



## Issue:

### How to use the absolute irradiance mode in SM32Pro

## Reason:

The absolute irradiance mode requires the irradiance calibration file that was provided by SP along with the spectrometer. Without the irradiance calibration data, the software will not give proper irradiance measurement data. To get into the absolute irradiance mode, some configuration setup must be completed first.

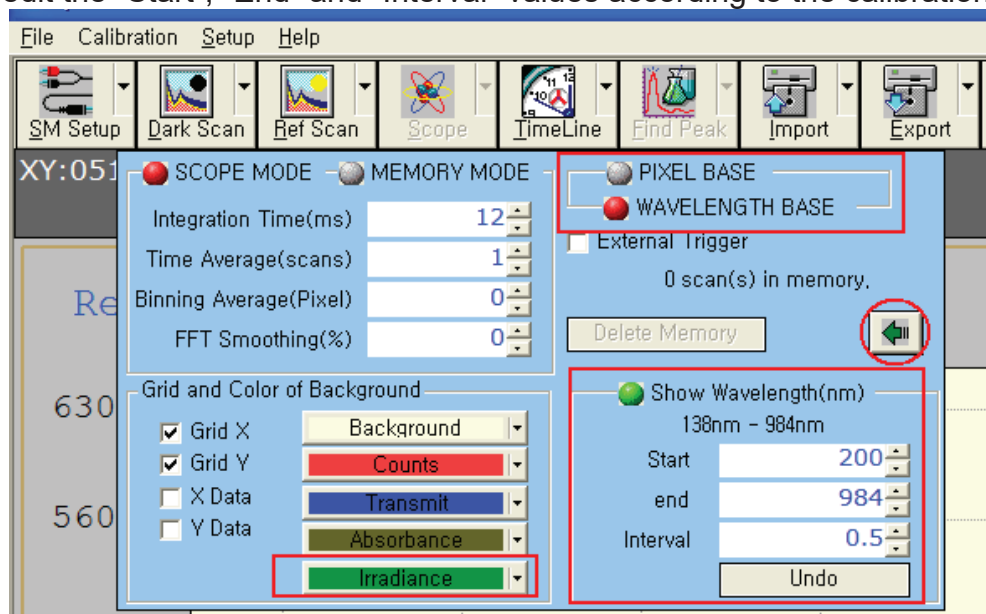
## Procedure:

### 1. Absolute irradiance activation in the ini file

The spectrometer ini file, SM32ProX.ini contains the setup keyword to activate the absolute irradiance mode. If the spectrometer was radiometrically calibrated at SP, the proper keyword setting would have been entered into the ini file provided by SP. If the spectrometer was calibrated somewhere else, the user has to change the keyword setting value manually. Under the [Extend Options] in the ini file, change the current "InitPane" setting value to "12" to activate the absolute irradiance mode. If there's no "InitPane" keyword, then put "InitPane=12" somewhere under the "[Extend Options]".

### 2. Change "Pixel base" mode to "Wavelength base" mode

After running SM32Pro, first click the black arrow button next to the "SM Setup" toolbar" to change the mode. To activate the absolute irradiance mode, the display mode must be "Wavelength base" mode. Click the WAVELENGTH BASE radio button in the pop-up dialog. If you click the dark green button at the lower right corner, you can extend the dialog to set other values. After extending the window, click the "Show Wavelength(nm)" radio button and edit the "Start", "End" and "Interval" values according to the calibration data range.



