ANNUAL REPORT SUBMITTED BY THE BUREAU OF GENERAL SERVICES ENERGY SAVINGS FEBRUARY 20, 2002

Prepared for: Joint Standing Committee on Utilities and Energy

Prepared by: Department of Administrative and Financial Services
Bureau of General Services

ANNUAL REPORT
SUBMITTED BY THE BUREAU OF GENERAL SERVICES
ENERGY SAVINGS
FEBRUARY 20, 2002

Prepared for: Joint Standing Committee on Utilities and Energy

Prepared by: Department of Administrative and Financial Services
Bureau of General Services

TABLE OF CONTENTS

1. Report Introduction

In 1994 many of the State of Maine's major facilities were either obsolete, outdated, and inefficient; or were salvageable but suffered from lack of capital repairs and maintenance. In both cases, the damage to buildings and occupants was much greater than inefficient energy usage. Buildings were plagued by poor air quality due in part to water infiltration leading to the proliferation of mold and in part to the lack of mechanical ventilation. Poor work environments adversely affected worker productivity. The cost of capital repairs increased exponentially from year to year.

Energy usage could not be measured in a meaningful way since buildings within major State campuses were not separately metered, nor were individual pieces of equipment.

As discussed during the hearing and many work sessions for "An Act to Encourage Energy Efficiency in Government Facilities," the previous administration attempted to address the facility crisis of the early 1990's by use of "ESCO's" for the Capital Complex and the then-AMHI campus. Both ESCO's failed because the buildings and systems serving the buildings were so deteriorated and obsolete that they required complete renovation or replacement. Unfortunately, when the Cross Building was properly renovated, the ESCO for the capital complex left the State with a liability, since by contract the significant changes in the building's condition triggered a payment to the energy company.

Since 1994, the King Administration has addressed energy issues as one aspect of a comprehensive program to restore the State's capital facilities. Energy savings have been a crucial aspect of the following efforts:

a. Disposal of excess State property

These include the sale of the Pineland Campus to the October Corporation; sale of the Maine Criminal Justice Academy in Waterville to the Home for Little Wanderers; sale of the Maine Tourism facility on St. John Street in Portland to the Sweetser foundation; and transfer of the Children's Home in Bath to the City of Bath.

b. Renovation/Reuse Planning

The Administration has undertaken major planning studies that have identified exactly which facilities are needed now and twenty years into the future for State agencies. The Augusta Area Facilities Master Plan is such a study. Others, which are about to begin, address the Stevens School campus in

Hallowell, the MDOT Motor Transport facility in Augusta, and the Southern Maine Juvenile Facility (the "Youth Center") in South Portland.

Decisions to retain or dispose of State property have a major affect on the State's energy consumption, leading to smart planning and deliberate choices. Master planning is a prerequisite to selection of ESCO projects.

c. Renovations with Energy Consumption as a Priority

Renovations conducted during the past seven years have been done with energy conservation as a top priority. For example, the design contract for the Psychiatric Treatment Center, going into construction in March, specifically required the architect to design the facility to maximize energy savings and efficiency. A separate report will be submitted about energy saving measures incorporated into both renovated and newly constructed State facilities.

d. Controls and Maintenance

BGS' Property Management Division, through its emphasis on maintenance and installation of controls, addresses energy savings at every opportunity. Through controls alone, the AMHI Campus boilers consumed 18,173 fewer gallons of oil between 2000 and 2001. During January and February of 2002, the boilers have used 4000 gallons less than 2001 (this is partly due to the mild winter).

e. Infrastructure Improvements

Two major projects on the East Campus promise to transform resource use and energy consumption. In 2003, the underground water distribution system at the campus will be replaced. The lines are ancient, seriously deteriorated, and waste enormous amounts of water due to leaks. Unpredictable breaks disrupt work at the East Campus.

The underground electrical loop upgrade and replacement, complete in Spring 2002, has incorporated a "Powerlogic" system that allows baseline energy consumption to be accurately measured for the first time at the East Campus.

2. Powerlogic

<u>What is Powerlogic System (PLS)?</u>

The PLS is a sub-metering system that permits remote monitoring of electrical power systems. Electrical power data is gathered locally at the building electrical service equipment and the data is transmitted to the user's computer via the computer network system. Software resident on the user's computer allows analysis of power data for "tenant" metering, and for power disturbance monitoring.

Tenant Metering:

This feature provides data to permit allocation of power costs to the occupying department or agency. The State buys power at primary rates on a single meter which serves the entire campus. Building, and in some cases intra-building, usage is allocated on the basis of information provided by the sub-metering system. The system software provides the ability to print reports containing this data.

Energy Conservation:

Monitoring of power usage is helpful in determining which buildings are using a disproportionate amount of electricity. Energy costs can be managed by monitoring and shedding loads during times of high peak power usage. As an example, the DHS building electric service is overloaded; the system helps BGS personnel to monitor power usage so that users can be notified of impending power failure and can then reduce load to prevent a shutdown. The Power Logic System also monitors individual electrical power phases so that imbalances in distribution wiring can be corrected thereby avoiding unnecessary stresses on the electrical system. Electrical power usage of mechanical equipment can also be monitored which will help to determine inefficient operations which can then be corrected saving electrical dollars as well as the costs associated with heating and cooling, etc. This kind of monitoring can also be used to warn of mechanical equipment problems so that repairs can be scheduled and sudden failures and resulting building shutdowns avoided.

