



Smart Metering

Global Resource Efficiency Services
www.gresworld.com

System Design

The system is a combination of both monthly utility bill information and 15-minute interval data information presented to the different end user audiences via a web application called the Web Info Center.

The following brief descriptions provide an overview of the different information sources and systems that are combined to bring energy information to life for its clients:

- Data Accumulators: Installation of a device located close to the pulse meter, which stores the recorded energy information and once a day sends the stored information to a central server via a phone line or local area network.
- Energy / Utility Bills: Energy and utility bills are entered into an energy accounting application for allocating energy use and cost to the individual buildings.
- Web Reporting: Delivery of reports for both information sources to the different end user audiences on campus that include but are not limited to: Facility Operations and Maintenance Technicians, Custodians, Administrators, Teachers and Students.

Note: All components of the infrastructure will be owned by the client and are designed for the client to take over the monthly operation of the information system at its sole discretion.

Pulse Metering

The addition of pulse metering adds a real-time or next day feedback confirmation to operational changes in the M&V strategy. It allows targeted measures to be monitored and their positive financial effects confirmed. The two most common types of pulse metering are real time metering, which pulses from the meter can be read in real time set to intervals of 5, 10, or 15 minutes. The other is next day metering which pulses are read the next day in intervals of 5, 10, or 15 minutes. Next day interval data is usually the most economical solution to obtain pulse metering.

There are a number of methods to add pulse meters to a site's BAS panel. Three pulse metering options are shown in Figure 1.

The top diagram shows how the BAS panel itself can be used for pulse metering by adding the appropriate sensors (current & voltage transformers for electrical pulse meters or pulse counters for gas or water pulse meters).

The middle diagram shows how the BAS panel can "talk" to a separate pulse meter by using a common protocol (language).

The lower diagram shows how a completely separate pulse metering system can be integrated to work with the BAS.

