Lambda 365 Integrating Sphere Installation Instructions

This instruction sheet describes the installation of this accessory which is used with the Lambda 365 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

- For measuring the reflectance
- For measuring the total transmittance

Figure 1 Lambda 365 50 mm Transmission / Reflectance Sphere [P/N : N4101011]

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

Produced in the USA.

Specification of 50 mm Transmission / Reflectance Sphere

Physical Characteristic	Specification
Spectral range	190 - 1100 nm
Dimensions	170 mm x 120 mm x 110 mm (LWH)
Sphere diameter	60 mm
Weight	1.22 Kg
Sample port aperture	12.5 mm
Sphere coating	Barium Sulfate

Specification of White Standard

Physical Characteristic	Specification
Dimensions	Ø 20 mm, 10 mm thick
Weight	36.7 g
Spectral range	250 - 1100 nm
White Material	OP.DI.MA. (ODM98)

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

Produced in the USA.

Description

Configuration of 50 mm Transmission / Reflectance Sphere

Detector Module

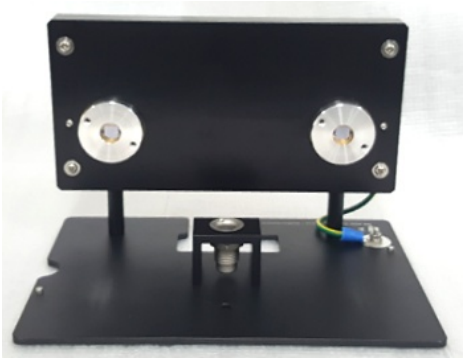


Figure 2 Detector Module of 50 mm Transmission / Reflectance Sphere

Sphere Module

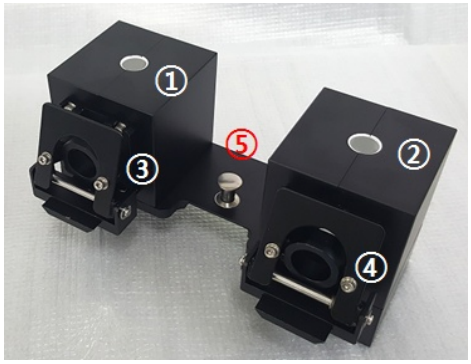


Figure 3 Sphere Module of 50 mm Transmission / Reflectance Sphere

① Reflectance Sampling port for loading reference
② Reflectance Sampling port for loading sample
③ Transmission Sampling port for loading reference
④ Transmission Sampling port for loading sample
⑤ Push-button Switch

Communication Cable

Figure 4 Communication Cable of 50 mm Transmission / Reflectance Sphere

50 mm Transmission / Reflectance Sphere Standard Accessories

White Standard (2 ea)	Light Trapper (2 ea)
 For measuring the Baseline	 For measuring the Dark Current
Alternative sample compartment cover (1 ea)	**T-Plate (2 ea)**
 For covering the sample compartment when using Integrating Sphere accessory	 For measuring transmittance of solid samples

Figure 5 50 mm Transmission / Reflectance Sphere Standard Accessories

Figure 6 Knob

50 mm Transmission / Reflectance Sphere Powder Sampling Accessory (Optional)

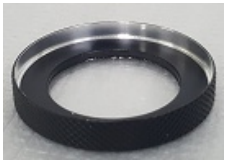
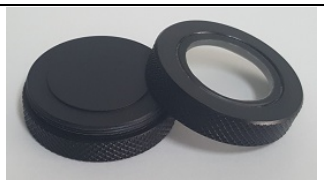
Quartz Guide for light Trapper (2 ea)	Powder Cell (1 ea)	Quartz Cap (2 ea)
 For measuring the Dark Current when using the powder cell	 For measuring the powder sample	 For measuring the Baseline when using the powder cell

Figure 7 Powder Sampling Accessory [P/N: N4101049] (Optional)

NOTE: *To measure powder sample, Powder Sampling Accessory [P/N: N4101049] is required as a separate purchase.*

Installation

1. Prepare the Lambda 365 Spectrophotometer to install this accessory.
2. Connect the power cable and the communication cable. DO NOT turn on the power of the instrument!

CAUTION	***Make sure that the instrument is turned off when the detector module of 50 mm Transmission/Reflectance Sphere is installed.***

3. Loosen the knob and remove the existing cell holder or the installed accessory.

Figure 8 Loosening the knob

4. Connect the communication cable of 50 mm Transmission/Reflectance Sphere to Lambda 365 system.

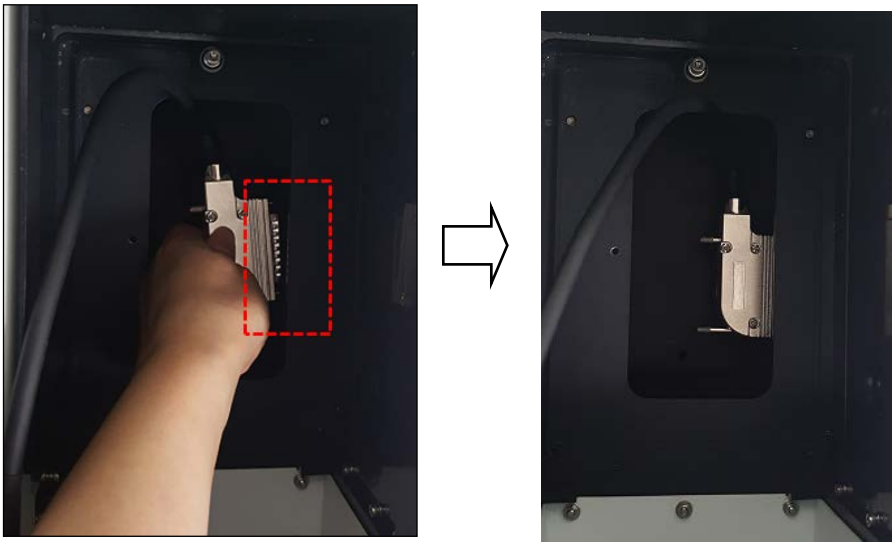


Figure 9 Connect the communication cable to instrument

5. Place the Detector module of the 50 mm Transmission / Reflectance Sphere in the sample compartment and connect the communication cable.

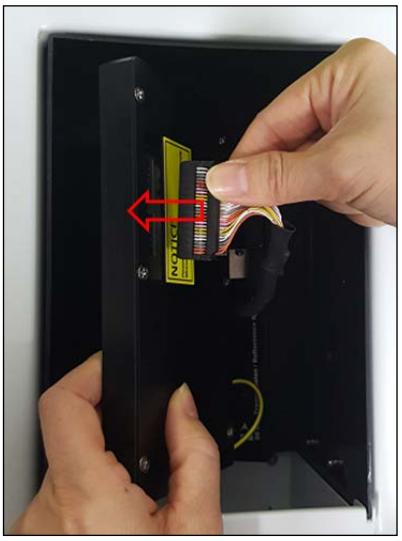


Figure 10 Place the detector module in the sample compartment and connect the communication cable

6. Place the detector module of 50 mm Transmission / Reflectance Sphere in the upright position and fasten the knob.

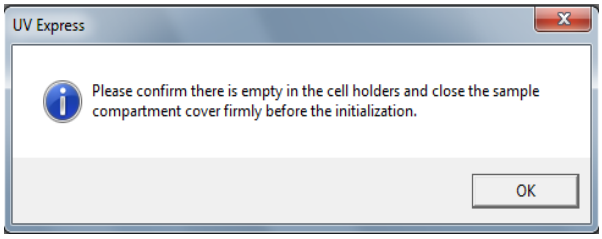
Figure 11 Detector module of 50 mm Transmission / Reflectance Sphere in the sample compartment

7. Close the sample compartment cover and turn on the instrument. Allow the instrument to warm-up for at least 20 minutes.

