FL 6500/8500 Single Cell Peltier Holder Installation Instructions

This instruction sheet describes the installation of this accessory which is used with the FL 6500/8500 Fluorescence Spectrometer.

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

- Full software control
- Liquid cooling system
- N_2 gas purging available

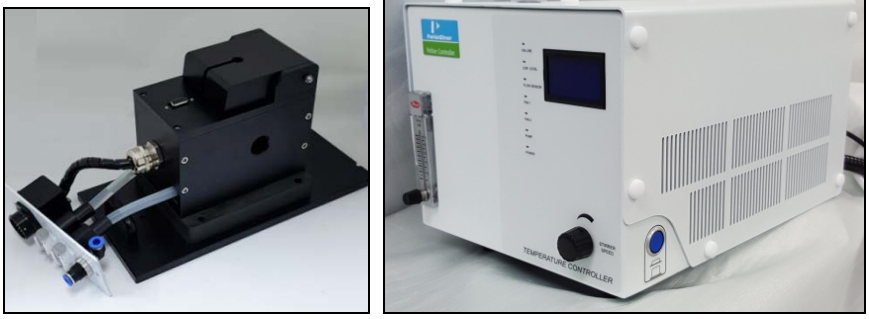


Figure 1 Single Cell Peltier Holder [P/N: N4201029]

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

Produced in the USA.

Dimensions and Specifications

Peltier Temperature Controller 201

Physical Characteristic	Specification
Power	100-240 VAC, 50/60 Hz, 380W
Temperature Range	-5 to 100°C (Maximum Internal Temperature)
Maximum Ambient Operating Temperature	40°C
Dimensions	295 (W) x 416 (D) x 283 (H) mm (11.6 (W) x 16.4 (D) x 11.1 (H) in)
Weight	16.0 Kg (35.2lb)
Coolant Volume	1 L
N_2 Gas Available	
Liquid Cooling System	
Magnetic Stirrer Control	

Single Cell Peltier Holder

Physical Characteristic	Specification
Number of Sample Cells	1
Dimensions	130 (W) x 267 (D) x 143.5 (H) mm
Weight	2.14 Kg
Temperature Accuracy	≤±0.1℃
Temperature Precision	≤0.1℃
Temperature Stability	≤0.1℃
Ramping Time (from 0 to 100°C)	5 minutes

Safety Warnings

WARNING

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

AVERTISSEMENT

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

WARNING

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

AVERTISSEMENT

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

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
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.

Warning
FUSE

Avertissement
FUSE

Configuration of Single Cell Peltier Holder

Part Name	Qty (ea)
Single Cell Peltier Holder	1
Peltier Temperature Controller 201	1
Power Cords	3 (US, UK, EU)
Interface Cable (USB)	1
Spare Fuse (AC 250V T5AL)	2
Temperature Probe	1
Stirring Bead	1
Coolant Hose	1
Coolant (700 mL)	2
Waste Basket for Coolant	1
Waste Hose for Coolant	1
Hose for Coolant circulation	1
Macro Cell with PTFE Stopper	1

Description

Single Cell Peltier Holder

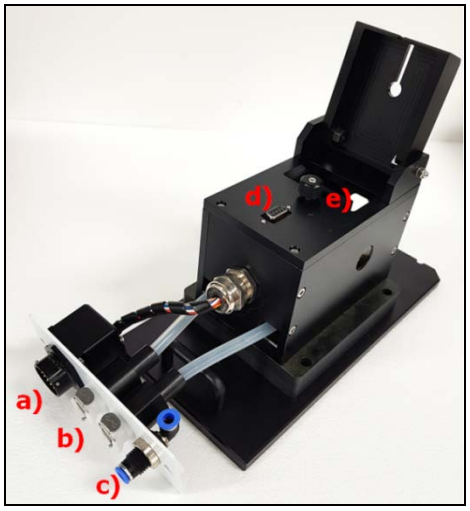
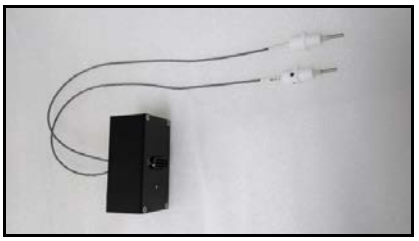


Figure 2 Single Cell Peltier Holder

a. Interface connector between Single Cell Peltier Holder and Peltier Temperature Controller 201
b. Coolant Inlet/Outlet Quick Coupler
c. N_2 Gas fitting
d. Interface slot for Temperature Probe
e. Cell Lifting knob

f. Temperature Probe



Peltier Temperature Controller 201

Front View of Peltier Temperature Controller 201

Figure 3 Front view

a. **Flow Gauge:** Indicator of the flow rate of N2 gas

b. **Coolant Inlet**

c. **LED Indicators:** Display the status of the operation of coolant circulation, fan, pump, etc. (If there is any problem in the components, the red LED will flash with the beep alarm.)

d. **Display Pad:** Display temperature of sample block

e. **Stirrer ON/OFF button:** It is used for controlling of the stirring

f. **AC Power:** Main power ON/OFF

Switch symbol

	IEC 60417-5268 (2002-10)	In position of a bi-stable push control
	IEC 60417-5269 (2002-10)	Out position of a bi-stable push control