Power Disturbance Monitoring:

In the present age of computers, power disturbances are a continuing cause of computer problems. The power monitoring system can monitor power quality and record disturbances. Power and voltage transients analysis of this data allows a rapid determination of when the event occurred, the nature of the problem (or absence of power problem), and help locate the source of the problem. This feature is a significant time saver for the maintenance crew in responding to power quality complaints. In cases where power transients recur, the system can generate an alarm so that impending problems can be corrected before a more serious problem results. The system can help determine the source of problems; was it caused by a lightning strike, or utility switching transient, or an internal source such as a large motor contactor which has defective switch contacts.

The above information, pertaining to Powerlogic, was prepared by George Ames, P.E., Consulting Electrical Engineer and Clair Chesley, P.E., BGS' State Mechanical/Electrical Engineer.

3. Energy Audits

Energy audits require analysis of historical data for high and low power usage. This allows identification of abnormal or unusual power usage. With the Powerlogic system in place, BGS is now in a position to undertake energy audits.

Issues to be addressed include high efficiency lighting, high efficiency motors, HVAC systems and chillers, compressors and compressed air applications, boilers, furnaces and ovens, and off-peak demand scheduling of major electric consuming devices.

BGS anticipates that the audit process will reveal opportunities to make changes and improvements in energy consumption.

4. Draft Performance Contract

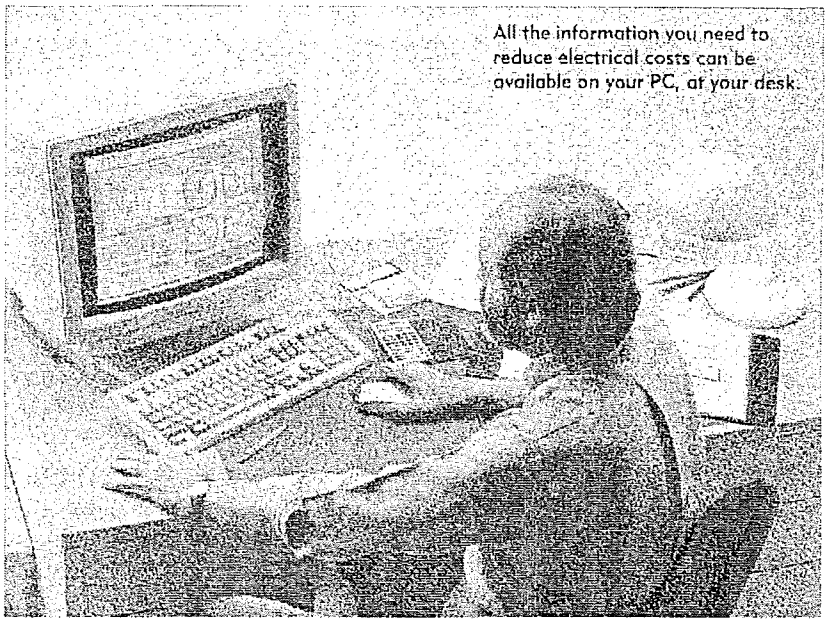
During the past year, BGS has developed a model set of conditions for energy savings agreements, and an agreement outline with general conditions. The agreement needs to be reviewed by the Office of the Attorney General, and circulated for comment.

5. Pilot Project

The East Campus Greenlaw Building will be the first of five pilot projects, and will be advertised in Spring 2002. It will be a good test of the suitability of the ESCO program, since it has many issues which seem appropriate for performance contracting, including old windows, window air conditioners, and outdated mechanical ventilation.

6. Conclusion

During the past seven years, the Administration has gradually put in place the essential prerequisites to a comprehensive energy conservation program. The Augusta Area Facilities Master Plan, enacted into law last session, identified the buildings that the State intends to demolish or retain; other planning studies will do the same for the Stevens School Campus in Hallowell, the MDOT Motor Transport facility, and the old Southern Maine Juvenile Facility buildings. The Powerlogic installation has given us the tool needed to measure energy consumption accurately. Draft documents have been developed for the performance contracting pilot program. An RFP for the Greenlaw Building will issue this Spring. Energy consumption continues to be a high priority in DAFS/BGS' comprehensive approach to rehabilitation of State facilities.



All the information you need to reduce electrical costs can be available on your PC, at your desk.

Cutting electrical costs with information

How power monitoring and control systems help facility engineers work smarter.

Andy Foerster, P.E., Square D Company, Smyrna, Tenn.

Imagine that you are evaluating a proposal for feeding a new uninterruptible power supply for your facility's refurbished computer center. Your assistant reported that she thinks two existing substations can handle the load. You turn to the personal computer on your desk, rap a few keys and access trending information that shows one of the substations would be badly overloaded by the uninterruptible power supply during the peak consumption days of August. (Note to yourself: Teach assistant not to make recommendations based on a one-time reading of substation meters).

The phone rings; the Management Information System manager is blaming maintenance for causing a computer crash, but maintenance insists otherwise. A couple more keystrokes show you that the plant took a two-cycle sag from the utility at the time the computers crashed. You print out the waveform of the sag and start to write a memo to the utility's industrial service group.

