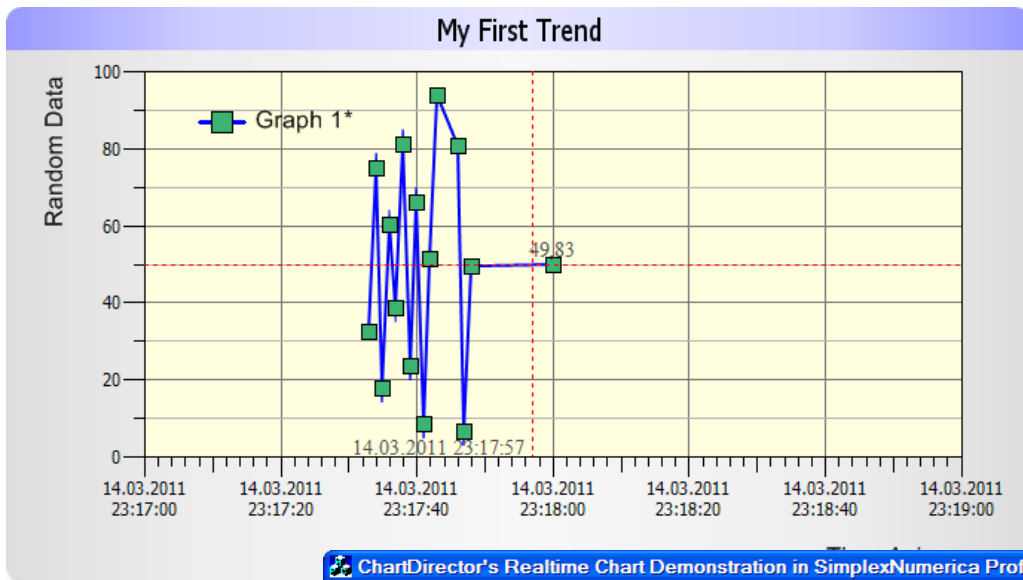


# Simplex

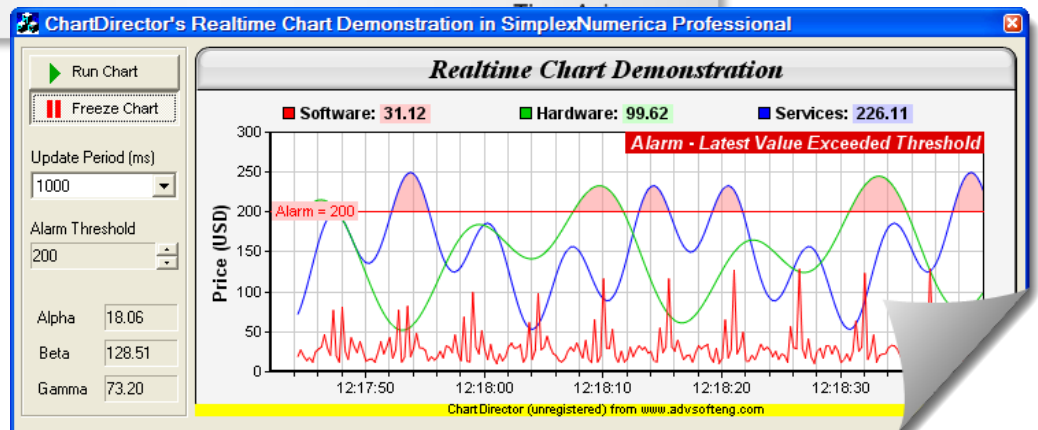
# Numerica

## Online Trend System (OTS)



Simple Trend

Sophisticated Trend



# Trend-up Manual

Shows the way to trend external data inside SimplexNumerica

## Simple Start

The Online Trending System (OTS) is the way to trend external data inside SimplexNumerica. Trending is for updating data as far as they changed on a medium (like Disk, Server or Databases).

To start-up, we will use a file interface because it is the simplest way to exchange data between different applications. Furthermore, if you are going to exchange data with the help of files you will have a persistent storage without data losses when one of the programs is crashing. The data can also be stored persistently into the file. When the program comes back, then it can refresh the lost data immediately. This interface is normally fast enough and very robust.

First we want to explain the functionality on the basis of an example:

### Trending Example V1

SimplexNumerica provides you with a Trending mechanism on a very simple way.

