

SmatterPlot v1.0

Help Files and Documentation

David Shackleford

8/17/2024

Introduction

SmatterPlot is a small, easy-to-use, versatile app for creating instant charts. The user only needs to drag-and-drop or copy-and-paste their data into the SmatterPlot window and the chart appears instantly. The user can then customize the chart with only a few clicks and can then export the chart image in whatever format they need.

SmatterPlot is intended to make charting easy for anyone ... students and teachers, scientists and engineers, business professionals or small business owners. Obviously, people who already make charts often will already have other software tools for this, but SmatterPlot may offer a quicker way to get a good chart with minimal effort. Less experienced chart makers will probably the most benefit from the quick download and minimal learning curve.

Under Development

SmatterPlot is not quite ready for prime time -- I'm still working on it. But you might find it useful, and you are welcome to try it out now.

Features Planned

SmatterPlot will have a lot of features designed to make everything quick and easy. When it's finished it will be the quickest way to make a plot from data whether it is in spreadsheet or simply copied from the web.

Some planned Features include:

- Instant chart with drag-and-drop or copy-and-paste.
- AI-based chart design selection, so the user doesn't have to choose all the chart features -- they are just there immediately.
- Instant title, axis and series labelling based on context.
- Open data from a wide range of formats (.xlsx, .csv, .txt, etc.)
- Generate charts in a wide range of image formats (.png, .jpg, .svg, .pdf, etc.)
- Instant unit conversions right in the chart.
- Instant zoom, pan, and resize.

- Easy customization of colors, styles, sizes, symbols, lines, etc.
- Easy sequencing of series with color, symbol, and line grouping.

Available for Many Platforms

SmatterPlot is being developed in FreePascal which enables us to write code once and then compile versions of it for many different operating systems. When complete, SmatterPlot will be available for Windows, MacOS, Android, IOS, ChromeOS, Linux Ubuntu, and Raspberry Pi.

Questions or Comments?

Please contact us at david@smatterplot.com.

Getting Started

Download SmatterPlot

SmatterPlot is a small, easy-to-use, versatile app for creating instant charts. But first, you need to get the app installed on your device. It should be available in your app store, but you can always download it from the SmatterPlot website here (www.smatterplot.com) or from the SmatterPlot GitHub page here (<https://github.com/offer8Simple/SmatterPlot>).

Open the App

SmatterPlot when first open will look like this:

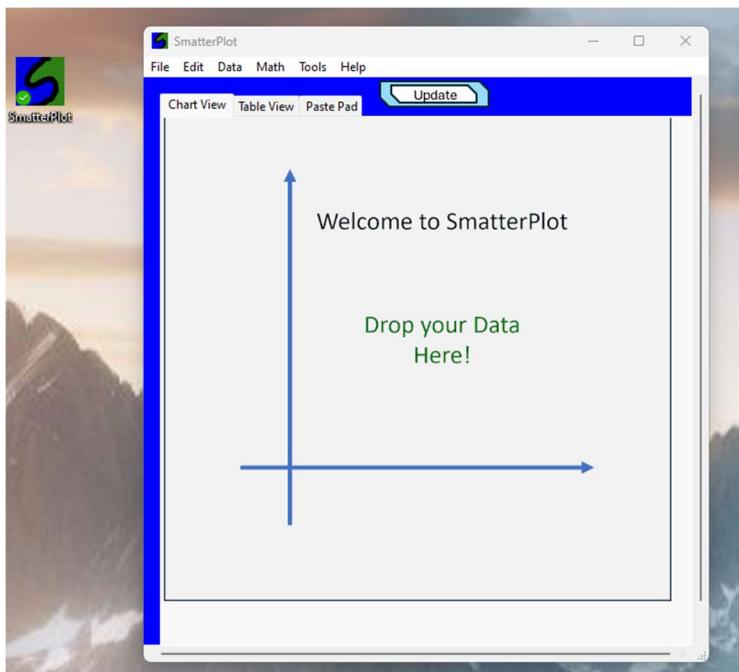


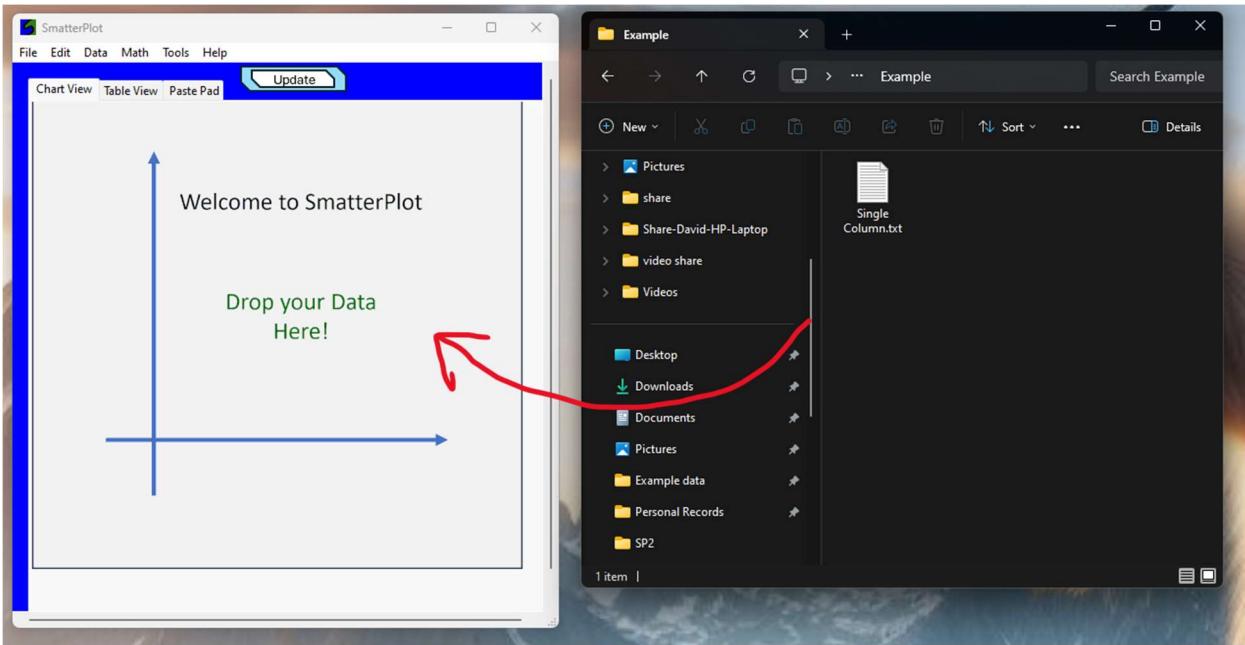
Figure 1: SmatterPlot when first opened.

Add Some Data

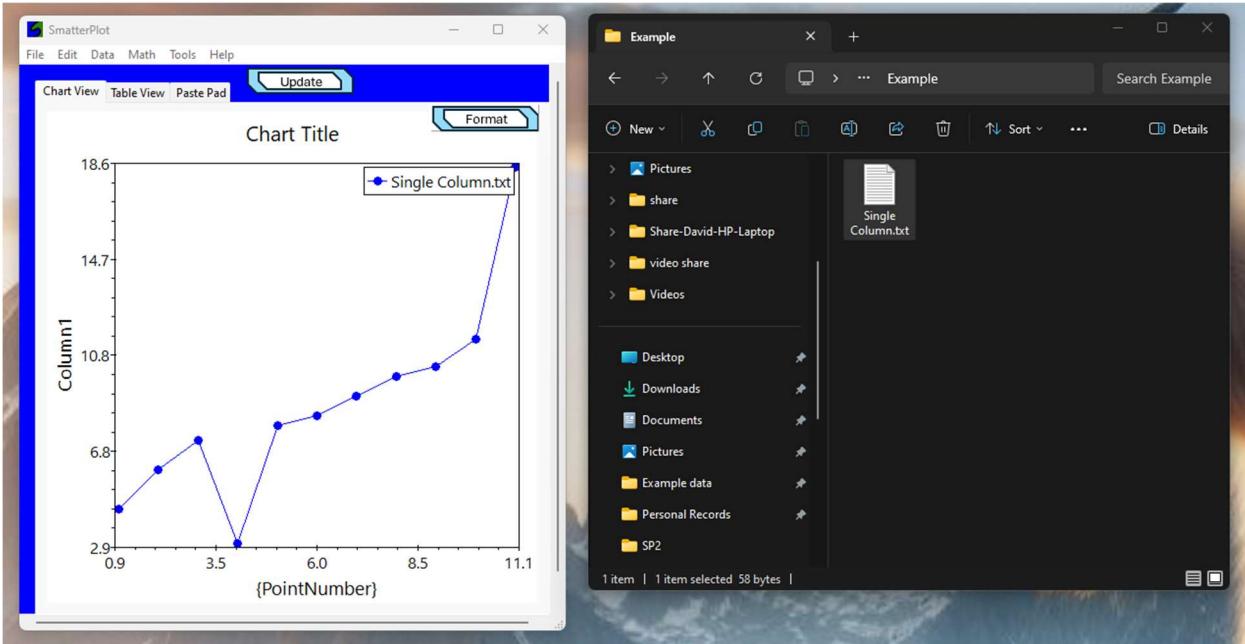
SmatterPlot isn't very useful until we add some data. There are four easy ways to do that:

1. Drag-and-Drop Data Files
2. Open Data Files Using the Menu
3. Copy-and-Paste Data in the Paste Pad
4. Type in your Own Data

To drag and drop a data file, just find the file you want on your device and drag-and-drop like this:

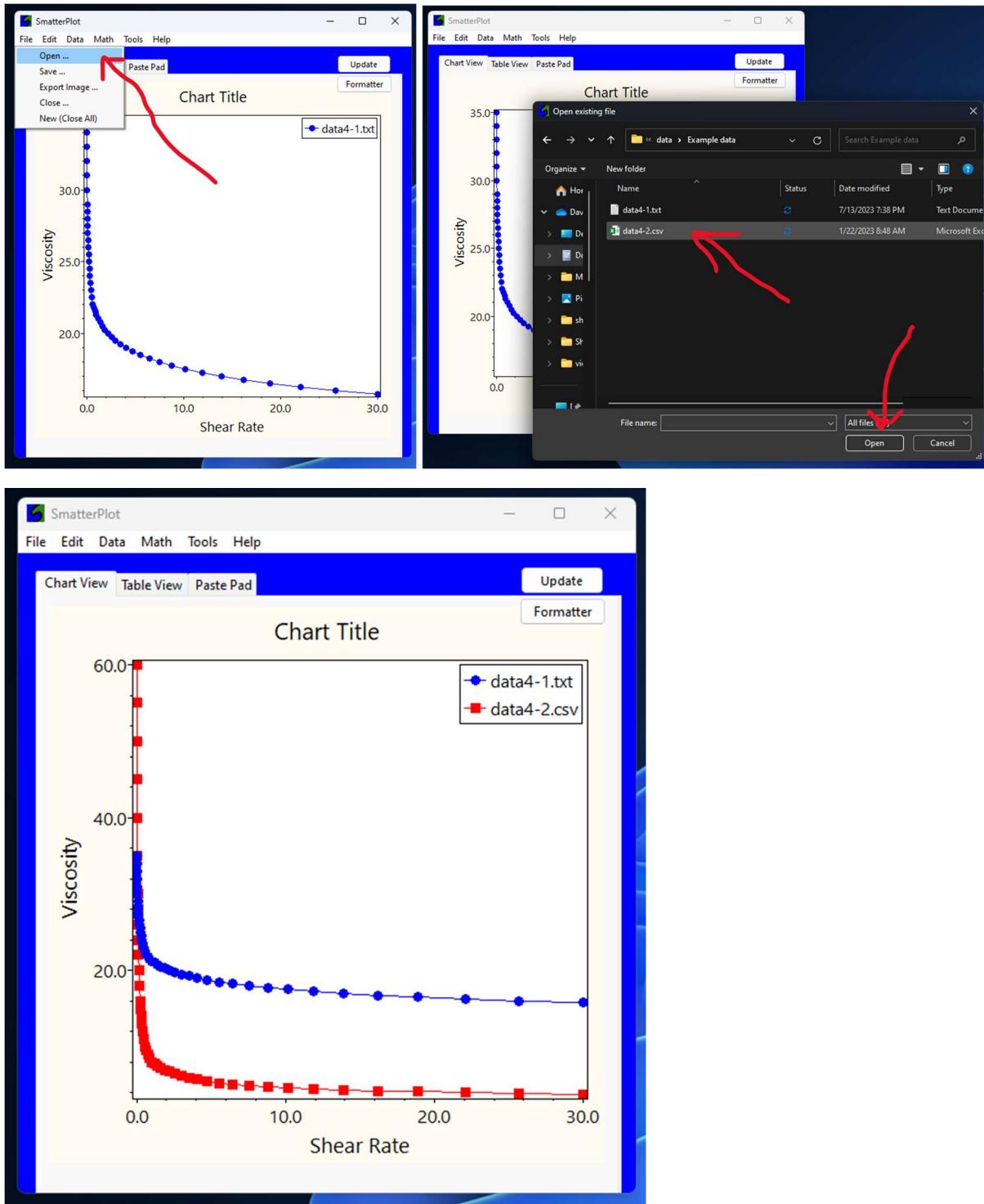


That's it! The datafile will open in SmatterPlot as a chart!