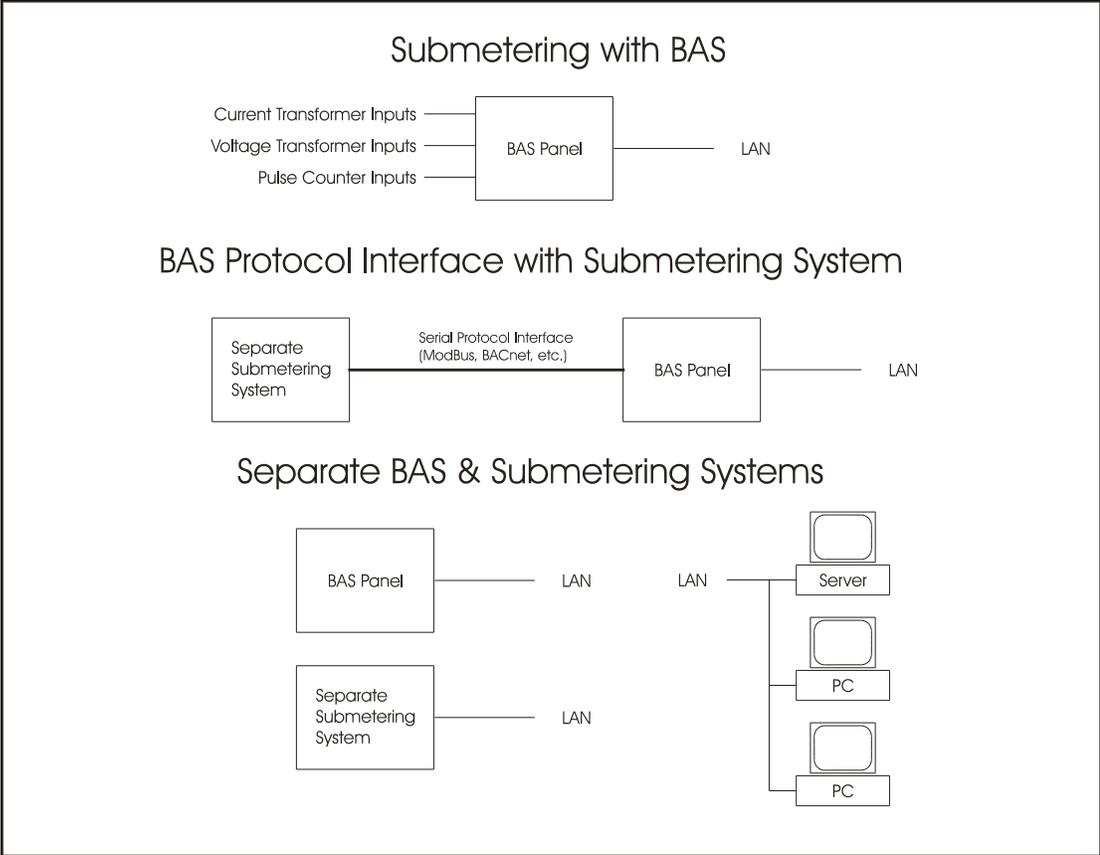


Figure 1 - Different methods of integrating real-time sub-metering to the BAS

Data collected off of the pulse meter will be programmed and displayed on an easy to read interface graph where it can be base lined for comparative reporting. **Figure 2** shows a sample screen.

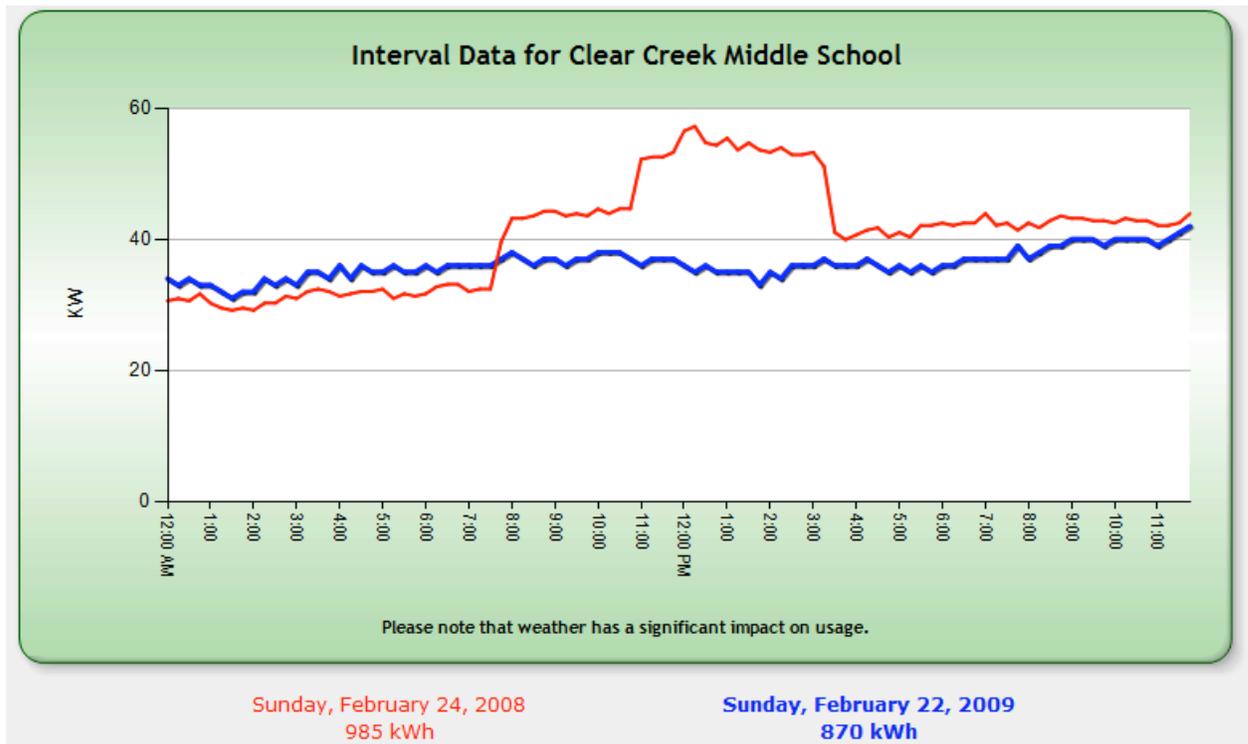


Figure 2 - Sample GUI screen showing a representation of an electrical interval-meter.

Data collected can be further broken down to show consumption patterns for individual points within a building as shown in Figure 3.

