

CASE STUDY

Schweitzer Engineering Laboratories, Inc.— Pullman, Washington

SEL Metering Solution Saves Campus 4,000 Gallons of Water Per Day

Pullman, WA—In May 2014, Schweitzer Engineering Laboratories, Inc. (SEL) opened its state-of-the-art Zocholl Research and Development Building, which includes an advanced metering system. The advanced metering system consists of two SEL-735 Power Quality and Revenue Meters and is set up for campus-wide energy monitoring and optimization. The system monitors resource usage, including energy, water, and gas as well as power quality (PQ) disturbances.

A month after the building opened, SEL landscape technician, Dennis Ollgaard, noticed that the irrigation system was spilling water onto the pathways outside the Zocholl building, as shown in Figure 1 and Figure 2. Because the advanced metering system was already in place, Dennis had easy access to the water metering data.



Figure 1—Water Spillage Outside SEL Zocholl R&D Building



Figure 2—Water Runoff on SEL Zocholl Parking Lot

Using the water consumption data available from the SEL meters (shown in Figure 3), Dennis quickly realized that an irrigation program was running twice per night instead of once. After making a system correction, he was able to reduce the daily water consumption by 32 percent, or 4,000 gallons per day. He was also able to verify that the system was not running on rainy days.

“This meter system helps us know if we are using more water than we should be,” said Dennis. “With just the utility bill each month, it is hard to know if the increase in water consumption is due to hotter days, a break that is not in sight, or more landscaping.”

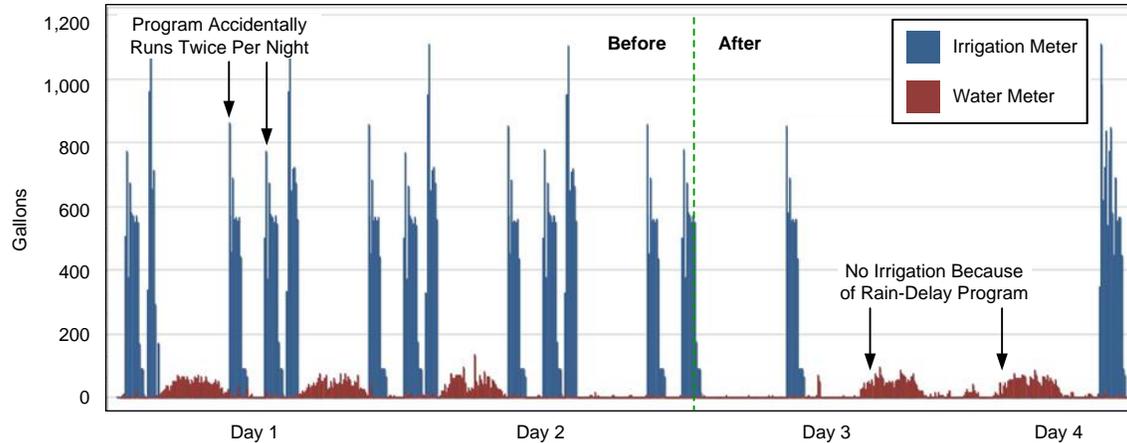


Figure 3—Trend of Water Consumption Before and After Change in Irrigation Program

The SEL-735 is an electric power meter that provides advanced trending capabilities in addition to PQ measurements. Although it cannot directly measure resources, such as water, air, gas, electricity, and steam (WAGES), it can count electrical pulses sent to it [1], as shown in Figure 4. For example, a pulse output device could send one electrical pulse for every gallon of water that passes through the utility water or gas meter.



Figure 4—The SEL-735 Can Count Electrical Pulses for WAGES Monitoring

As part of the construction of the Zocholl building, SEL had asked its utility provider to supply pulse output devices from the utility’s gas and water meters. These pulse output devices were connected to the two SEL-735 Meters at the Zocholl building, as shown in Figure 5.

The pulse output devices send pulses corresponding to a certain quantity passing through the meters. The main SEL-735 at the Zocholl building is set to scale the units by 0.1 to indicate that every electrical pulse represents 0.1 gallons of water through the flow meter. It counts pulses from the utility

gas and water meters and determines the consumption trend over time using its internal recorders. The trending views can help identify water leaks, overusage, time of use, and so on. In the case of combining gas and electric metering, the trended data can be used to optimize HVAC control systems to reduce peak electrical demands and identify any HVAC efficiency issues.

