BridgeVIEW Monitors Natural Gas Pipelines

by Thierry Warpelin, Software Engineer, Soft-Concept

The Challenge: Efficiently monitoring and controlling a gas pipeline system.
The Solution: Using National Instruments BridgeVIEW to create a PC-based SCADA system.

Introduction

Gaznat SA, Aigle and Vevey, is a company that distributes and transports natural gas in the French-speaking region of Switzerland. Gaznat chose Soft-Concept to design and develop a SCADA system that locally monitors and controls gas distribution in some of their sites, located anywhere from 10 km to 120 km away. The existing system controlled all Gaznat sites remotely. However, Gaznat wanted to add new features and capabilities to their system using BridgeVIEW. Gaznat wanted to control the local site with the same graphical user interface (GUI) used for the main site.

Gaznat controls 50 sites that are spread out across the entire natural gas network. A teletransmission system connects the PLCs on each site to the dispatching site located in Aigle. An operator controls the entire network from Aigle with specially-designed software. Gaznat wanted us to create a SCADA application for the 10 most important sites that possessed the same functionality as the main application running at the dispatching site. Gaznat listed the following specifications:

- A GUI identical to that of the main site
- An application that works in parallel with the remote control system; thus, the local system working with BridgeVIEW is also available on the remote system and vice versa
- Ensured security
- Easy and fast maintenance and extension of the application

System Configuration

We configured a system using National Instruments BridgeVIEW that fulfilled Gaznat's requirements and more. For the 10 sites designated by Gaznat, a typical

Soft-Concept used National Instruments BridgeVIEW to create a PC-based SCADA system to monitor this gas pipeline system.

system consists of a Pentium 133 MHz PC with 32 MB of RAM and a touchscreen connected to a PLC (SAT-Systeme für Automatisierungs-Technik Gmbh & Co.). The system works with a Modbus protocol that uses approximately 320 I/O points – mainly digital and analog inputs.

I was completely unfamiliar with graphical programming, but with the documentation, the examples shipped with BridgeVIEW, and the excellent technical support available from National Instruments, I was up and running in a very short time.

The system performs data logging regularly with a maximum delay of one hour between two records. In addition, we set the historical database to retain data for one year. With the data logging, you can view historical trends and identify defective sensors based on the historical data of the specific sensor.

Safety

The rooms where the installations are located are accessible only by authorized individuals. We initiated this safety precaution to avoid any kind of modification of the parameters and to limit the incidence of operator errors.

The most critical risk to a system is operator error. Therefore, we set three different levels of log-in access:

- Administrator – the operator can modify and add new features to the SCADA application.
- Control – the operator can visualize and control the gas process.
- Visualization – the operator can visualize the gas process. The controls are visible but disabled.

The BridgeVIEW application we developed for Gaznat was a complete success, surpassing their expectations. Because of the user-friendly environment, as well as the flexibility of BridgeVIEW, we reproduced the GUI exactly – our goal for this project.

With the integrated security functions in BridgeVIEW, we easily locked some controls according to the log-in priority level. However, we saved tags on the database so
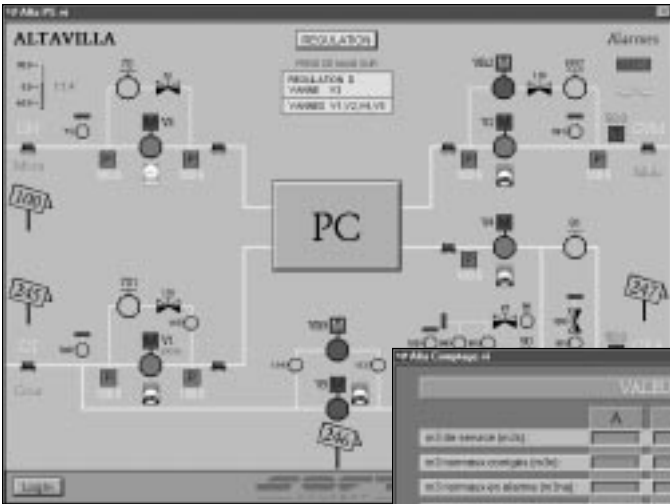
You can view historical trends and identify defective sensors, based on the historical data of the specific sensor.

the operator can visualize them for diagnostic or information purposes.

Conclusion

BridgeVIEW was an easy programming language to learn, use, and modify. With the documentation and the examples shipped with BridgeVIEW, and the excellent technical support available from National Instruments, I was up and running in a very short time. BridgeVIEW is the best SCADA/HMI tool you can get on the market in terms of price versus performance.

With this application, we now have a better security system for the gas network. Development time lasted approximately two to three months. This period included learn-

ing BridgeVIEW, developing the VIs, configuring the Modbus server, configuring the local PLC, and installing the application.

Bridge VIEW is the best SCADA/HMI tool you can get on the market in terms of price versus performance.

About BridgeVIEW

National Instruments BridgeVIEW, which is based on the same patented graphical programming technology as the company's industry-leading LabVIEW software, offers unique capabilities for creating high-

performance, flexible, SCADA and HMI solutions for manufacturing and process control applications. BridgeVIEW is a native, 32-bit application that takes full advantage of the robust architecture of Windows 95 and NT. Users can analyze real-time or historical data on-line, and make important process decisions quickly and reliably.

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