CAUTION	***Do not disconnect the communication cable while the instrument is turned on. If it is disconnected while the instrument is turned on, the instrument could be damaged electrically.***

8. Double-click on the **UV Express Software** folder and select Scan mode.

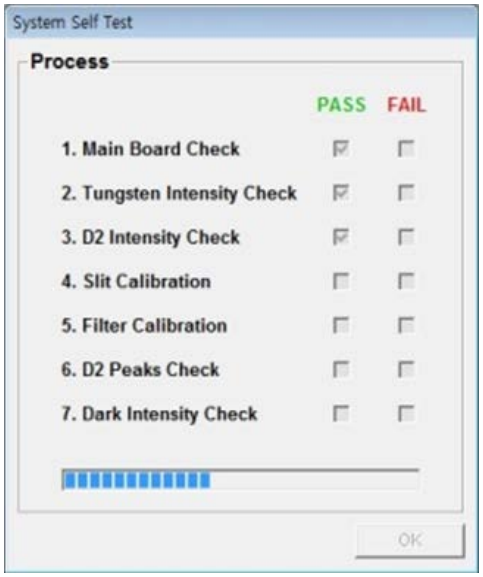
9. The following window will appear. Make sure that the detector module only is installed and the sample compartment cover is closed firmly and select **OK**.



NOTE: *When executing System Self Test with the Transmission/Reflectance Sphere accessory installed, you have to install the only detector module, not the whole accessory unit (Do **not** install the Sphere module).*

NOTE: *The electrical and optical conditions of the detector module of 50 mm Transmission / Reflectance Sphere are checked by itself as soon as the instrument is turned on. Thus, if the instrument is turned on and System Self Test is performed with the sample compartment open, the system checking could be performed inappropriately due to the stray light from outside. Be sure to close the sample compartment firmly.*

10. **System Self Test** starts itself.



11. Select **OK** after finishing the System Self Test.

12. Assemble the Sphere module of 50 mm Transmission / Reflectance Sphere to the detector module by pushing the push-button switch.

Figure 12 50 mm Transmission / Reflectance Sphere in the sample compartment

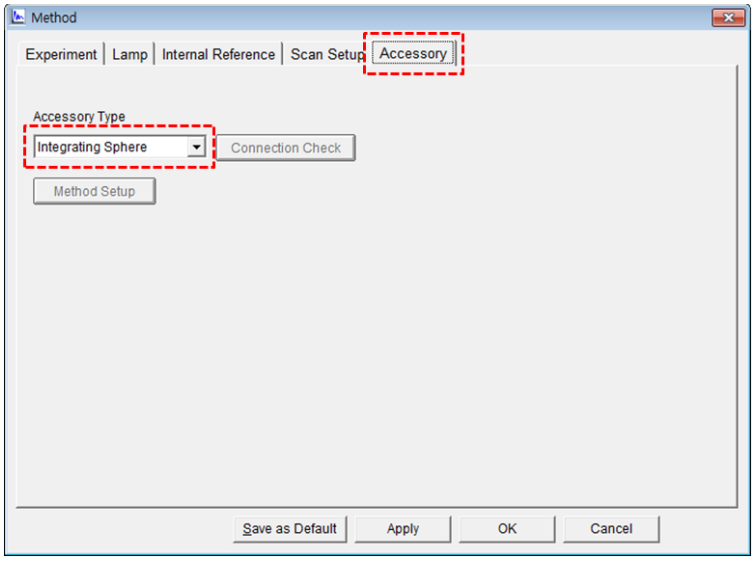
13. Installation of 50 mm Transmission / Reflectance Sphere after the System Self Test is finished. Measure samples by following the procedures for each sample measurement method in the next chapters.

Reflectance Measurement of Solid sample

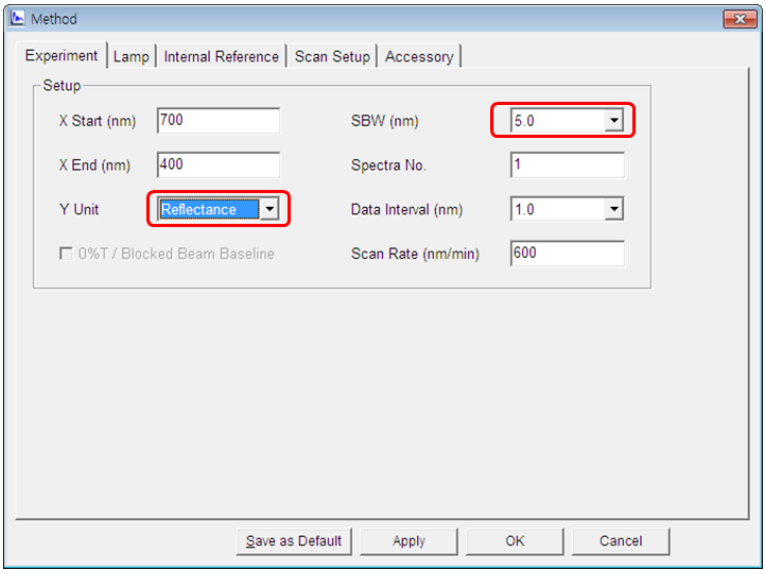
1. Complete the installation of 50 mm Transmission / Reflectance Sphere and the Self System Test, referring to chapter **Installation**.

2. Select **New** to open a new window. Select **Experiment Type** and select **OK**.

3. Select **Method** and click the **Accessory** tab, and select **Integrating Sphere**.



4. Select **Experiment** tab and set up parameters. Be sure to select Y unit as **Reflectance** and SBW as **5.0 nm**.

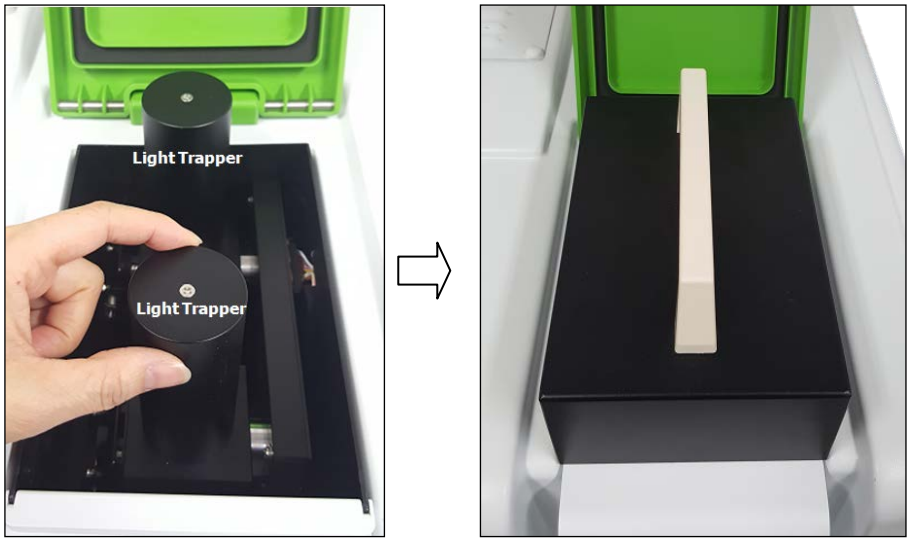


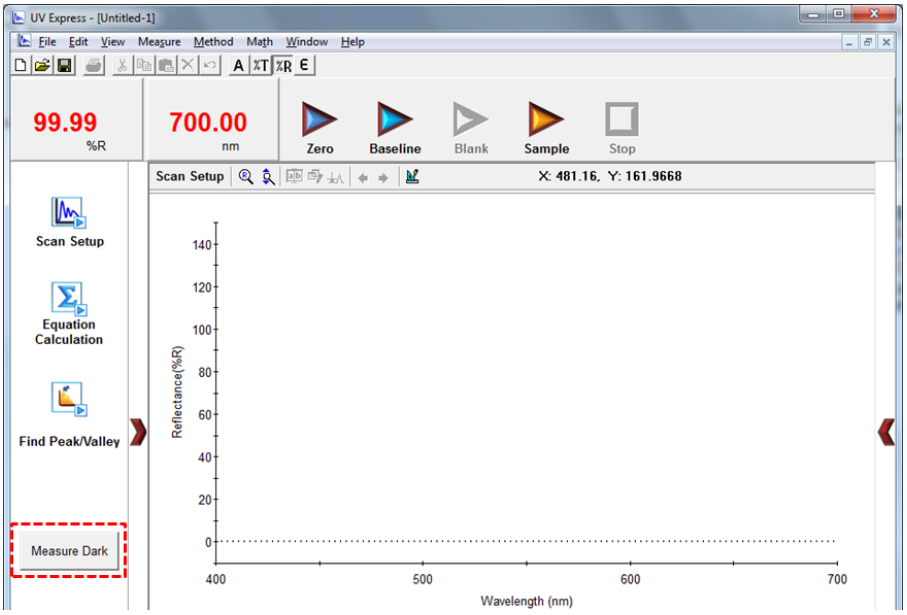
5. Set up the parameters in the Lamp, Internal Reference and Scan Setup tabs in turn.