Before you can finish, a window opens in the middle of your screen warning that the plant is about to set a new demand power peak. You call the production supervisor; yes, he saw it on his computer too, and the system is already shedding non-essential loads.

Meanwhile, accounting has been crediting your budget with funds for the electricity used by other groups and tabulating new cost figures for products based on the electricity consumed in making them. Of course, they have done it from their own personal computer without bothering you at all.

Real technology, real results

If you think you're dreaming, think again. You *can* do these things today, saving your facility substantial amounts of money and making your own workday more efficient and rewarding. The technology that makes it possible is called power monitoring.

Used effectively, power monitoring and control systems cut energy waste and utility penalties, allocate costs, trim overhead and maintenance costs, and reduce downtime.

Electrical costs can he a major expense of doing business. Electrical costs include the monthly utility bill, of course, but they also include costs that usually are overlooked, such as the cost of buying and maintaining electrical distribution equipment and the cost of down time when electricity fails due to poor power quality or other undetected problems.

These true costs of electricity have been ignored because, until recently, there was no cost-effective way to measure them. But power monitoring and control systems changes that, giving facility engineers the tools to identify and control these hidden costs.

With power monitoring and control systems, an engineer can identify exactly where a facility's power dollars are being spent—and where they're being wasted. A power monitoring and control system warns of overloads or other problems, helping to prevent downtime. It plots trends of plant parameters, allowing maintenance to be anticipated and scheduled. And it tells a facility engineer exactly how much capacity is available at each point in a distribution system, eliminating guesswork about accommodating major plant expansions and capital improvements.

❖ **These true costs of electricity have been ignored because, until recently, there was no cost-effective way to measure them.**

Getting there

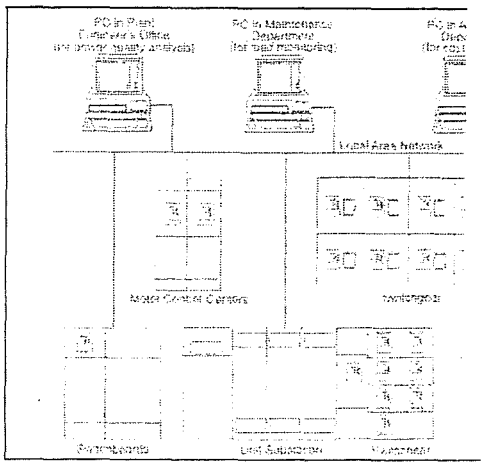
To get the latest electric information from your personal computer, and allow your co-workers to do the same, you need a power monitoring and control system with the following functionality:

Monitoring. The ability to measure plant electric parameters, including amps, volts, power, energy, and other basic measures, as well as more sophisticated readings such as power factor, total harmonic distortion, and circuit breaker position. Display of actual system waveforms is another option that can aid in troubleshooting both harmonic and disturbance power

Special Report: Electrical systems

Ignorance Is Expensive:
How Electric Plant Information Can Save Money

- Find ways to cut utility demand charges.
- Promote energy accountability and conservation.
- Provide information needed to negotiate best possible power agreement with utility for a plant given situation. Take advantage of interruptible demand or peak shoving if available.
- Track energy content/cost of products so that better pricing and marketing decisions can be made.
- Reduce plant down time down time by anticipating overloads or failures.
- Identify problems caused by poor power quality and evaluate solutions.
- Reduce maintenance costs by carefully monitoring equipment performance.
- Reduce capital expenditures by more effectively using existing electric plant equipment.
- Obtain state sales tax rebate for electricity used in production.
- Take advantage of any state enterprise zone concession.



quality problems. Monitoring devices can be either stand-alone circuit monitors or an integral part of circuit breaker trip units, transformer temperature controllers, protective relays, adjustable frequency drives, or other components.

Communications. A means of moving the raw data from the monitoring devices in the field to the personal computers. The communication system must be capable of forwarding data to users over some practical medium. Direct interfaces with other automation systems also is desirable. Inadequate communications can make an otherwise attractive system virtually useless.

Application software. Transforms your personal computer into a user-friendly window on your power system. The software allows your personal computer to collect, sort and translate the data. Then, since getting buried in raw data is the last thing most engineers need, the software organizes, stores, and presents the data in useful ways. Displays may include trend plots, graphic overlays of the plant with current data, bar charts, alarm screens, and other intuitive presentations. A key item to be considered early is whether the graphics can he changed later to reflect, for example, the addition of a new substation. Is capturing those changes easy, or will you need to become a programmer just to keep your system current?

Automatic control (Optional). Added if the information collected is to be used to automatically compensate for problems or carry out money-saving actions. For example, power factor correction, load shedding, emergency load transfer, and demand control are tasks that may be automated.

Evaluating a potential system

Many choices must be made when selecting a power monitoring system. Following are some considerations that will help you to make an informed decision.

Monitoring devices

Data. Begin by deciding what types of data to collect. Choices include volts, amps, power, energy, power factor, demand values, running min/max values, and harmonic analysis. With modern electronic meters, measuring many parameters costs just a little more than measuring a few.

Accuracy. Decide how accurate each metered value must be. Remember that accuracy is money—a two percent error is $2,000 if a facility has a $100,000 power bill. Also remember that one percent of full scale is actually about five percent of reading at light loads. Ask if power factor affects accuracy or if annual recalibrations are required. Look for a system that uses true RMS sensing to reflect actual heating of conductors and equipment if harmonics are present.