First, we need a source that changed data in a trending way. The author has made a small CSharp program that generates a data file and updates arbitrary data continuously. You can find the CSharp project (incl. source code) in the SimplexNumerica tutorial folder, eg. in

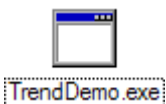
```
[your_install_folder]\SimplexNumerica\Tutorial\CSharp\TrendDemoProject
```

There is the solution file <TrendDemo.sln>.

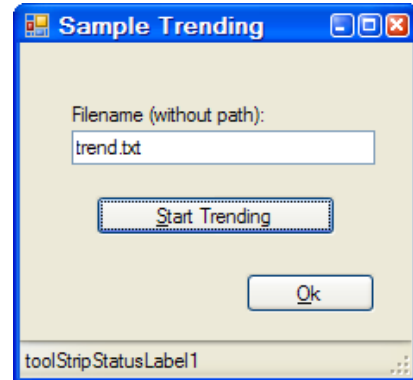
The program to start is in the folder

```
...\TrendDemoProject\TrendDemo  
\bin\Release
```

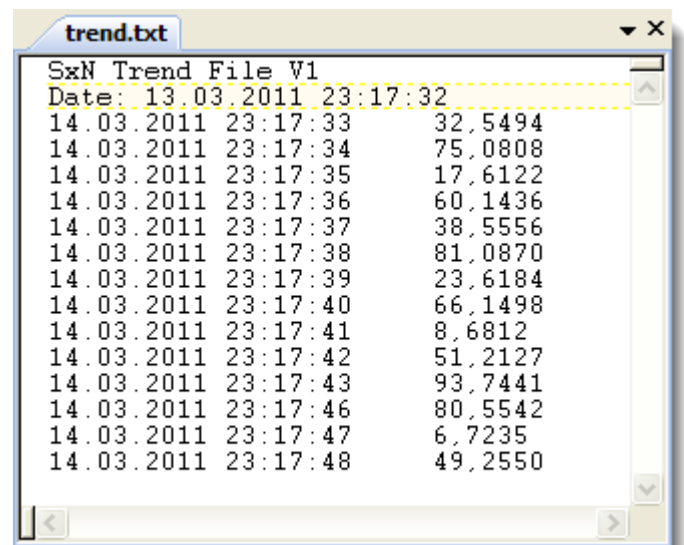
The name of the program is:



Start this program and put a filename in the edit field. The press *Start Trending*.



The content of the file will change each second. Next view is an example of the produced data.



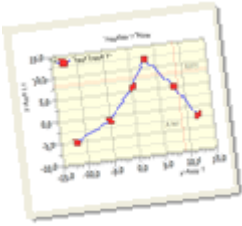
The file has two columns, date/time and a real value.

Please stop the trending mechanisms now!

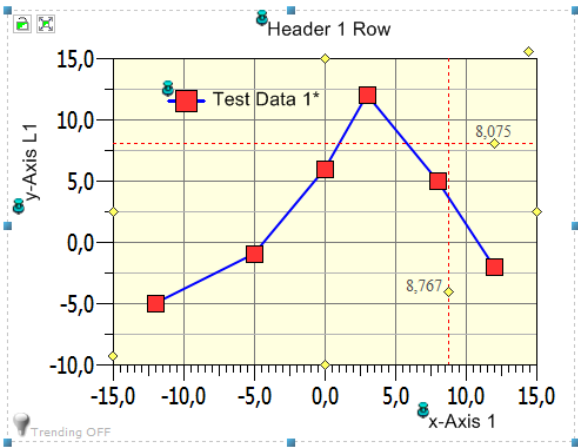
Next, we will show these data inside SimplexNumerica.



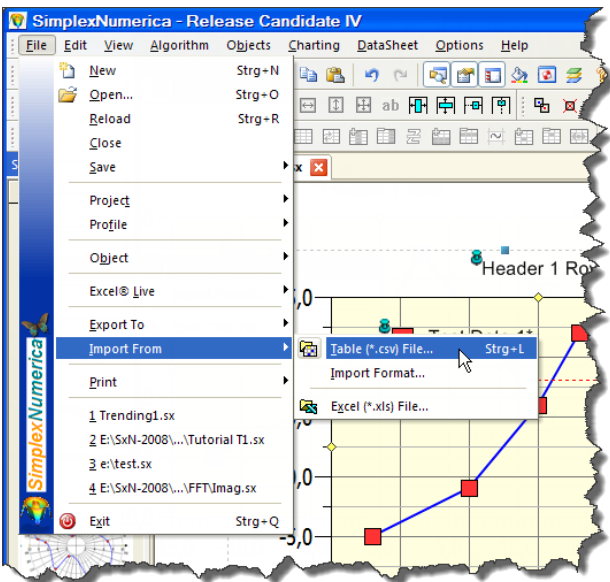
Please start the program from desktop.