NOTE: *For more details of the method setup, refer to X. Measurement Modes in the UV Express Software Users Guide.*

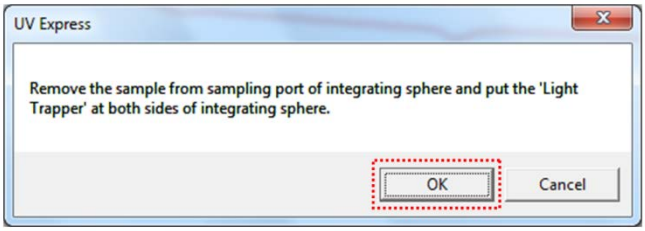
6. Select **Apply** and **OK** after completing the set-up of parameters.

7. Put the light trappers on both the reflectance sampling ports for reference and sample. Close the Alternative sample compartment cover and click **Measure Dark**.



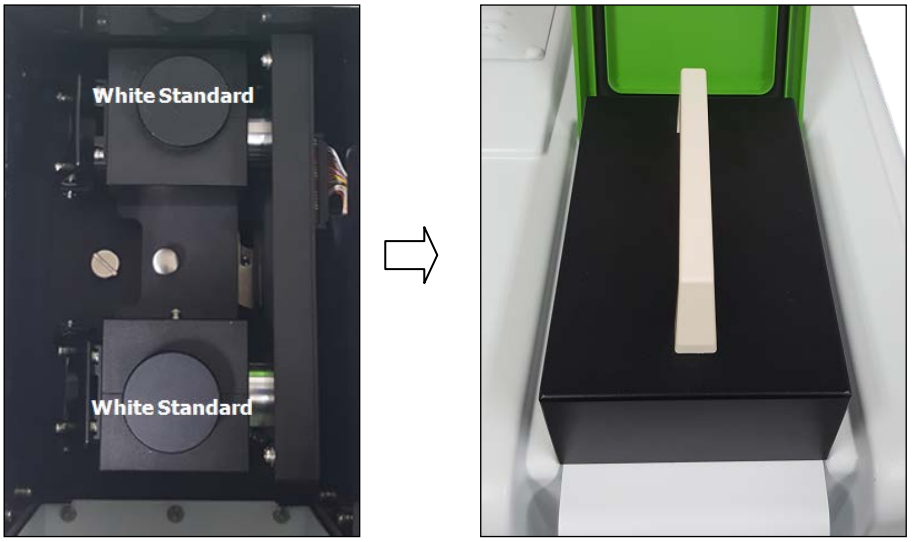


8. Click **OK** when ready to measure dark.

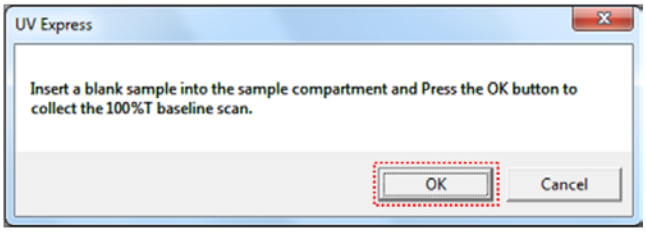


9. Dark measurement starts.

10. After Dark measurement, remove the light trappers and put the white standards on both the reflectance sampling ports for reference and sample. Close the Alternative sample compartment cover and select **Baseline**.

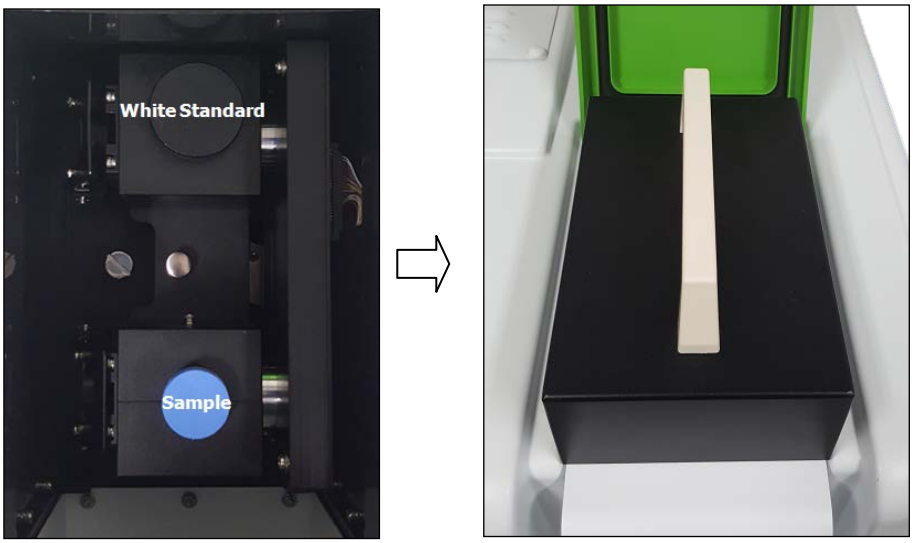


11. The following message is displayed and then click **OK**.

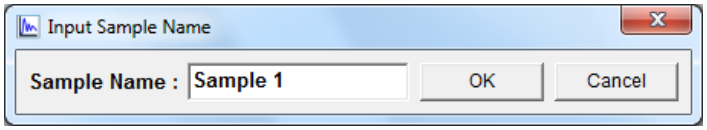


12. Check the Baseline measurement result.

13. Put the sample on the reflectance sampling port for sample while the white standard is put on the reflectance sampling port for reference. Close the Alternative sample compartment cover and select **Sample**.



14. Input the sample name and click **OK**.



15. After sample measurement, the spectrum will be displayed. Save or print the data.

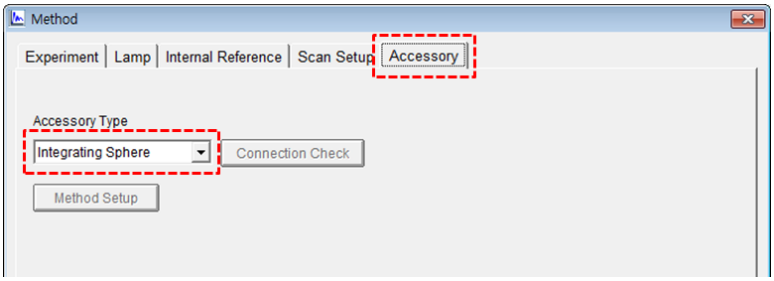
Reflectance Measurement of Powder Sample

NOTE: *To measure powder sample, Powder Sampling Accessory [P/N: N4101049] is required as a separate purchase.*

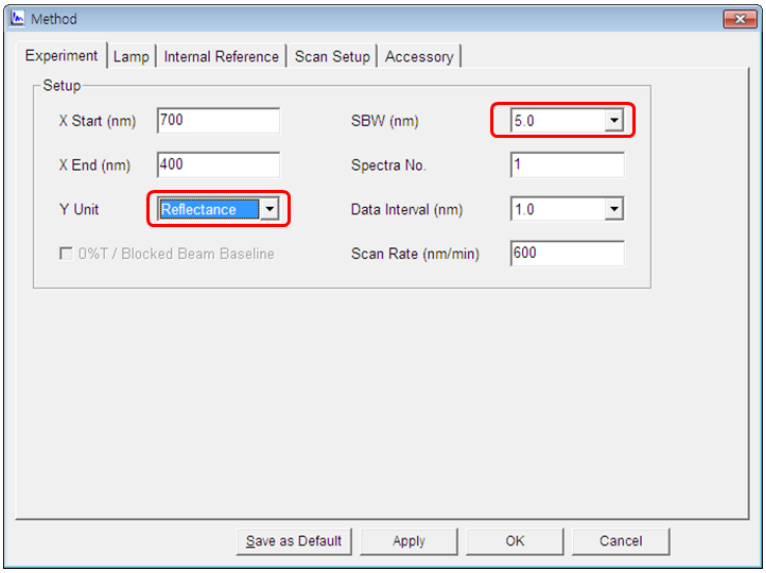
1. Complete the installation of 50 mm Transmission / Reflectance Sphere and the Self System Test, referring to chapter **Installation**.

