White Paper: Web-enabling Remote Processes Reduces Management Costs

Summary

As the need to remotely control processes increases, so does the need for a convenient management solution. Web-enabling remote processes simplifies management and reduces downtime, lowering maintenance and operation costs.

History

Remotely operated applications such as wastewater treatment, wind energy generation and pumping stations must be regularly monitored and controlled to ensure optimal performance. Wastewater facilities must consistently meet government regulations for efficiency and are regularly monitored to ensure environmentally friendly operation. Wind energy companies must control fields of turbines located many miles away, and pumping stations require constant surveillance that, without remote access, involves costly on-site monitoring.

The alternative solution—entirely automating remote processes—can be just as inconvenient and expensive. Automation requires frequent maintenance visits, either to prevent failures in critical systems or to fix failures once they occur. Both these scenarios can result in significant downtime and often require external service providers, costing businesses substantial time and money.

Remote process operation has also become a concern for smaller companies or self-employed individuals. In order to stay competitive with larger corporations, many smaller businesses must rent expensive processing equipment—which may be installed and operated many miles from the renter.

In addition, equipment is consistently becoming more complex to accommodate new production and quality regulations, making the management of such equipment more complicated. The distance between where the equipment is located and where it must be managed, combined with constantly changing technology, makes solving remote process applications increasingly challenging.

Challenge

Preventative maintenance, determined by system and equipment status data gathered during equipment operation, is critical to ensuring that remote processes maintain optimal performance. When wastewater is treated, for example, filters must be regularly checked and maintenance is scheduled when filter changes are needed. Car wash applications often require daily liquid level surveillance, and pump and system status feedback is needed in order to avoid controller crashes. These and many more applications involving equipment with moving parts must be checked often and all data carefully monitored to prevent malfunctions and recognize potentially costly problems.

If the equipment cannot be sufficiently monitored and controlled from a remote location, on-site visits multiply, since maintenance workers are needed to perform simple system checks as well. The additional trips quickly add up in cost and often result in production downtime. Also, if an external service provider is hired, the task becomes additionally time-consuming—which causes significant concern when monitoring is crucial to preventing critical system failures.

Monitoring and controlling processes remotely and in real time helps identify future problems before they occur, increasing the efficiency of preventative maintenance and decreasing the number of on-site visits required, thereby reducing expenses. For this task, a time-efficient, cost-effective monitoring and control solution is necessary.

A Problematic Solution

Securing a robust, reliable method for remote equipment surveillance has proven problematic for many businesses. When external service companies are employed for such purposes, they will often install a control system comprised of PLCs, drives, and additional controllers—a variety of products often of different brands. Gathering complex machinery data in real time from all these sources at once can be challenging, as data usually can be acquired from only one PLC or critical controller at a time. This system is also inconvenient because the devices are virtually incompatible with one another, making communications among PLCs and other controllers either complex or very limited.

Other methods require computers and specialized operating systems, as well as complicated and often expensive software, to help organize and log collected data. This requires further external sources to provide the knowledge and support needed to

program, maintain and troubleshoot the system. Plus, this complex solution is often unstable and system crashes are common.

A Solution That Works

Web-enabling remote processes simplifies system monitoring and control and provides a comprehensive, cost-efficient solution. When a web-enabled product is used to gather critical system data from all equipment simultaneously, the information can be simply concentrated then monitored or logged for future availability online. This solution ensures all data concerning machine input/output, status and faults is easily referenced and addressed, and it can be accessed easily from an Internet-enabled PC.

Another method of web-enabling remote processes involves on-demand or automatic synchronization. Using this solution, data can be automatically transferred from multiple remote sites to one central server, where engineers or service managers can monitor information directly. This avoids unnecessary connections to the remote controllers. Instead, remote devices can synchronize with the server, or the server can pull data from remote sites using FTP. This solution also allows operators to easily visualize the status of remote processes, providing central data for SCADA packages.

In addition, web-enabled systems can be configured with alarm capabilities, ensuring notifications of equipment failure or other critical system events are delivered promptly to a set destination: a control panel, a PC or even a cell phone. With this system in place, any faults in a remote process are communicated as they occur, enabling engineers and plant managers to address manufacturing and production problems immediately.

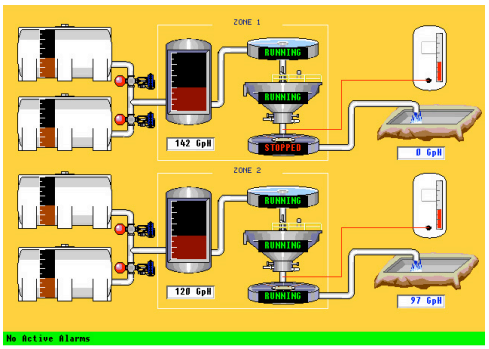
A Comprehensive Solution: Red Lion's Data Station Plus

In order to facilitate communications among equipment produced by many different manufacturers, the Data Station Plus by Red Lion Controls can communicate with multiple devices at once—simplifying the monitoring and control of an intricate remote system. Also, the Data Station Plus comes standard with an embedded protocol converter, enabling all connected serial or Ethernet devices to communicate with one another. This data exchange is set-up using a simple drag-and-drop mapping interface, reducing programming time.

All data collected by the Data Station Plus can quickly be logged in an IT-ready, comma separated variable (CSV) format that concentrates all information for easy reference. These comprehensive data logging capabilities provide an easily accessible record of the remote processes' status history, allowing companies to perform preventive maintenance in a timely and cost-effective manner. Plus, current system quality can be monitored from

a PC or other interface, and the Data Station Plus' excellent data collection abilities ensure traceability for diagnosis and troubleshooting of system faults.

The Data Station Plus allows users to reliably control remote processes via its embedded web server. It features a sophisticated array of remote tools and acts as a virtual HMI, enabling operators to view data and make decisions accordingly in real time. When an alarm sounds or production quality issues arise, operators can launch a backup system, open a value or adjust PID gain from an office web browser. In addition, the Data Station Plus allows operators to alter their process' parameters to adapt to changing weather or additional environmental concerns.



Wastewater Treatment Monitoring

This product's advanced remote monitoring and control abilities have proven invaluable in a number of applications. The filters critical to wastewater treatment can be easily checked to determine when they must be changed. Liquid level data, as well as pump and valve status in car washes or pumping stations can be easily monitored, logged and referenced. Wind energy generation and concrete plant operations can be placed under constant surveillance, ensuring system errors or abnormalities are readily identified and addressed. In addition, since logs collected by the Data Station Plus can be easily downloaded online via FTP services, this monitoring and control can be performed from virtually any location with Internet access.

Web-enabling remote processes allows both small and large companies to save time and money by making the managing of these applications more efficient, reducing downtime and lowering maintenance costs. The Data Station Plus provides a reliable, robust solution for web-enabling processes, concentrating data from a host of devices made by a variety of manufacturers and located in a remote location. With its embedded protocol facilities and exceptional data logging capabilities, the Data Station Plus ensures all system data can be monitored and managed from virtually any location. This tool enables manufacturers to easily and efficiently identify potential problems, thereby minimizing interventions and reducing costs.