

MIIPS[®] 2.0 Software Notes

How to clear/load the compensation mask

Revision 1.0
November 2014

1. Introduction

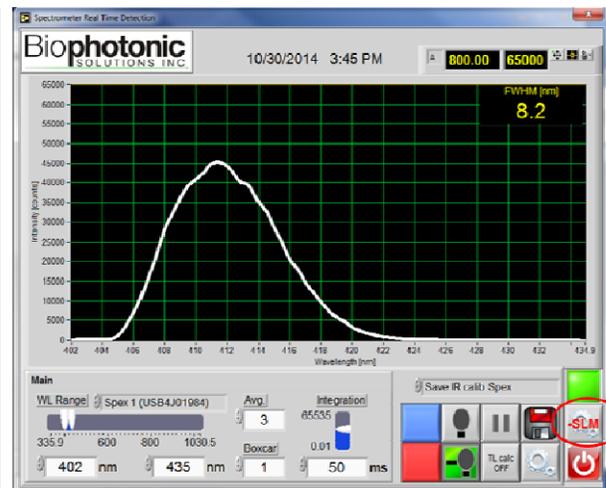
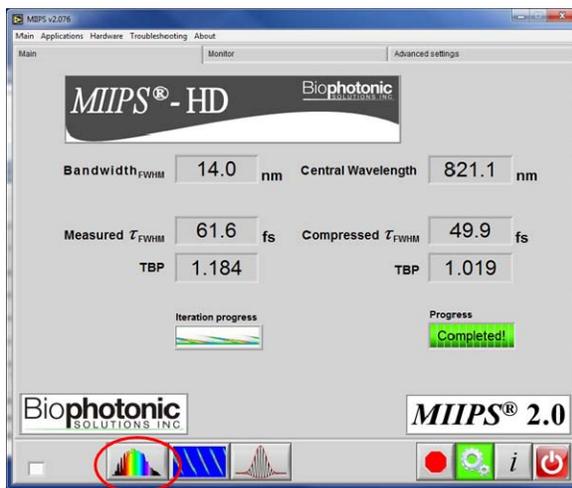
Typically, the dispersion compensation mask is automatically applied upon the successful completion of a MIIPS[®] scan. For many different reasons though, the user might find it necessary to either cancel the applied mask or load one manually. The user might also want to add some phase mask on top of the dispersion correction to produce an optical waveform other than a transform-limited pulse. These notes provide brief guidelines on how to do so.

2. How to clear the applied compensation mask

One way to reset the applied mask to a zero phase ($\text{Ph}=0$ across all SLM pixels) is to use the “Spectrometer Real Time Detection” interface. It features a set of SLM controls and provides an instantaneous feedback by showing the effect of the modified mask on the monitored spectrum.