Device options. Determine what options are offered and which best suit your application. A general purpose circuit monitor is fine for almost all applications, but compatible trip units, protective relays, molded case breakers, motor relays and other devices may be less costly options in certain cases.

Power quality analysis. If harmonics or disturbances are an issue, you will want a system that can display waveforms. Ask if the voltage and current waveforms are taken simultaneously so that meaningful comparisons and harmonic flow analysis can be done. Make sure that the waveforms presented are real system waveforms and not synthetic composites. Ask how many samples are taken per cycle. The more samples, the more accurately distorted waveforms can be reproduced.

Logging. Logging is one of the major uses of a power monitoring system, so look carefully at how it is done. Logging may be performed by the individual monitoring devices or by the system software. Each has advantages. Logging at the software allows more flexibility and is more versatile. Logging at the monitor preserves the data in case of a communication failure.

Inputs and outputs. I/O is used to sense the status of external devices, pick up transducer data, or count pulses from older watt-hour meters. To interface or control using I/O, make sure that the correct digital or analog I/O is available.

Communications. Determine whether the monitoring device being considered can communicate with a complete control system. Ask whether additional hardware is required. Is it possible—and convenient—to retrieve internally logged data or perform diagnostics through a temporary connection?

Durability. Monitoring devices should be designed and tested for the environments in which they will be installed. Determine whether the device you're considering can stand up to temperature extremes and other special con-

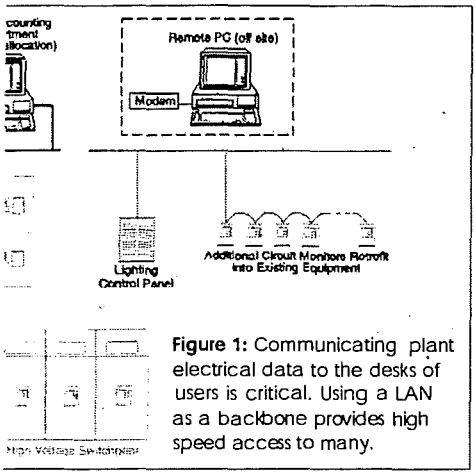


Figure 1: Communicating plant electrical data to the desks of users is critical. Using a LAN as a backbone provides high speed access to many.

ditions in your facility

Communications

Speed. Power monitoring systems can create a lot of data; one general purpose monitoring device is equivalent to more than 50 analog meters. Disturbance monitoring and waveform capture creates more data. If communications is slow, the system bogs down.

Sharing information. Can multiple personal computers access the same data? The more people who use the information, the more it is worth. Consider whether the maintenance supervisor, electrical shop, plant engineers, accountants, and others will be able to get the information they need simultaneously, when they need it, without interrupting each other.

Programming. Are programmable logic controllers used for communications? Who will program them? Or is the communication system a fairly straightforward matter of connecting cables?

Protocol. Physical protocol relates to the hardware—the wiring and voltages used and other parameters. RS-485 is the industry standard, and it allows the use of off-the-shelf converters and modems; non-standard protocols may require special hardware. Logical protocol is the digital language used, and there is no industry standard. Look, therefore, for a commonly used logical protocol.

Noise immunity. Many industrial settings have significant electrical noise from motors, welding and other equipment. This noise can interfere with the data transmitted by a power monitoring system, Make sure that the communications system was designed to operate reliably in electrically noisy environments and has a proven track record under such conditions.

Flexibility. Can the power monitoring and control system communicate with the facility's pre-existing automation or accounting systems?

Expandability. If remote devices are to be added over time, can the communications network be extended? Will extensive rewiring be required?

Physical medium. Network options include copper cable, fiber optics, telephone modems, line drivers and Ethernet. Does the vendor offer the network type YOU prefer or may need later?

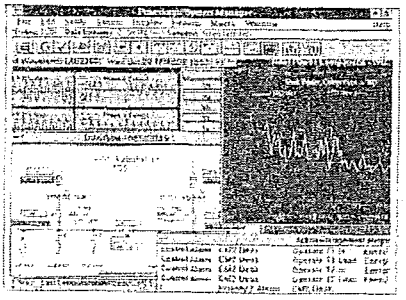
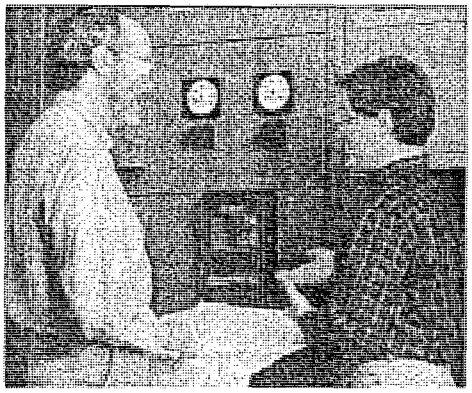


Figure 2: Easy-to-use software runs on your PC. Disturbance waveforms, time trend plots, and graphics of your plant should be just "mouse clicks" away.

