

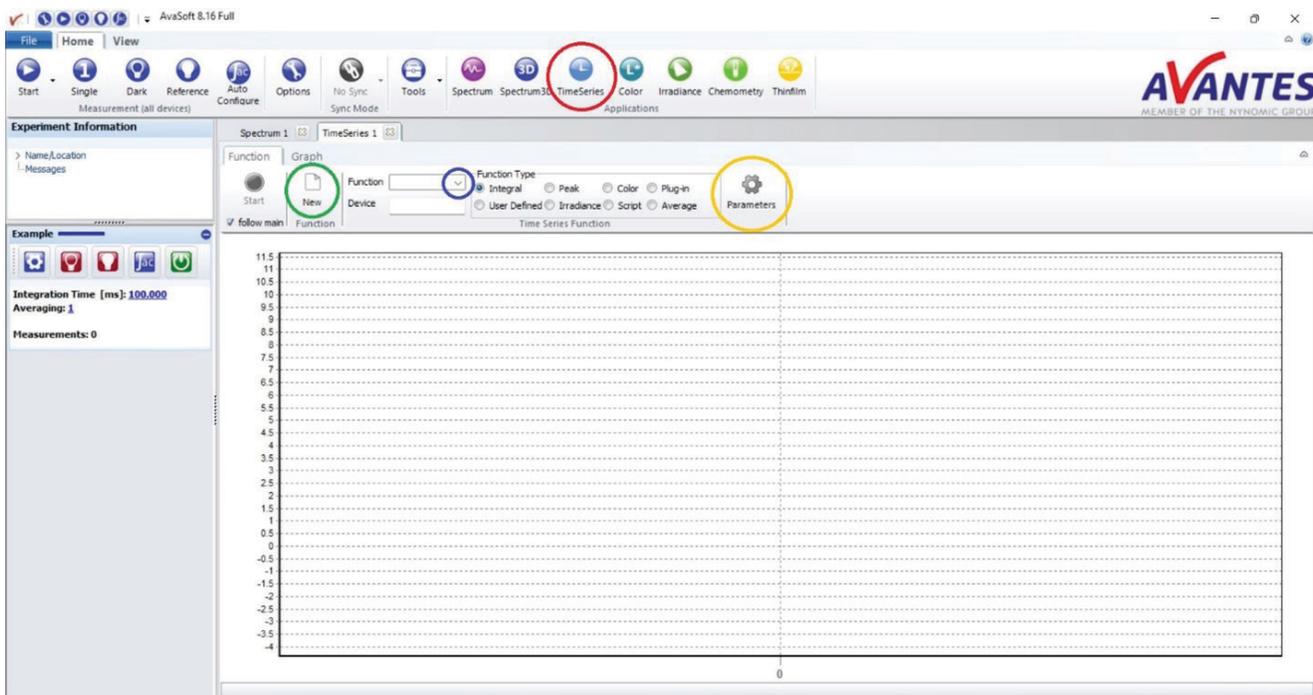
SPECTRAL TIPS AND TECHNIQUES: USING THE TIME SERIES MODULE IN AVASOFT 8 - BASICS



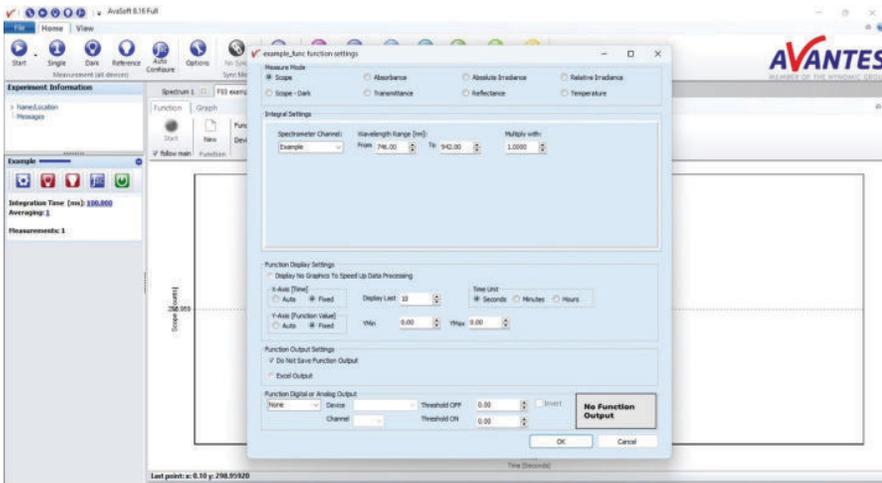
INTRODUCTION AND STEPS

In our last guide, we discussed utilizing the Spectrum3D module as a means of measuring and analyzing multiple spectra over a period of time. This module is an excellent tool for displaying multiple spectra over a period of time and performing simple analysis of a whole spectrum at a point in time or a single wavelength over a period of time. However, more complex analysis is not available in this module and requires additional post-processing. For example, one may wish to track the integral of a wavelength range over a period of time, or track where the largest peak occurs along with its intensity within a wavelength range. These options, along with more advanced functions and outputs, are available in the TimeSeries module. This module lets the user define a function in terms of integral, peak, average, and many other parameters to track over time. These values can be displayed over the whole measurement period, or a number of the most recent measurements can be shown and updated in real time. For more experienced users, this module can read in user scripts and functions, save data into an output file, and send analog and digital outputs based on the measurement data. Below is a short guide covering some of the basic functions of the TimeSeries module in AvaSoft 8. Future guides will cover more advanced techniques within this module.

