

Using Microsoft .NET controls inside the ArchestrA Graphic Toolbox for development and management of a Recipe Database

Highlights

- Software**
- Wonderware System Platform ®
 - Wonderware InTouch ™
 - Microsoft .NET
 - Microsoft SQL Server™

- Objectives**
- Customer Business Goals**
- Recipe Management
 - Prevent Recipe Creep
 - New Recipe Setup
 - Quality Control

A recipe structure is used for maintaining process setpoints so a specific outcome can be predicted. The recipes are maintained in the PLC to eliminate reliance on outside systems and for maximum uptime while still allowing system functionality.

Problem Statement

At one site, operators had the ability to load recipes and modify the running recipe. Users with administrator rights could save a modified recipe to the PLC recipe structure. Over time, small changes compounded to generate a recipe at risk of changing the final product. A master recipe list solution was needed so a System Engineer could compare the current PLC

recipe database to a gold standard, or CenterLine, saved elsewhere and identify where changes may have occurred.

Design Considerations

A Microsoft SQL Server database is a natural choice to store CenterLine recipes. A graphical display was needed to show a comparison between the values in the PLC, which had been edited over time, and the CenterLine. Although the native ArchestrA Graphic Toolbox can achieve the desired results, the technical resources behind the Microsoft .NET DataGridView allowed for a rapid development cycle. The DataGridView has a very strong body of public documentation on the MSDN website and was a very mature product – particularly regarding interactions with a SQL database. The solution was also constrained to be within the existing ArchestrA framework and control system so the System Engineer had flexibility to operate the interface from the HMI while standing in front of the machine.

Solution

A SQL database was developed to match the PLC Recipe structure. An interface was provided to ReadFrom, CompareTo, or WriteTo either the PLC or the CenterLine SQL Database. The classic solution would be to use the ArchestrA Graphic Toolbox to create individual boxes, then use the SetCustomProperty function on each individually drawn box to highlight, but the SetCustomProperty function in our experience is slow to execute. Future modifications and maintenance also become an issue when dealing with so many individual graphic elements. We chose to import and use the DataGridView and leverage the native functionality to display data and color them appropriately to provide clear feedback to the System

Engineer. The System Engineer can now periodically compare the CenterLine values to the value in the PLC recipe structure and identify inconsistencies which may need addressed. The System Engineer needed a way to see the changes, make appropriate edits, and review them before saving the data to either the CenterLine database or the PLC. We used the HMI display as a temporary memory location so they could confirm the changes before saving anything.

The DataGridView's body of technical documentation relating to Events and Properties also provided solutions for additional built-in functionality such as drag-drop, filtering, and data validation. The DataGridView provided very clean SQL statements and concise, readable code for such a large volume of displayed information. This solution provided a much quicker development cycle and provided a robust solution for future updates to the recipes.

Results

During the first demonstration, the customer was immediately interested in the inconsistencies identified in many of their recipes – enough so they doubted the comparison functionality. The customer is actively using this tool to identify recipe changes. The tool is also being used to assist in the population of new recipes where there was forethought to create spare recipes. This gives PREMIER confidence we are able to utilize further Microsoft .NET controls in creative ways to make the ArchestrA Graphic Toolbox even more robust.

50	52	52	52
52	52	300	51
52	52	79	78
25	25	80	79
50	45	126	89
125	125	126	125