You can drag-and-drop multiple files at the same time. The files can be in wide range of formats such as text files (.txt or .csv) or spreadsheets (.xls or .xlsx).

If you would rather pick the file to open from the file menu you can do that too. Click on "File" and "Open ..." and then pick the file you want to open from the Open Dialog Box. The new file will overlay with whatever datasets are already open.



You can also copy and paste data from another application or maybe something interesting you found on the internet.

Box Office Mojo
<https://www.boxofficemojo.com> › top_lifetime_gross

Top Lifetime Grosses - Box Office Mojo

Rank	Title	Lifetime Gross	Year
1	Avatar	\$2,923,706,026	2009
2	Avengers: Endgame	\$2,799,439,100	2019
3	Avatar: The Way of Water	\$2,320,250,281	2022

[View 197 more rows](#)

Just select the table and click "Copy" or in Windows you can use "Ctrl+C":

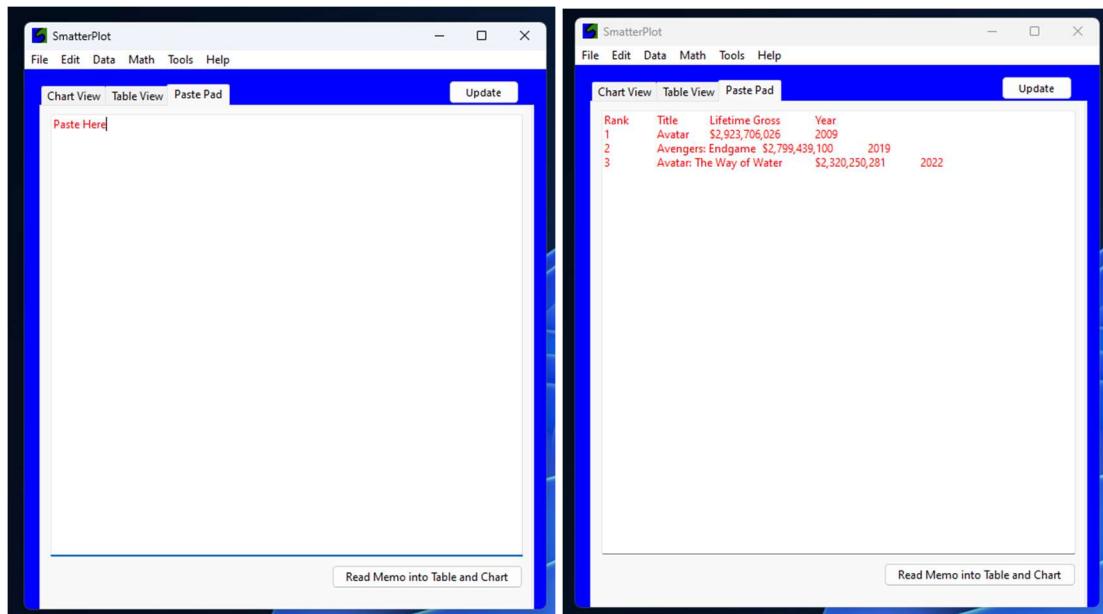
Box Office Mojo
<https://www.boxofficemojo.com> › top_lifetime_gross

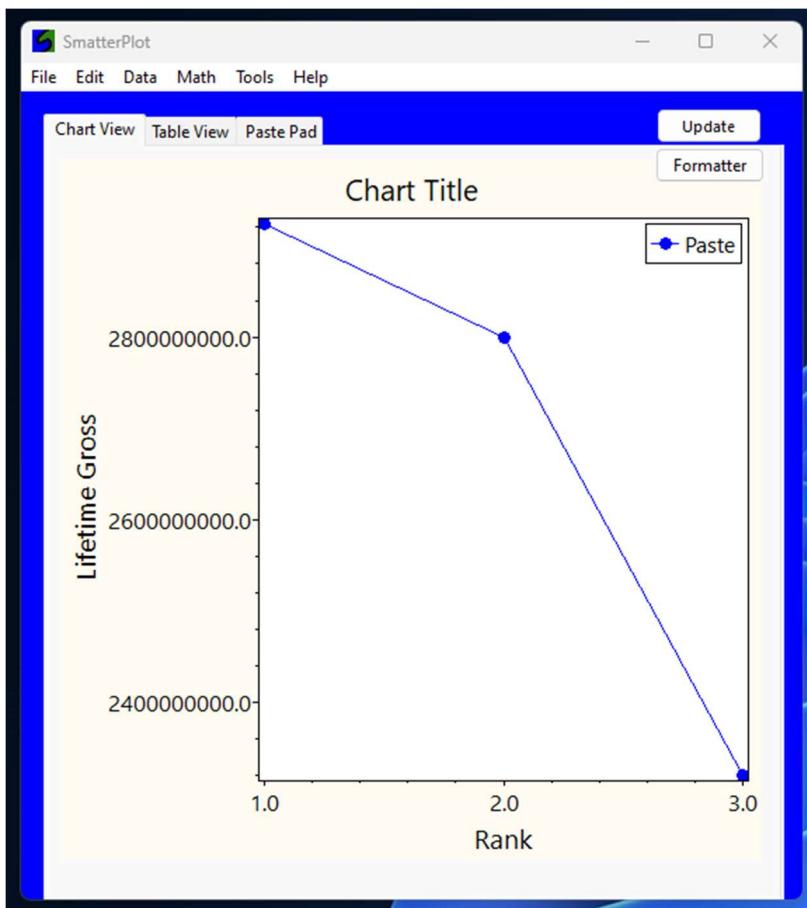
Top Lifetime Grosses - Box Office Mojo

Rank	Title	Lifetime Gross	Year
1	Avatar	\$2,923,706,026	2009
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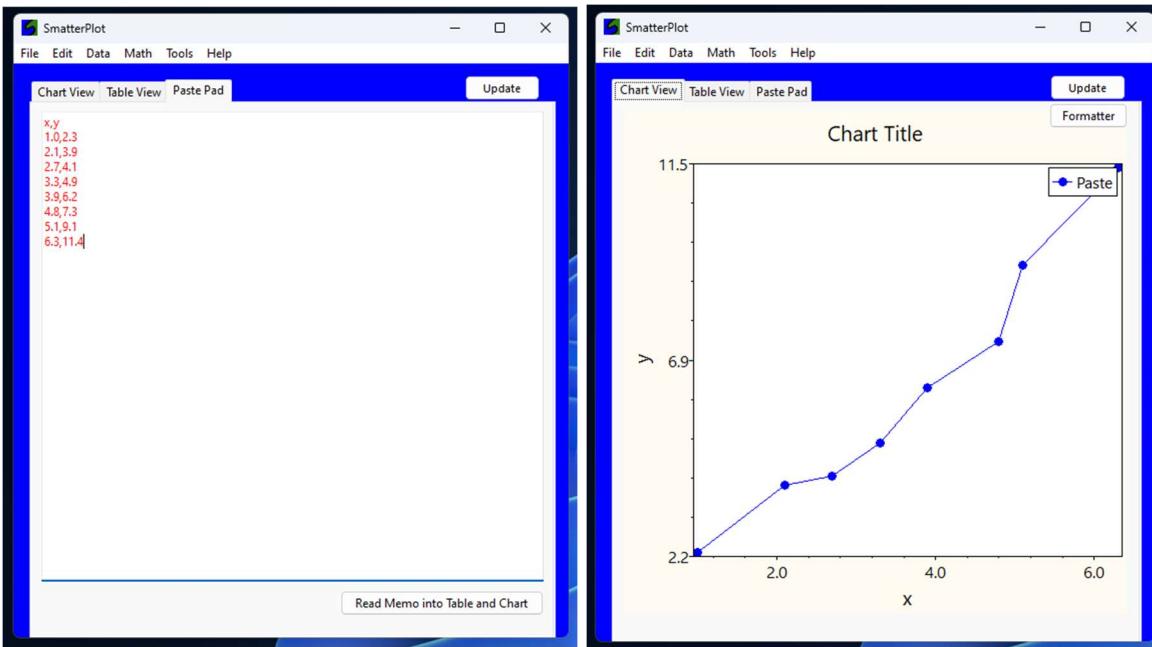
[View 197 more rows](#)

Then go back to SmatterPlot, click on the "Paste Pad" Tab and paste the table of data in the paste pad, either by clicking "Paste" under the edit menu or by hitting "Ctrl+V". You can edit the table if you need to and then click "Read" to put the dataset in the chart. It's that easy.





The last method is to type in the data using the paste pad. For example, you can type in this little table below. You can then click the “Read” button and it will plot your data!

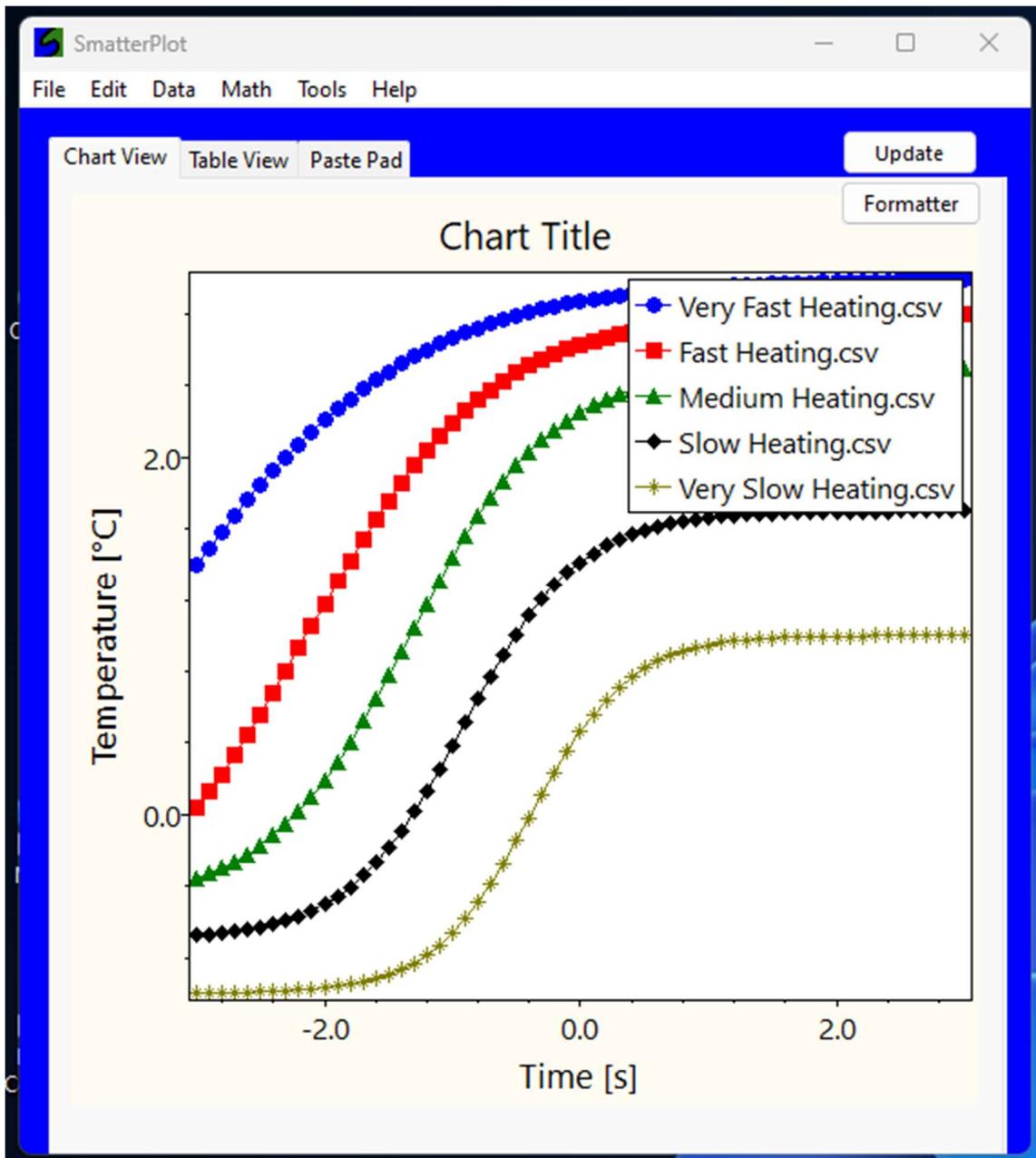


You can separate your columns with commas or tabs – either will work. You can add a header row, with column headings like “x” and “y”, but it’s not necessary.