Rear View of Peltier Temperature Controller 201

Figure 4 Rear view

a. **Air Vent Manual button:** It is used to identify the cause of warning alarm that sounds when the trouble occurs with Peltier. The causes of the alarm are as follows;

i. When air occurs in the coolant hose
ii. When the liquid coolant does not flow
iii. Lack of liquid coolant

NOTE: *Air Vent Manual button is recommended to be manipulated by the service engineer.*

b. **Buzzer:** It makes an alarm sound. If there is any problem before the measurement or the malfunction occurs during the operation, the buzzer beeps
c. **USB port**
d. **Fuse:** AC socket + fuse holder
e. **Interface:** Interface cable is connected to the Single Cell Peltier Holder
f. **Quick Coupler of Coolant Inlet/Outlet**
g. **Quick Coupler of Coolant Drain**
h. **N_2 Gas Inlet/Outlet ports**

NOTE: *N_2 gas is not always required (the tube for N_2 gas is not supplied with the accessory).*

How to Fill or Drain the Coolant

How to Fill the coolant

NOTE: *When the Single Cell Peltier Holder is installed for the first time, the enclosed coolant should be filled by following this procedure.*

1. Prepare the Peltier Temperature Controller 201 in a location that is compatible with the required environmental conditions for the operation.

2. Connect the hose for coolant circulation to the Peltier Temperature Controller 201.

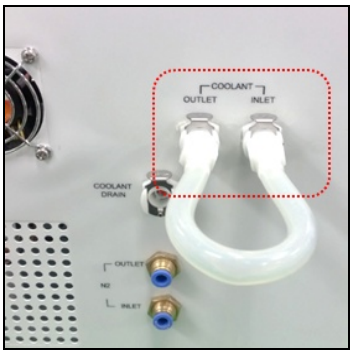


Figure 5 Connect the hose for coolant circulation

3. Connect the power cord to the Peltier Temperature Controller 201.

Figure 6 Connect the power cord

4. Remove the four Phillips screws on the Air Vent Manual cover using the screwdriver.

Figure 7 Remove the Phillips screws

5. Push the Air Vent Manual Button on.

Figure 8 Push the button

6. Turn on the AC power switch of the Peltier Temperature Controller 201.

Figure 9 Turn on the AC power switch

7. Check if the LEDs of LOW LEVEL and FLOW SENSOR are lit on.

Figure 10 LEDs of LOW LEVEL and FLOW SENSOR

8. Open the lid of the coolant inlet on top of the Peltier Temperature Controller 201 and fill up the liquid coolant using a funnel.

Figure 11 Lid of coolant inlet

9. Maintain the amount of liquid coolant to a level where the indicator is located between the 'L' (low) and 'H' (high) mark in the scale on the left side of the Peltier Temperature Controller.

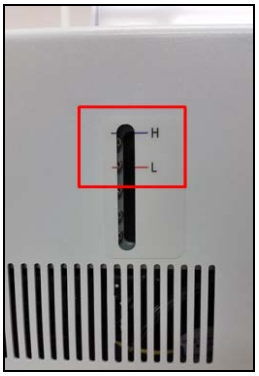


Figure 12 Coolant level

CAUTION	*Liquid coolant should be used as refrigerant. Do **not** use any water (tab water, DI, etc.). If water is used as refrigerant, the Peltier Temperature Controller's components might be corroded, and its performance may be deteriorated.* *Use any kind of liquid coolant of normal grade that 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).*

10. After filling up the coolant, check that the 'LOW LEVEL' LED is not lit.

Figure 13 Coolant level

11. Close the lid of the coolant inlet.

12. Turn off the AC power switch of the Peltier Temperature Controller 201.

13. Push the Air Vent Manual button off.

14. Fasten the four Phillips screws on the Air Vent Manual button cover using a screwdriver.

15. Install the Single Cell Peltier Holder referring to section **Installation** (see page 12).

How to Drain the Coolant

1. Turn off the Peltier Temperature Controller 201.

2. Remove the four Phillips screws on the Air Vent Manual cover using a screwdriver.

Figure 14 Remove Phillips screws

3. Push the Air Vent Manual button on.

Figure 15 Push the button

4. Prepare a waste basket.

Figure 16 Waste basket

5. Turn on the AC power switch of the Peltier Temperature Controller 201.

Figure 17 Turn on the AC power switch

6. Connect the waste hose to the Coolant Drain port on the rear panel.

Figure 18 Connect the waste hose

NOTE: *The coolant flows out as soon as the waste hose is connected, so the other side of the waste hose should be placed into the waste basket before connected.*

7. The coolant will be drained automatically.

8. If the coolant falls below 'L' (Low level), the LEDs of LOW LEVEL and FLOW SENSOR are lit on.

Figure 19 LEDs of LOW LEVEL and FLOW SENSOR

9. When drain is completed, disconnect the waste hose.
10. Turn off the AC power switch of the Peltier Temperature Controller 201.
11. Push the Air Vent Manual button off.
12. Fasten the four Phillips screws on the Air Vent Manual button cover using a screwdriver.

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. Prepare the FL 6500/8500 and Peltier Temperature Controller 201 in a location that is compatible with the required environmental conditions for the operation.

