



GridWorX64 Viewer Displaying SPC Data



APPLICATION NOTE

August 2014

Description: A guide to displaying SPC Data in GridWorX64 Viewer

General Requirement: Version 10.85 or later, basic knowledge of GridWorX and GENESIS64.

Introduction

GridWorX64 Viewer was developed in order to visualize database data or OPC DA data through a data grid control. The GridWorX Viewer was designed to support generic purpose charts, and now allows integration with SPC Charts.

This application note provides a quick guide on how to configure the GridWorX Viewer to show SPC data.

This application note assumes that you have followed the examples in the Application Notes titled *GENESIS64 – GridWorX64 Server*, *GENESIS64 – GridWorX64 Viewer*.

Before You Start

Where does SPC data come from?

The following information is applicable only to users who have a source of SPC data. In ICONICS software, SPC data can be pulled from either Hyper Historian or the Quality AnalytiX package from the AnalytiX suite. This application note assumes that you have a source of SPC data configured and available.

What is SPC?

SPC stands for Statistical Process Control.

The SPC plot shows how the sample values for an SPC tag vary over time with respect to the defined control limits (UCL, CL, and LCL). These limits appear with the sample values on a GridWorX Viewer chart when this chart type is used. Using this chart type, you can easily view the spans during which samples have exceeded the defined control limits and have triggered an alarm state. You can also see at a glance the samples that contain operator annotations.

Why should I use SPC charts in GridWorX64?

The TrendWorX Viewer can also show SPC charts, but they must be time-based (the X-axis will be Time). The GridWorX Viewer doesn't have this limitation.

Another benefit of displaying SPC data using the GridWorX Viewer is that historical reads from HyperHistorian are optimized.

How to Configure an SPC Chart

There are three ways to configure an SPC Chart: using the Wizard (for first-time users), using the Configurator (for intermediate users), and using the Property Grid (for advanced users). This section will walk you through each of the three ways to configure an SPC Chart in a GridWorX64 Viewer.

Using the Wizard (Beginner Users)

First open a new GridWorX64 Viewer. Right-click on the "Add SPC Chart Wizard" menu item to run the wizard.

SPC charts will be added to the selected tab. If you have the root item selected, shown as "GdxViewControl" in Figure 1, then the SPC charts will be added to a new tab.

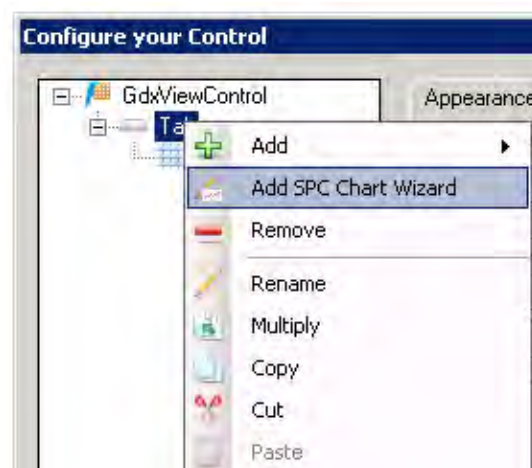


Figure 1 - Adding SPC Chart from Wizard

The wizard automatically sets titles for Average and Range charts. It also automatically sets similar properties in all charts, and connects the charts so that one History Overview is used to navigate through them.

In Step 1 of the Wizard, you configure the most common options – the source tag and the chart types. See Figure 2.



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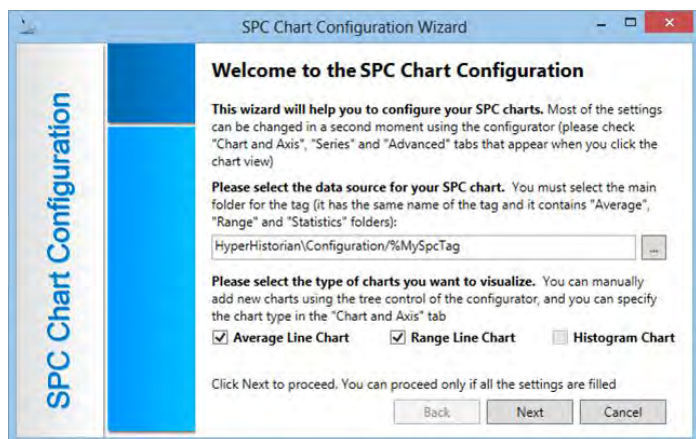


Figure 2 - SPC Chart Wizard, Step 1

In Step 2 of the Wizard, you configure the timings and limits of your charts. See Figure 3.