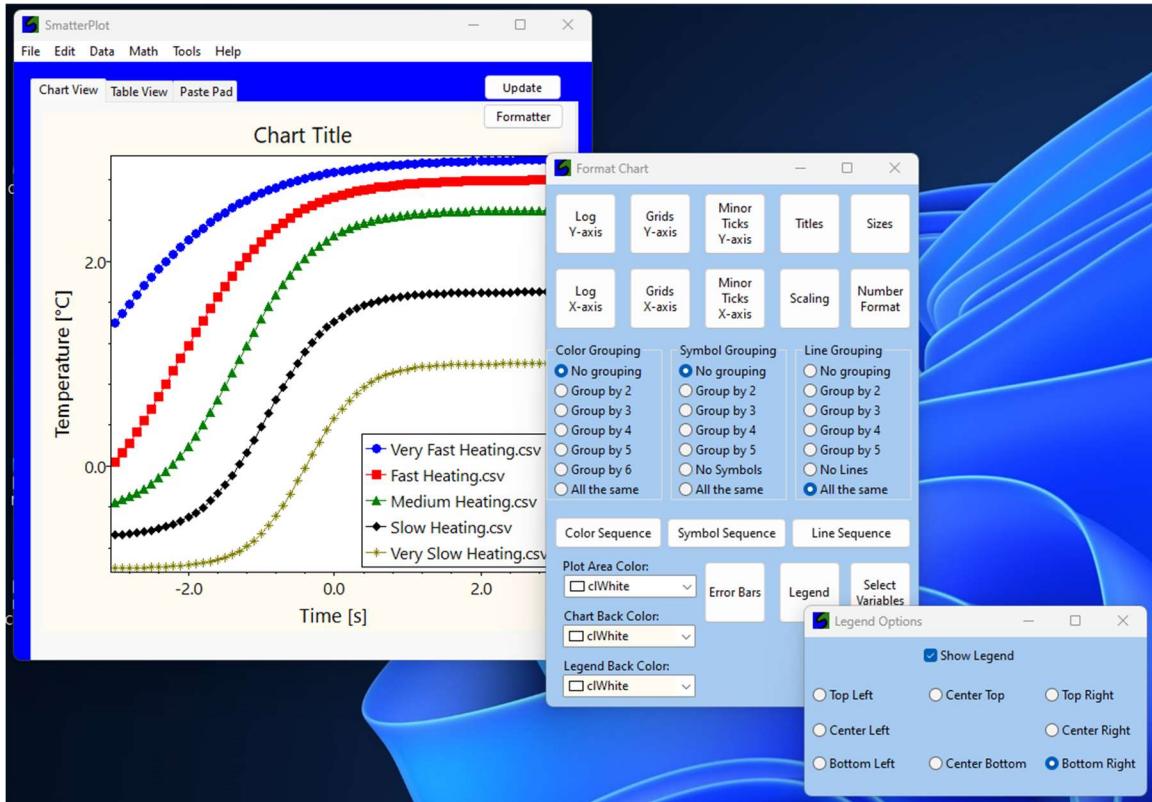
Formatting Your Chart

The Chart Formatter

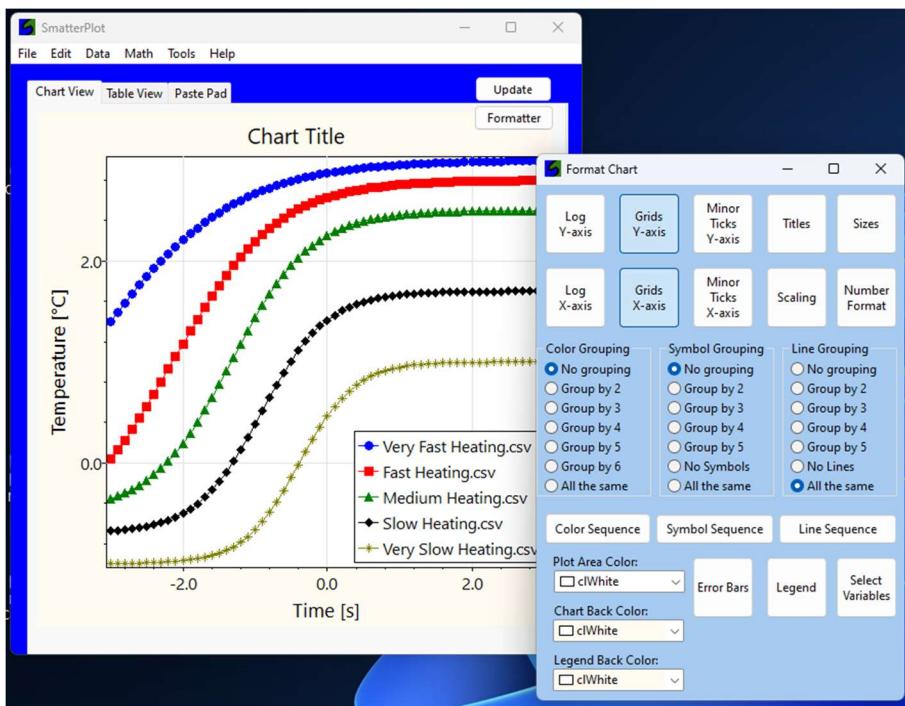
SmatterPlot automatically creates a chart to plot your data and automatically formats it so that you don't have to make too many decisions unless you want to. But of course, you may want to customize the formatting so that it makes your point clearer. Let's work through an example. In the examples folder there are five data files with different heating rates. Drag-and-Drop them into SmatterPlot to make a chart – This is what you get by default:



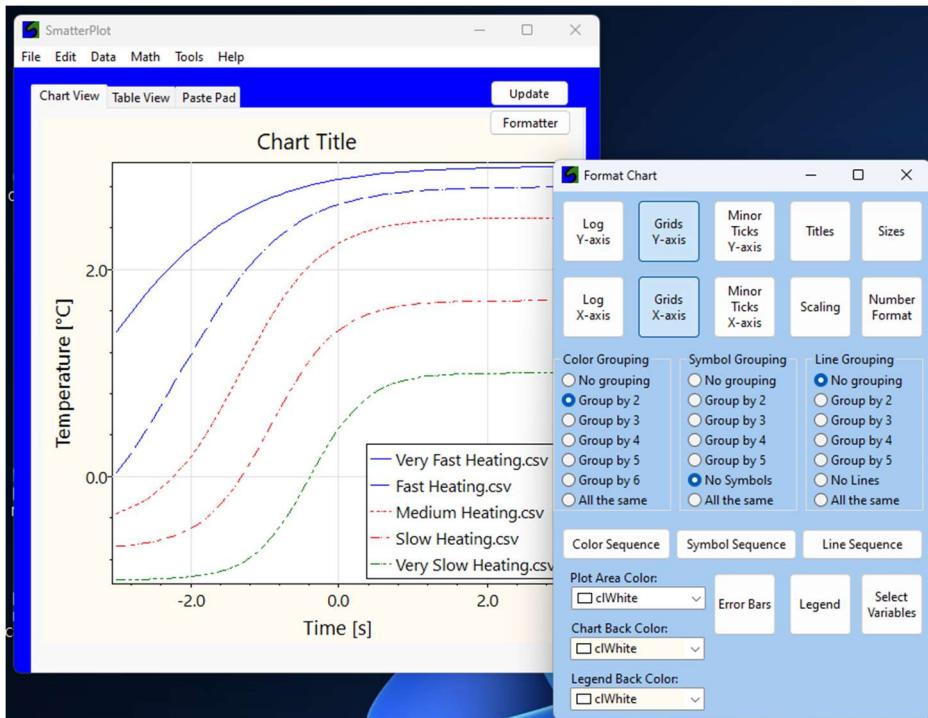
It actually looks pretty good already but you might want to change a few things. Open the chart formatter by clicking the “Formatter” button. Click the “Legend” button and then click the “Bottom Right” radio button to move the legend out of the way:



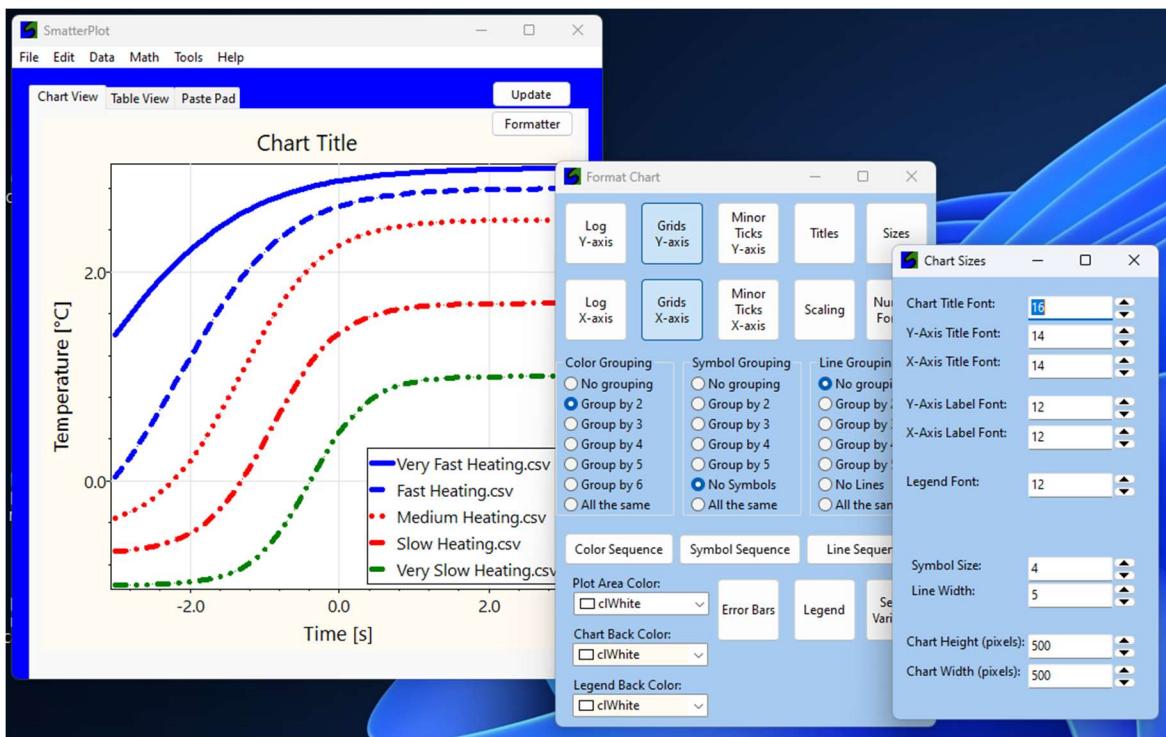
Then click the Grid lines button to toggle them on and off.



Now Customize the Color Sequence by clicking Group by 2 under color grouping. Click no symbols and then click No grouping under Line grouping.



Maybe the lines are too small to see clearly – lets increase their width by clicking "Sizes" and then clicking the up arrow next to the line width.