2. Select **New** to open a new window, and select **Experiment Type** and **OK**.

3. Select **Method** and click the **Accessory** tab, and select **Integrating Sphere**.



4. Select **Experiment** tab and set up parameters. Be sure to select Y unit as **Reflectance** and SBW as **5.0 nm**.



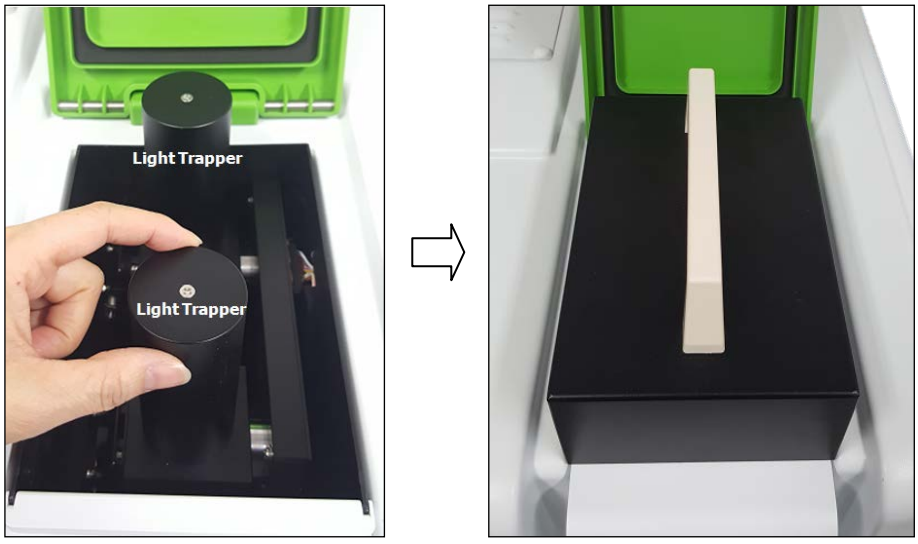
5. Set up the parameters in the Lamp, Internal Reference and Scan Setup tabs in turn.

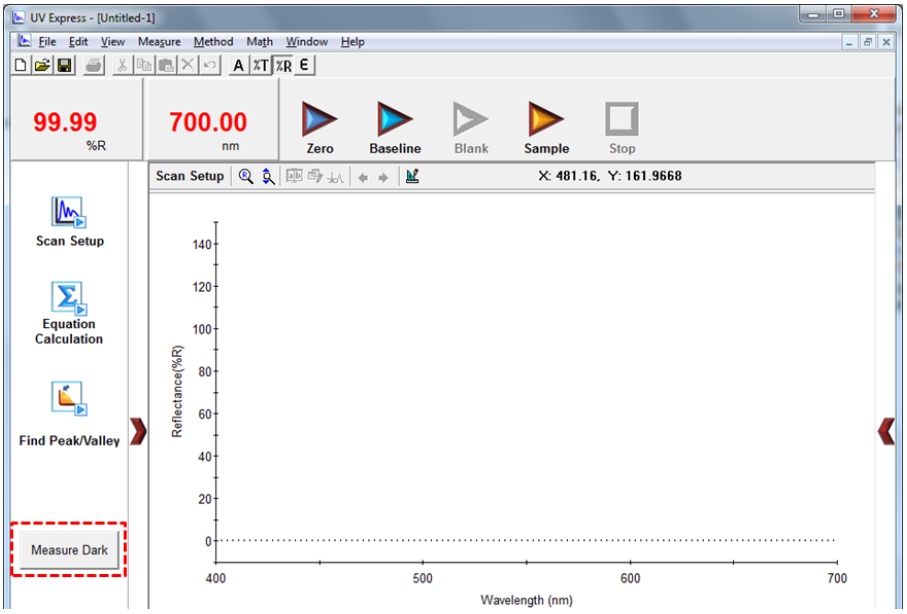
NOTE: *For more details of the method setup, refer to X. Measurement Modes in the UV Express Software Users Guide.*

6. Select **Apply** and **OK** after completing the set-up of parameters.

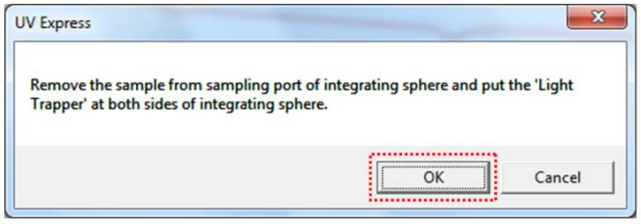
7. Put the Quartz guides for the light trapper on both the reflectance sampling ports for reference and sample of the 50 mm Transmission /Reflectance Sphere.

8. Put the light trappers on both the quartz guides. Close the Alternative sample compartment cover and click **Measure Dark**.





9. Click **OK** when ready to measure dark.

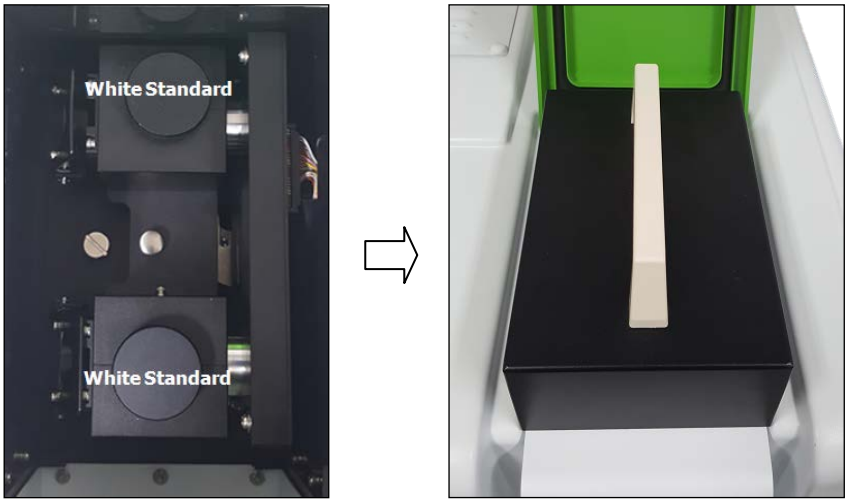


10. Dark measurement starts.

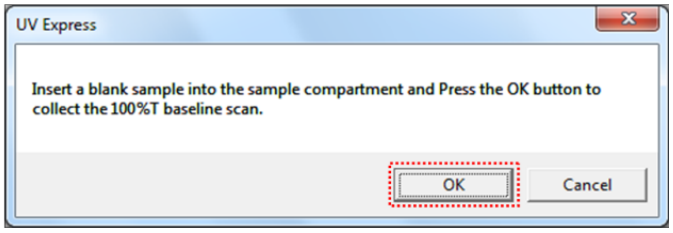
11. After Dark measurement, remove the light trappers and quartz guides.

12. Screw the quartz cap on the white standard.

13. Put the white standards with the Quartz caps attached on both the reflectance sampling ports for reference and sample. Close the Alternative sample compartment cover and select **Baseline**.



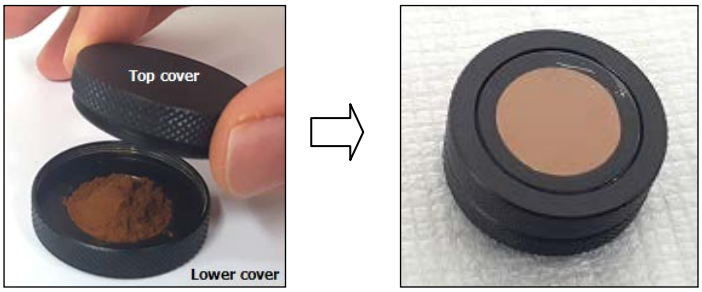
14. The following message is displayed, and then click **OK**.