2. Connect the power cord and communication cable of the instrument.

3. Loosen the knob to take apart the existing accessory.

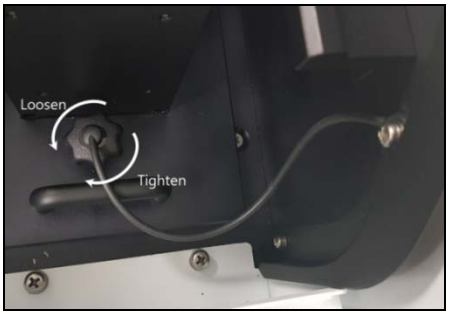


Figure 20 Loosening the accessory fixing bolt

4. Pull out the cell holder by hand.

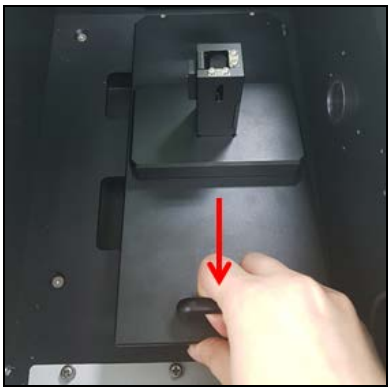


Figure 21 Pulling out the cell holder

5. Remove the front cover plate.

Figure 22 Front Cover Plate

6. After checking the pogo pin position in the sample compartment, place the Single Cell Peltier Holder to be fit into the pogo pin.

Figure 23 Inserting the Single Cell Peltier Holder

7. Fix the front cover plate of the Single Cell Peltier Holder with the bolts.

Figure 24 Fixing the Front Cover Plate

8. Tighten the accessory fixing bolt again.
9. Connect the accessory interface cable of the Peltier Temperature Controller 201 to the interface connector of the Single Cell Peltier Holder.

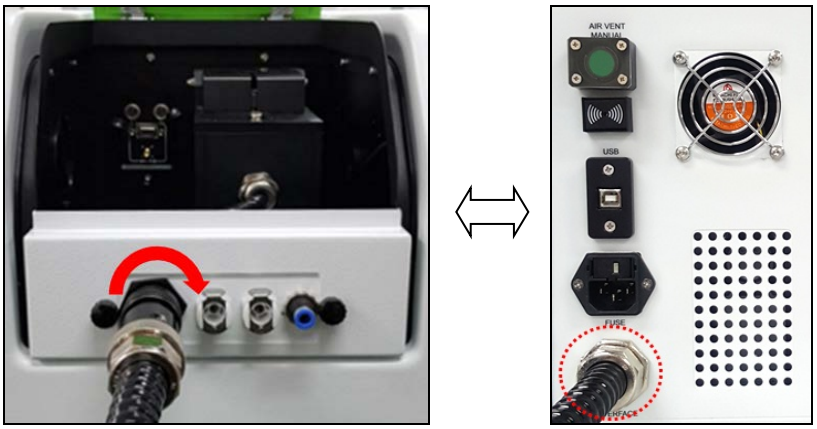


Figure 25 Connecting the accessory interface cable

10. Disconnect the hose for coolant circulation.

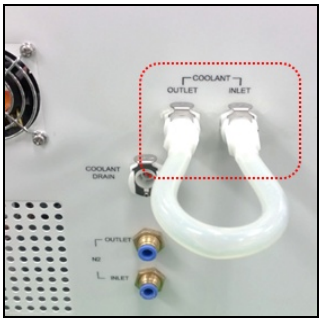


Figure 26 Disconnecting the hose for the coolant circulation

NOTE: *If you disconnect the hose, the remaining coolant in the hose may flow out of the hose. Be careful not to touch the coolant with your bare hands.*

11. Connect the coolant inlet/outlet hosed and N_2 gas tube between the Peltier Temperature Controller 201 and the Single Cell Peltier Holder.

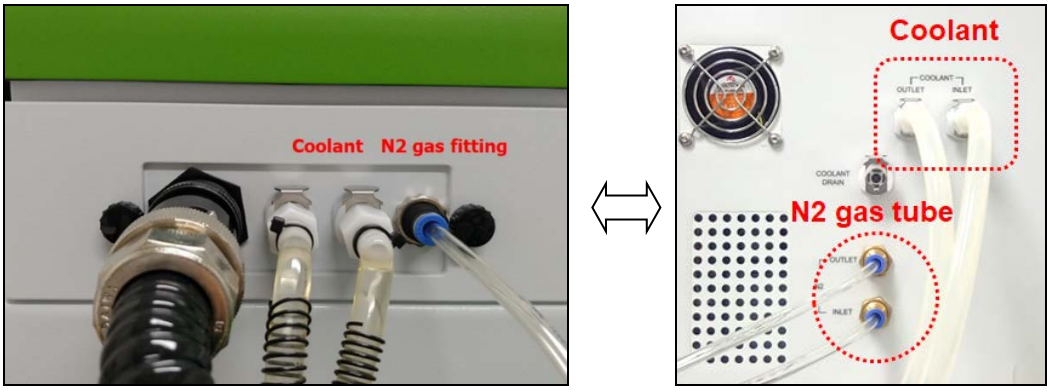


Figure 27 Connecting the coolant inlet/outlet and N_2 gas fitting

NOTE: *N_2 gas is not always required. If no gas is required, the user does not have to connect N_2 gas tube.*