Because we want to keep it simply click on Icon *Physics* on the left Shortcut bar. The result should be similar to this:

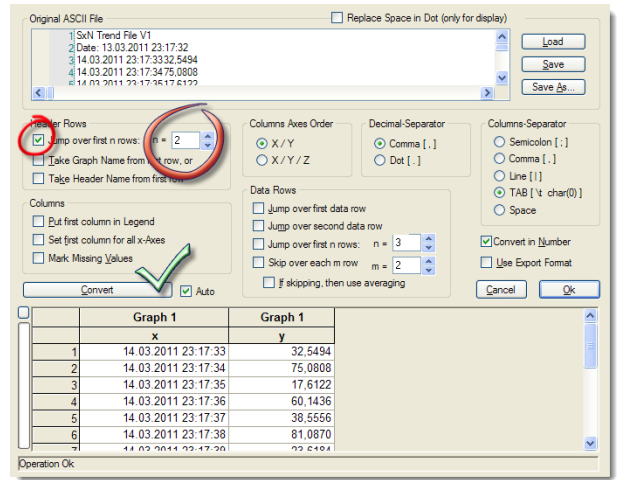


Now, we want to read the produced data (trend.txt). Use the data import dialog from the Pulldownmenu File, Import From Table (\*.csv) File...

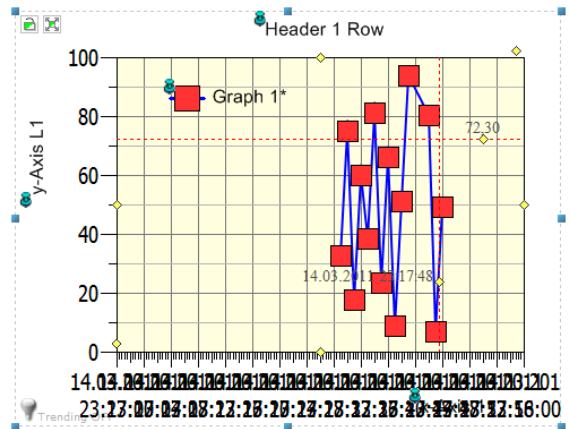


You can also use the icon  from the Array/Table Editor toolbar.

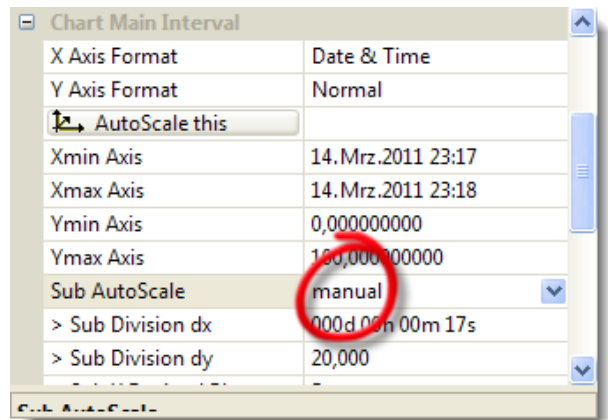
Open the right file (e.g. ..\Tutorial\CSharp\TrendDemoProject\TrendDemo\bin\Release\trend.txt) in the next fileselectbox.



Jump over the first two lines and press *Convert* to see a preview in the data sheet. Then Ok to leave the dialog to the table in Sheet Mode (SM). Then press <F3> to see the graphics result.

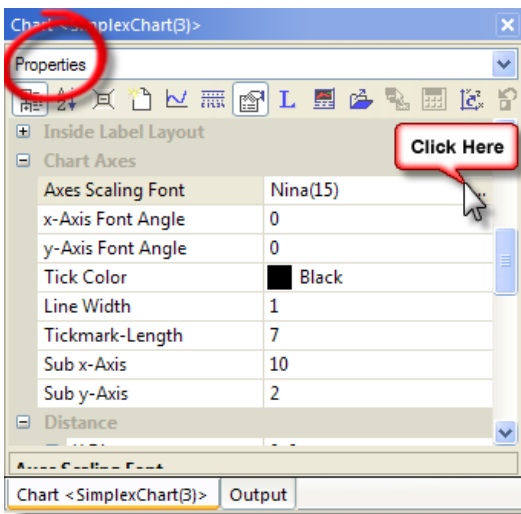


A little bit ugly how it looks like. AutoScale doesn't help here. Why?