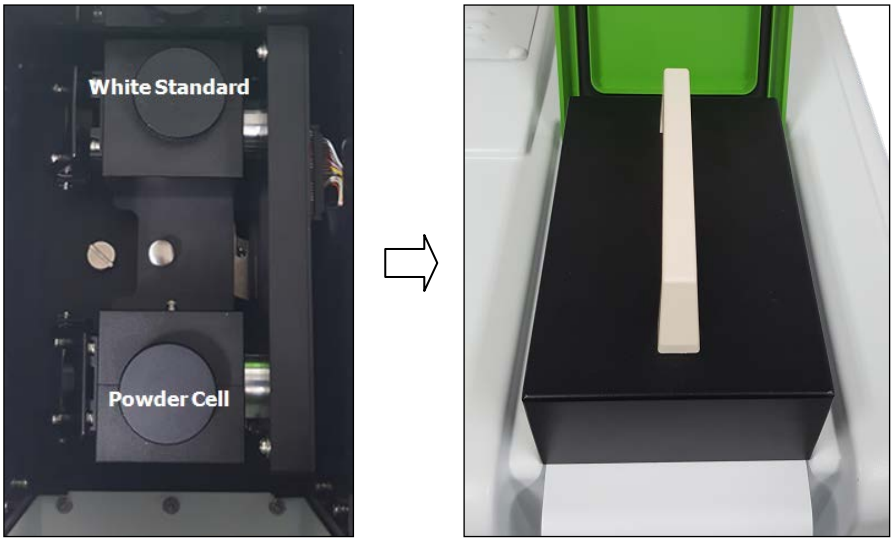
15. Check the Baseline measurement result.

16. To prepare for powder sample measurement, load powder sample on the base of the powder cell's lower cover.

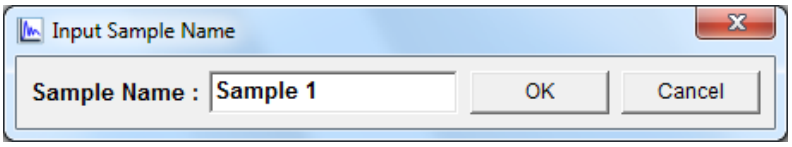
17. Screw the top cover on the lower cover.



18. Put the prepared powder cell on the reflectance sampling port of the sample sphere while the white standard is put on the sampling port of the reference sphere. Close the Alternative sample compartment cover and select **Sample**.



19. Input the sample name and click **OK**.



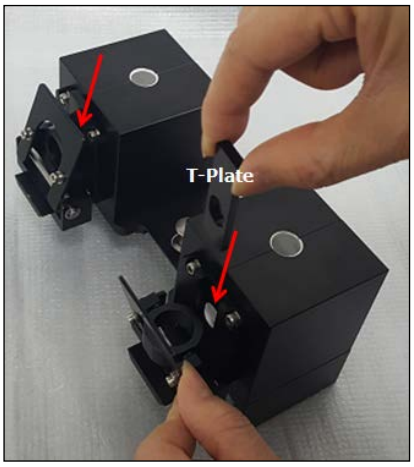
20. After sample measurement, the spectrum will be displayed. Save or print the data.

Total Transmittance Measurement of Solid Sample

NOTE: *To measure transmittance of solid sample such as Glass, Film, plastic, etc., it is required to insert the T-plates on the transmittance sampling ports before loading samples.*

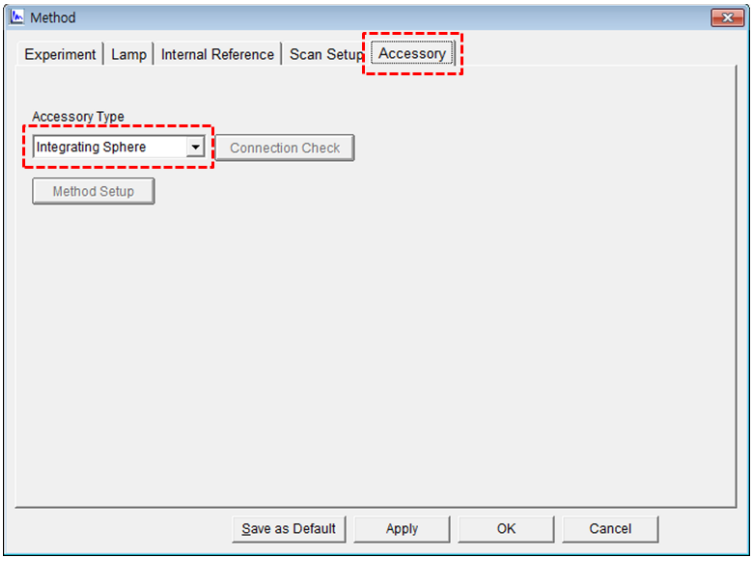
1. Complete the installation of 50 mm Transmission / Reflectance Sphere and the Self System Test, referring to chapter **Installation**.

