperature:** Enter the end temperature for the calculation.

NOTE: Calculation Start Temperature and Calculation End Temperature must be entered within Start Temperature and End temperature.

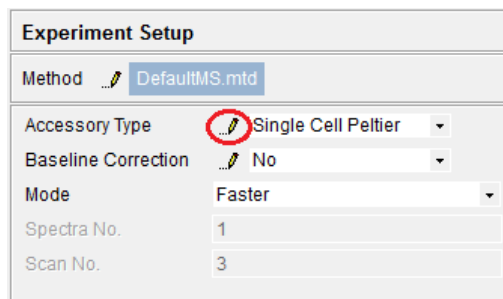
4. Select **Wavelength Range** and enter the wavelength range for the measurement.



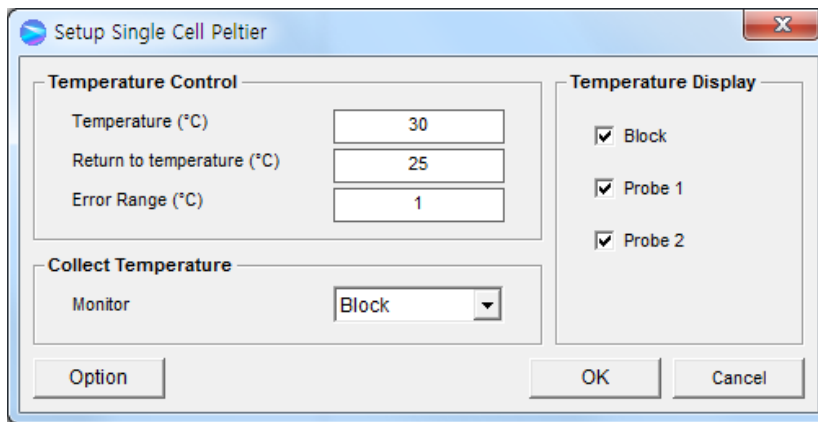
5. After setting parameters for **Experiment Setup**, **Baseline Correction** and **Temperature Based Kinetics**, select **OK**.
6. Select **Single Cell Peltier** in the **Accessory Type** on the main screen of the software.



7. Click on the **setup** button (pencil icon) in the **Experiment Setup** on the main screen of the software.



8. The **Setup Single Cell Peltier** window will be shown. Set parameters according to the experiment conditions.



► Temperature Control

- a. Temperature(°C): Enter the preset temperature for the experiment.

NOTE: *Starting the temperature of experiment needs to be set up in the method window.*

- b. Return to temperature (°C): Enter the returning temperature after the experiment is finished.
- c. Error Range (°C): Enter the temperature tolerance between the sampling temp. and monitored temp. The measurement will start when the temperature tolerance reaches within the set Error Range.

Example: Set the starting temperature as 30°C and error range as 0.3°C, and the monitoring temperature is set as the temperature of cell block. In this case, the measurement will start when the temperature of cell block reaches between 29.7°C and 31.3°C.

NOTE: *When selecting probe for Monitor in Collect Temperature box, the slower the real heating speed maybe, the smaller the set Error range (°C) is.*

► Collect Temperature

- a. Monitor: Select which temperature will be monitored in the display panel.
- Block: The temperature of Cell Block
 - Probe 1: The temperature of Probe 1
 - Probe 2: The temperature of Probe 2