12. Connect the temperature probe to the interface slot of the Single Cell Peltier Holder.

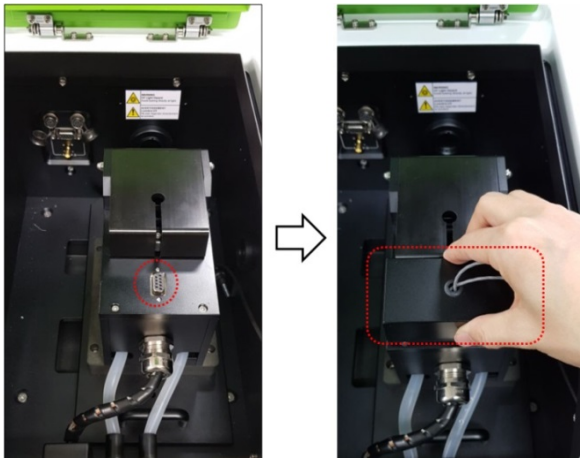


Figure 28 Connecting the temperature probe

13. Connect the Peltier Temperature Controller 201 to the PC via the USB cable.

Figure 29 Connecting the Peltier Temperature Controller 201 with the PC

14. Connect the power cord to the Peltier Temperature Controller 201.

Figure 30 Connecting the power cord

15. Turn on the power switch of the FL 6500/8500 and the Peltier Temperature Controller 201.

CAUTION	*The air vent manual button should be off before turning on the main power of the Peltier Temperature Controller and also during the operation since it could be a problem for the communication between FL 6500/8500 and the Peltier Temperature Controller.*
ATTENTION	*Le bouton manuel de ventilation doit être éteint avant de mettre sous tension le contrôleur de température Peltier et pendant le fonctionnement, car cela pourrait poser un problème de communication entre le FL 6500/8500 et le contrôleur de température Peltier.*

Figure 31 Turn on the power switch

16. Check that the Power LED is shown as a blue light.

Figure 32 Location of Power LED

NOTE: *Peltier Temperature Controller 201 can be compatible with various peltier cell holders (single or multi). Whenever you exchange the existing peltier cell holder to another one, you should perform the "Auto Tuning" setup referring to section* ***Peltier Temperature Controller 201 Auto Tuning Setup*** *(see page 23).*

17. Turn off the power after the experiment is done.

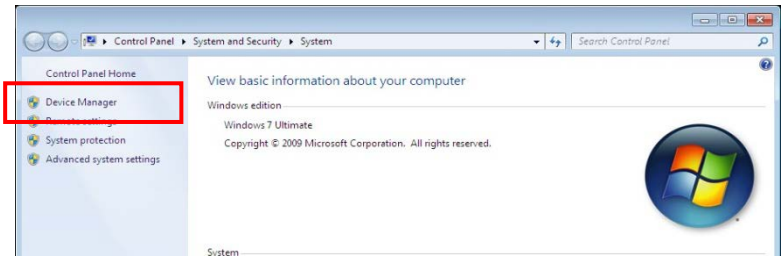
Setting USB Serial Port

NOTE: *When using the USB cable, USB Driver has already been installed when installing the FL 6500/8500 and Spectrum FL software, you do not need to install it again.*

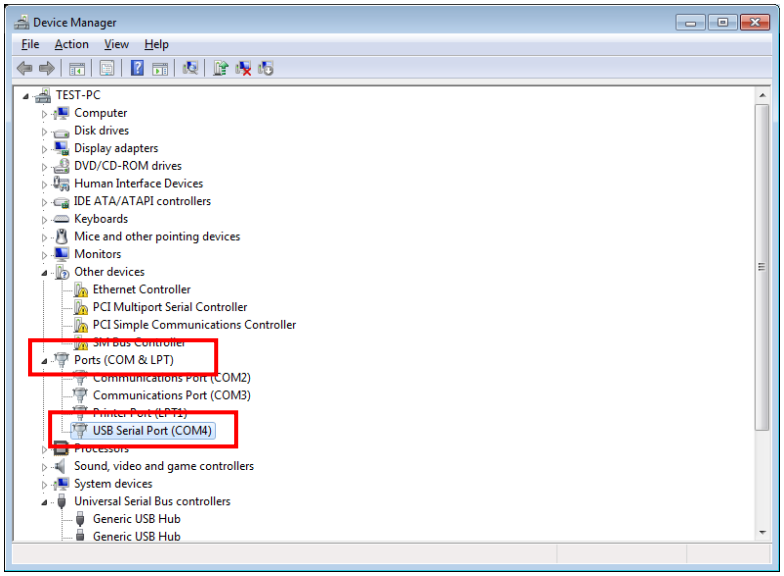
If communication by the USB is not established, change the port setting as follows;

1. In Windows 7, select **My Computer →Properties.** In Windows 10, press **Windows**  **+Pause/Break** on the keyboard.

2. Select **Device Manager**.

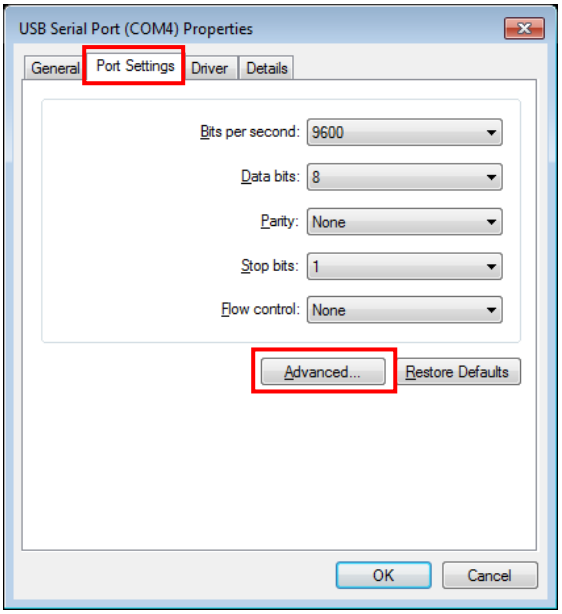


3. Select **Ports (COM & LPT)** to scroll down. These are the devices currently connected to the COM ports. **USB Serial Port (COMx)** is listed when the driver installation is completed successfully.