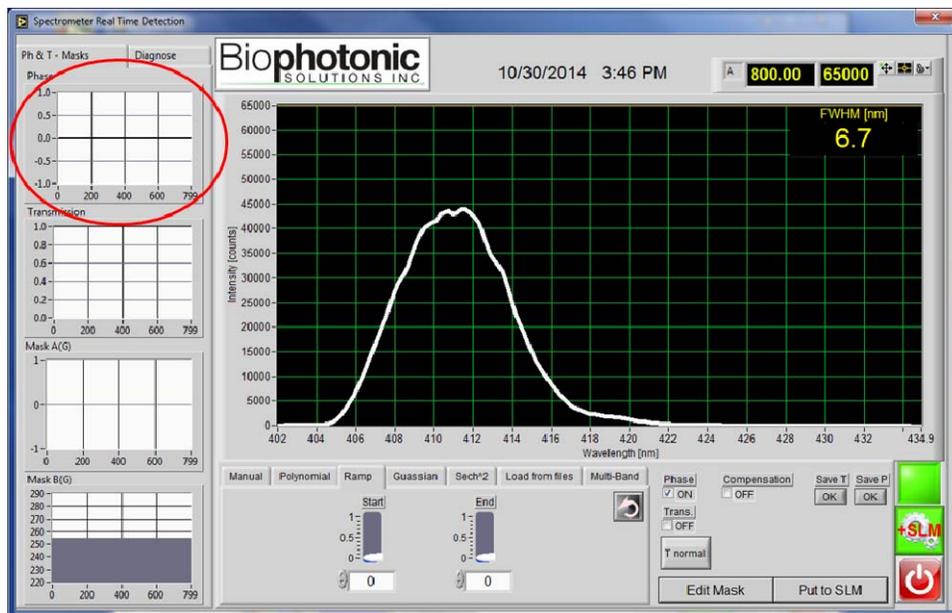
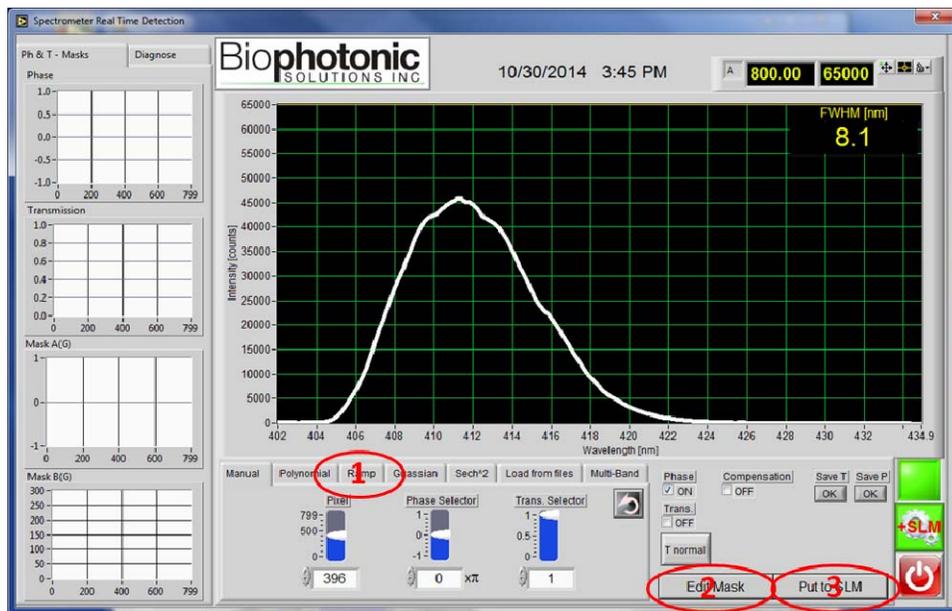
To enter the “Spectrometer Real Time Detection” window, press  on the tool bar of the MIIPS[®] 2.0 software. The start-up window gives access to the spectrometer controls and hides the interface that relates to the communication with the SLM/shaper.

Click the “SLM control” button  to access the SLM controls.