Working More Closely With the Electrical Energy Supplier

In the past	Here and now
Bill paid by accountant—plant lacked any accurate meter to verify or audit.	Facility engineer can thoroughly verify charges and penalties before forwarding to accountant.
Each bill a "surprise" with only rough data and budget figures for prediction purposes.	Bill can be anticipated almost to the cent as plant production changes are accounted for in real time.
Like taxes, electricity was a cost of doing business. Paid out of overhead.	Each department or product line held accountable for energy used. Greatly increases motivation to find savings.
Production cost of products known roughly.	"Energy content" of each product known with great precision. With better knowledge of costs, more profitable and competitive prices are set.
Only facility engineer—if anyone—knew about energy usage.	Local area networks can provide data directly to those needing access. Personal computers that have access to data in system can be connected wherever needed—accounting, operations, engineering, maintenance.
Only power quantity was an issue. No measure of quality.	Quality of prime importance, as with any other vendor. Especially for facilities with sensitive electronic equipment. Data used to encourage utility to provide quality electrical service.
Little flexibility in negotiating power agreements with utility.	Negotiate as with any other major vendor. Utilities offer attractive incentives to facilities that can control power factor, demand and other parameters. Plant managers have the information they need to select the lowest cost rate structure.

Special Report: Electrical Systems



Circuit monitors in the plant, easily retrofit into existing gear, collect electrical data needed for better decisions.

Software

Change. Electrical systems grow and change. If equipment is to be added or moved, can you easily enter the changes to system drawings and files or will you need a programmer or systems integrator to handle the job? Some systems offer software development tools for modifications, but following them can be impossible for all but skilled programmers. Ask whether such software tools are necessary and, if so, whether they are included.

Platform. Will the software run on the IBM-compatible computers normally found in commercial and industrial settings, or does it require a specialized workstation? Can it time-share an existing computer, or will it require a dedicated unit?

Operating system. Ideally, power monitoring and control system software should run on common commercial operating systems already in place in the facility's personal computers. The most common of these are DOS or WINDOWS. If you want to operate your power monitoring and control system from personal computers your company already has, find out what operating system it uses and look for a control systems that can use it as well.

User friendliness. This deals with how easy the system is to learn and to use. Look for systems that have "help" windows and other on-screen prompts that help operators use the program without having to remember complex typed-in codes or refer to bulky manuals.

How much software? Does the vendor offer one easy-to-use package with the functionality desired? Or must you use other spreadsheets, databases, and graphics tools to get the displays and features you want? With the all-in-one approach you do not have to learn to use multiple applications to tend the software "links" that tie the applications together.

Displays. Think about how you currently prefer information to be formatted. Look for a power monitoring and control system that can display information the same way. If you like tables, charts, graphs and plots, a system that can only display columns of numbers will have limited value. Ideally, choices should include one-line drawings, elevations and plan views with real-time data overlaid.

Trending. The ability to display plots of data over time is extremely useful in troubleshooting problems or planning plant upgrades. You will want the ability to plot trends over any time window you specify. Another useful feature is the ability to overlay multiple trends from different monitoring devices on the same plot.

Logging. One of the attractions of power monitoring and control systems is that they can collect and log the same data that, until now, could only be collected by time-consuming manual logging. Determine what logs you need, and verify that the system you are considering can take them.

Alarms. Can the system warn when an electric system parameter is out of specification? Are customized alarm sounds an option?

Passwords. Are multiple levels of security available so that unauthorized personnel cannot tamper with the system?

Conclusion

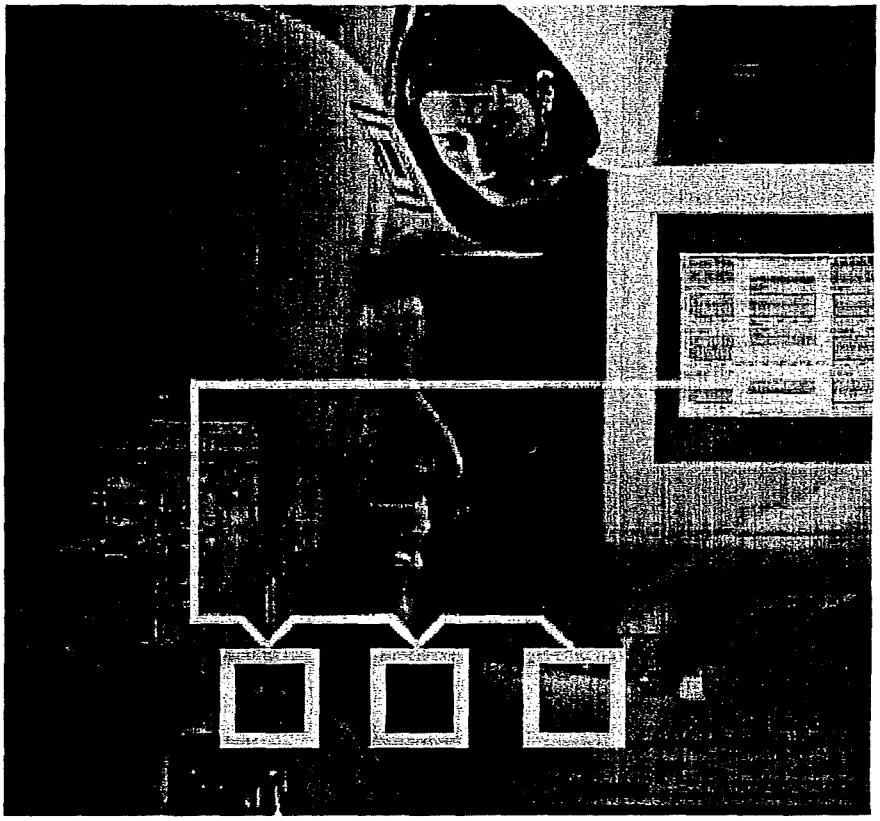
The exciting potential of power monitoring and control systems to improve productivity, cut costs, and empower facility operations personnel makes them one of the most attractive capital investment opportunities today. Hundreds of facilities around the globe are already using this technology to gain a competitive edge in their markets.