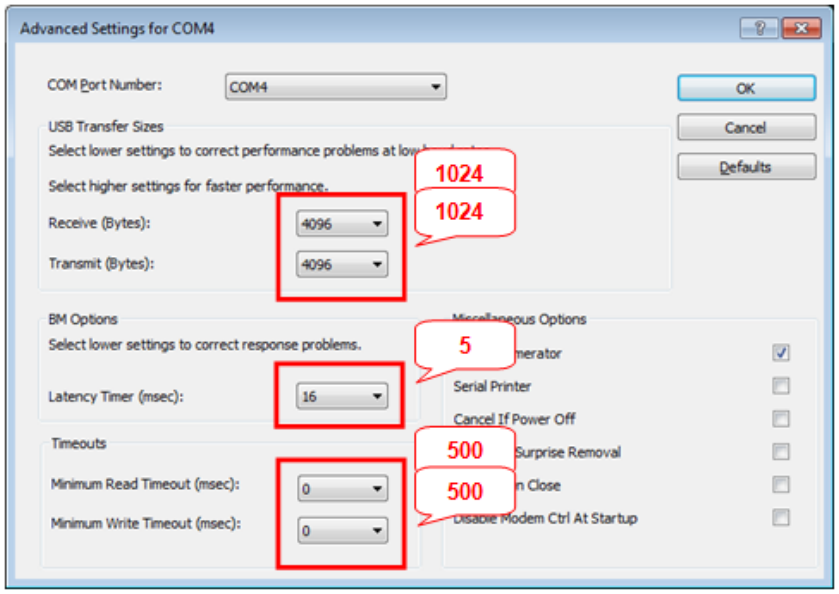


4. Double click on the **USB Serial Port (COMx)** of the **Ports (COM & LPT)**.

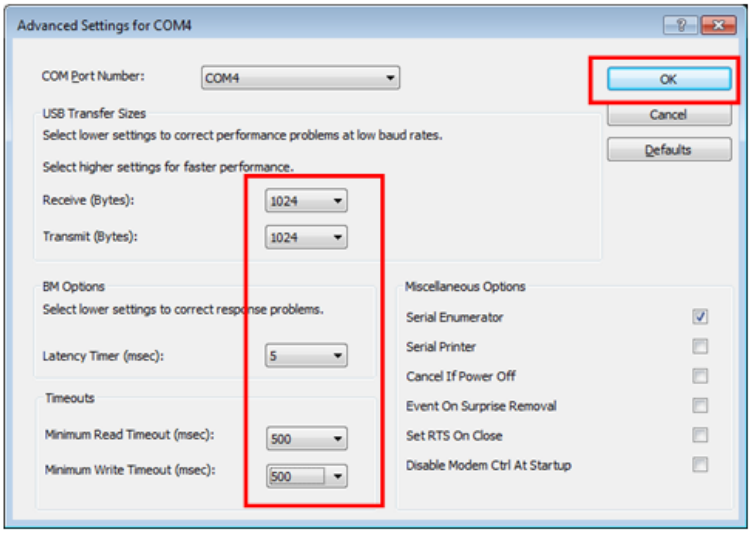
5. Select the **Port Settings** tab and select the **Advanced...** button.



6. Set the parameters as shown below.



7. Select **OK**.

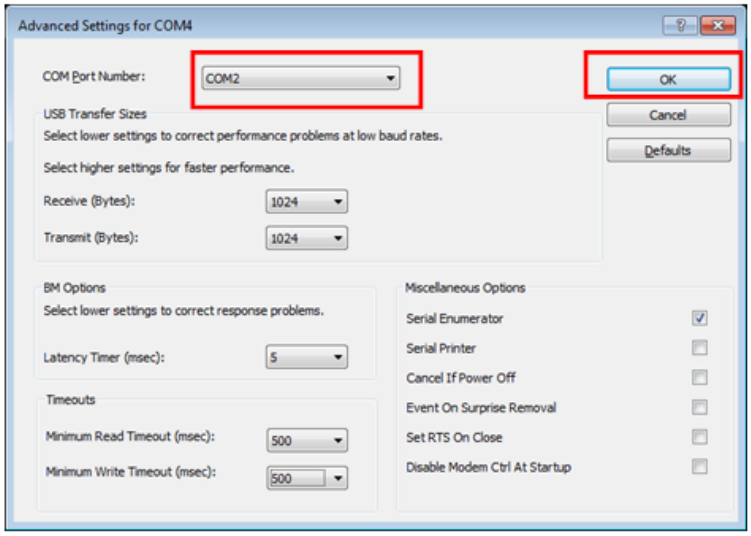


8. If the Peltier Temperature Controller 201 fails to communicate with the PC, change the COM Port Number by the following steps.