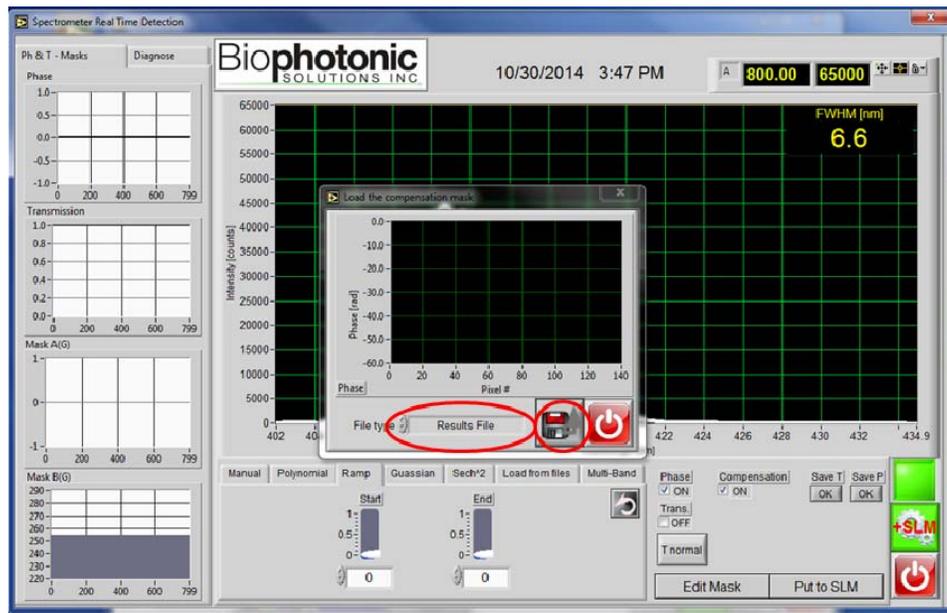
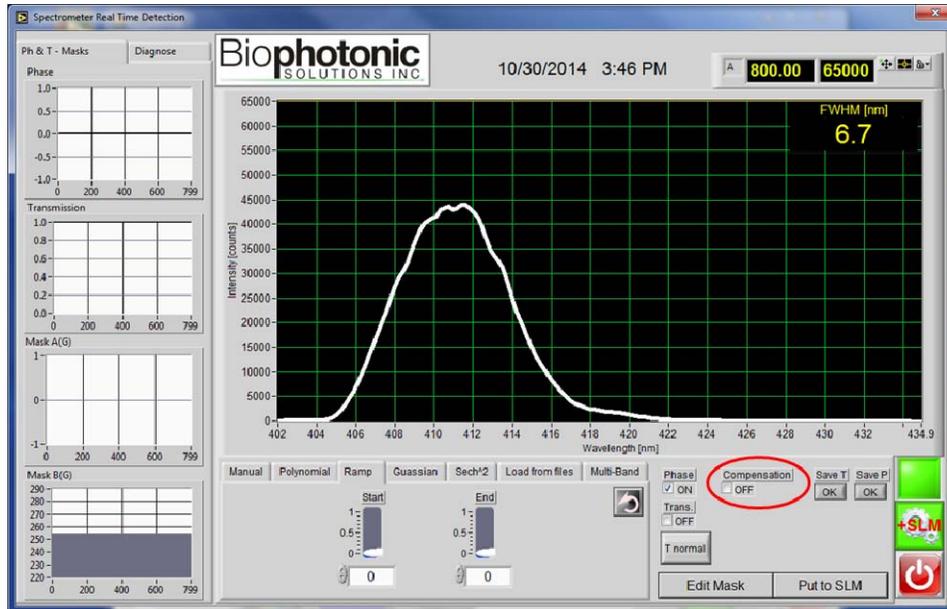
Upon initialization of the “SLM Controls” panel, the controls are set to work only with the phase (“Phase” checkbox is ON; “Trans.” checkbox is OFF) and the function tab is switched to “Manual”. The user is to review and modify these default settings for the task to be performed.

To generate the zero phase across the entire SLM array, switch to “Ramp” tab and confirm that the “start” and “end” values are set to zero. Then, press the “Edit Mask” button. The desired mask will be calculated and plotted. Once the “Put to SLM” button is pressed, the mask will be written to the SLM and activated. If the prior phase mask is different, one should see the effect of the applied zero phase mask on the SHG spectrum generated by the shaped laser pulses.



3. How to load and apply a compensation mask

The dispersion compensation mask can be loaded from a file using the same interface as in section 2. To do so, click the “Compensation” checkbox as shown below.



The pop-up window that would follow gives two different options to load the compensation mask. One of them is to read the compensation mask from the “Results File” that summarizes the outcome of a MIIPS scan. This option is recommended if the user would like to use the “best compensation mask” picked by the software upon the scan completion.

The other option is to read the compensation mask from a “comp*.txt” file, which has a simple two-column format (phase vs. SLM pixel wavelength). The user can either load a compensation mask from some specific MIIPS-scan iteration or from a user-generated ASCII file, compiled in the same format.