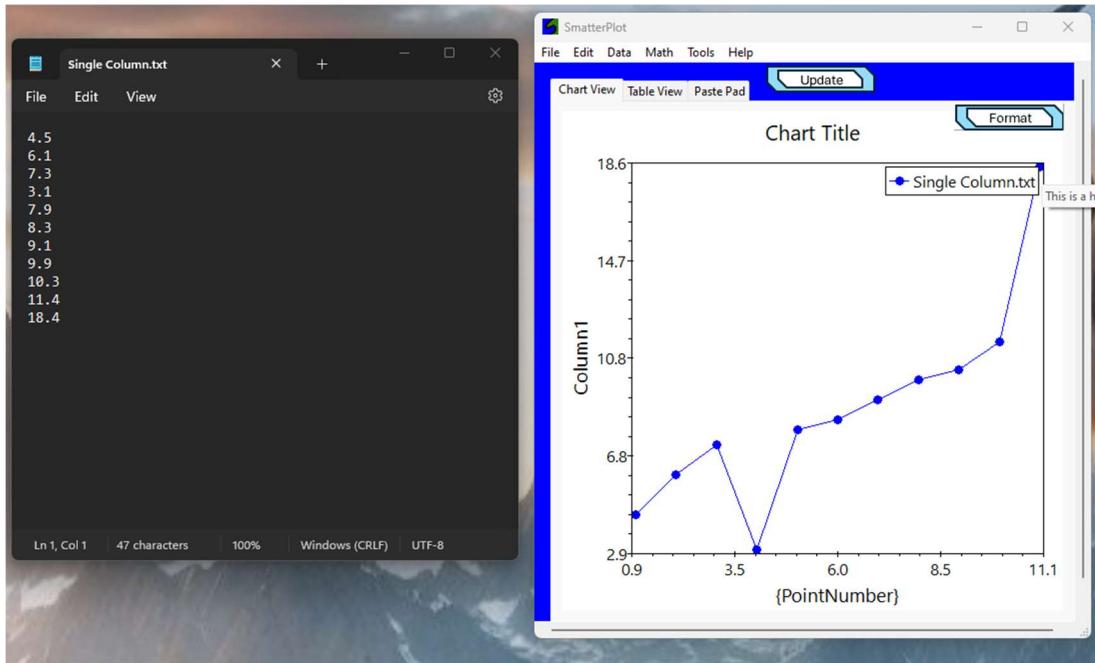
Now let's increase the size of the fonts and then change the chart title to something more meaningful by clicking "Titles". We can delete the ".csv" from the chart legend and then we get a chart that looks like this:



This is just a quick overview, but the point is that you can customize the chart in only seconds and produce a chart that is very presentable without painful effort.

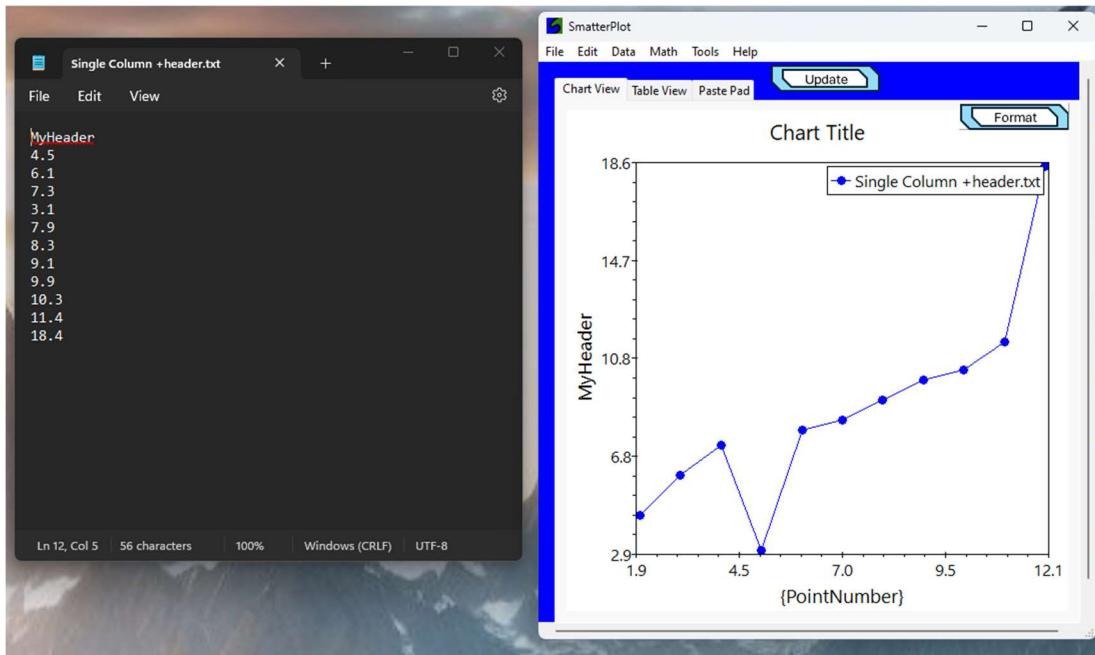
Preparing Your Data for a Chart

You can enter data into SmatterPlot in many ways and it is designed to recognize a range of different formats and structures. The simplest would be just to make a column of numbers in a text file like this:

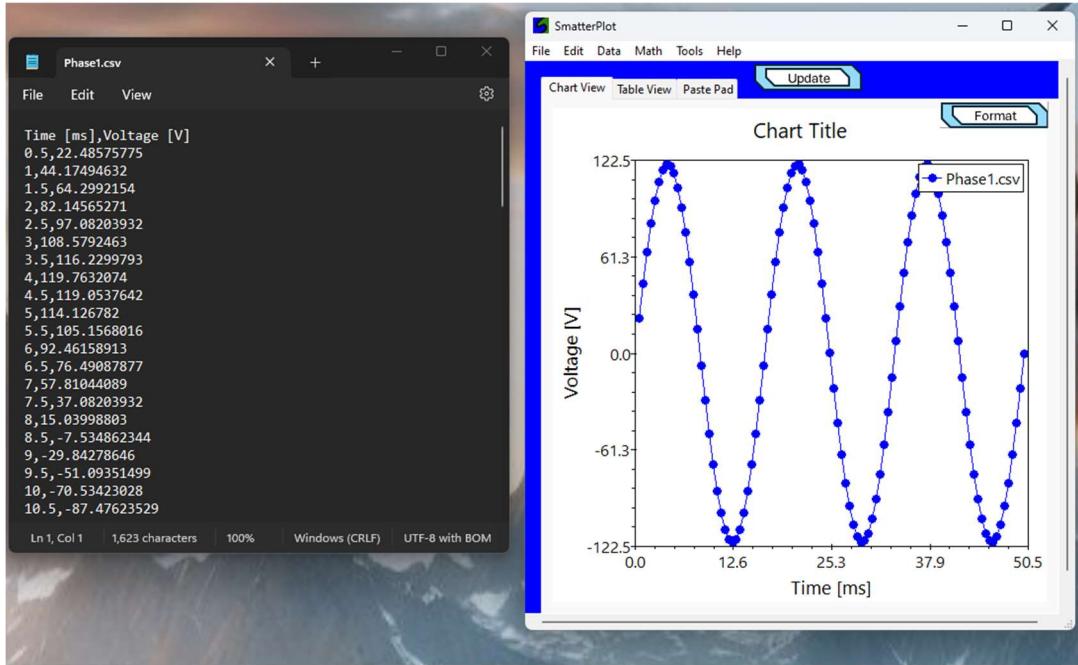


Here there is no header row so the data is labeled as “column1” and there is only one column so that column is plotted as the Y-axis values, with the row numbers or {PointNumber} serving as the X-axis values.

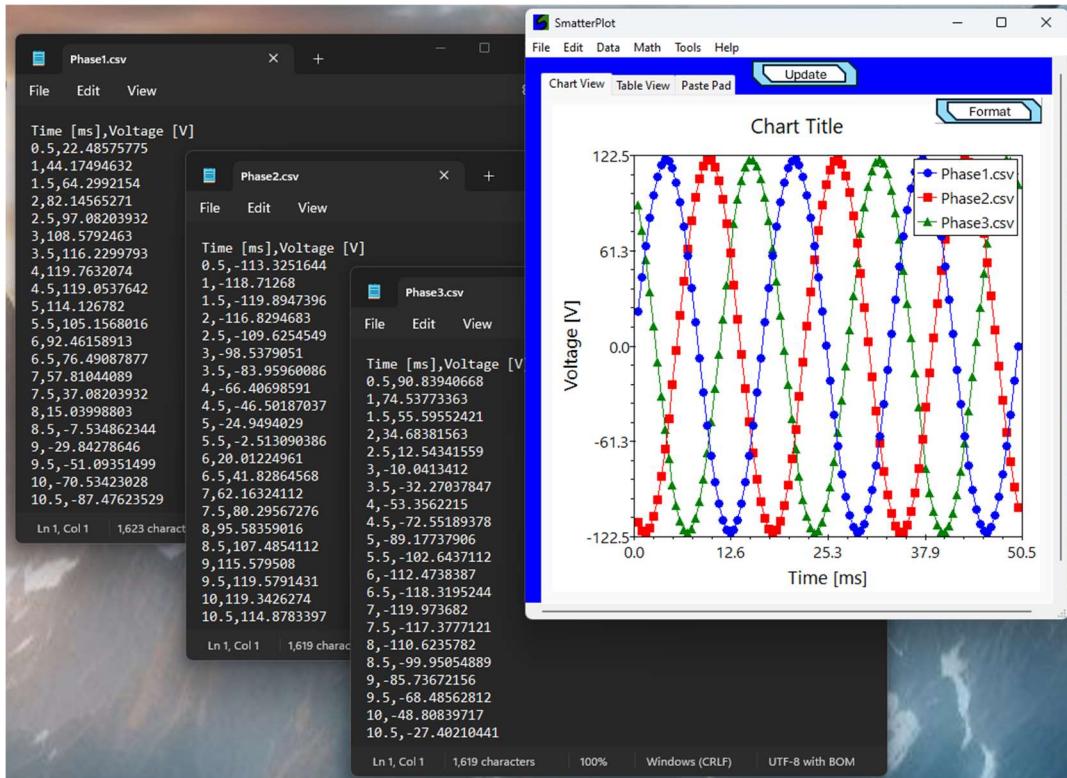
If you have a file with a header row, SmatterPlot will use that header to label the Y-axis like this:



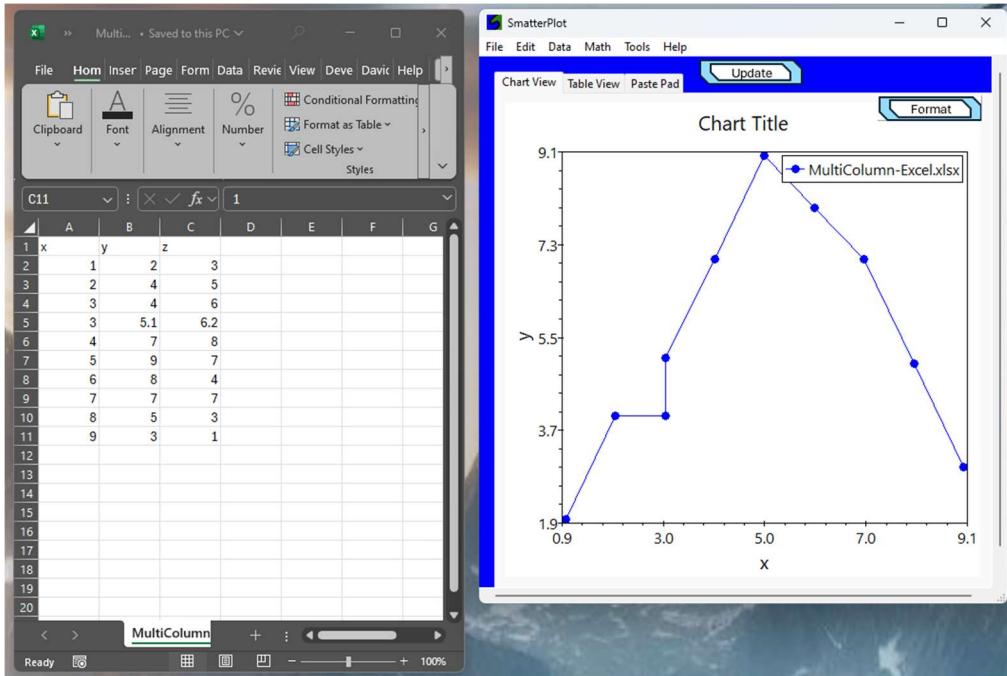
If your file has two columns it will use the first column as the X-axis values and the second column as the Y-axis values, like this:



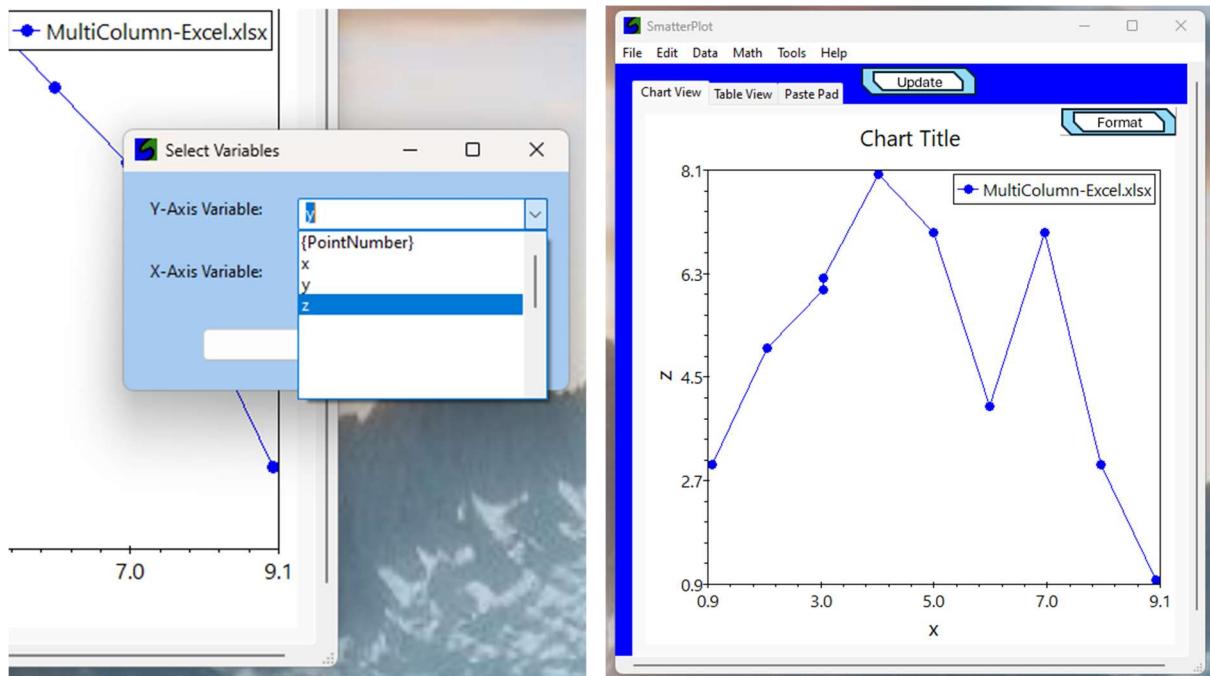
If you have multiple files with the same columns, you can open them all and each file will be treated as a different chart series:



If you have more than two columns, SmatterPlot will open all of them (up to 20 total columns), however, it will only plot the first two numerical columns. For example, here we have a spreadsheet with three columns labelled "x", "y", and "z", however SmatterPlot only plots "y" versus "x" upon opening:

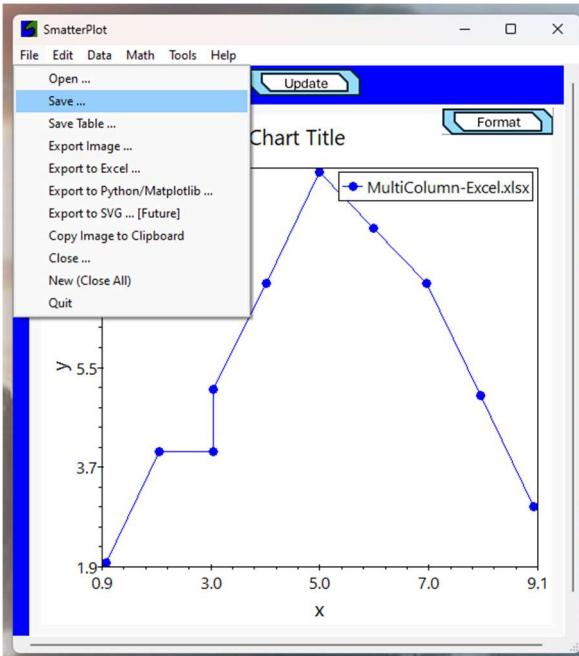


After opening the file, you can plot the "z" data by selecting different variables. See here:

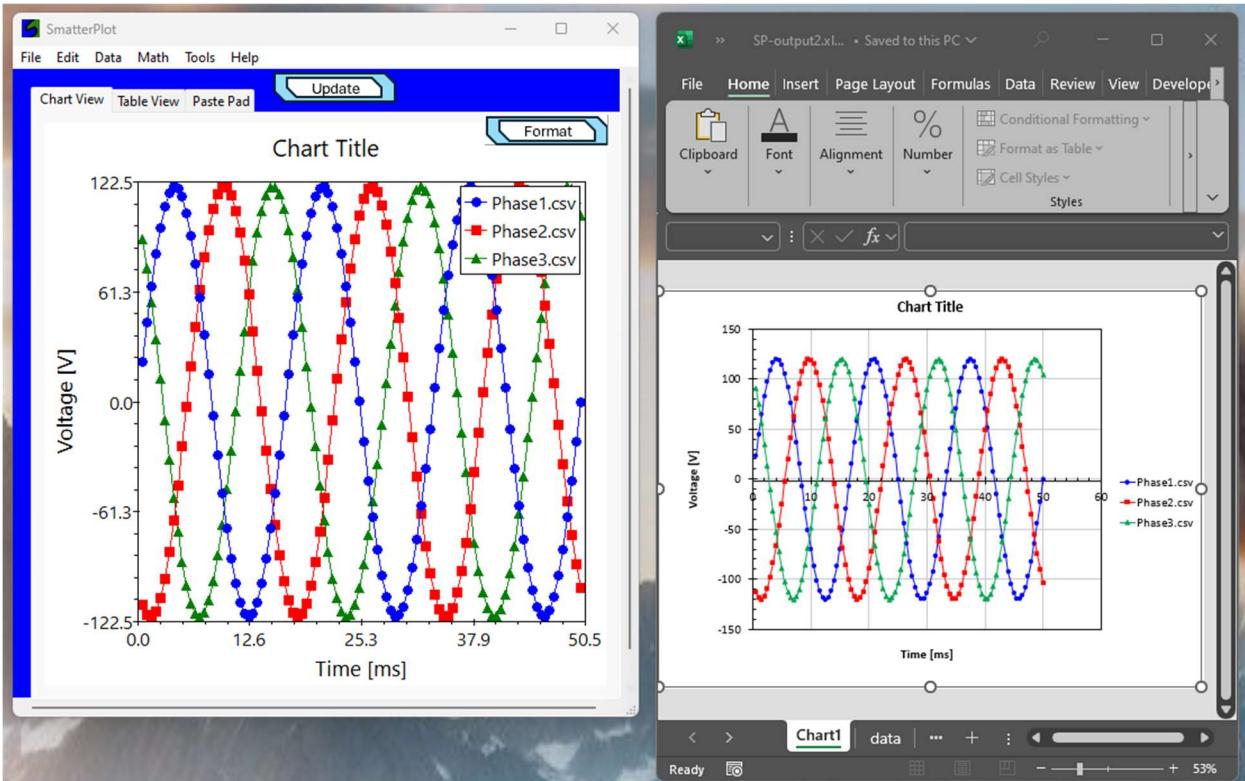


How to Save a Chart

To save a chart to work on later, you can simply click the “File” menu and the click “Save ...” like this:

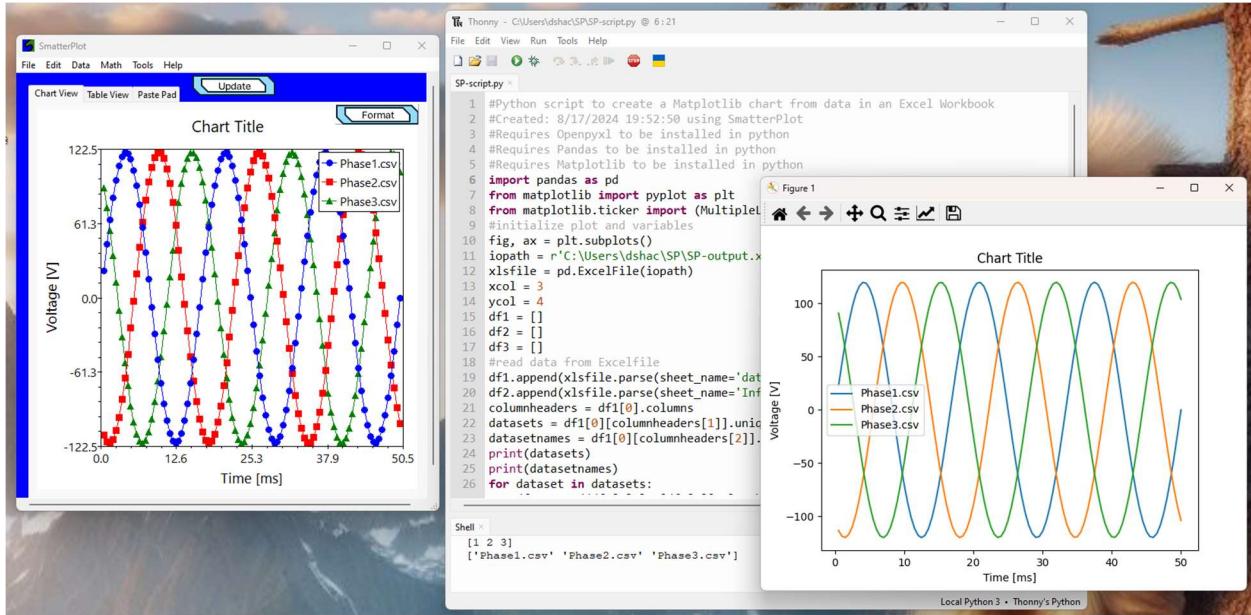


However, there are a lot of other options. If you only want to save the data table you can do that too. Also, you can export the chart to an Excel spreadsheet – which will include an Excel chart replicating the one you just created in SmatterPlot:



The Excel-formatted spreadsheet can also be opened in nearly any other spreadsheet program such as LibreOffice, OpenOffice, Apple Numbers, or Google Sheets.

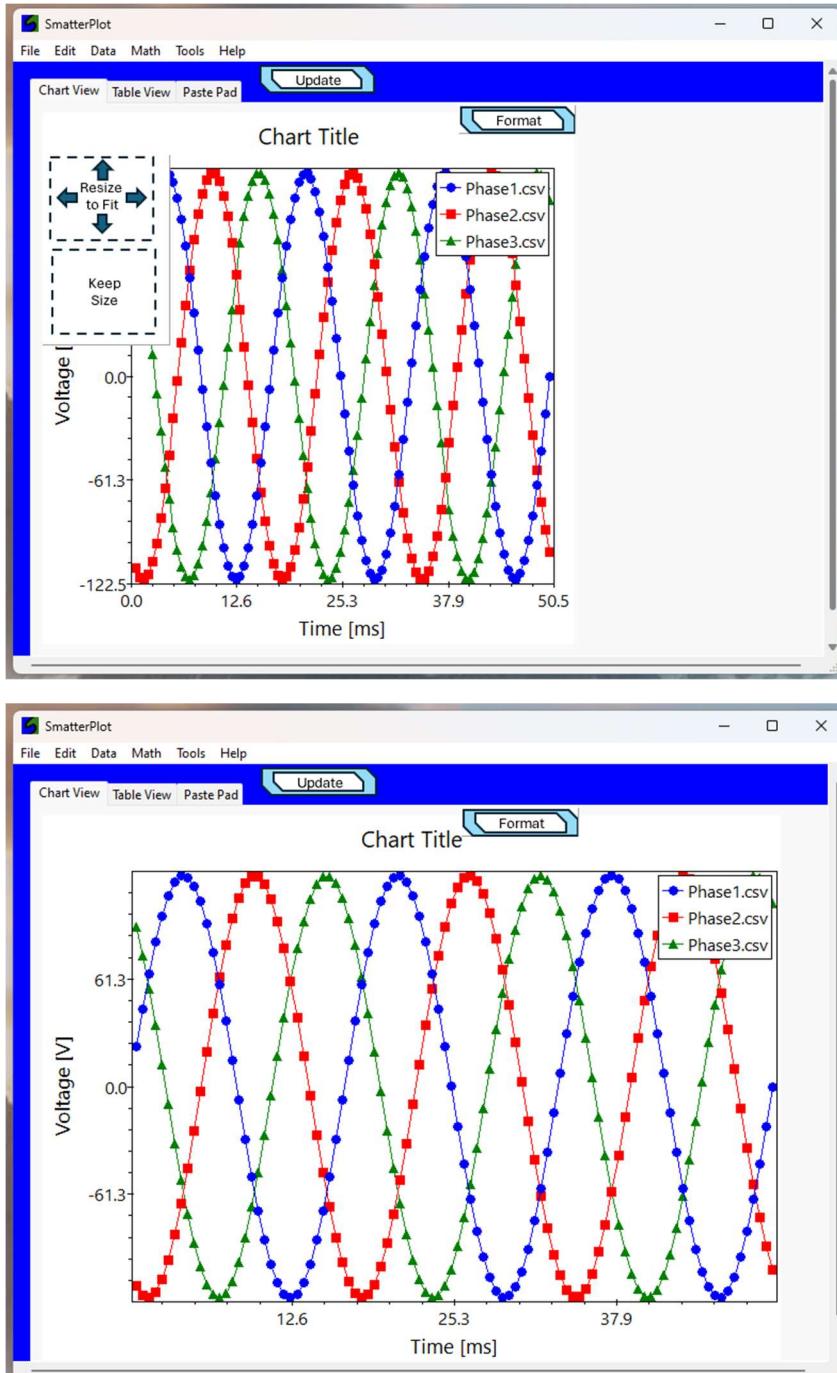
You can also export the chart by generating a python script that can recreate the chart using the Matplotlib library, as shown below. This is a great way to take datasets and combine them into a Pandas dataframe for further processing with Python.