The biggest edge, however, goes to those who have succeeded in finding the system best suited to their special needs. By carefully identifying what they want to accomplish and choosing a power monitoring and control system that can meet those objectives, these facilities have turned their electrical power system from a largely uncontrollable expense into a valuable cost management ally.

Reprinted from **Plant Services** January 1994

Order No. 3000H09401

POWERLOGIC® Power Monitoring
and Control System



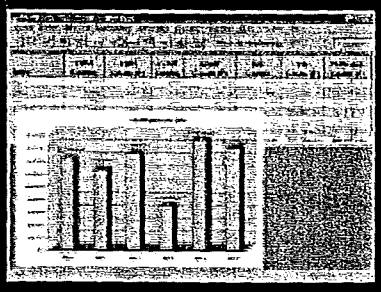
Merlin Gerin
Modicon
Square D
Telemecanique

Power *Management* from Start *to Savings*®

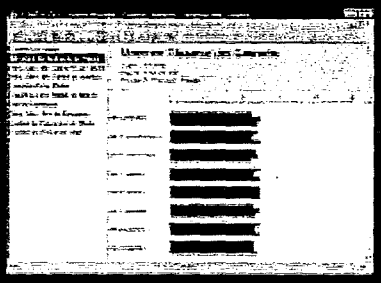
SQUARE D
Schneider Electric

POWERLOGIC System Manager - New Workspace - [Importing - C

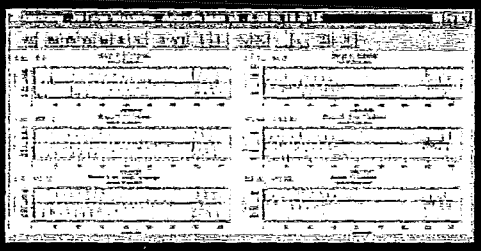
The POWERLOGIC™ Philosophy: The Closer You Look, the More You'll Save.



Save on Utility Bills
By tracking and analyzingy our energy consumption patterns in detail,y ou'll bea ble to identify savingso pportunities andn egotiate better powerrate s with your utility.



Reduce Capital Equipment Costs
By monitoring circuitloadingan dpower problems,y ou'llkno w wherey ouhav e excess capacity,howtouti lizeit b etter,and when equipmentnee dsmaint enance or replacement.



Prevent Downtime
With real-time data on system faults, youca n react quicklya nd implement load preservation schemeso rp ower qualityco rrection strategies to minimize lostp roduction.

Are you getting the best rates on electricityt hat youc ould? Are you tracking your power usage to better control demand charges? Is your existing power equipment operating at maximum efficiency? Are power qualityi ssuessuch as harmonics and voltage disturbances adverselya ffecting operations?

If you're not monitoring your power, youp robably can't answer these questions. Andi f you can't answer them, you're probably missing lots of opportunities to reduce costs, increase operating efficiencies and improve margins. Electricityi s a major cost of running a business, and in today's intensely competitive climate, you shouldbe treating it like any other raw material, continually looking for ways to increasequ ality and cut expenditures.

That's where the POWERLOGIC power monitoring andc ontrol system comes in. Itg ives you thei nsight and power over your electrical network to save money on your utility bill—and on other hidden costs of power as well. With the POWERLOGIC system, you can:

- **Take advantage of the multiple cost-saving opportunities provided byut ility deregulation, including more informed rate negotiation.**
- **Maximize the efficiency and life of your power distribution equipmentan d plan expansion more intelligently.**
- **Avoid thed owntime and lost production caused by poor power quality.**

A POWERLOGIC system isa high-yield investment, helping you buy cheaper power, squeeze every efficiency out of every kilowatt, and give your operation a real competitive edge. It's the answer that energy- and cost-conscious companies havebee n asking for.