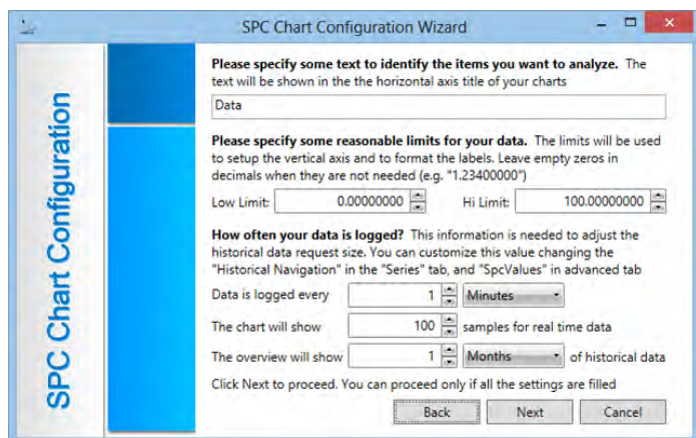


Figure 3 - SPC Chart Wizard, Step 2

In Step 3 of the Wizard, you configure the most common layout settings. See Figure 4.

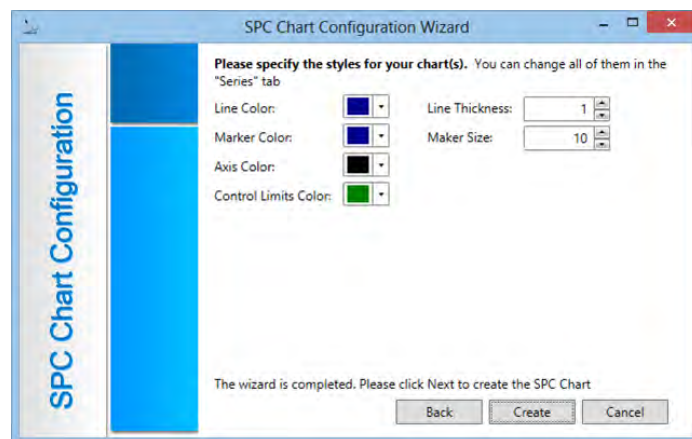


Figure 4 - SPC Chart Wizard, Step 3

Using the Configurator (Intermediate Users)

It's possible to add a new chart and change the Chart Type to SPC line – this creates a new SPC Chart without using the wizard.

The **Chart and Axis** tab of the SPC chart contains settings for different axis properties, such as range, grid lines, tick marks, labels, and visibility. For details, see Figure 5 and the Help files.

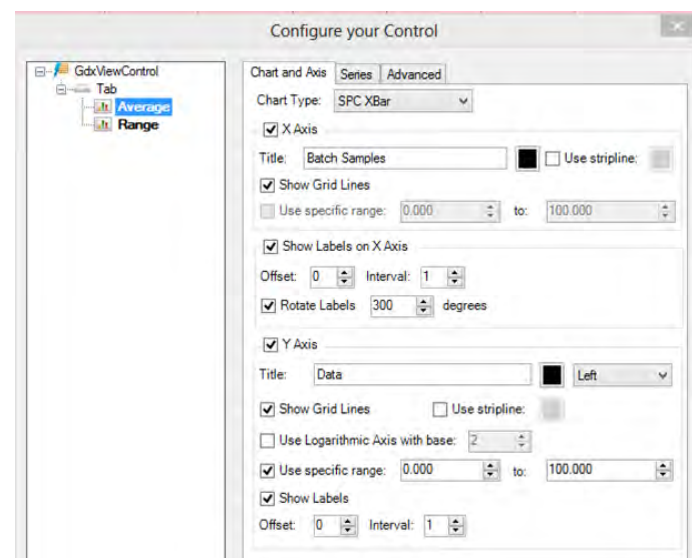


Figure 5 - Chart and Axis tab of the SPC Chart Configurator

The **Series** tab of the SPC chart contains settings to configure:

- Data Source
- Control Limits and Specification Limits
- Timings
- Markers
- Areas and colors



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For details, see Figure 6 and the Help files.

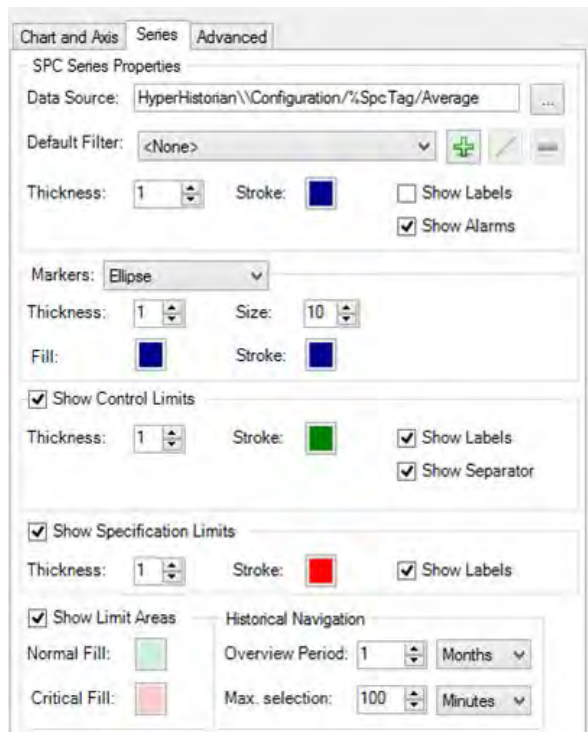


Figure 6 - Series tab of the SPC Chart Configurator

Using the Property Grid (Advanced Users)

The Property Grid is the Advanced tab of the Configurator. After adding an SPC Chart (either through the wizard, or by adding a Chart and changing the type to SPC line), you can begin configuring these advanced settings.