2. Insert the T-Plates on both the transmittance sampling ports for reference and sample.

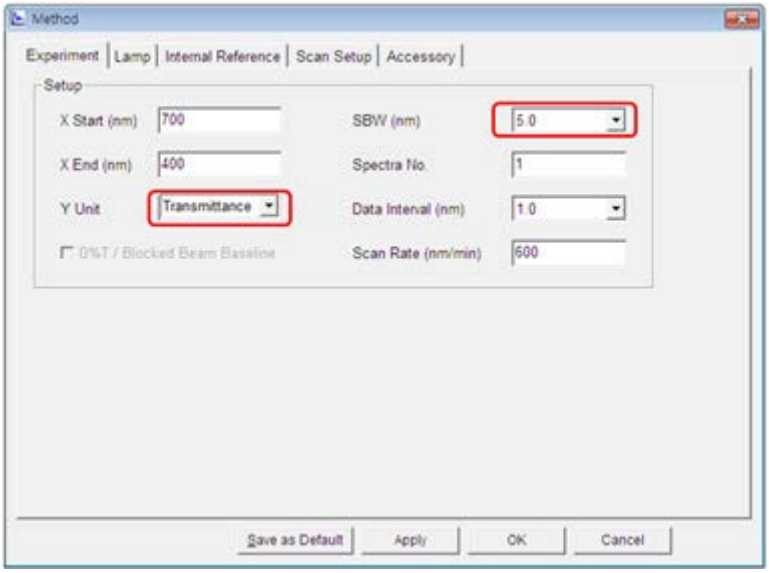


3. In the software, select **New** to open a new window. Select Experiment Type and select **OK**.

4. Select **Method** and click the **Accessory** tab, and select **Integrating Sphere**.



5. Select **Experiment** tab and set up parameters. Be sure to select Y unit as **Transmittance** and SBW as **5.0 nm**.

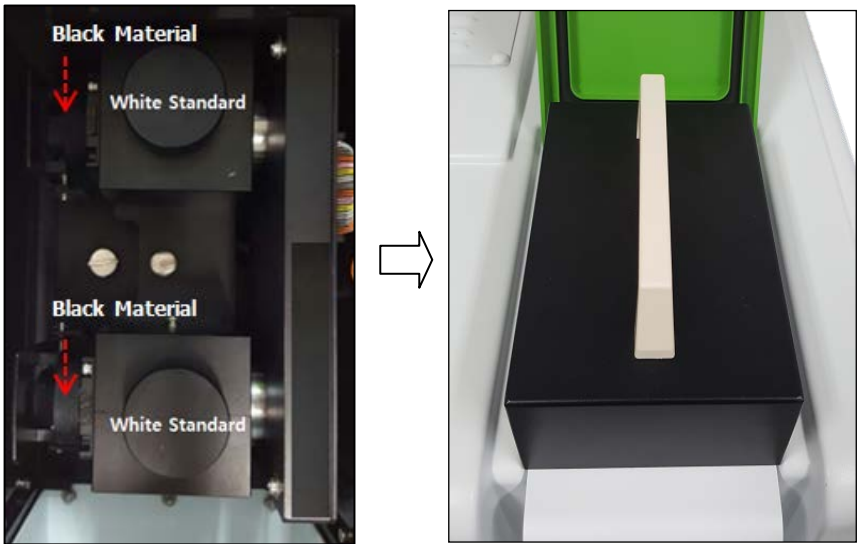


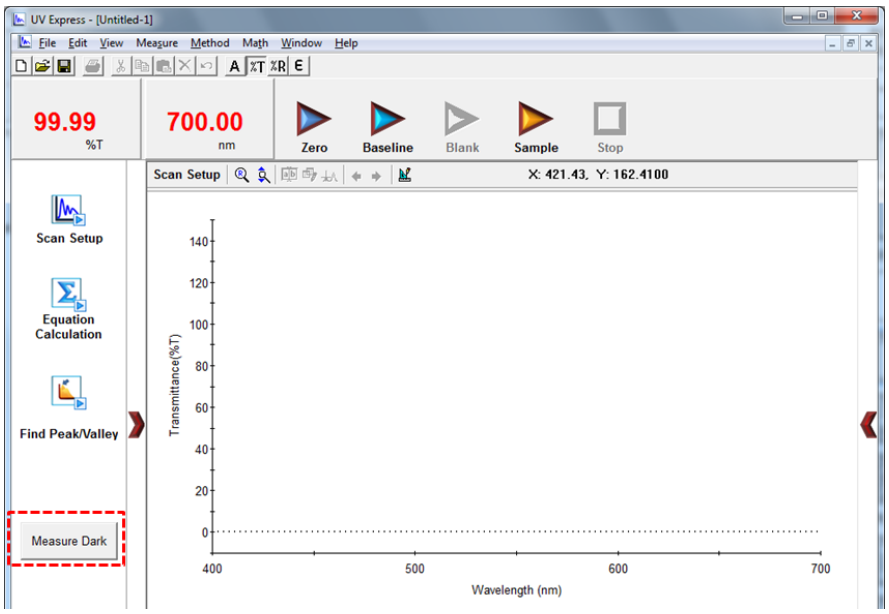
6. Set up the parameters in the Lamp, Internal Reference and Scan Setup tabs in turn.

NOTE: *For more details of the method setup, refer to X. Measurement Modes in the UV Express Software Users Guide.*

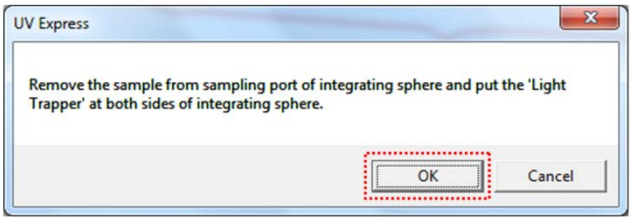
7. Select **Apply** and **OK** after completing the set-up of parameters.

8. Mount a black material such as a white standard cap on both the transmission sampling ports so that any light cannot get through the transmission ports into the spheres. And then, put the white standards on both the reflectance sampling ports for reference and sample of 50 mm Transmission /Reflectance Spheres. Close the Alternative sample compartment lid and click **Measure Dark**.



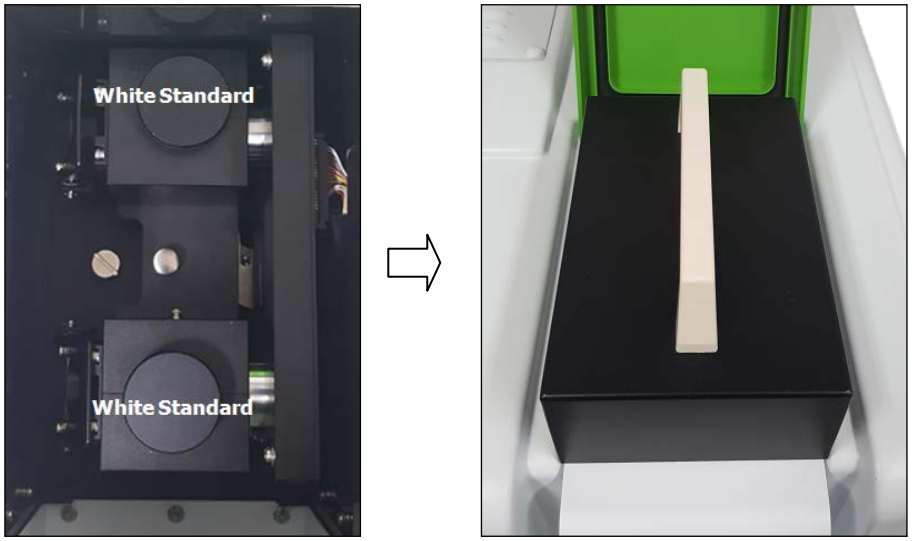


9. Click **OK** when ready to measure dark.

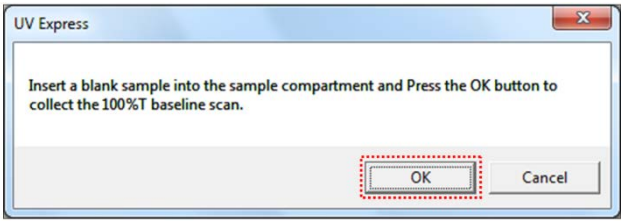


10. Dark measurement starts.

11. Remove the black materials from both the transmission sampling ports, leaving the white standards on the both reflectance sampling ports of reference and sample. Close the Alternative sample compartment lid and measure **Baseline**.

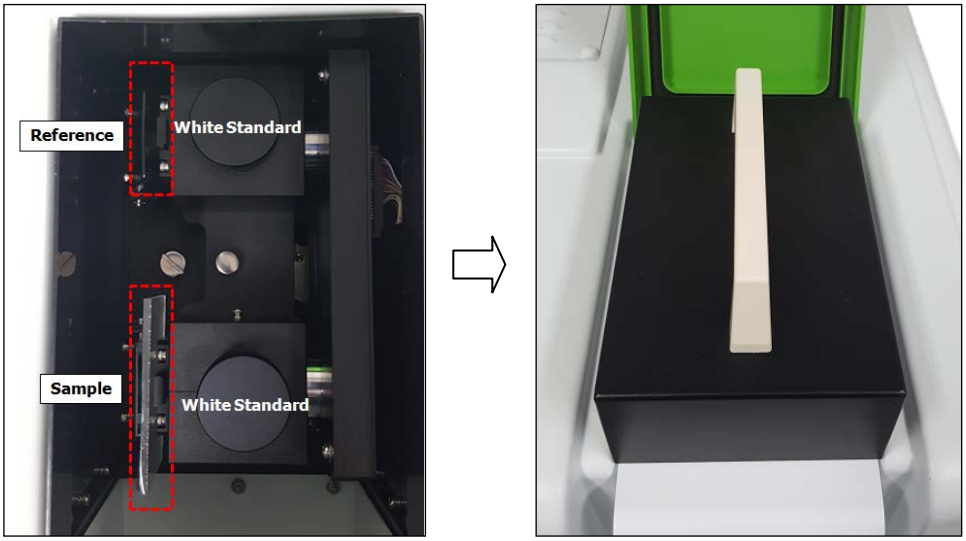


12. The following message is displayed and then click **OK**.

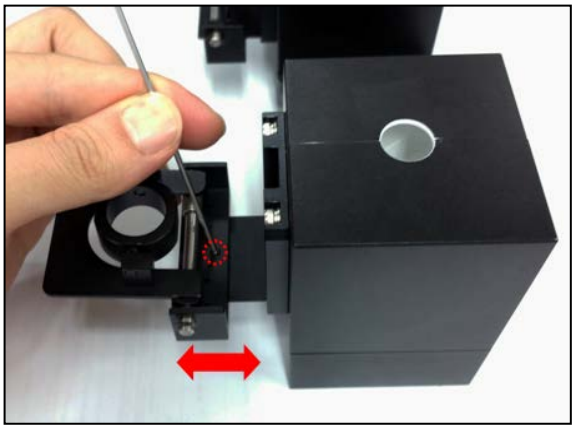


13. Check the Baseline measurement result.

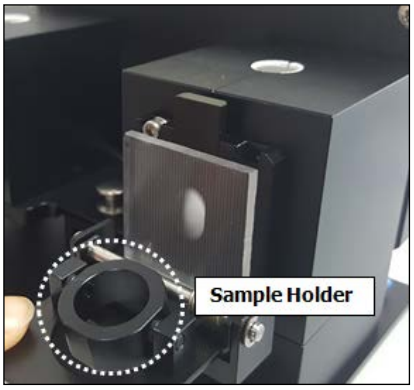
14. Put the reference and sample on each transmittance sampling port while the white standards remain on the both reflectance sampling ports of the reference and the sample. Close the Alternative sample compartment lid and measure **Sample**.