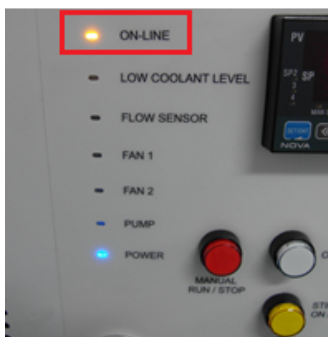
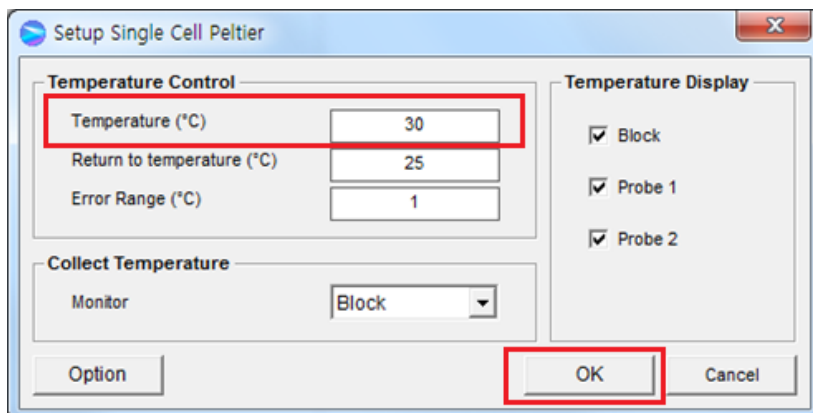
Example: If Block is selected, measurement will start when the temperature of the cell block reaches the setting temperature.

► Temperature Display

Select which temperature will be displayed on the panel: Block, Probe 1 or Probe 2. The selected temperature is only displayed in real time.

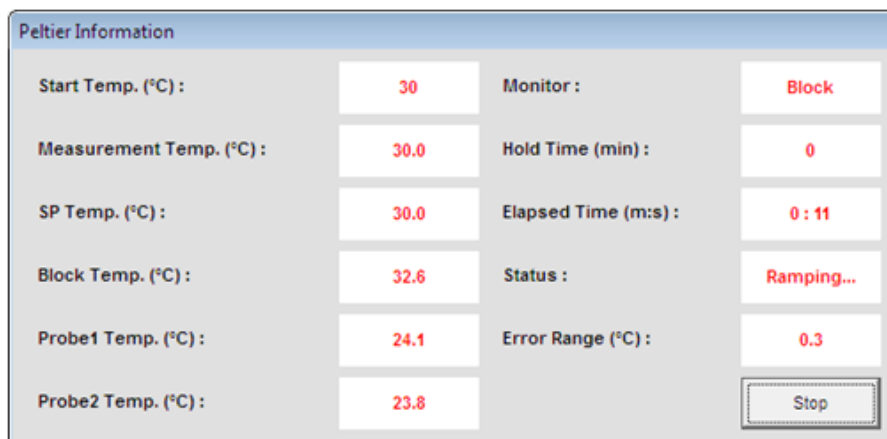
- **Option:** This function is used to adjust temperature. It is only used for the manufacturing process, so do not modify the values.

9. After completing the parameter setup, select **OK**. Then the LED for On-Line is turned on, and it will start heating up or cooling down to the set temperature in the Setup Single Cell Peltier.



10. Select **Blank**, and then the blank is measured when it reaches the set start temperature.
NOTE: To monitor the probe temperature, the probes should be immersed in the sample, or to use the block temperature for monitoring, the cell lid should be closed tightly.

11. Select **Sample**.
 12. When the temperature reaches the target temperature, the measurement starts.



- a. **Start Temp (°C)**: Shows the starting temperature of the experiment.
 b. **Measurement Temp (°C)**: Shows the temperature at which the sample will be measured.

- c. **SP Temp (°C)**: Shows the current temperature while it goes up / down to the measurement temperature.
- d. **Block Temp (°C)**: Shows the temperature of Cell Block.
- e. **Probe 1 Temp (°C)**: Shows the temperature of Probe 1.
- f. **Probe 2 Temp (°C)**: Shows the temperature of Probe 2.
- g. **Monitor**: Monitored temperature is shown out of Block, Probe 1 and Probe 2.
- h. **Hold time (min)**: Shows the set holding time.
- i. **Elapsed time (m:s)**: Shows the elapsed time to reach the sampling temperature.
- j. **Status**: Shows the status of experimental progress.
- k. **Error Range (°C)**: Shows the temperature tolerance between the sampling temperature and monitored temperature. The measurement will be made only when the temperature tolerance reaches within the set Error Range.

NOTE: To pull out the cell easily, use the cell lifting knob.