The TimeSeries module is accessed by clicking the TimeSeries button at the top of the window (circled in red below). This will open a new tab labeled "TimeSeries 1" with no data. To create a new function, simply click the "New" button (circled in green below). This will open a window prompt to name the function. For this guide, the function will be named "example_func". This will auto-populate the window with a default data set and change the name of the TimeSeries tab to "F00 example_func". A different previously defined function can be chosen by clicking the down arrow to the right of the function name (circled in blue below). While the Device text will likely show "No Device selected" initially, this will be updated in the parameters of the function. To the right of this, the function type can be chosen as Integral, Peak, Color, Plug-in, User Defined, Irradiance, Script, and Average. In this guide, the Integral, Peak, and Average types will be covered, while the other types will be covered in future guides. The parameters of the function can be set and adjusted by clicking the "Parameters" button to the right of the Function Type (circled in orange below). This window will automatically open if a different function type is selected.



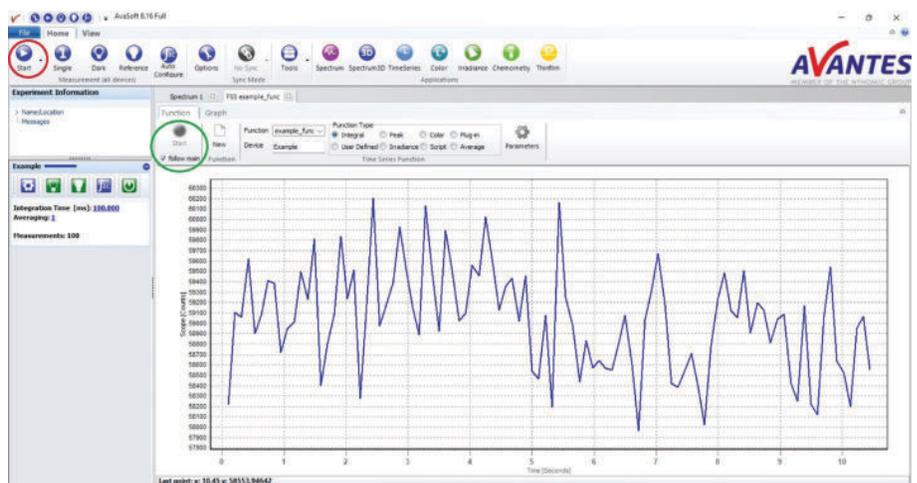
In the Parameters window, the Measure Mode can be selected at the top, with available options including Scope mode, Absorbance, both Absolute and Relative Irradiance, and even the detector or electronics board Temperature in the User Defined function type. The Integral function type is shown below, with the Integral Settings directly below the Measure Mode portion. Here, the wavelength range of the integral can be set, and a multiplication factor can be added to the final integral value. The spectrometer channel can be used to select a different spectrometer if using multiple spectrometers. The Function Display Settings has adjustments for the X- and Y-axes, along with an option to not display the graph to speed up processing time. The default setting for the axes is Auto, which will update the X-axis scale to display every measurement and the Y-axis scale to contain the maximum and minimum function values. If Fixed is selected for the X-axis, the last n measurements will be displayed in the X-axis, with n being the number of measurements defined by the user. The time unit can also be adjusted to seconds, minutes, or hours. If Fixed is selected for the Y-axis, the range of the Y-axis can be set by the user. The Function Output Settings and Function Digital or Analog Output parameters will be discussed in a future guide.



Minor differences can be seen in the Peak and Average function types. For the Peak function type, the "Multiply with:" section is replaced by a "Peak Output" section where the user can select if the peak wavelength or peak intensity within the wavelength range is measured and tracked. For the Average function type, no additional setting is available, as this function takes an average value of the measure mode over the wavelength range.

With the parameters finalized, click OK to exit this window. Now, as soon as measurements are started by clicking the "Start" button (circled in red below), the TimeSeries window will populate with data from the defined function in real time. This data will stop when measurements stop and will populate with new data as soon as a new measurement is started. This synchronization can be disabled by unchecking the "follow main" box (circled in green below). This will cause the start/stop button located above the "follow main" box to no longer be locked, and TimeSeries data can be started and stopped independently from the measurement start and stop.

With these steps complete, a much wider variety of data can be measured and analyzed over a period of time compared to the Spectrum3D module.



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