9. Open the **Advanced Setting for COMx** window again by repeating the steps 1 to 6.

10. Select the **COM Port number list** to scroll down it and change the COM port number to another one which is not in use, for example 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.

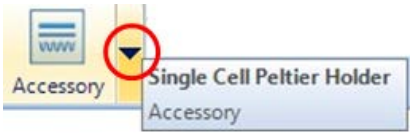
Measurement

1. Install the Single Cell Peltier Holder by referring to section **Installation** (see page 12).

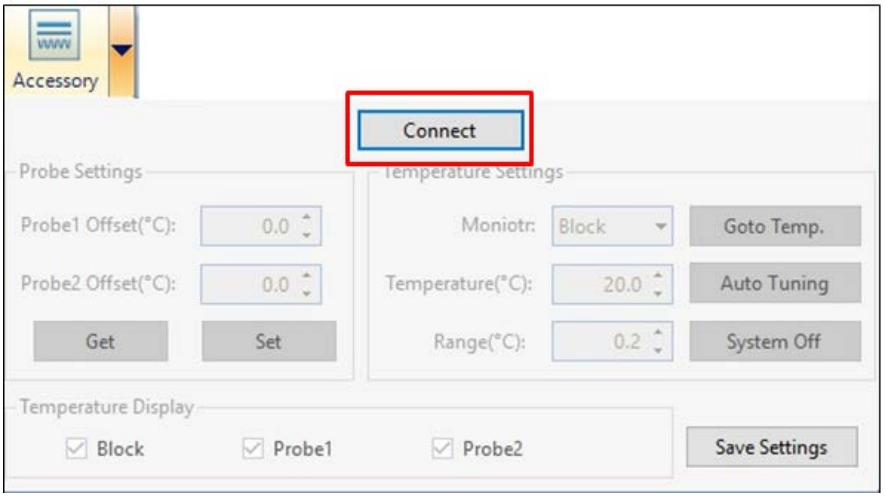
2. Close the sample compartment cover and turn on the instrument.

3. Double-click on the **Spectrum FL** software and select a measurement mode.

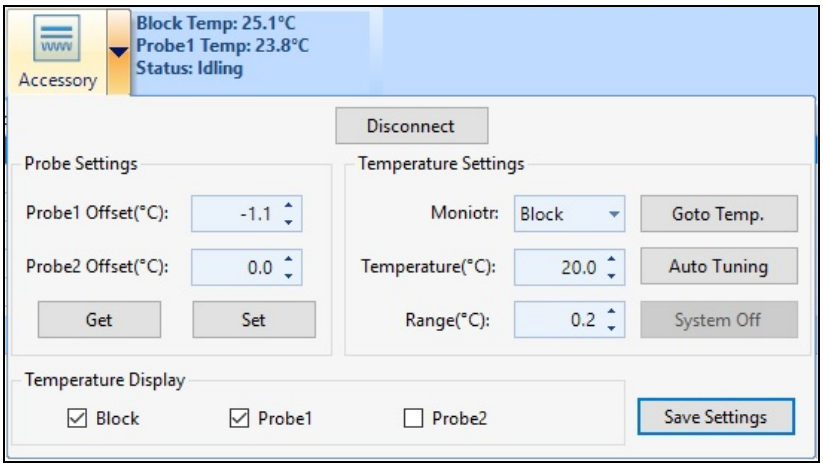
4. Check the recognition of Accessory and click the **arrow** icon.