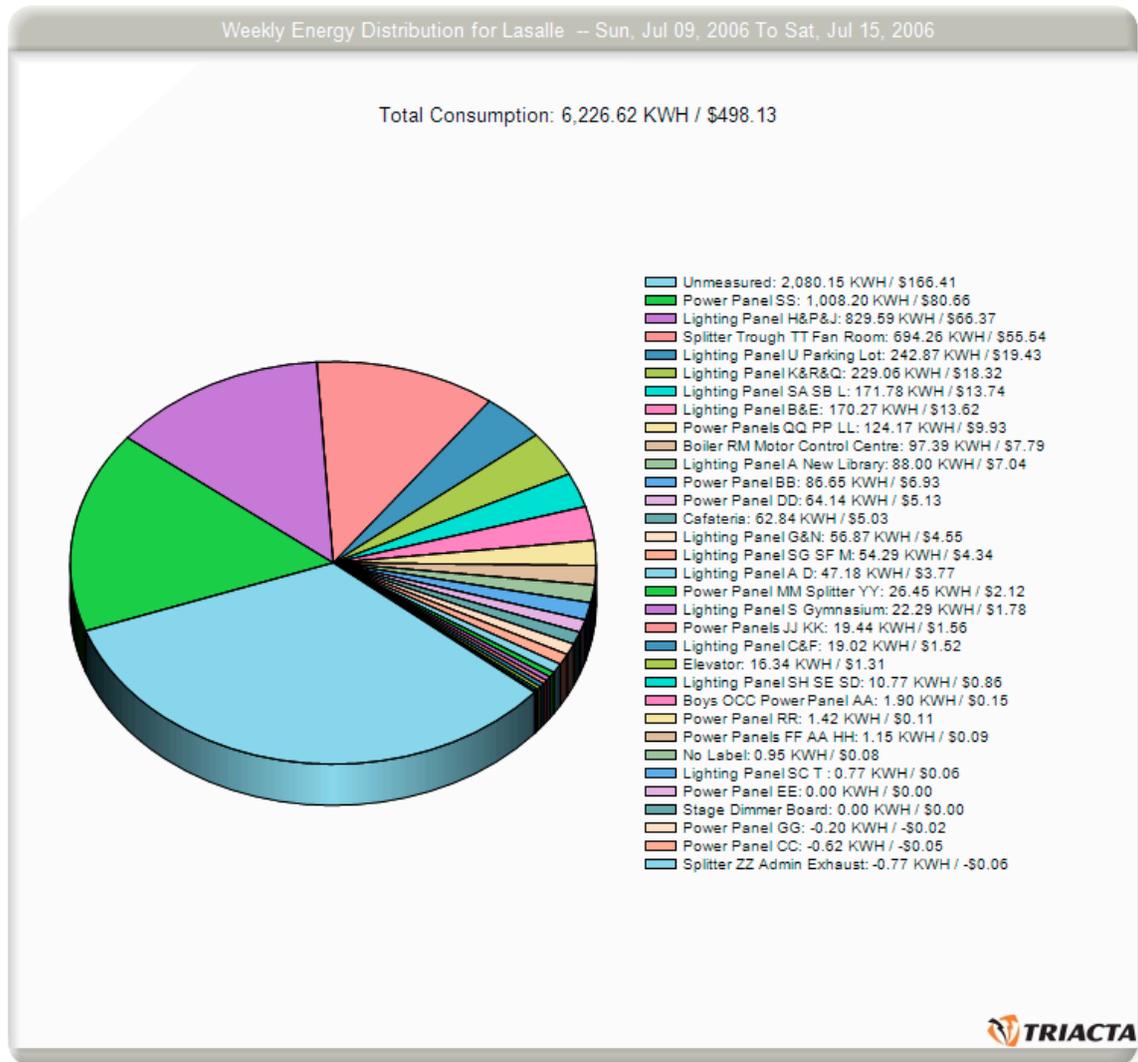


Figure 3 - Sample screen showing a representation of consumption patterns for individual points.

System Implementation

Database Structure

- Construct Site Groups, Sites, Utility Vendors, Utility Accounts, and Utility Meters
- Construct Production Units such as Degree Days, Square Footage, and Custom Fields

Database Population

- Download historical databases
- Contact Utility Vendor for EDI Formats

Pulse Data

- Database Structure
- Build Defined User Tabs/Sections
- Build Multi-level reports
- Database population
- Download pulse meter data

Annual Data Hosting

Monthly Data

- Populate monthly data

Pulse Data

- Populate daily data