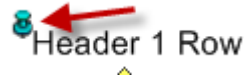


Because, at present, it is not taking into account the font size of the scaling text. You can fix that manually; set the property *Sub AutoScale* on "manual" instead of "Automatic".

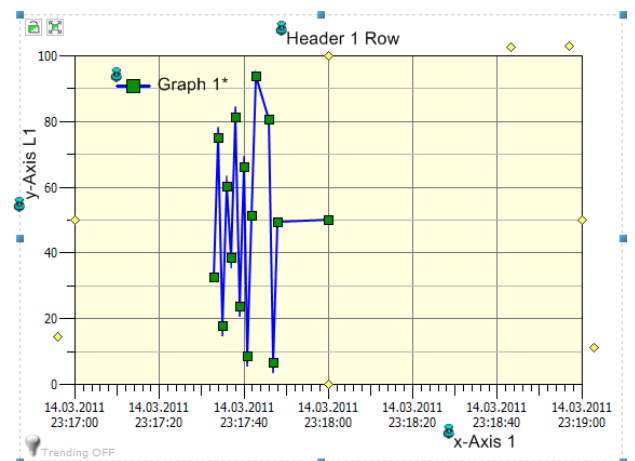
The scaling text is also to height. To change it, use the properties, too.



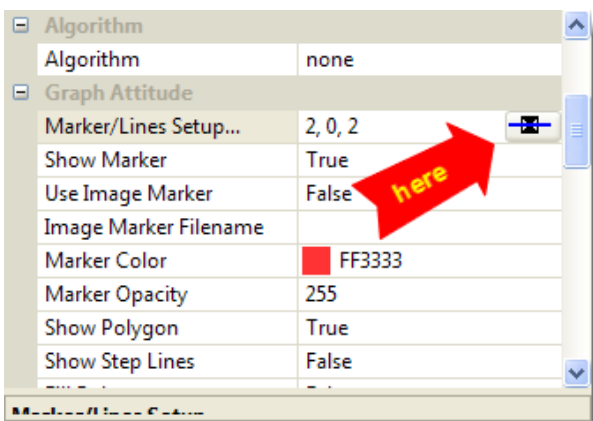
If you like to change header and axes label text, then that is also very simple. Please double click on the green pin on top of each label text.



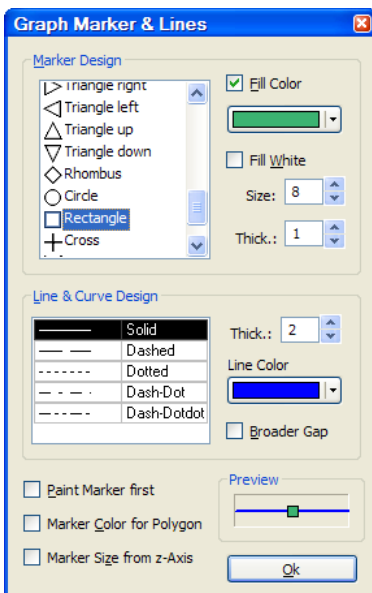
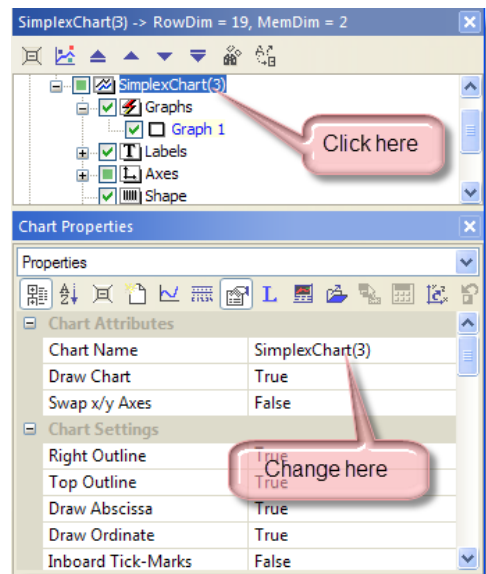
Then the result should look like this:



There are some other things here that could be changed: The red markers are too big. Simple, click on any red marker and change it in the properties.