An advanced metering system using the SEL-735 can allow users to monitor multiple resources through a single interface. This is in contrast to a typical setup, which can have disparate systems (HVAC, water, gas, electrical, and so on) in one building, with none of the systems communicating with each other. Because the SEL-735 collects pulses from WAGES meters, users can view trends for water, irrigation, gas, and electrical consumption in a single report.

The advanced math, logic equations, and trending capabilities of the SEL-735 enable it to count pulses from virtually any legacy device. Data can be exported as a report or communicated via industry-standard protocols.

By submetering each of its buildings and monitoring WAGES, SEL is able to create accountability at the process or departmental level with almost minute-by-minute data acquisition on resource consumption and trends.

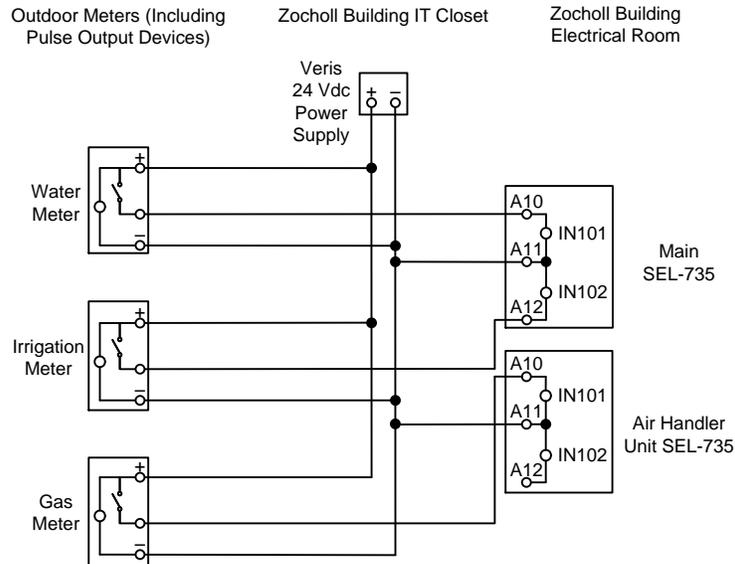


Figure 5—Wiring Schematic of Water and HVAC Monitoring System at SEL

With a close look at data, accounting can accurately allocate costs to each department. Short-term monitoring and spot measurements provide information about equipment performance, loading, and instantaneous consumption, while long-term data are used for energy management and to assess the impact of projects.

For site-wide data visualization from all meters on campus, SEL uses ACCELERATOR[®] Meter Reports SEL-5630 Software. Data from the meters are periodically sent to a common database where they are queried for reports. Meter Reports allows users to customize reports, perform addition and subtraction of metering points, and analyze events—all through a single interface.

Conclusion

The advanced metering system at the Zocholl building made finding the water waste simple, quick, and easy. Data reporting and analysis have allowed SEL to save 4,000 gallons of water each day, waste that may otherwise have gone unnoticed. Having the SEL-735 integrated into the building's design enables SEL to quickly troubleshoot a

wide variety of scenarios far into the building's lifespan.

The WAGES metering capabilities of the SEL-735 supplies SEL with the necessary data to make strategic decisions that save additional costs and resources.

Resources saved by system improvement and problem solving ultimately free up additional financial resources for the company as a whole. Furthermore, with data from meters across the SEL campus, facilities can manage energy usage and optimize operations to shift peak demands. Years of data storage also provide the ability to analyze the impact of energy efficiency measures, which can drive further energy optimization.

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Reference

- [1] C. Hilling, "Programming an SEL-735 to Accumulate, Store, and Report Pulse Meter Data," SEL Application Guide (AG2013-21), 2013. Available at <https://selinc.com>.

About SEL

SEL has been making electric power safer, more reliable, and more economical since 1984. This ISO 9001:2000-certified company serves the electric power industry worldwide through the design, manufacture, supply, and support of products and services for power system protection, control, and monitoring. For more information, please contact SEL at 2350 NE Hopkins Court, Pullman, WA 99163-5603; phone: +1.509.332.1890; fax: +1.509.332.7990; email: info@selinc.com; website: www.selinc.com.

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