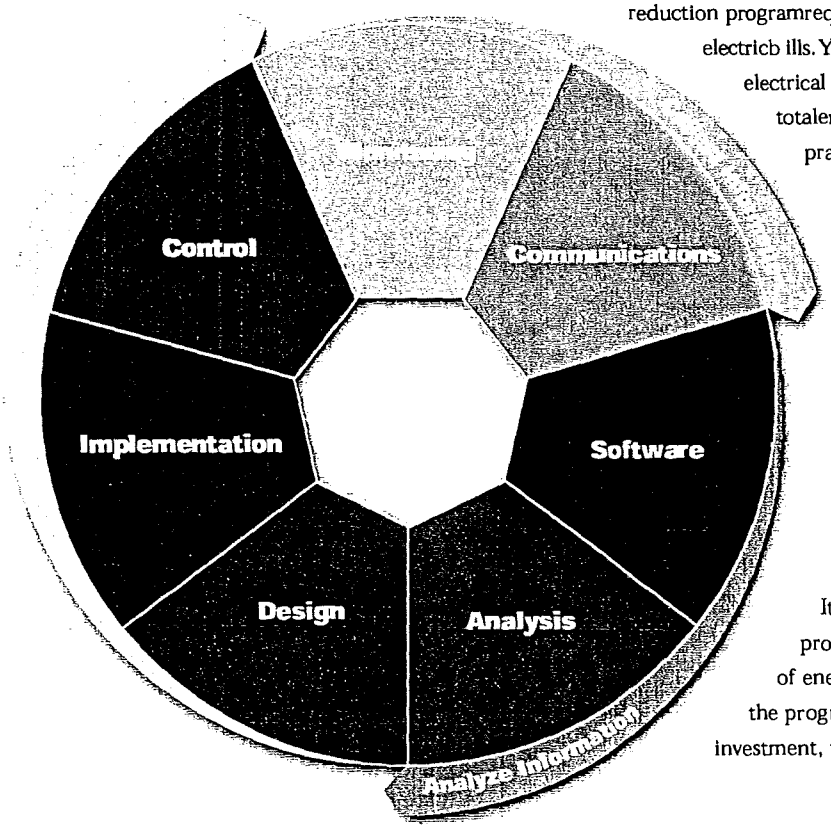
The POWERLOGIC Process: Collect, Analyze and Act on Information.

Saving money on your power bill is, like most other cost-cutting efforts, a process. It'sn ot just af ancy piece of hardwareor c olorful software. It's a continuous series ofac tions which starts withc apturing data aboutyour electrical system, continues withc ontrolling or changing thesystem based on thatd ata, then verifying the expectedi mprovement.

Square Do ffersa unique portfolio of products and services to helpyou at everystag e ofthe process. This includessta te-of-the-art monitoring devices; a variety of communications options; software that canstore , organize, and reporton pow er data; engineers who specialize in analyzing thed ataand designing solutions; the staffto manage the installationand star t-upof your monitoring and control system; ande quipment that can actually control energyc onsumption and power quality problems to save youm oney.

With many yearsof proven experience inpow er management, Square D has the know-howand re sources toprovide asol utlon that will workfor you.

The POWERLOGIC approqach to energys avings isa con tinuous, multi-step process. It'sm uch moret han justha rdwareor software.



Collect Information

Youca nnotco ntrolw haty oudo notmea sure. An effective energyco st reduction programrequ iresmuch moreth anmont hlymonit oringof electricb ills. Youne edt oco ntinuouslymea surea w idera nge of utility, electrical consumption, and power quality datasoy ou cant rack totalenerg yus e, identifyop portunities formoreeff icient practices, andrea ctqu icklyto avoidout ages.

Analyze Information

Datam ustbe anal yzedto be truly useful. The information you need to save money is often hidden behindse emingly normal meter readings. Power management software can greatlyai d with analysis. However, complex issues may requirethe focusand talentsof an experienced energy engineer who understandswha t data meansi n thec ontextof the facility operations.

Act on Information

It takesac tion toget results. Costs cannot be cut or processes improved if nothing changes. A clear picture of energy issues within af acilitywil l allow you to choose the programs or improvements with the highest return on investment, thenm onitorsav ingsfro m thec hangesyou make.

POWERLOGIC™: The Closed-Loop Power Management Solution

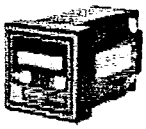
The POWERLOGIC system integratesal l of thec omponentsne cessary to manage your electrical network including innovative hardware, software andc ommunications. But that's only the beginning. Square D also backs its products with a variety of services tohe lp you getthe most savings and efficiencies from yourP OWERLOGICsystem .

Collectinfor mation

Fullran ge of industry-leading powerm onitoring equipment

- Monitoringsolu tions forall le velsof the distribution system
- Revenueacc urate, trueRM Sme tering ofcur rent/voltage
- Capabilitiesg ow ell beyondst andard metering:w aveform capture (patented), high speedloggi ng, monitoringofp ower qualityi ncluding harmonics and voltage disturbances
- Sequenceof events recording
- Easy to install into any existinge quipment

CircuitMon itor2 000



Power Meter

Enercept®

MOMENTUM® I/ O

810Don DS Br eaker

Medium VoltageDigit al Relay

MICROLOGIC® TripUn it onBr eaker

Communication

Many options for transportingdata to where itcanbe used

- Download data directlyt oaPC viaRS-48 5por t
- Networkmul tiple MODBUS® device daisy chainsto oneor more PCs via Ethernet
- Utilizee xisting LANs with our plug-and-play Ethernetga teway
- Connect remotely viamod em,e tc.
- Use theIn ternetfor enterprise-wide power monitoring

EthernetGatew ay

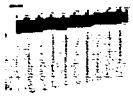
Internet

Control

Integratecontr ol functionstosol ve problems and save money

- Tieinav arietyof devicesfromc ircuit breakerstoPLCs
- Executelo ad control strategies: load shedding,peak shaving,li ghtingand generatorc ontrol
- Solvepo werq uality problems:sim ple powerfac tor correction,p assive harmonicfi lters, real-timecor rection of pulsing,non-li near loads