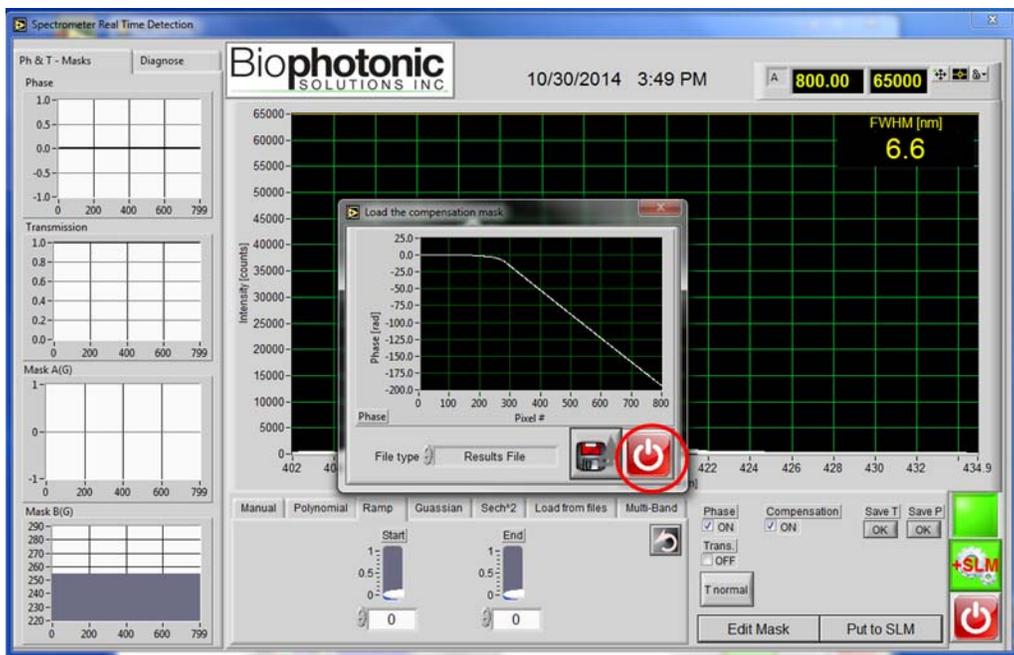
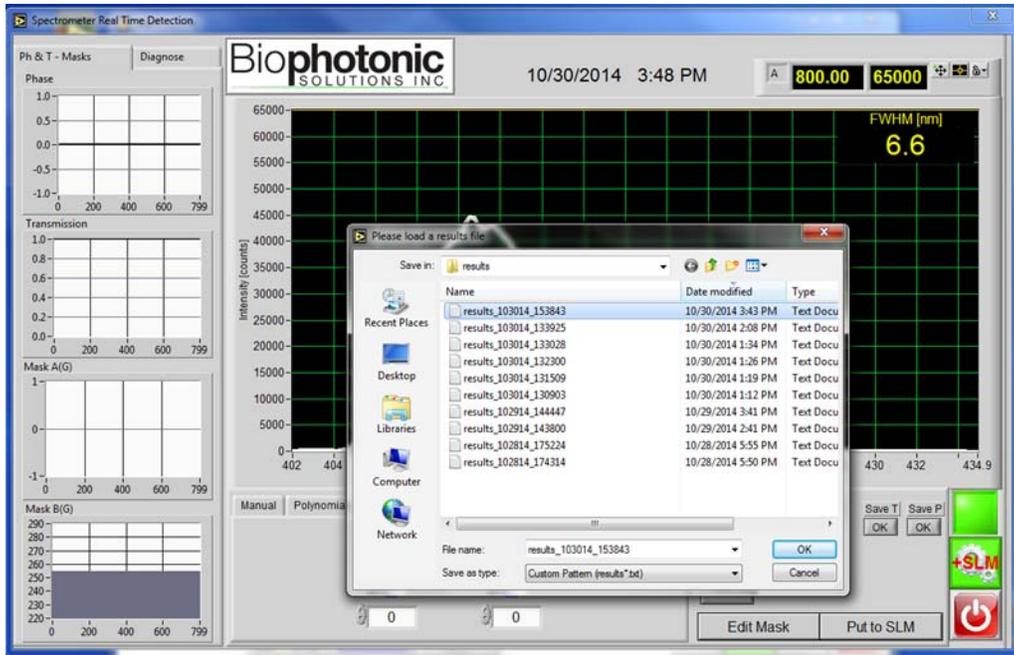
Please note that the wavelength values should match the corresponding SLM pixels and the total number of points should match the total number of SLM pixels.

If the “Results File” option is selected, the program will look for the file in the “results” sub-folder (the default path is C:\shaperdata\results\). The file name format is:

results_MMDDYY_hhmmss.txt,

where YY – year; MM – month; DD – day; hh – hour; mm – minute; ss – second.