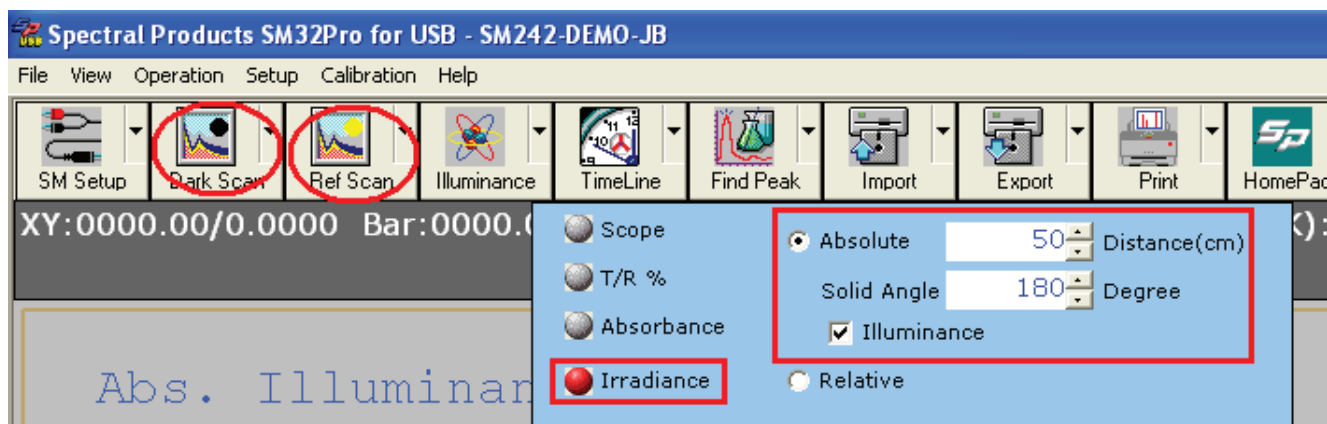


If you want to change the line color, click the color setting button.

### 3. Activate the irradiance mode

After setting the values in the “SM Setup” toolbar, click the “Dark Scan” button next to the SM Setup button under the “dark” condition. “Dark Scan” is very important to set the base line (0.0 uW/cm<sup>2</sup>/nm, irradiance) in the irradiance mode. Then Click the “Ref Scan” button next to the “Dark Scan”. This “Ref Scan” is important for the T/R mode or Absorbance mode but in irradiance mode it is only for activating the “Scope” button next the “Ref Scan”. After the “Scope” button is activated, click the black arrow next to the “Scope” and choose the “Irradiance” radio button. The “Relative” and “Absolute” selection buttons will appear when the “Irradiance” is chosen. Click the “Absolute” button and set the distance from the light source to the spectrometer in centimeter scale and the solid angle of the light beam from the light source.

For the solid angle, you can give from 0 to 360 in degree scale. It means the projected angle onto 2-D plane of the spatial 3-D dimensional real solid angle. If you check the “Illuminance” check box the SM32Pro will show the calculated light values in photopic illuminance scales, like Lux/nm or Lumen. If not, it will show the values in spectroscopic irradiance scales, like uW/cm<sup>2</sup>/nm or Watt.



In the calculated data pane, you will see the “Color temperature” of the light source in Kelvin degree, the lux or irradiance, and total lumen or total power.

#### 1. In Illuminance mode:

XY:0724.28/5.5817 Bar:0000.00/0.0000 Memory:0000/0000 Color Temp. (K):05155 Total Lux (lux):421.109 Total Lumen(lm):661.477

#### 2. In Irradiance mode:

XY:0000.00/0.0000 Bar:0000.00/0.0000 Memory:0000/0000 Color Temp. (K):05590 Total Irrad. (uW/cm<sup>2</sup>):430.478 Total Power (uW):676.193



#### 4. Set the Y-axis scale.

Scope ☐ Absolute 100.0 Distance(cm)  
T/R % Solid Angle 180.0 Degree  
Absorbance ☐ Illuminance  
Irradiance ☒ Relative  
Max: 3.00 (uW/cm<sup>2</sup>/nm) Min: -0.10 (uW/cm<sup>2</sup>/nm)

There are two ways to change the Y-axis scales. One is changing the max/min values on the display mode change pop-up dialog. The other is setting these max/min values manually. The first one is easy by just put the number or clicking the spin (up/down arrows) button (ref, figure above). The manual setting is related to the ini file editing. After closing the SM32Pro, open the ini file (SM32ProX.ini) again and locate the “MaxI” keyword under the [Extend Options]. If there is no “MaxI” keyword, SM32Pro will set 3.0 (uW/cm<sup>2</sup>/nm) as a default. If you want to change the Y-axis scale, enter the “MaxI” keyword and give some proper number, like “MaxI=10.0”. After saving the ini file, re-run the software and follow the 3<sup>rd</sup> step again.