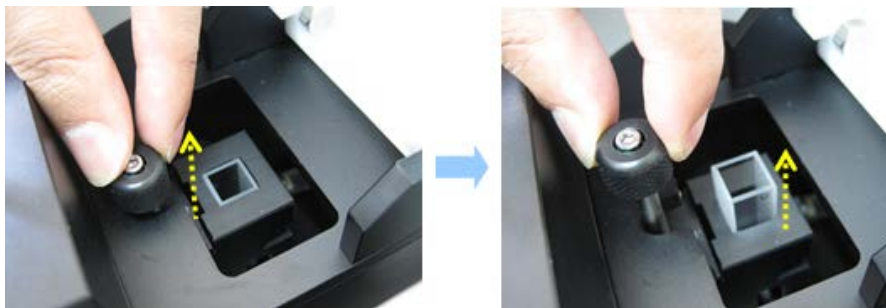
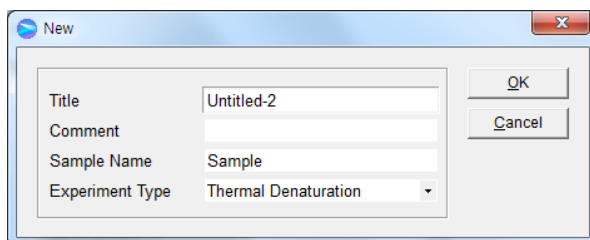


Figure 16 Pulling out the cell

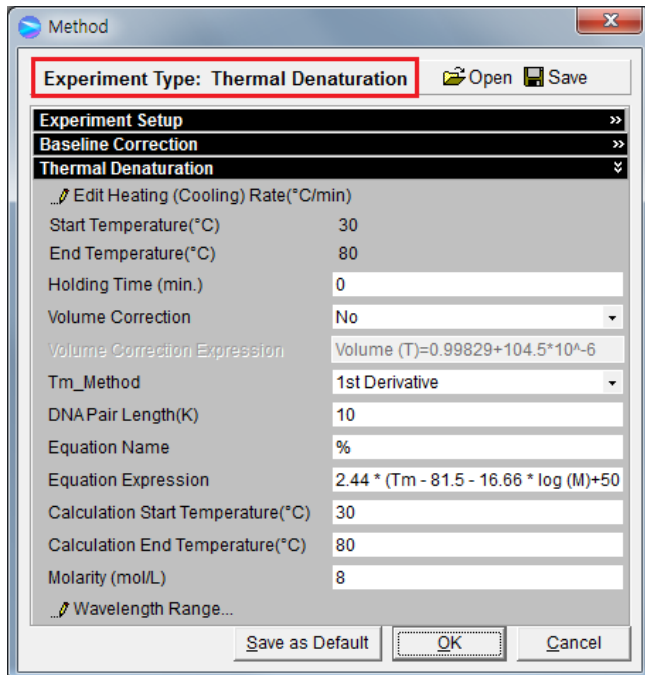
13. After the measurement is finished, the results are displayed in the result window. Save or print results as required.

Thermal Denaturation

1. Launch UV Lab software and then, select **Thermal Denaturation** in the **Experiment Type**.

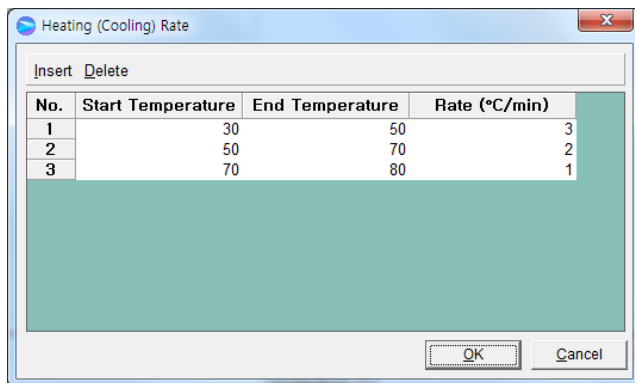


2. The following dialog box will be displayed.



3. Setup test parameters as follows:

- a. **Edit Heating (Cooling) Rate (°C/min)**: Set the heating (cooling) temperature rate in each temperature range. Sample is measured whenever it reaches the set temperature by the Rate (°C/min), and the sample is also measured at the Start Temperature and the End Temperature. Click on **Insert** and **Delete** to edit the temperature range and the rate.