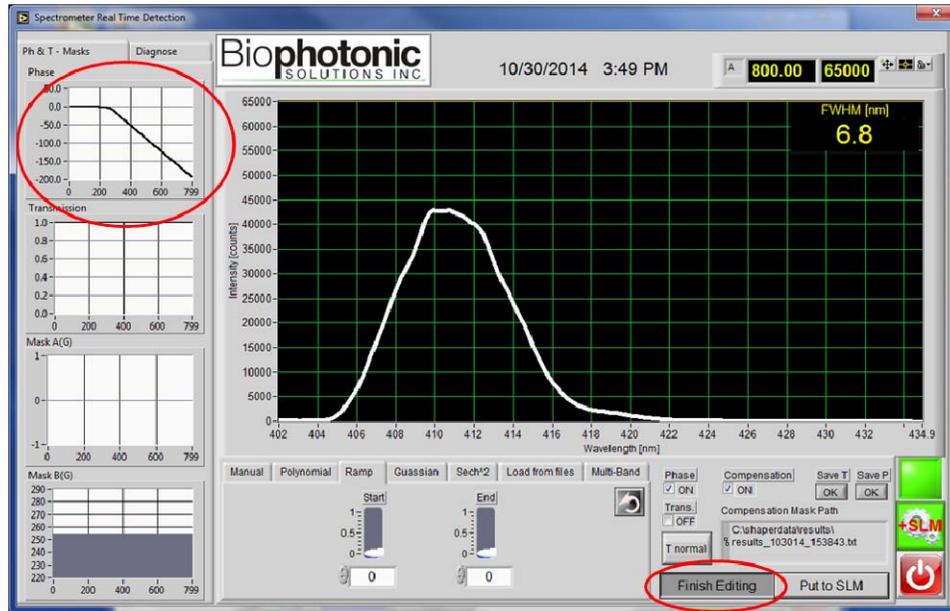
Once the phase mask is uploaded, click the exit button to return to the “Spectrometer Real Time Detection” window.



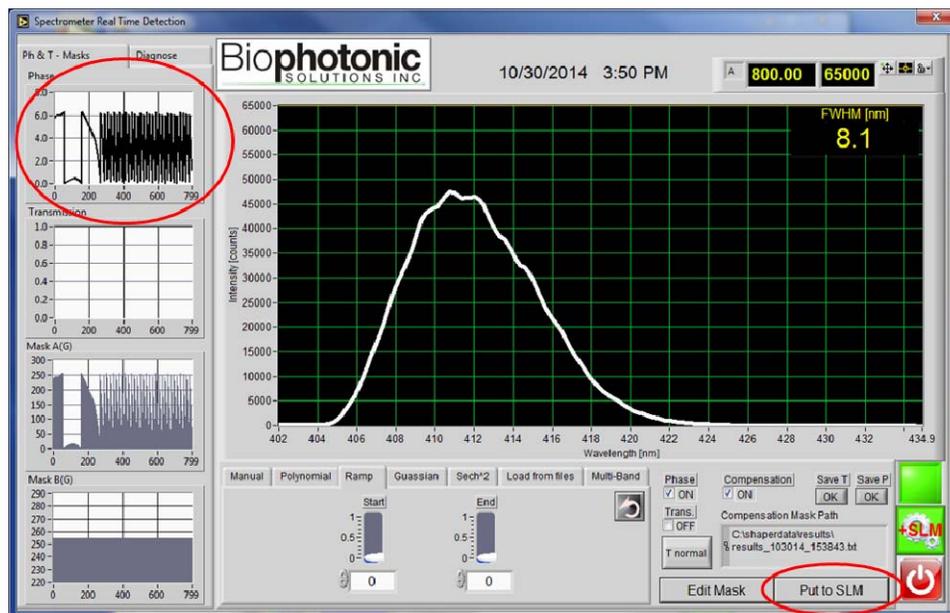
At this point, the user can choose to either apply the phase compensation mask alone or add some mask on top of it using one of the tab functions; e.g., using the “Polynomial” tab.

To ensure that no other mask is written on top of the loaded compensation mask, switch to tab “Ramp”, confirm that the “start” and “end” values are zeros and only checkbox “Phase” is ON (“Trans.” checkbox is OFF).

Press the “Edit Mask” button to calculate and plot the mask.



Press the “Put to SLM” button to write and activate the calculated mask.



Note that the plotted phase profile will change to reflect the offset and wrapping that fit the calculated mask into the liquid-crystal retardance range. Again, one should see the effect of the applied mask on the monitored spectrum (if applicable).