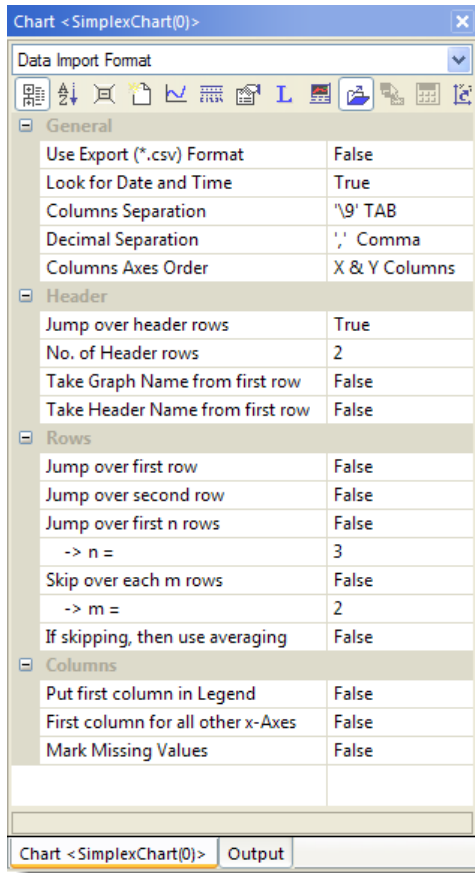
By the way, give the chart another name, instead of SimplexChart(n).



Please change the name of the chart for instance to "My First Trend".


It is time now to come back to the trending issues. We had before imported the file 'trend.txt' into the data sheet. The parameters of the import dialog are also

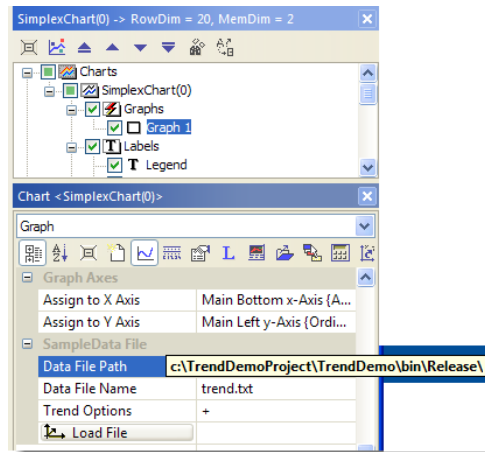
available in the property section 'Data Import Format'.



These entries are primarily for the trending routines inside SimplexNumerica. The routines for import data and trending are caused historically differently, but the parameter should be updated from the data import dialog.

Normally, each individual graph has its own data import file. That makes sense because they could be changed independent from the external data production program(s). In the case that you manually import data from file as done before, SimplexNumerica will put that file name to "Graph 1". To see that file entry, click on *Graph 1* in the *Chart Explorer* and in the *Property Graph* section *SampleDataFile*.

If you like, then you can reload the file again. Press button  **Load File**. The chart should look the same as before.



As mentioned just now, each graph can have its own trending file. Important is that the file should have only one x/y(/z) column, respectively, like the sample file.

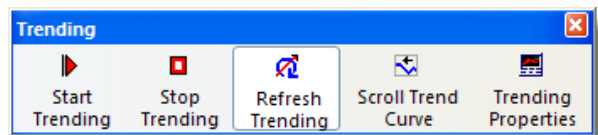
This *Trend Option* + sign indicate that the current graph should be used for trending.

This graph is now capable for refreshing/trending. That means that you can extend our test file continuously and SimplexNumerica is going to update the graph with the new data.

To control the trending behaviour, please use the dedicated toolbar (or Pulldown-menu).