5. Click **Connect** to connect the Temperature Controller 201.

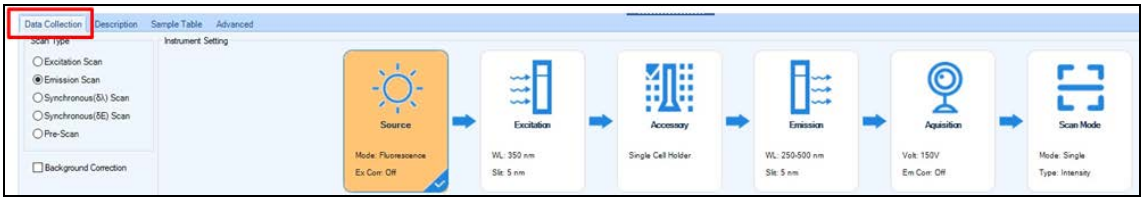


6. Set the parameters of for the probe, temperature and temperature display settings.



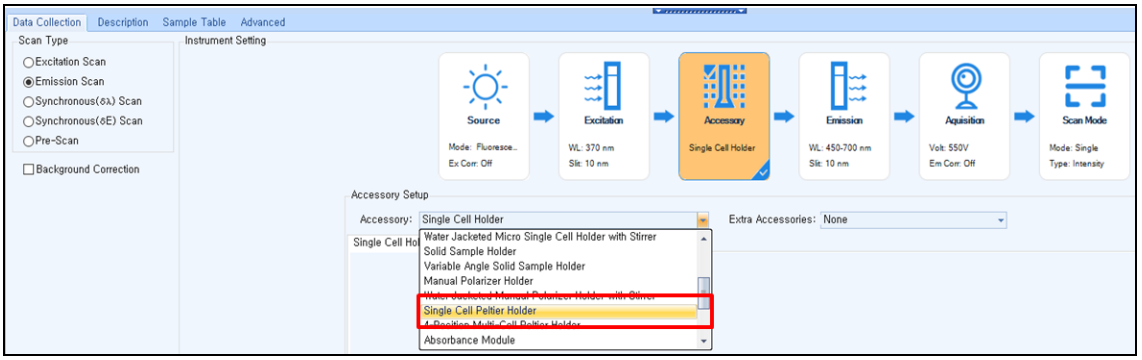
Probe Settings	This function is used to adjust temperature. It is only used for the manufacturing process, so do not modify the values.
Temperature settings	
Monitor	Select the temperature used to monitor during measurement. Options include: Block, Probe 1 or Probe2.
Temperature(℃)	Enter the preset temperature for the experiment. NOTE: *Starting temperature of experiment needs to be set up in the method window.*
Range(℃)	Enter the error tolerance range.
Goto Temp	After completing the parameter setup, select **Goto Temp**. Then the LED for On-LINE is turned on and it will start heating up or cooling down to the set temperature in the temperature settings.
Auto Tuning	This function is used to minimize the temperature fluctuation at the target temperature. Refer to Pettier Temperature Controller Auto Tuning Setup on page 23.
System Off	This function is used to stop the heating up or cooling down to the set Temperature in the Temperature Settings.
Temperature Display	Select which temperature will be displayed on the panel: Block, Probe 1 or Probe 2. Note that the selected temperature is only displayed in real time.
Save Settings	Save the Probe, Temperature and Temperature Display setting parameters.

7. Set parameters for the experiment in the **Data Collection** tab.

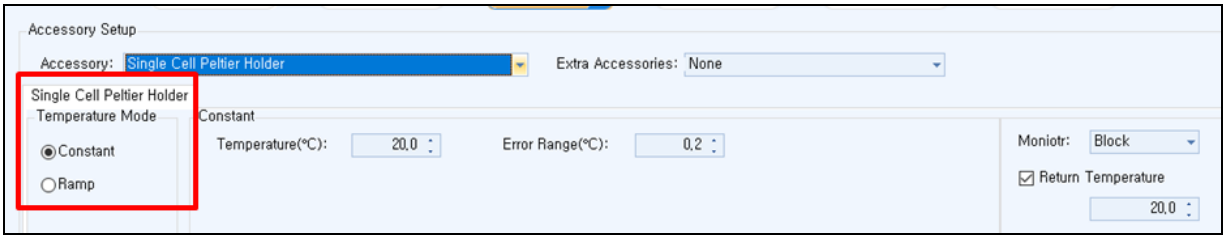


NOTE: *For more detail of method, refer to Spectrum FL Software Users Guide.*

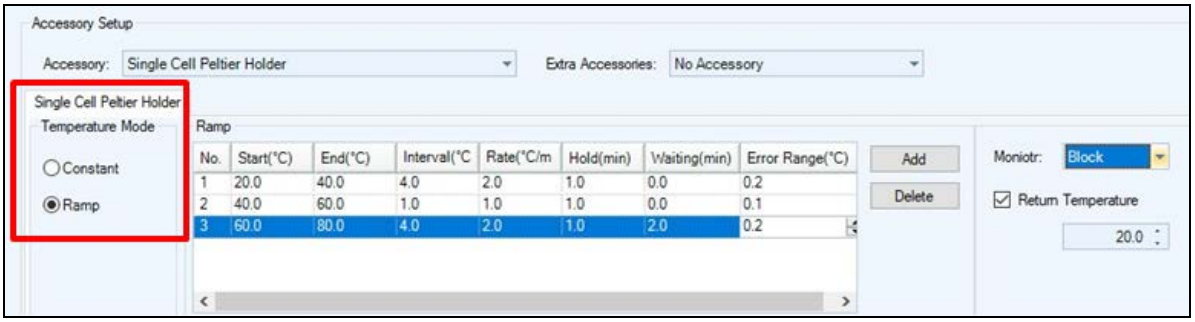
8. In the Accessory tab, select **Single Cell Peltier Holder**.



9. Select **Constant** or **Ramp** mode in the Single Cell Peltier Holder Temperature Mode.



Constant mode	The measurement is only performed with isothermal state in the constant mode.
Temperature (℃)	Enter the temperature for experiment.
Error Range (℃)	It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set error range. Example: Set the temperature at 20℃ and error range 0.2℃ and then the measurement will start when the temperature reaches between 19.8℃ and 20.2℃.
Monitor	Select temperature used to monitor during measurement. Options include: Block, Probe 1 or Probe 2.
Return Temperature	Allow user to input a safety temperature which can be returned before inserting new sample or at the end of experiment. If uncheck this option, it will either keep current temperature for Constant mode or go to start temperature for Ramp Cycle1.



Ramp mode	The Ramp mode can be set up according to desired temperature conditions.
Start (℃)	Enter the start temperature for the measurement.
End (℃)	Enter the end temperature for the measurement.
Interval (℃)	Enter the measurement interval temperature. For instance, you set 5℃, the sample will be measured from start temperature to end temperature every 5℃.
Rate (℃/min)	Enter the heating (or cooling) temperature rate in each temperature range.
Hold (min)	Enter the holding time. For example, if you set 1 min, the measurement will start one minute after the temperature reaches at the set point.
Waiting (min)	Enter the waiting time at the end of current grade. For example, in the No. 3 setting, the measurement will be start after holding 1 min at each interval temperature (60, 64, 68, 72, 76, 80), and it will wait 2 min after measurement at 80℃, then start next grade or finish current method.
Error Range (℃)	It shows the temperature tolerance between the sampling and monitored temperature. The measurement will start when the temperature tolerance reaches within the set error range. Example: Set the temperature at 20℃ and error range 0.2℃ then, the measurement will start when the temperature is reached between 19.8℃ and 20.2℃.
Add/Delete	Click on **Add and Delete** to edit the temperature range and the rate.
Monitor	Select the temperature used to monitor during measurement. Options include: Block, Probe 1 or Probe2.
Return Temperature	Allow user to input a safety temperature which can be returned before inserting new sample or at the end of experiment. If uncheck this option, it will either keep current temperature for Constant mode or go to **start temperature for Ramp Cycle1**. .