- **Start Temperature (°C)**: Enter the start temperature for the measurement.
 - **End Temperature (°C)**: Enter the end temperature for the measurement.
 - **Rate (°C/min)**: Enter the heating (cooling) rate.
- b. **Holding Time (min)**: Enter the holding time before sample measurement after it reaches the each set temperature.
- c. **Volume Correction**: If volume correction is selected, the baseline corrected absorbance value is corrected for the thermal expansion of an aqueous buffer. The default equation for volume correction is:

$$\text{Volume (T)} = 0.99829 + 104.5 * 10^{-6}T + 3.5 * 10^{-6}T^2$$

Where, T is the Celsius temperature (°C).

- d. **Tm method:** Select a method for determining Tm (DNA melting temperature). Options include: 1st derivative and Average.
- e. **DNA Pair Length (K):** Enter the DNA base pair length. If a DNA base pair length is above 5000, enter "0".
- f. **Equation Name and Expression:** The melting range is calculated within the specified calculation range by defining the low temperature where the slope begins to increase steadily, and the high temperature where the slope approaches zero again. The default equation for the calculation of %G-C (Guanine-Cytosine) base pairs is:

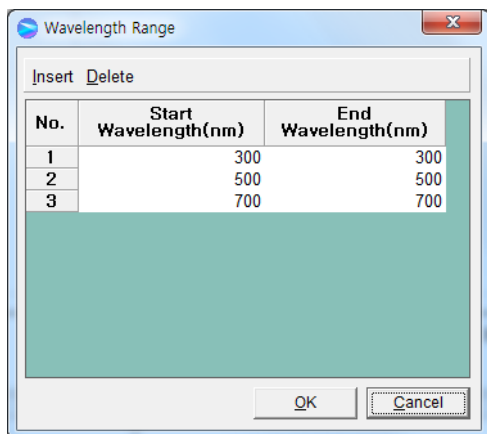
$$\%G-C = 2.44 * (T_m - 81.5 - 16.66 * \log(M) + 500/K)$$

Where, M is the molarity of salt in mol/l, and K is the DNA base pair length.

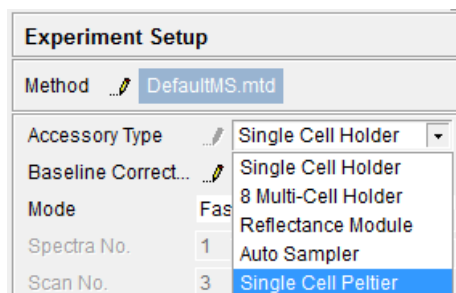
If a DNA base pair length (K) is entered as '0', then the equation becomes:

$$\%G-C = 2.44 * (T_m - 81.5 - 16.66 * \log(M))$$

- g. **Calculation Start Temperature (°C):** Enter the start temperature for calculating the Tm value using the selected method.
 - h. **Calculation End Temperature (°C):** Enter the end temperature for calculating the Tm value using the selected method.
 - i. **Molarity (mol/L):** Enter the salt molarity of the solution[mol/l].
4. Select **Wavelength Range** and enter the wavelength range for the measurement.



5. Select **OK** in the method dialog box. Select **Single Cell Peltier** in the **Accessory Type** on the main screen of the software.



6. Click on the **setup** button (pencil icon) in the **Experiment Setup** on the main screen of the software.

Experiment Setup	
Method	DefaultMS.mtd
Accessory Type	Single Cell Peltier
Baseline Correction	No
Mode	Faster
Spectra No.	1
Scan No.	3

7. **Setup Single Cell Peltier** window will be shown. Set parameters according to the experiment conditions.

Setup Single Cell Peltier	
Temperature Control	
Temperature (°C)	30
Return to temperature (°C)	25
Error Range (°C)	1
Collect Temperature	
Monitor	Block
Temperature Display	
<input checked="" type="checkbox"/>	Block
<input checked="" type="checkbox"/>	Probe 1
<input checked="" type="checkbox"/>	Probe 2
Option	OK Cancel

► Temperature Control

- a. **Temperature (°C)**
Enter the preset temperature for the experiment.