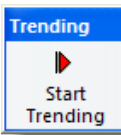
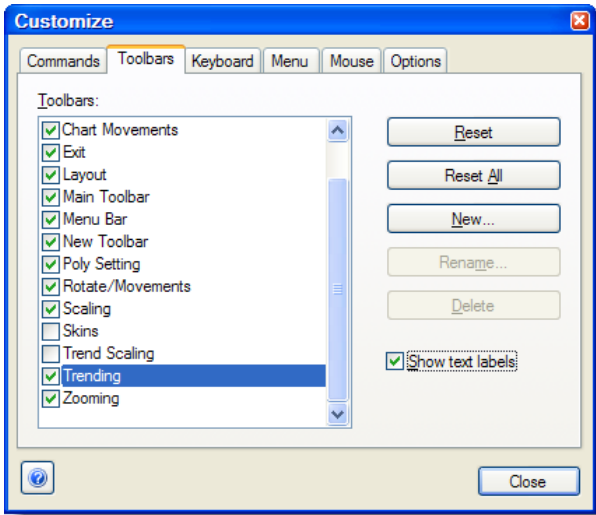
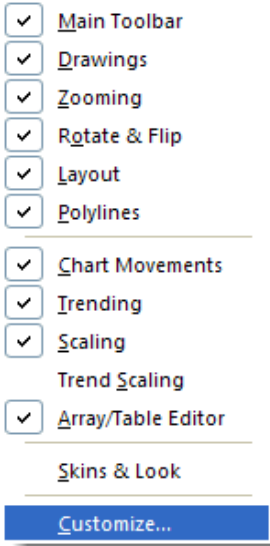
..or from that view:




### Change Toolbar Style:

Right mouse click right to any toolbar shows you the toolbar popup menu. Click on *Customize...* will open the next dialog.

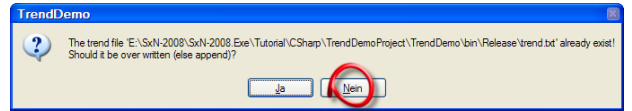
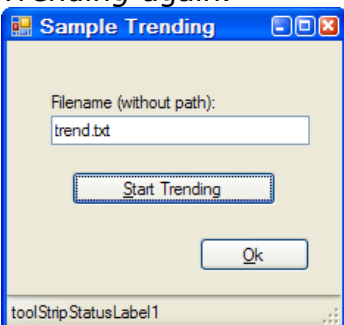
Select tab *Toolbars* → *Toolbars: Trending* and check the button *Show text labels*.



Please click on *Start Trending*.

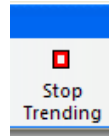
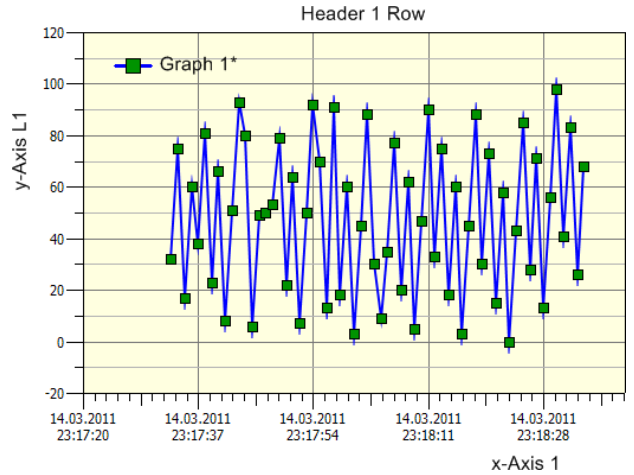
On bottom left to the chart is a flashing lightbulb  **Trending ON** to identify a trending watchdog.

Please start the external trending program (see above) and press button *Start Trending* again.



Press No in the Messagebox to append the new data to the old ones.

You should see the new data in the chart updating every second.



Please click on *Stop Trending*.

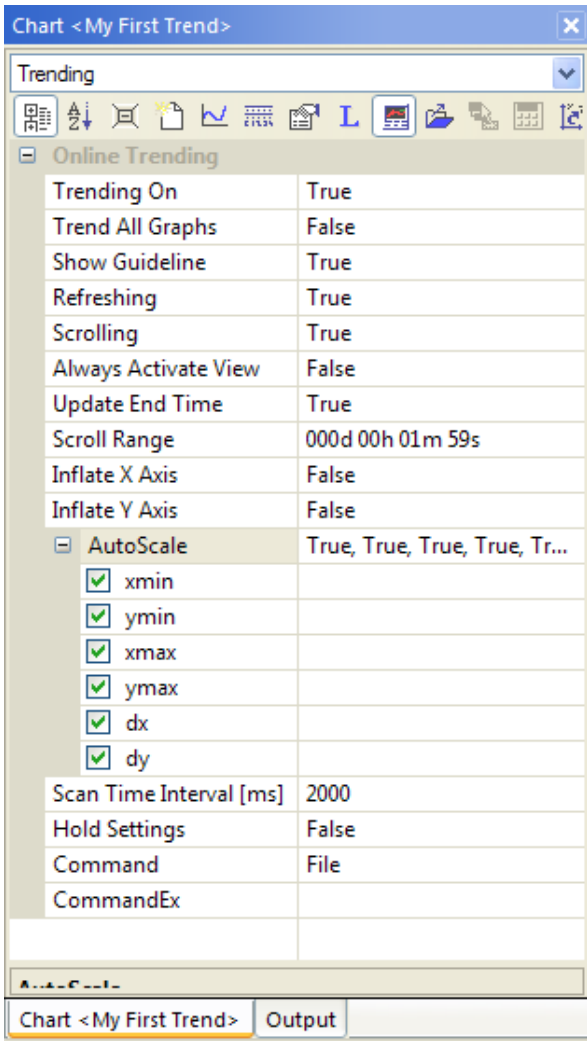
You can test it also with Notepad. Put some arbitrary sample data into the editor and press save.