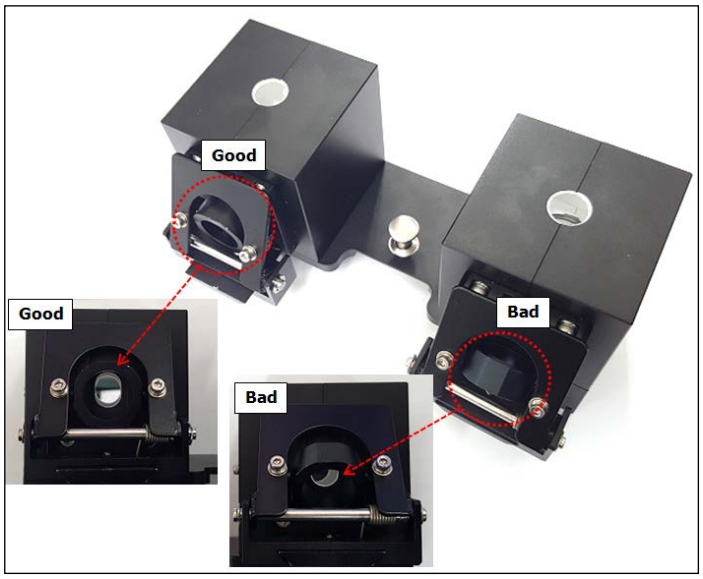


NOTE: *If the sample size is too thick to hold, adjust the sample shelf position by M1.5 wrench driver.*

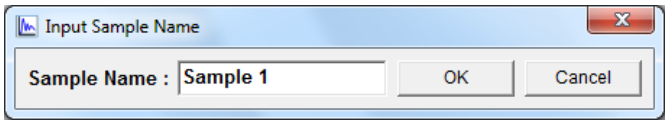


NOTE: *When loading sample, the wrong position of the sample holder interferes in the beam path which causes incorrect measurement results. Be sure to place the sample holder in the correct position.*





15. Input the sample name and select **OK**.



16. After sample measurement, the spectrum will be displayed. Save or print the data.

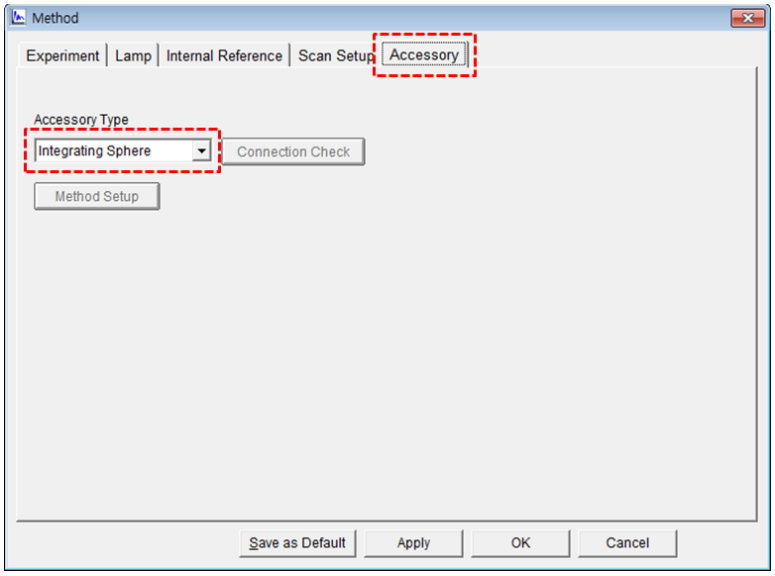
Total Transmittance Measurement of Liquid Sample

NOTE: *To measure total transmittance of liquid sample, Standard Quartz cells (10 x 10 mm) are required to load the sample. Quartz Cells are not included in the 50 mm Transmission/Reflectance Sphere accessory and it is required as a separate purchase.*

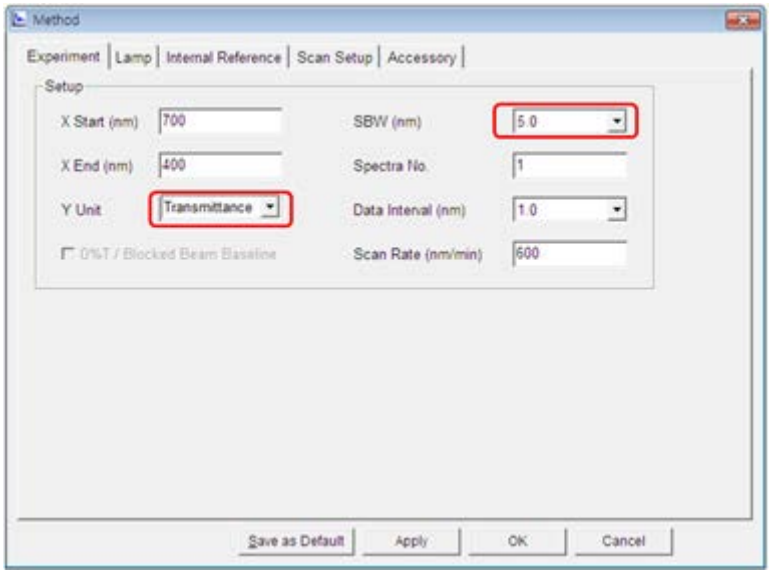
1. Complete the installation of 50 mm Transmission / Reflectance Sphere and the Self System Test, referring to chapter **Installation**.

2. Select **New** to open a new window. Select Experiment Type and select **OK**.

3. Select **Method** and click the **Accessory** tab, and select **Integrating Sphere**.



4. Select Experiment tab and set up parameters. Be sure to select Y unit as **Transmittance** and SBW as **5.0 nm**.

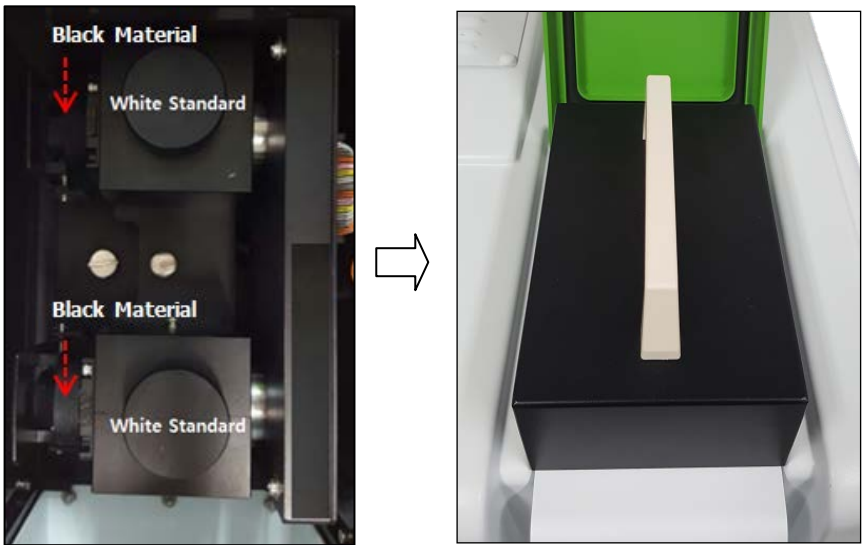


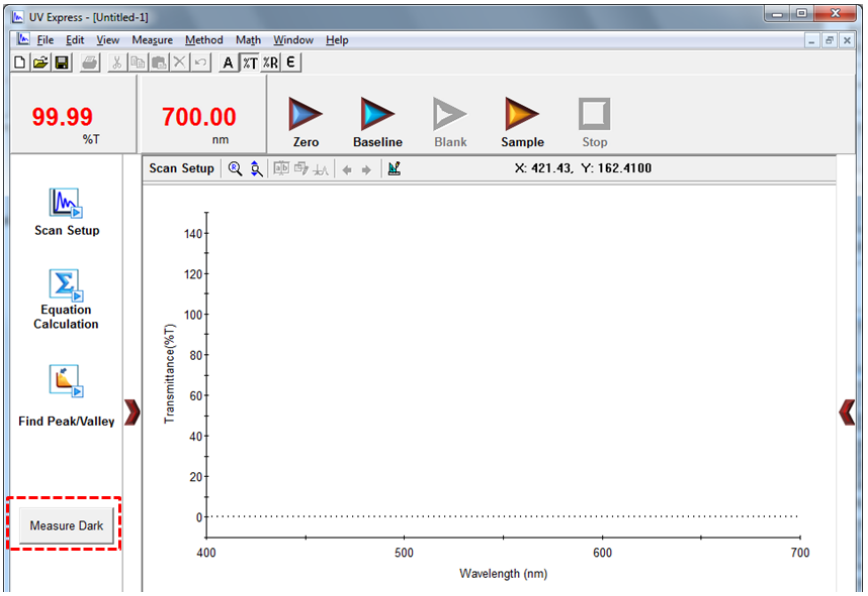
5. Set up the parameters in the Lamp, Internal Reference and Scan Setup tabs in turn.