NOTE: Starting the temperature of experiment needs to be set up in the method window.

- b. **Return to temperature (°C)**
Enter the returning temperature after the experiment is finished.
- c. **Error Range (°C):** Enter the temperature tolerance between the sampling temperature and monitored temperature. The measurement will start when the temperature tolerance reaches within the set Error Range.
Example: Set the starting temperature as 30°C and error range as 0.5°C then, the monitoring temperature is set as the temperature of cell block. In this case, the measurement will start when the temperature of cell block reaches between 29.5°C and 30.5°C.

NOTE: When selecting probe for Monitor in Collect Temperature box, the slower the real heating speed may be, the smaller the set Error range(°C) is.

► Collect Temperature

- a. **Monitor**

Select which temperature will be monitored in the display panel.

Block: The temperature of Cell Block

Probe 1: The temperature of Probe 1

Probe 2: The temperature of Probe 2

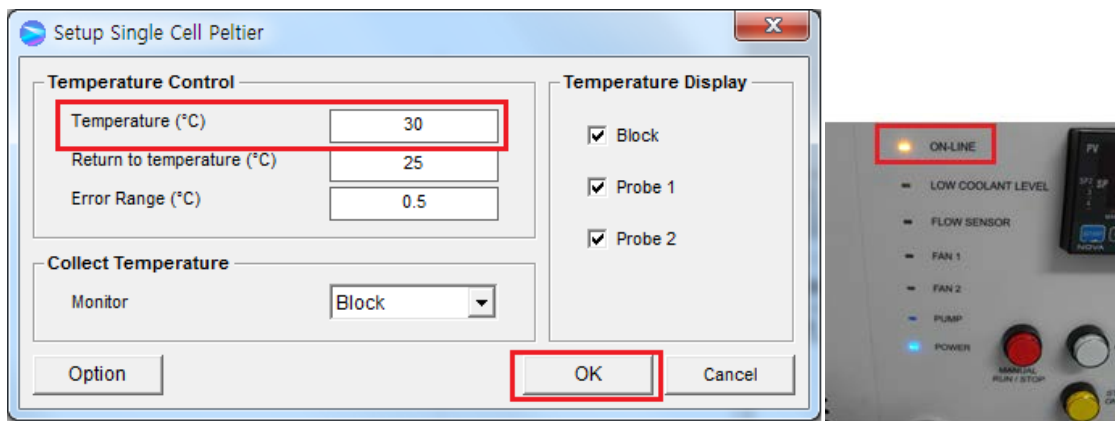
Example: If Block is selected, measurement will start when the temperature of the cell block reaches the setting temperature.

► Temperature Display

Select which temperature will be displayed on the panel: Block, Probe 1 or Probe 2. The selected temperature is only displayed in real time.

► **Option:** This function is used to adjust temperature. It is only used for the manufacturing process, so do not modify the values.

- After completing the parameter setup, select **OK**. Then the LED of the On-LINE light on the Peltier controller will be turned on. It will start heating up or cooling down to the set temperature in the Setup Single Cell Peltier.



- Select **Blank**, and then the blank is measured when it reaches the set Start Temperature.

NOTE: To monitor the probe temperature, the probes should be immersed in the sample, or to use the block temperature for monitoring, the cell lid should be closed tightly.

- Select **Sample**.
- When the temperature reaches the target temperature, the measurement starts.