Set the parameter as shown above. When you set the checkbox in front of 'Look for Data and Time' then the program accept the following formats for date & time and for real values (separation is county specific):

Format	Example	or	or
Normal	123.14		
Scientific 1	1.2314E02		
Scientific 2	0.12314E03		
Technical	123.14E00		
Date	23.07.1996	07/23/1996	23-07-1996
Time	16:10		
Date and Time	23.07.1996 16:10	07/23/1996 16:10	23-07-1996 16:10

There are several other options for trending. We will have a look to each property and influenced the trending behaviours.

Please click on icon *Trending Properties* in the toolbar and have a look to the properties for trending:




A short explanation of the individual points follows now.

Hint:

View means evaluation in a window (\*.sx files). Views are separated in tabs straight under the toolbar.

The meaning of graph is:

Graph = DataPoints + CurvePoints

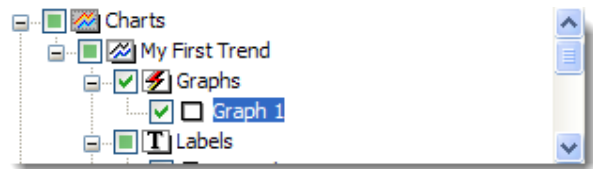
Trending On	Enable/Disable a chart for trending. If there is more than one chart in a view, then it makes sense to switch on/off one of them.
Trend All Graphs	Enable/Disable a graph for trending. If there is more than one graph in a chart, then it makes sense to activate/deactivate some of them for trending or not. This can <u>not</u> be done here (see instead graph properties*). Here one only can adjust whether all graphs shall be trended or not.
Show Guideline	The guideline is a vertical line at the end of the last data point from the active graph. The color of the guideline is equal to the color of the active graph.
 Refreshing	There is an icon in the trending toolbar for Refreshing. Refreshing is only available for database and server online trending (see SimplexNumerica Custom).
Scrolling	Scrolling equal True will scroll the graph along the x-axis. Use <i>Scroll Range</i> for the data time range.
Always Activate View	If there are more than one view on screen, then it makes not always sense to update the views in the background, because the program performance will get slower with the number of views. If there are views horizontal or vertical, respectively, ordered on the visi-

	ble level, then each view should be activated.
Update End Time	This here is only available for database and server online trending (see SimplexNumerica Custom).
Scroll Range	000d 03h 01m 30s Scroll Range for scrolling along the x-axis. Edit day, hour, minute and second.
Inflate X Axis	If AutoScale has been activated for x-min/x-max values, then only if a data point exceeds the left/right border of the chart, min/max will be extended.
Inflate Y Axis	If AutoScale has been activated for y-min/y-max values, then only if a data point exceeds the top/bottom border of the chart, min/max will be extended.
AutoScale xmin ymin xmax ymax dx dy	AutoScale can be activated for xmin, ymin, xmax, ymax, dx and dy. Dx and dy are the real distance between two labels.  <u>Hint:</u> <i>If you have checked this here, then no manual scaling will still work during trending.</i>
Scan Time Interval	This is the scan time interval between two trend updates (in ms).
Hold Settings	unused
Command	File SimplexNumerica Standard Edition always file. SimplexNumerica Custom Edition command for Database and Client/Server-

	Connections Connections.
CommandEx	- SimplexNumerica Standard Edition nothing here (or -). SimplexNumerica Custom Edition commands for extended Database and Client/Server-Connections

**\*Graph Properties**

Chart Explorer: Click on Graph 1



Scroll down to Sample Data File and put a + right to Trend Options to mark this graph for trending.