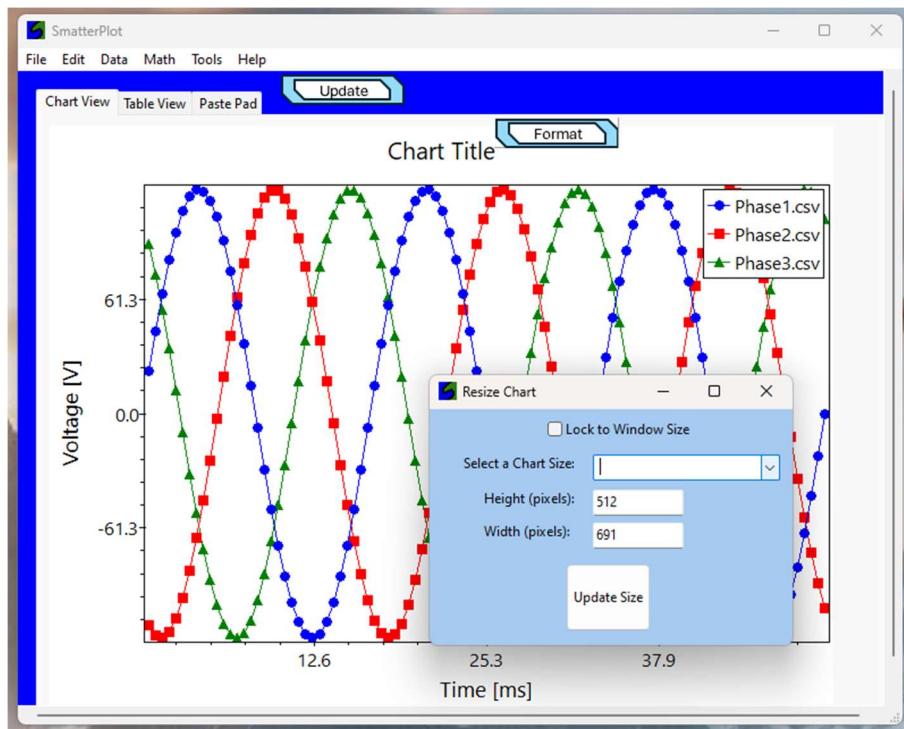
It's also possible to export the chart as an image, or simply copy the image to the clipboard and paste the image in another application as an image.

How to Resize a Chart

One great feature of SmarterPlot is that it's easy to adjust the size of the chart but also to maintain control. If you resize the window, it will display buttons allowing you to resize the chart to fit the window or to keep the current size:



You can also set the chart size exactly by clicking the "Edit" menu then "Resize Chart ..." and then entering the exact number of pixels. There are also a variety of common sizes preprogrammed for easy selection.

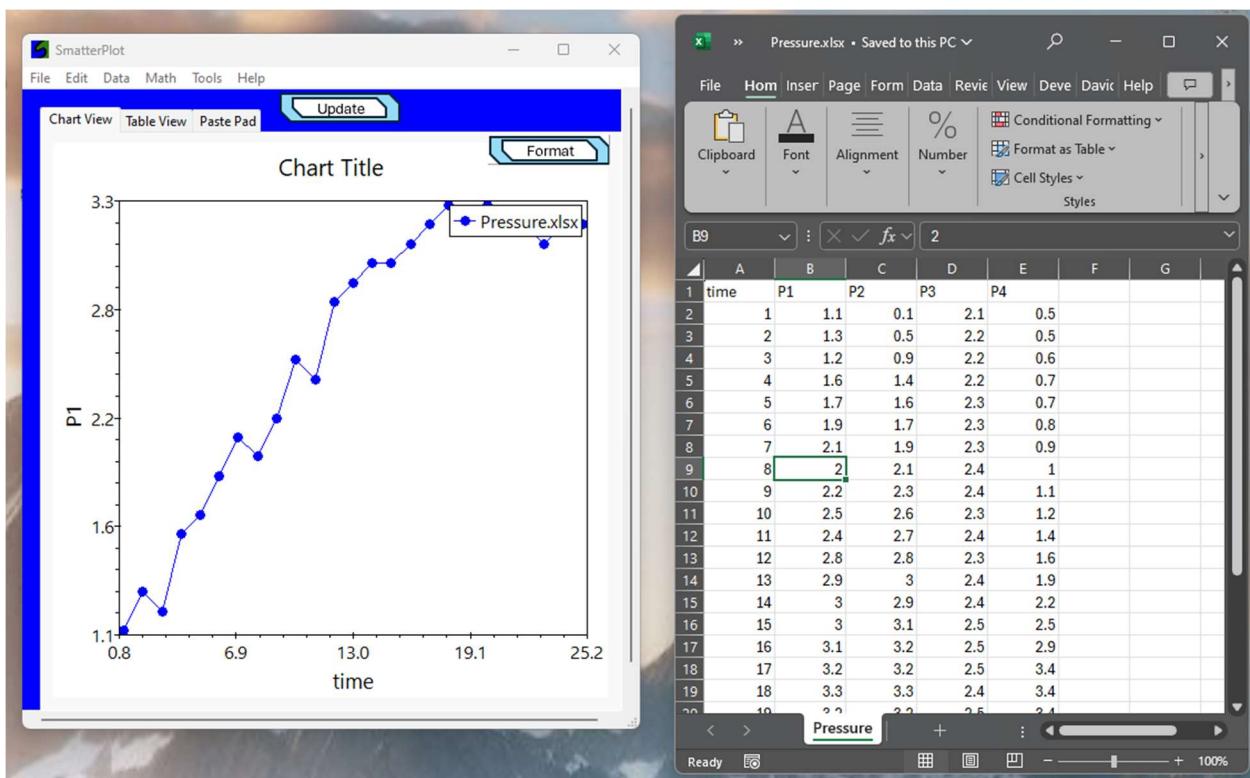


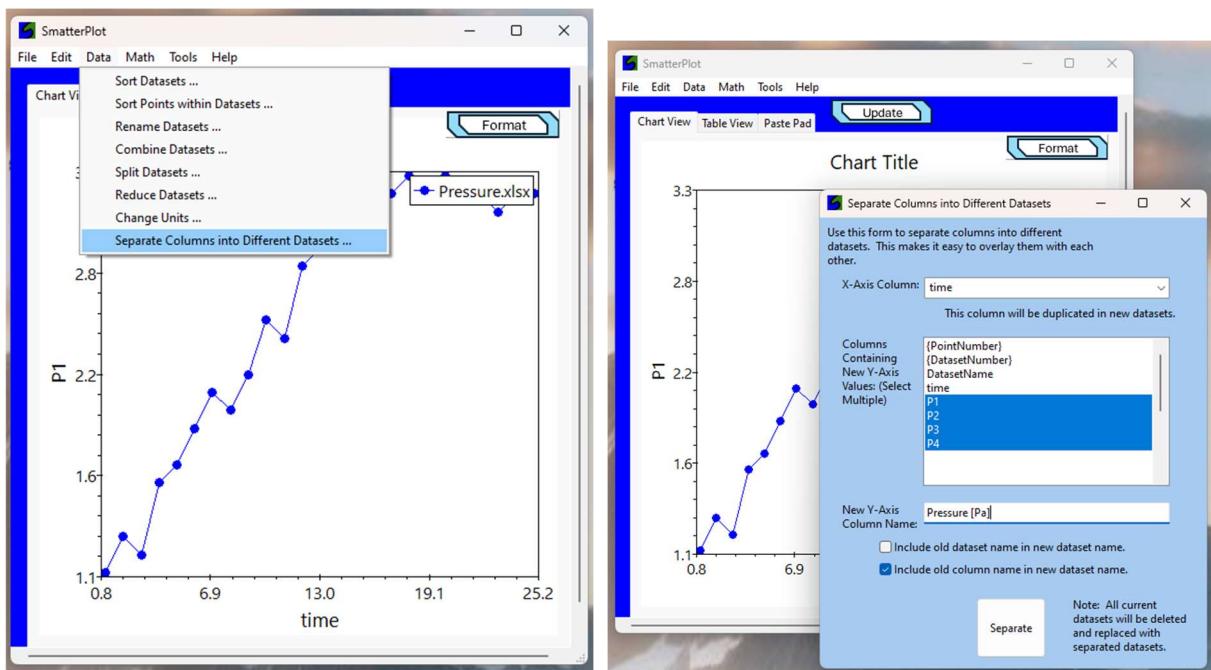
Working with Datasets

SmatterPlot manages data in tabular form as shown on the “Table View” tab. Each new data file that is opened is added to the same table but as a separate dataset. Once opened the datasets can be combined together, split apart or transformed in various ways.

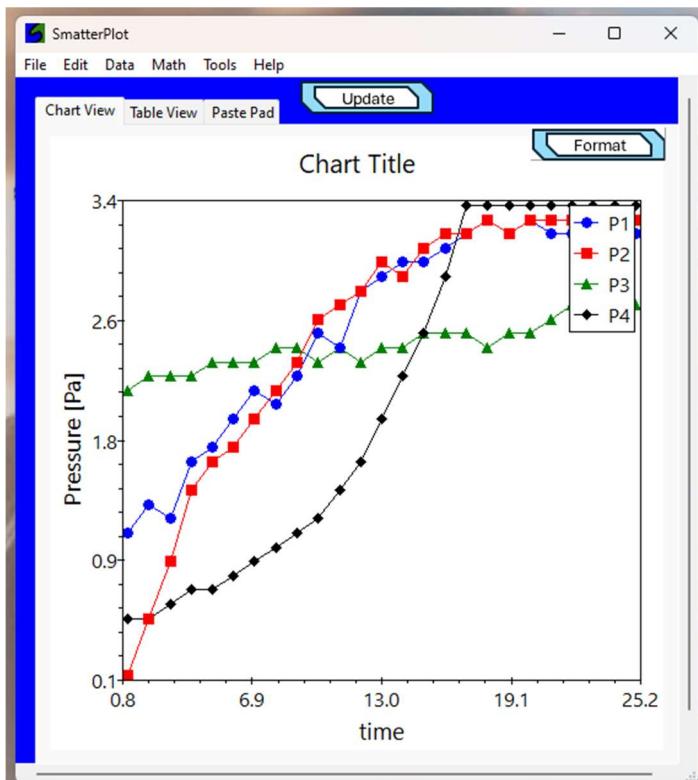
Separating Columns into Separate Datasets

One common challenge that we often face with chart making is using data found in separate columns of the same file to make separate series for an overlay chart. For example, the pressure data below has four different pressure readings listed as four columns titled “P1”, “P2”, “P3”, and “P4”. But by default SmatterPlot only plots the data in the “P1” column vs. the “time” column because it is treating the whole file as one dataset and it only plots the first two numerical columns. We can separate the other columns into separate datasets, by clicking the “Data” menu and the clicking “Separate Columns into Different Datasets ...”