The Property Grid contains settings to configure advanced properties, such as the cursor background. Every color in the SPC chart is configurable, as well as other settings for the vertical and horizontal axes, the cursor, and the chart in general. It is also possible to use placeholders in the cursor to show dynamic data (e.g. Timestamp or Alarms).

For more details on the settings available on the Advanced tab, click on each item for a brief description, or refer to the Help files.

Additional Details about SPC Charts

Control and Specification Limits

All values for the control and specification limits come from the server. The labels, areas, and lines for each limit can be shown. When the limits change a vertical line is shown. For an example

of what a changing limit may look like on a chart, please refer to Figure 10. For an example of an Average SPC chart showing the limits, refer to Figure 7.

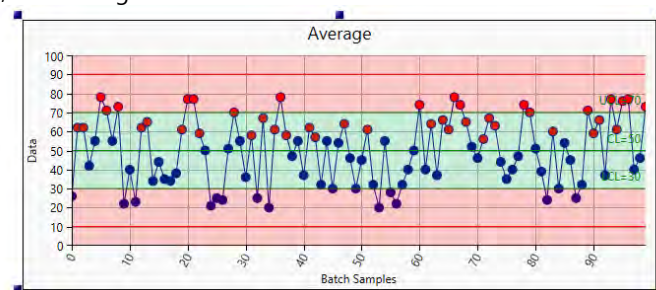


Figure 7 - Example of an Average SPC Chart

Alarms and Notes

Alarms can be visualized using the markers. It is possible to see the alarm description and notes in the cursor tooltip. For an example, see Figure 8.

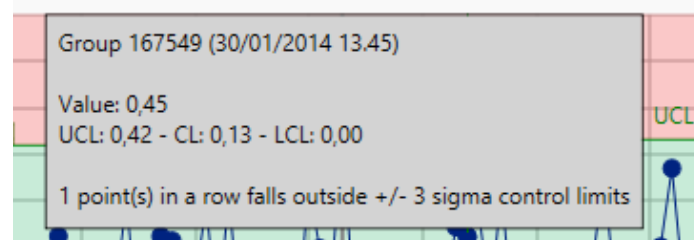


Figure 8 - Alarm description in cursor tooltip

History Navigation and Overview

The GridWorX Viewer supports history navigation for SPC Charts. You can view the "Summary View" for each chart, or one "Summary View" for all charts in one GridWorX Viewer.

The Overview is created using Hyper Historian interpolated values, so replay is fast. It's possible to select a range of data in the "Summary View" (the SPC sample number will change). It's also possible to select a specific point in time (a pre-defined number of SPC samples will be shown).

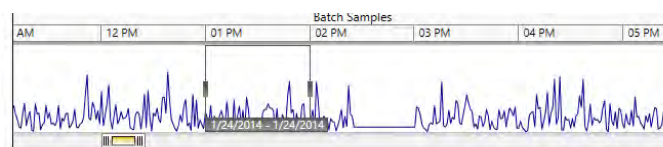


Figure 9 - Summary View showing history of a chart

In summary, it is possible to have multiple SPC charts in one GridWorX64 Viewer, with one Summary View showing the history of every SPC chart within the Viewer. In the example in Figure 10,



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you can see that there is an Average chart, a Range chart, and a Summary View. The control limits change partway through the SPC charts, which is indicated by the vertical green line in each chart.

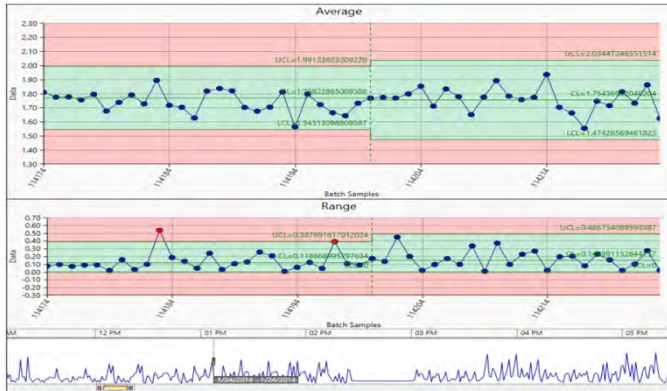


Figure 10 - Average and Range SPC Chart, Summary View