

Decreasing the cost of SCADA

With the ever increasing demands of regulatory reporting and security customers, are required to invest in SCADA infrastructure to monitor critical water assets. However, many customers may harbor bad memories of SCADA from past experience. Twenty years ago remote monitoring was expensive, black-box technology: controllers were not user friendly and only manufacturers had the ability to program their proprietary system. Communication through radios or leased lines was intermittent and prone to failure.

What does the SCADA picture look like today? Is it really any better? The answer is a resounding “yes” with today’s SCADA technology being more affordable and much easier to use than its predecessors.



Discover how Control Microsystems' SCADA host platform, ClearSCADA, can help save money and increase productivity while reducing engineering burden, and management overhead.

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The RTU advantage

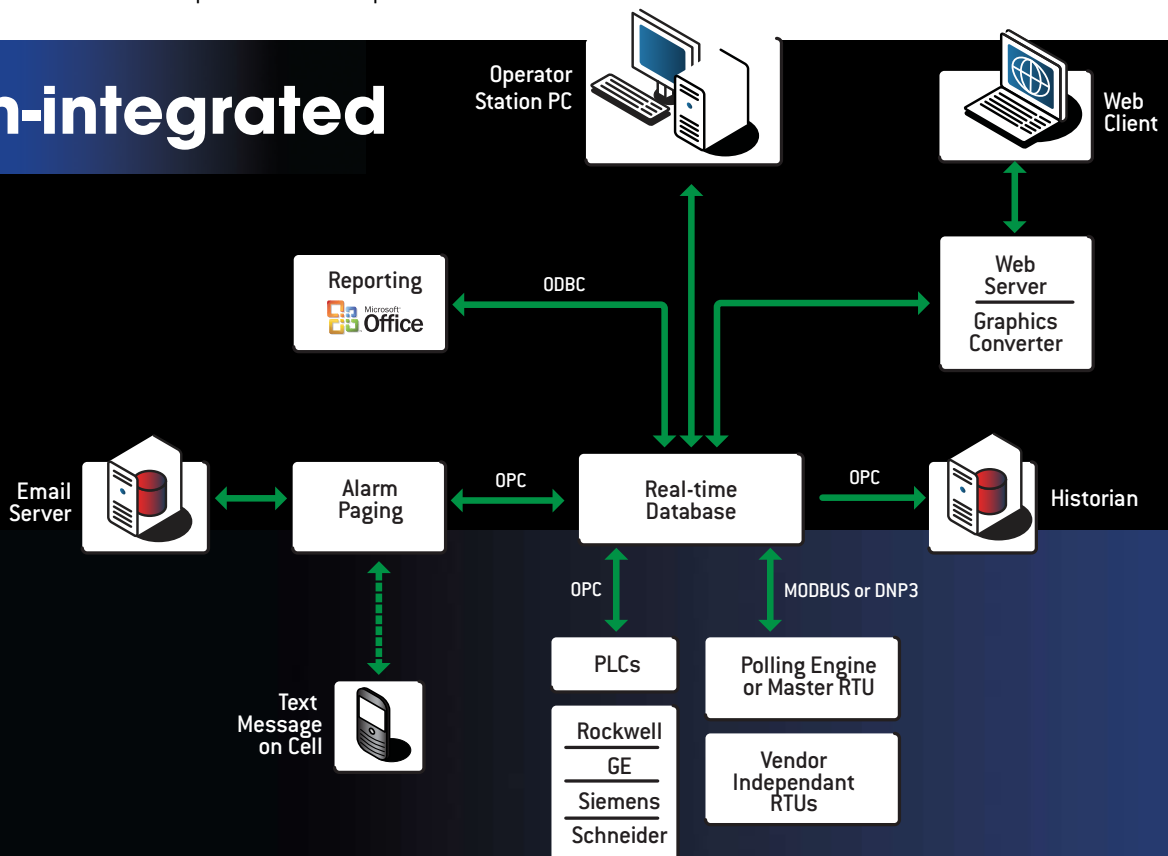
The development of the Remote Telemetry Unit (RTU) is the first area where SCADA has improved. The growth of Programmable Logic Controllers (PLCs) into a multi-billion dollar market supporting the manufacturing industry paved the way to create the RTU, essentially a PLC modified to include more robust environmental specifications and integrated communications. RTUs now start at less than \$1,000 and may include radio communication functionality at that price point.