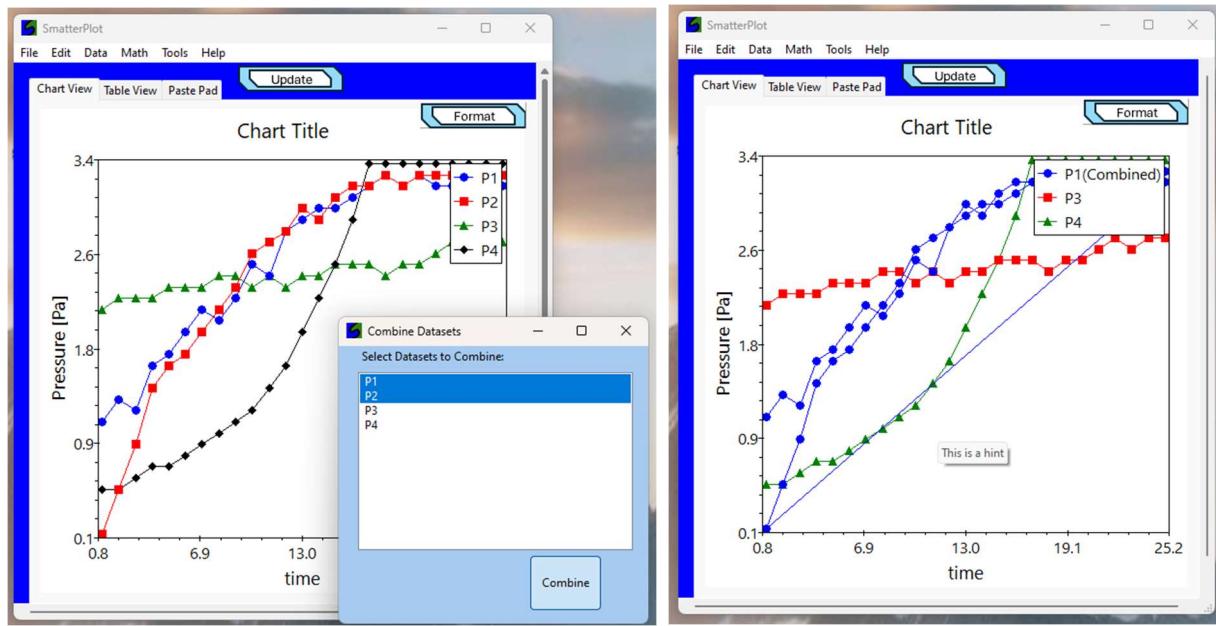


In the dialog box that pops up, select the columns that you want to separate. You can select multiple columns using the Ctrl or Shift keys or by dragging over several selections. Also select the column that you want to use as a common x-axis value for all the separated dataset. You can also rename the new column and the new datasets. The result is separate datasets – and therefore separate series – for each of the columns that you separated as shown below:



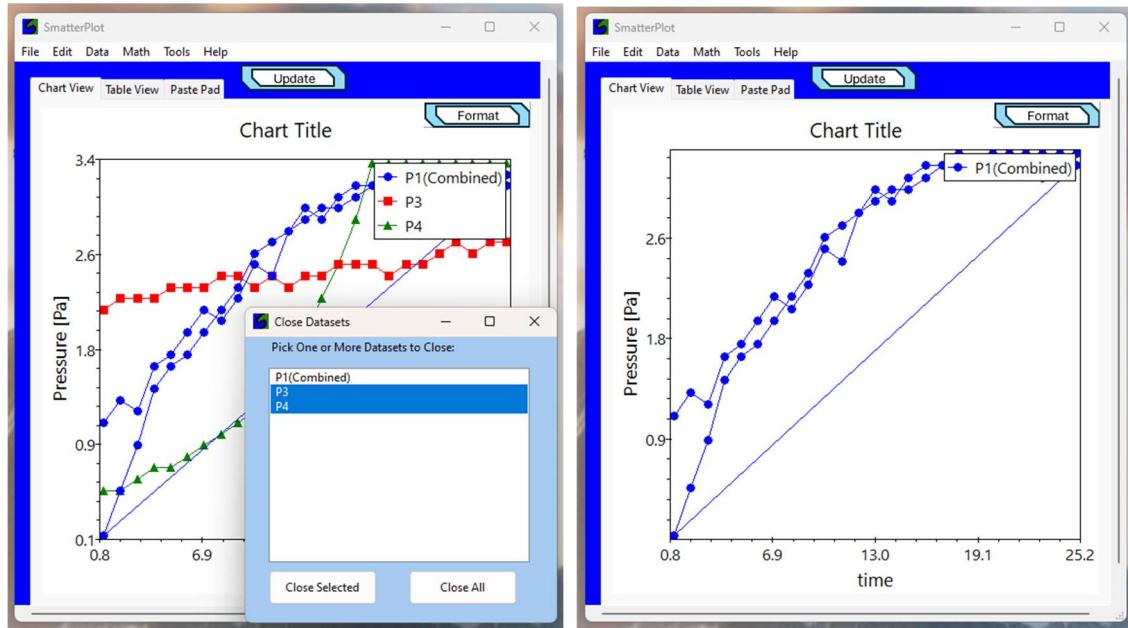
Combining Datasets

You may want to combine some of the datasets together – which is easy to do – by clicking the “Data” menu and then clicking “Combine Datasets ...” then select several of the datasets that you want to combine. The result is a combination of the datasets you selected as shown below.



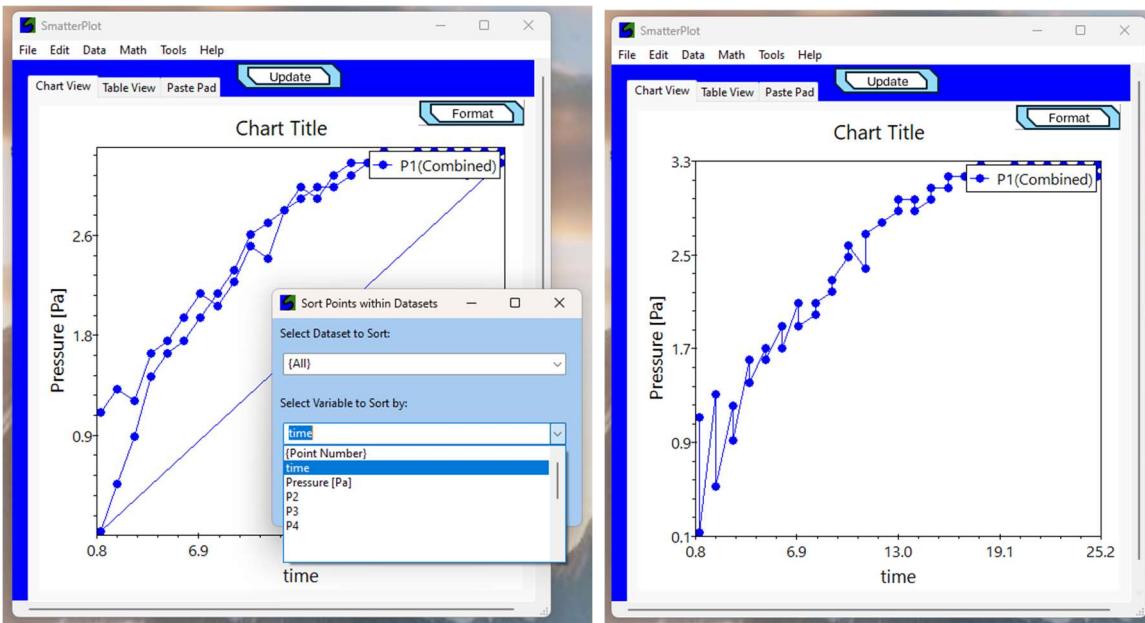
Closing Datasets

You can close datasets you don't want in the “File” menu by selecting “Close ...” and then selecting the datasets you want to close like this:



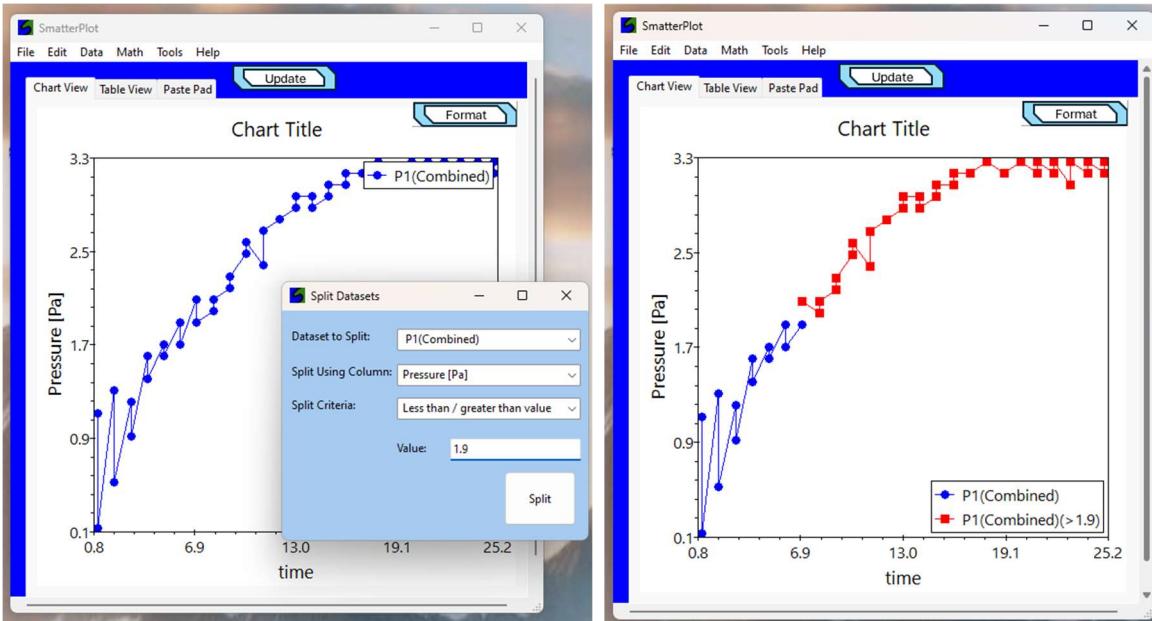
Sorting Datapoints within Datasets

Note that the datapoints have a certain order which is evident from the collector lines. You can change the sort order by clicking “Sort points within datasets ...” from the “Data” menu. Select the criteria for sorting such as by the variable “time” in this dataset. Note that you can sort by a variable that is not displayed on the chart.



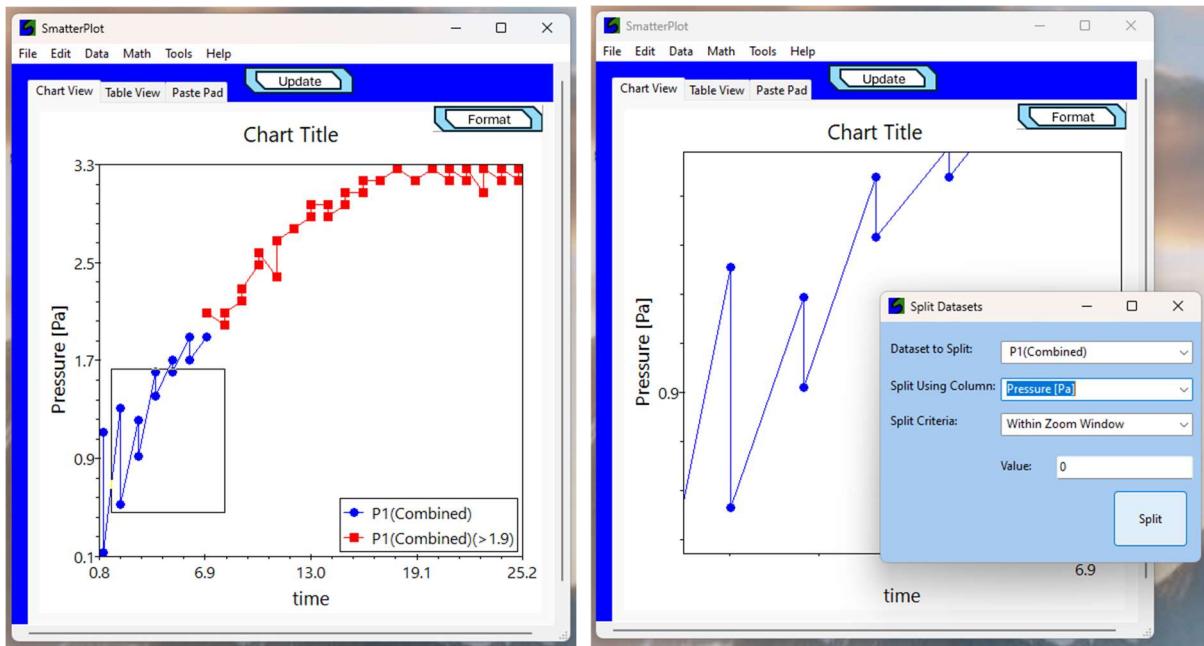
Splitting Datasets

You can also split datasets in several ways using the “Split Datasets ...” menu item. For example, you can split datasets based on the value of a variable like so:

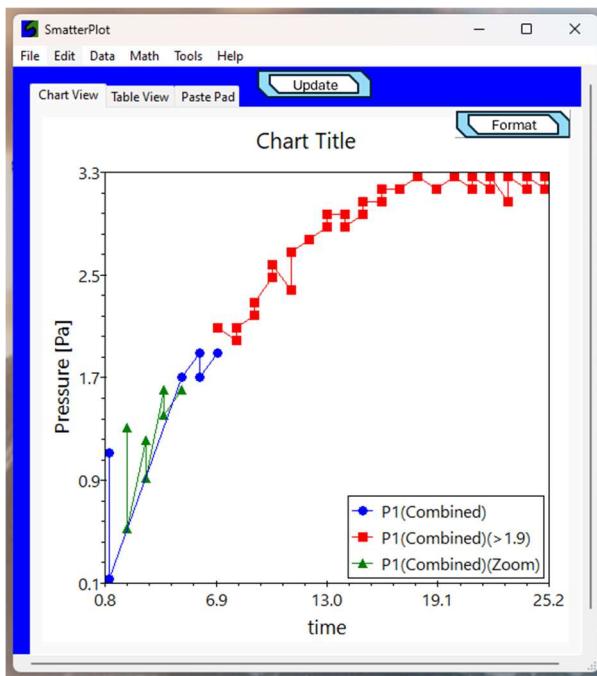


Here we have split the dataset into two by moving the datapoints with a pressure value greater than 1.9 into one dataset and all of those less than or equal to 1.9 remaining in the original dataset.

