Energy Management Case Study

Usiminas Steel

Largest supplier of steel products to South America, with 13 industrial plants.

Evolving a legacy system for long-term viability

CHALLENGE

- To replace the 100,000 tag legacy FactoryLink system, modernize the user interface and system architecture, add more stations on the network

SOLUTION: FactoryStudio

- The old system with 100,000 tags has been replaced by FactoryStudio which requires less than half of the development time, due to the built-in properties and application objects.
- Native features in FactoryStudio are used to avoid human failure.

RESULTS

- ***"The Tatsoft FactoryStudio software, used in the migration of the Integrated Recirculation Monitoring System at the Ipatinga facility, proved to be stable and reliable, increasing the process efficiency and costs optimization."*** - Guilherme Publio Teixeira, Manager of the Energy and Utilities Systems Support group in Ipatinga, MG

For more information, and to discuss how FactoryStudio can help modernize your SCADA HMI application, please contact us at our website: **www.tatsoft.com**

Energy Management Case Study

Usiminas Steel is the largest supplier of steel products to South America. With 13 industrial plants strategically located in the states of São Paulo, Minas Gerais, Rio Grande do Sul, Espírito Santo and Pernambuco, Usiminas provides heavy plate, galvanized steel, electro-galvanized steel, cold-rolled strips, and more to the automotive, civil construction, mechanical industry, road and agriculture machinery, furniture, container, tube, oil & gas and home appliance markets across Brazil and Latin America.

Guillermo Pubio, Manager of the Energy and Utilities Systems Support group at the plant located in Ipatinga, MG, had been managing an energy system application developed with FactoryLink, which was no longer supported by the original developer. This created an increasing concern over the future reliability of the system as upgrades to the computer hardware may render the software unstable, unreliable, and certainly unusable.

The Energy system collects real-time data from all steel-mill, plate- mill, coking, lamination, continuous casting and other process units, using advanced optimization algorithms created by Usiminas for performance and demand prediction requirements.

As part of the Energy system, the Water monitoring application is comprised of a general overview screen and manages 25 water systems, in a hot-stand-by configuration. Hot Standby redundancy is a standard feature with FactoryStudio so our clients don't need to worry about missing data or downtime caused by a server failure.

The challenge was to replace the 100,000 tag legacy FactoryLink system with a modern user interface and system architecture, add more stations on the network, and add the hot stand-by server to help ensure system availability and uptime is maximized. The difficult part was finding an application development platform to best fit their needs.

Enter FactoryStudio from Tatsoft

Usiminas collaborated with Tatsoft to design, build, and implement their new system. Tatsoft provided consulting, project management, application development, testing and installation services. USIMINAS provided the advanced optimization prediction algorithms as well as committed resources to assist with the implementation of the system.

One of the most demanding aspects of this project was the need to communicate with serial and Ethernet devices from several different manufacturers such as Siemens, GE, Rockwell, Reliance, and Altus simultaneously. To reduce the need for upgrading the controllers and devices on the system, Usiminas leveraged a third-party serial-to-Ethernet interface to allow industrial devices to be directly accessible from the network more quickly and reliably.

Legacy devices are thus transformed into Ethernet devices, which can be monitored and controlled from any network location or even the internet. Different configurations and features are available for specific applications, such as protocol conversion, real COM drivers, and TCP operation modes to name a few.

There were several other devices for which OPC Servers were used, including managed SNMP devices.

Usiminas also needed to interface with Oracle and MS-Sql databases where historical alarms, trend and process data are stored and managed. Interfacing with these databases is simple thanks to the connectivity tools provided within FactoryStudio.

A flexible full-featured solution

The old system with 100,000 tags has been replaced by FactoryStudio which requires less than half of the development time, due to the built-in properties and application objects. The new system now includes 35 nodes distributed across the entire plant, and operators can now monitor the unit operations with remote clients so they are not tied to a single desktop location.

To help ensure the correct Operators are logged in during a shift, FactoryStudio provides an automatic log-out feature which, after an eight hour period, logs the operator out and gives access only to the operator registered in the current shift. Another standard FactoryStudio feature provides for a startup delay which prevents erroneous alarm conditions from being generated by the system as it starts up. This helps the operators focus on real issues instead of wasting their time unnecessarily.

Native features in FactoryStudio are used to avoid human failure by notifying the operator if an active alarm requiring action has not been resolved after a specific amount of time.

For example: The tank water level was becoming low and triggering a critical alarm. The correct operator action is to turn on the water pump to increase the water level or stop the process. However, if the operator forgot or neglected to take either of these measures, the water level became too low and mud would enter into the injector. Now with FactoryStudio sending another warning to the operator, this unneeded large expense to the company is avoided.

The FactoryStudio system controls external components like third-party Windows services, and other external processes used to provide greater stability when the primary station has an unexpected shutdown. It used to be that when this would happen, the third-party software would stop functioning.

In the displays there are pumps, motors, valves, and the operator can include comments about operations that other operators can read to know what is happening or know specific process details. A summary of actions is kept which includes those comments.

The Security system was designed to manage shifts of Operators. The currently logged-in Operator can now execute only the specific actions for which they have clearance. In these cases, the Operator can only log into the system if they are on the correct shift. There are three shifts configured with a specific group of Operators each. The system executes an “auto-logoff” at the end of shift to be ready for the next Operator on the next Shift.

One final major benefit for Usiminas is that FactoryStudio fully leverages the resources available from the computer. This includes memory, multi-core CPUs, advanced graphics cards and more. To take full advantage of those resources, the computer being used as the server for this system includes Windows 64-bit OS and 10GB RAM, which provide plenty of processing power.

What features of FactoryStudio reduced engineering time?

The Symbol Library was leveraged to help expedite the project development process. This project has several libraries of motors, pumps, pipes used in more than 200 displays. When using the Symbol Library, changes to the library object results in all instances of the object being changed automatically. This saves you time and money by decreasing the engineering and maintenance time, thus increasing engineering productivity.

This project has several areas that were developed using a template project. After an area is finalized, it is imported into in the master project that has all areas. The import operation is a native feature created to import components already defined elsewhere, for example, from a master project. This not only expedites the engineering process, but it helps to establish and implement corporate standards easily.