The role of the SCADA host

The advance in SCADA host software that collects and displays data from the remote controllers was the next significant improvement. Depending on the needs of a specific SCADA system, the SCADA host may comprise multiple pieces of software to provide all the required

functionality. A Polling Engine, or communications driver, sequentially scans remote controllers using radio or other communication links. As the Polling Engine acquires data, it is copied to the SCADA Real-Time Database. Data in the Real-Time Database is formatted by the Graphic Display used to show the operators what is happening. Customers who wish to archive historical data and alarm events require additional Historian software and sharing data with management or remote users requires a Web Client module that allows users to connect to the SCADA host through a Web browser. Each additional piece of software adds software license fees and increasing annual maintenance costs, to say nothing of the engineering difficulty to build, configure, and maintain the system. Fortunately, some newer SCADA hosts include all the functionality mentioned before in a pre-integrated package to reduce costs and simplify installation and maintenance.

Non-integrated





The problem with older SCADA systems

Looking at the previous example of a non-integrated SCADA system, red lines crossing a data connection between the Real-Time Database to another application indicate a tag or point that needs to be configured and maintained each time the system changes or expands. No wonder the engineering costs for SCADA are high – in environments like those pictured, it is possible for annual maintenance costs to outstrip the price of purchasing new software. If this resembles your SCADA system you may be better off replacing your existing system with a product that integrates all of the components to reduce software license fees, configuration overhead, and ongoing maintenance costs.

In situations where your network of remote monitoring stations is continually expanding, or remote monitoring sites must communicate back to an office or control centre, the proper SCADA solution can reduce costs and increase performance. For example, when deploying new remote sites you elect to use RTUs with integrated radios rather than a basic PLC. However, an upgrade to the entire radio system is required to support the additional volume of data generated by the new remote sites and prevent performance issues. When faced with this problem, you can choose to upgrade, or you can leverage the existing communication infrastructure by switching your SCADA to the more efficient DNP3 protocol.

The DNP3 solution

DNP3 is an open, industry-standard protocol developed 30 years ago for the power transmission market. Its key features include time-stamped data at the RTU and event-based communications. DNP3's use of event-based communication is what enables it to use communications more efficiently: only data that has changed since the last poll is sent to the SCADA host. By sending less data per polling cycle, less communication resources are consumed, allowing more sites to share an existing communication network. With DNP3, you can expand your system without taxing existing communication channels while guaranteeing that critical data is being reliably collected.

**... today's SCADA systems
are simpler to
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and manage**



How integrated SCADA systems reduce operational costs

If you are a small or medium-sized organization, it is unlikely that you have a central control room with an operator monitoring your SCADA system 24/7 for alarms. It is more likely that standby operators receive alerts from a call-out system when general alarms are triggered.

A SCADA host can simplify management of alarms and allow faster response to problems before they cause production losses. An integrated SCADA system has the provision to redirect critical alarms to any operator (or group of users) via pager, SMS, or email message automatically and provide details on the specific alarm to allow quick response. For example, a high-level probe in a lift station sends an alarm that a spill is eminent. The SCADA host forwards the alarm to an operator's cell phone through an SMS text message; upon receiving the alarm, the operator can respond immediately by sending a reply SMS text message to the SCADA host with instructions to shutdown the upstream pump, averting a spill and operational expense. This example can be further enhanced with escalation rules configured at the SCADA host that automatically alert a supervisor or management if an operator does not acknowledge and respond to an alarm within a preset time limit.

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Integrated SCADA – the clear way forward

The evolution of SCADA systems from expensive, complex, closed systems to affordable, easy to use, open solutions mean that today's SCADA systems are simpler to deploy, configure, and manage. RTUs add increased functionality to remote monitoring locations without breaking the bank. SCADA hosts offer a clear view of operational data collected by remote sensors while providing operational data logging and permitting timely response to alarm situations. Adoption of the DNP3 protocol allows engineers to maximize the lifespan of communication infrastructure by allowing more remote controllers to share existing communication channels. System monitoring and alarms are handled quickly and efficiently with integration into ubiquitous modes of modern communication like pagers, email, and text messages. These features, when combined into an integrated, modern SCADA system, help save money and increase productivity while reducing engineering burden, operator effort, and management overhead.

Eric Schwantler

Eric Schwantler has over 20 years of experience in the SCADA industry including 15 years dedicated to the development, promotion and sales of SCADA management software. As Control Microsystems' ClearSCADA Product Director, he is responsible for the end to end delivery of the ClearSCADA product. This starts with providing product development plans, marketing, sales assistance and support and training.

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