You can also separate datasets by zooming in on a region and separating all of the points in the zoom region into a separate dataset. To zoom in, draw a box around the region to zoom. Then select “Split Datasets ...” again and select the split criteria as “Within Zoom Window”.

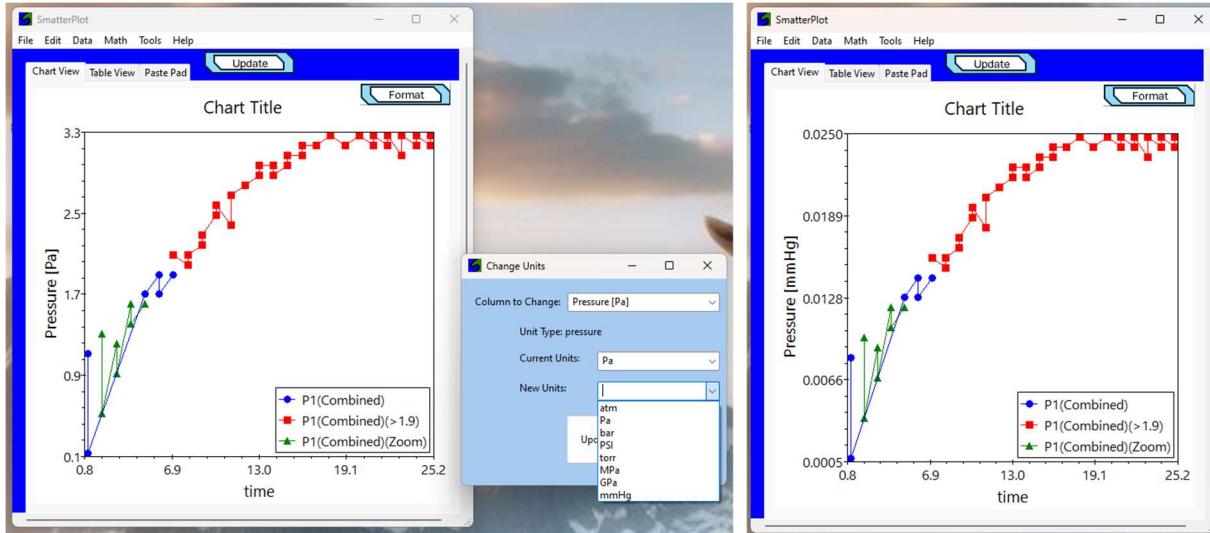


The result is a new dataset containing only those points within the Zoom Window. You can get back to a full view by clicking anywhere in the chart again. You may also want to click the “Update” button to refresh the axis labels.



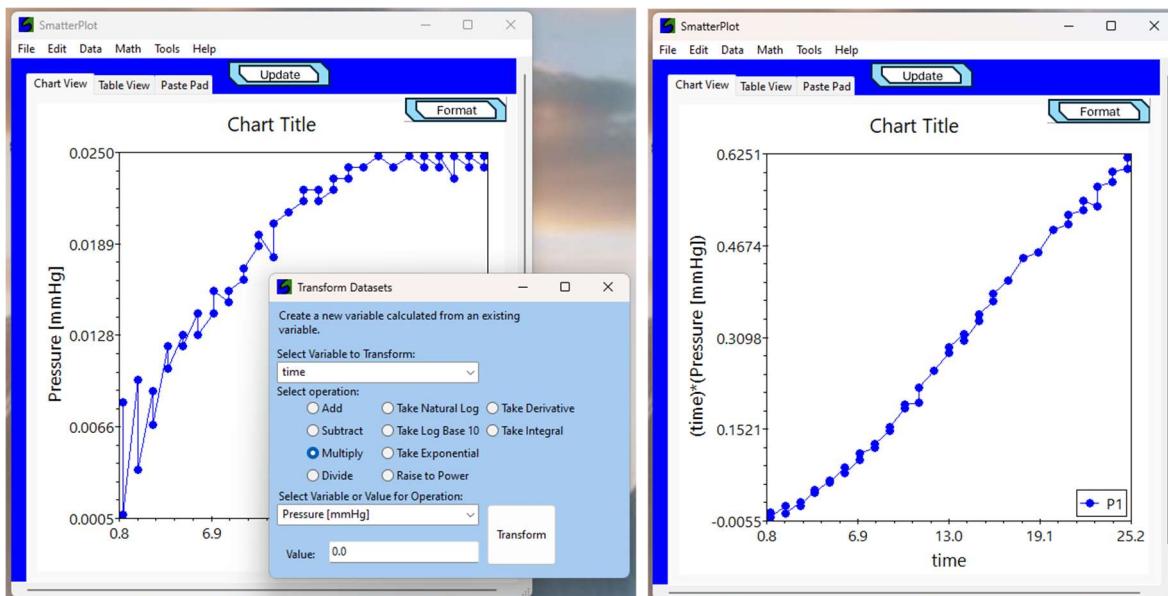
Changing Units

A common task is to change the units in the chart. For example, the pressure data we have been working with is in units of Pascals (Pa). If the units are surrounded by square brackets in the variable name, SmatterPlot can recognize them as units and can transform the dataset to other known units of the same unit type. To do this, click “Change Units ...” and then select the column you want to change and the new units desired. Here we have changed from Pa to mmHg:



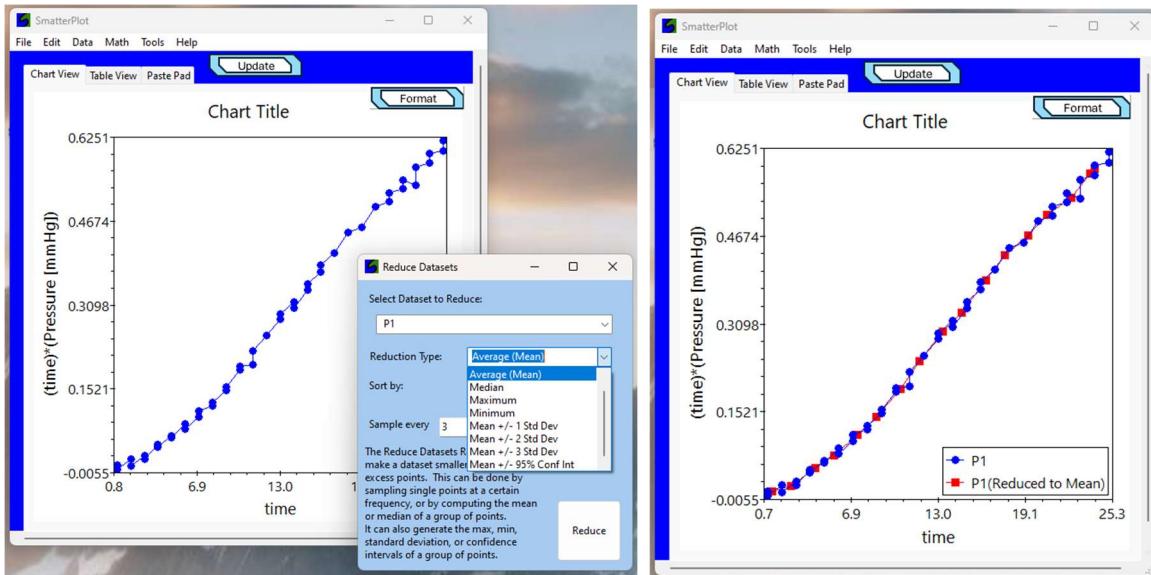
Transforming Datasets

The Change-Units feature is really just one type of mathematical transformation we can perform, but there are other possibilities. For example, you may want to multiply two columns together. To do this, select the “Math” menu then click “Transform Datasets ...”. Select the two variables you want to multiply such as time and pressure and then click multiply. The result is a new variable plotted on the Y-axis with the product of the two variables time and pressure:



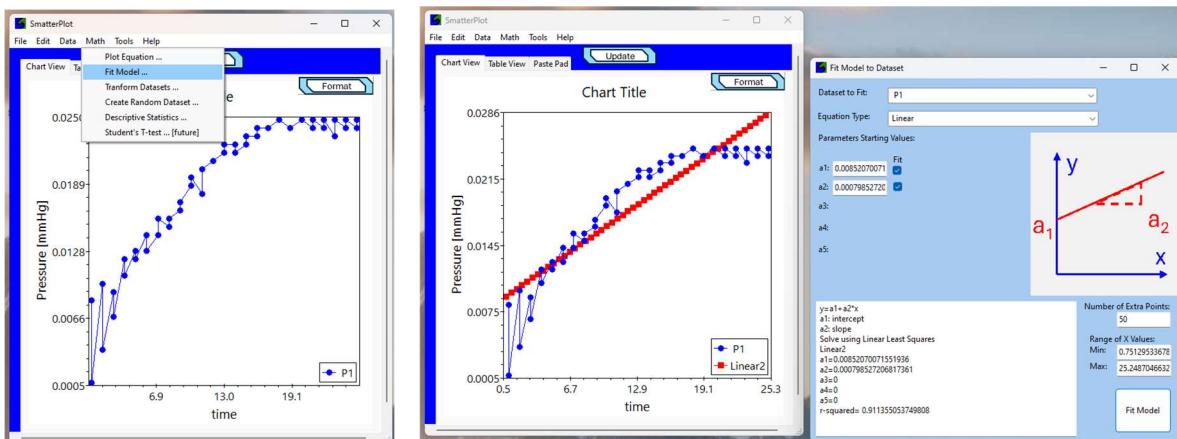
Reducing Datasets

You may also want to reduce the number of points in a dataset. For example, you can smooth the data by taking an average of every three points. After clicking “Reduce Datasets ...”, select the reduction type as “Average (Mean)” and then enter “Sample every” as “3” to reduce the dataset size by three. The result is a new dataset with fewer points, that is smoothed by averaging of every 3 points.



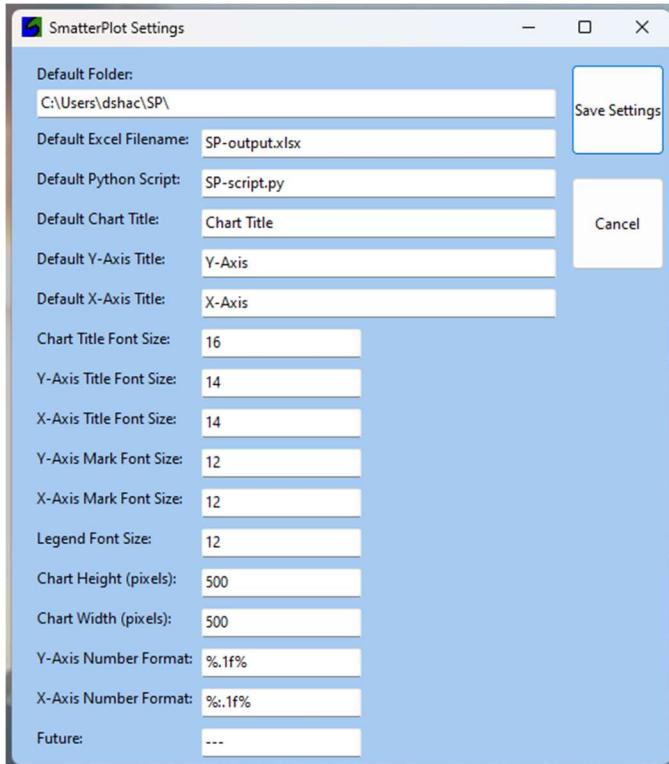
Fitting a Model to a Dataset

You may also want to fit a model to a dataset. To do this, click “Fit Model ...” in the “Math” menu. The Linear model is the default equation type but there are many non-linear options available. The model fit results are generated as a new dataset which can be transformed with all of the tools that we have just seen.



Saving Settings

The settings in SmatterPlot are saved in a “Smatterplot Settings.txt” file saved in the same file with the application. It can be modified by the user like any text file but it can also be updated by clicking on “Settings ...” under the “Tools” menu. These settings are read whenever SmatterPlot restarts.



Getting More Help

Beyond this document, you can also learn more about SmatterPlot from the “SmatterPlot” YouTube channel and TikTok Channel.

If you find an error or want to suggest a feature, you can message me at: david@smatterplot.com