NOTE: *For more details of the method setup, refer to X. Measurement Modes in the UV Express Software Users Guide.*

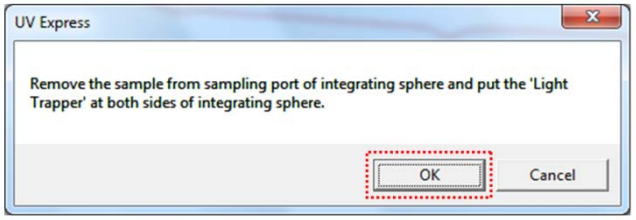
6. Select **Apply** and **OK** after completing the set-up of parameters**.**

7. Mount a black material such as a white standard cap on both the transmission sampling ports so that any light cannot get through the transmission ports into the spheres. And then, put the white standards on both the reflectance sampling ports for reference and sample of 50 mm Transmission /Reflectance Spheres. Close the Alternative sample compartment lid and click **Measure Dark**.



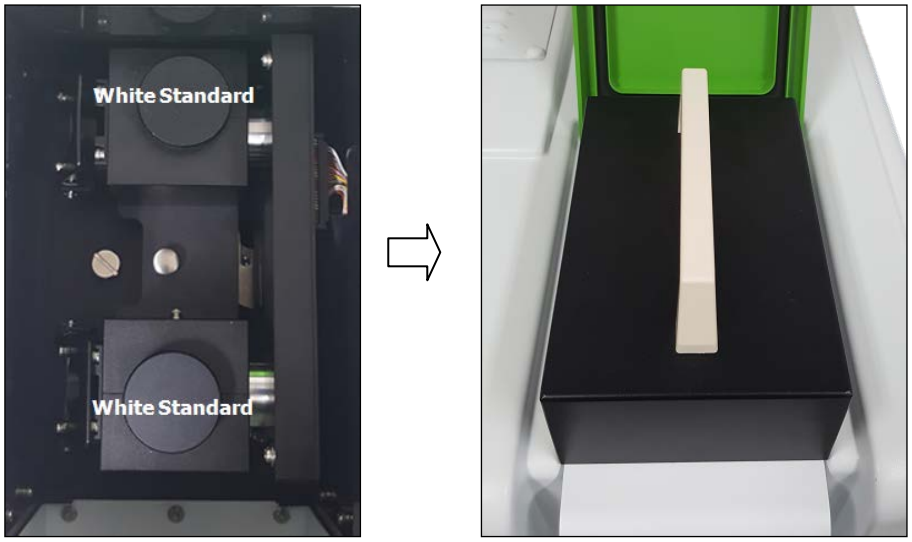


8. Click **OK** when ready to measure dark.

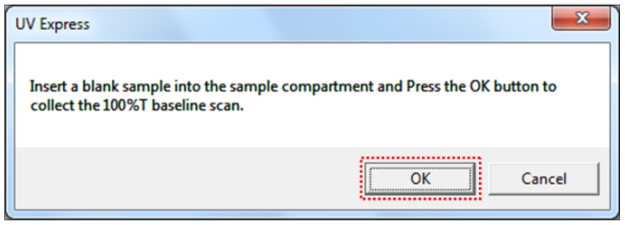


9. Dark measurement starts.

10. Remove the black materials from both the transmission sampling ports, leaving the white standards on the both reflectance sampling ports of reference and sample. Close the Alternative sample compartment lid and measure **Baseline**.

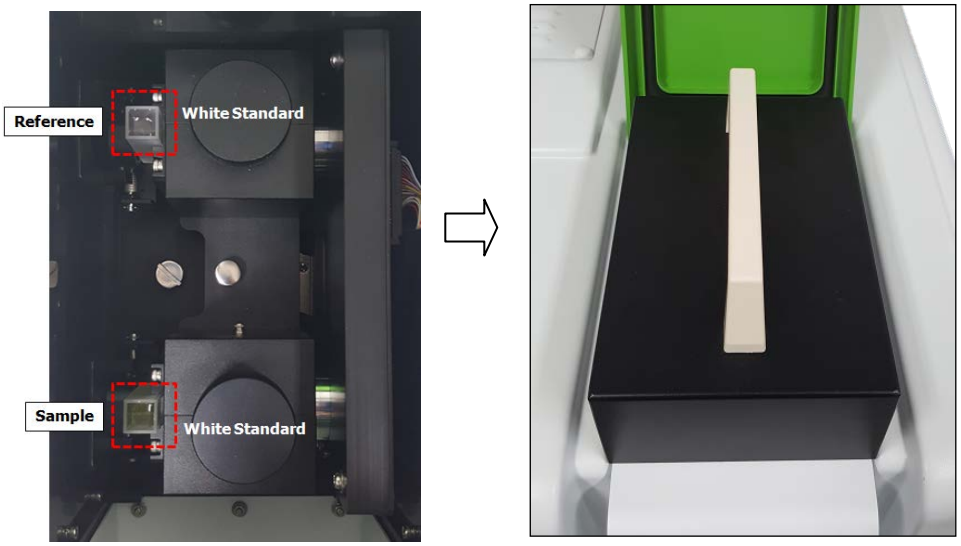


11. The following message is displayed and then click **OK**.

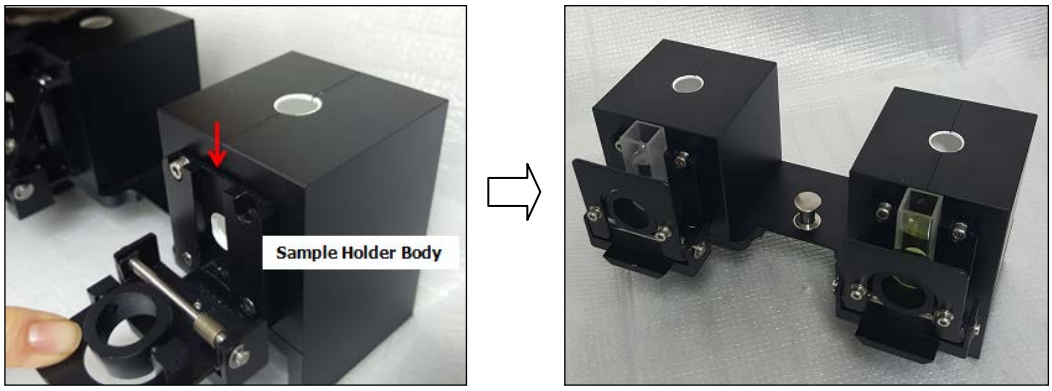


12. Check the Baseline measurement result.

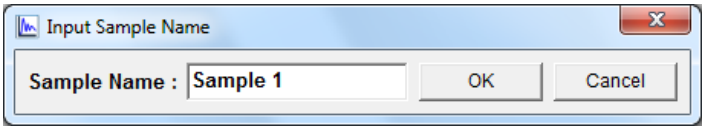
13. Put the reference and sample quartz cells on each transmittance sampling port while the white standards remain on the both reflectance sampling ports of the reference and the sample. Close the Alternative sample compartment lid and measure **Sample**.



NOTE: *10 x 10 mm Quartz cells should fit into the sample holder body when inserted.*



14. Input the sample name and select **OK**.



15. After sample measurement, the spectrum will be displayed. Save or print the data.