Peltier Information			
Start Temp. (°C) :	30	Monitor :	Block
Measurement Temp. (°C) :	30.0	Hold Time (min) :	0
SP Temp. (°C) :	30.0	Elapsed Time (m:s) :	0 : 11
Block Temp. (°C) :	32.6	Status :	Ramping...
Probe1 Temp. (°C) :	24.1	Error Range (°C) :	0.5
Probe2 Temp. (°C) :	23.8		Stop

- a. **Start Temp (°C)**: Shows the starting temperature of experiment.
- b. **Measurement Temp (°C)**: Shows the temperature at which the sample will be measured.
- c. **SP Temp (°C)**: Shows the current temperature while it goes up / down to the measurement temperature.
- d. **Block Temp (°C)**: Shows the temperature of Cell Block.
- e. **Probe 1 Temp (°C)**: Shows the temperature of Probe 1.
- f. **Probe 2 Temp (°C)**: Shows the temperature of Probe 2.
- g. **Monitor**: Monitored temperature is shown out of Block, Probe 1 and Probe 2.
- h. **Hold time (min)**: Shows the set holding time.
- i. **Elapsed time (m:s)**: Shows the elapsed time to reach the sampling temperature.
- j. **Status**: Shows the status of experimental progress.
- k. **Error Range (°C)**: Shows the temperature tolerance between the sampling temperature and monitored temperature. The measurement will be made only when the temperature tolerance reaches within the set Error Range.

NOTE: To pull out the cell easily, use the cell lifting knob.

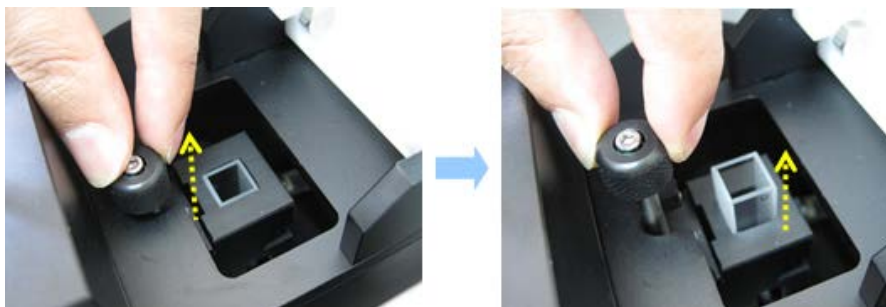


Figure 17 Pulling out the cell

12. After the measurement is finished, the results are displayed in the result window. Save or print results as required.

Troubleshooting

Power LED is not lit on

1. Check the connection of the power cable or the fuse. The fuse is located at the rear of the instrument.



WARNING

There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.

Il y a un risque d'électrocution si les fusibles sont remplacés tandis que le cordon d'alimentation est encore branché.

2. Turn off and unplug the instrument.
3. Locate the fuse cover on the left rear panel of the instrument.
4. Carefully open the compartment latch where the fuse is located.



Location of latch on the fuse compartment door

Figure 18. Fuse

5. Disconnect the fuse.
6. Replace with a new T5AL fuse (AC 250V). One spare is contained in the power module.
7. Close the compartment door.
8. Plug in the instrument and turn on.

On-Line LED is not lit on

1. Check whether the communication cable is connected tightly.
2. Check whether the **Air Vent Manual** button is switched off.
3. Check whether the **emergency switch** is off.
4. When you use USB to RS-232 cable, change the port see Setting USB to RS-232 Port on page 12.

FANLED is lit on with an alarm sound

- Fan needs to be replaced.

Low Water Level LED blinks with an alarm sound

1. Check the coolant level and if it is lower than L (low) mark, add more coolant.



Figure 19. Access to coolant

2. Restart the Peltier Controller.

Flow Sensor LED is lit on with an alarm sound

1. Check whether the tubing is bent or whether it is connected correctly, and then restart the Peltier Controller.
2. Push the **Air Vent Manual** button on and check if coolant flows properly for about one minute after the error occurs. If the Flow Sensor LED is continuously on with the alarm sounding, contact PerkinElmer.

Pump LED is lit on with an alarm sound

1. Check whether the tubing is bent or whether it is connected correctly, and then restart the Peltier Controller.
2. Push the **Air Vent Manual** button to be switched on and check if coolant flows properly for about one minute after the error occurs. If the Pump LED is continuously on with the alarm sounding, contact PerkinElmer.

Connection is failed

1. Check whether the Interface connector is lined properly.
2. Check whether the **MANUAL RUN/STOP** button is pushed on. If yes, turn off the Manual button.