10. Click **Save** to save the method after setting up the parameters.
11. Prepare a solution of the sample for measurement.
12. Select the **Run** icon.
13. Input the Experiment name and select **OK**.

14. Confirm the spectrum and results. Save or print the data.

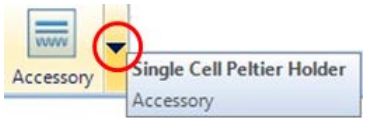
NOTE: *To pull out a cell easily, use the cell lifting knob.*

Peltier Temperature Controller 201 Auto Tuning Setup

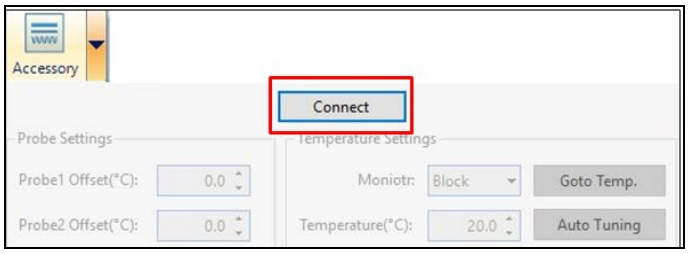
NOTE: *Peltier Temperature Controller 201 can be compatible with various peltier cell holders (Single or Multi). Whenever you exchange the existing peltier cell holder to another one, you should perform the "AUTO TUNING" set up to minimize the temperature fluctuation at the target temperature.*

1. Connect the accessory interface cable of the Peltier Temperature Controller 201 to the connector of the peltier cell changer.
2. Turn on the power switch of the FL 6500/8500 and the Peltier Temperature Controller 201.

3. Double-click on the **Spectrum FL** software and select a measurement mode.
4. Check the recognition of Accessory and click the **arrow** icon.

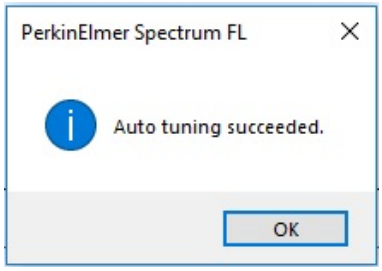


5. Click **Connect**



6. Click **Auto Tuning**.  Auto Tuning will start.

7. Click **OK** when the **Auto tuning succeeded.** message pops up.



Troubleshooting

POWER LED is not lit on

1. Check the connection of the power cord 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.

AVERTISSEMENT

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. Carefully open the compartment latch where the fuse is located.

Location of the latch on the fuse compartment door

4. Disconnect the fuse.
5. Replace with a new T5ALfuse (AC 250V). One spare is contained in the power module.
6. Close the compartment door.
7. Plug in the instrument and turn on.

ON-LINE LED is not lit on

1. Check whether the communication cable is connected tightly.
2. Change the port setting referring to the chapter ***Setting USB Serial Port*** (see page 19).

FAN LED is lit on with an alarm sound

1. Fan needs to be replaced.

LED of LOW LEVEL, FLOW SENSOR and PUMP blinks with an alarm sound

1. Turn off the power of the Peltier temperature controller 201.

2. Remove the four Phillips screws on the Air Vent Manual button cover using a screwdriver.

3. Push the Air Vent Manual button on.

4. Restart the Peltier Temperature Controller 201 and check the coolant level and if it is below the 'L' (low) mark, fill up the coolant adequately.

5. Check if the LED blinks of LOWLEVEL, FLOW SENSOR and PUMP stop.

6. Close the lid of the coolant inlet.
7. Turn off the AC power switch of the Peltier Temperature Controller 201.
8. Push off the Air Vent Manual button.
9. Fasten the four Phillips screws on the Air Vent Manual button cover using a screwdriver.

FLOW SENSOR and PUMP LED is lit on with an alarm sound

1. Turn off the power of the Peltier Temperature Controller 201.
2. Remove the four Phillips screws on the Air Vent Manual button cover using a screwdriver.

3. Push on the Air Vent Manual button.

4. Restart the Peltier Temperature Controller 201.
5. Check whether the tubing is bent, or it is connected correctly. Check if coolant flows properly for about one minute.
6. Check if the LED blinks of FLOW SENSOR and PUMP stop.

7. Close the lid of the coolant inlet.

8. Turn off the AC power switch of the Peltier Temperature Controller 201.
9. Push off the Air Vent Manual button.
10. Fasten the four Phillips screws on the Air Vent Manual button cover using a screwdriver.
11. If the FLOW SENSOR and PUMP LED is continuously on, contact your PerkinElmer Service representative.

Connection is failed

1. Check the Interface connector of the Peltier Temperature Controller 201 is lined properly.