POWERLINK® AS



MODICON® PLC

REACTIVAR® F ilter

Implementation

Variouslevel sof projectm anagement support

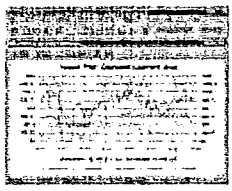
- Phones upportto on-site system start-up andtraini ng to complete,t urnkey installation
- Workwithy ourl ocal staffandc ontractors asdesi red

Software

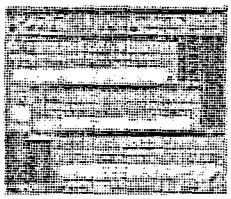
Providesf lexible, multi-useraccess toi nformation

- WindowsNT ® and Windows®98 platforms
- Multitudeof data display formats: tables, bar charts, trend plots, meterpanel s, etc.
- Easy-to-use,use r-configurable graphical interface
- Earlyw arning alarmsa nd powerful diagnostict ools
- Supports all POWERLOGIC andmany third party devices
- Easilysharesand receivesda ta from otherapp lications anddat abases

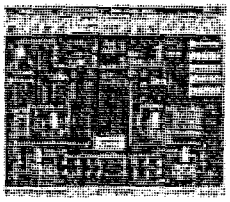
Analyzeinf ormation



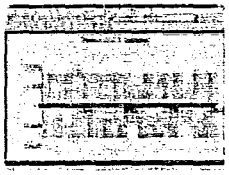
Trending



Alarming



Graphics



Sag/Swell

Analysis

Consulting services to helpyou assessdata

- Isolatepo werquall ty problemsandsug gest responses
- Identifyene rgy managementsa vings opportunities
- Powersyst emstudie s, including shortcircuit andprotec tivede vice coordination analysis
- Loadflo w and voltage dropanalysi s

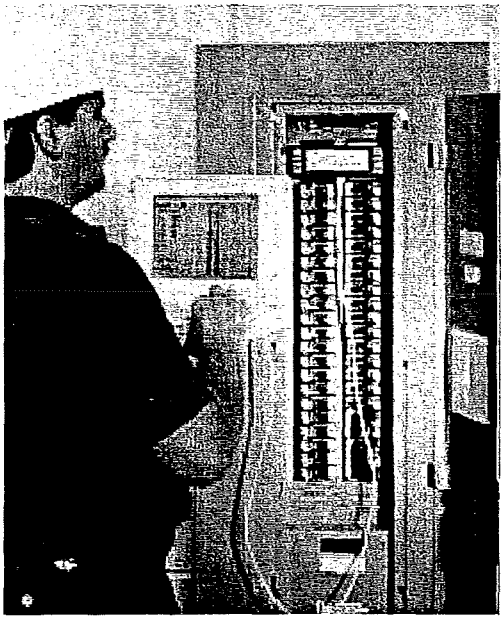
Design

Expertisei n developingpower controlsol utions

- Lighting control systemstoh uge, automaticl oad preservation schemes
- Integrationof hardware, software andcom munications with completes ystem drawingsand documentation
- Provensucc ess designingsyst emsto meetspec ificnee ds

ThePOWERLOGIC® Advantage: Integrated Thinking, ExperiencedPeople, aFocuson You.

The right power management system can save you money in many ways—on your utility bill, on capital equipment costs, on the huge expense of downtime and lost production caused by power quality problems. But how can you be sure you're getting the right system—and the best value for your investment? Here are a few suggestions.



On-sites tart-up and maintenance services by factory technicians.

Keep the Focus on *System* Performance

Plentyofc ompanies canofferpo wer management components such as powerme ters andsof tware. What theydon't deliver nearlyasw ell, however, is system integration, andi n powerm anagement, that'swh at counts. At Square D, systemi ntegrationst artswit h the manufactureof meters, protective devices, communicationcomponent s, and softwareth at are designedtofunction together and continues withc ustomization of systemstome et your uniquene eds.

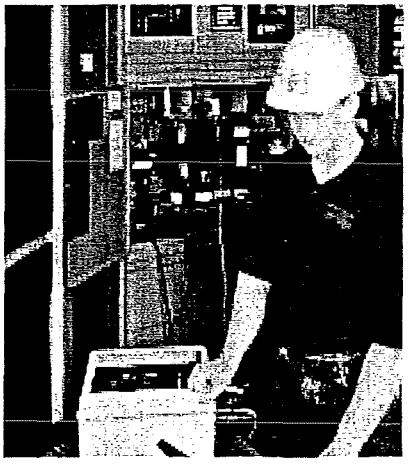
Square D isane xpert ati ntegratingm onitoringandc ontrol systems. Usingf ast, highba ndwidth communications and sophisticatedsoft ware, we can tie together multiple devices from monitors toP LCs to breakersandre lays.

It's the People as Much as the Products

The informationa powerm anagement system provides is onlyasgo od your ability to interpreti t anduse it to cutcost s andreduce dow ntime. Square D has ast aff ofdedi catede ngineers whospeciali ze in analyzingpo wer data andhelping youput it to gooduse. Wealso offerav ariety of project management servicesto implement changesor additions to youre lectrical system basedon data insights. No other company offersth is integrated package of productsandser vice.

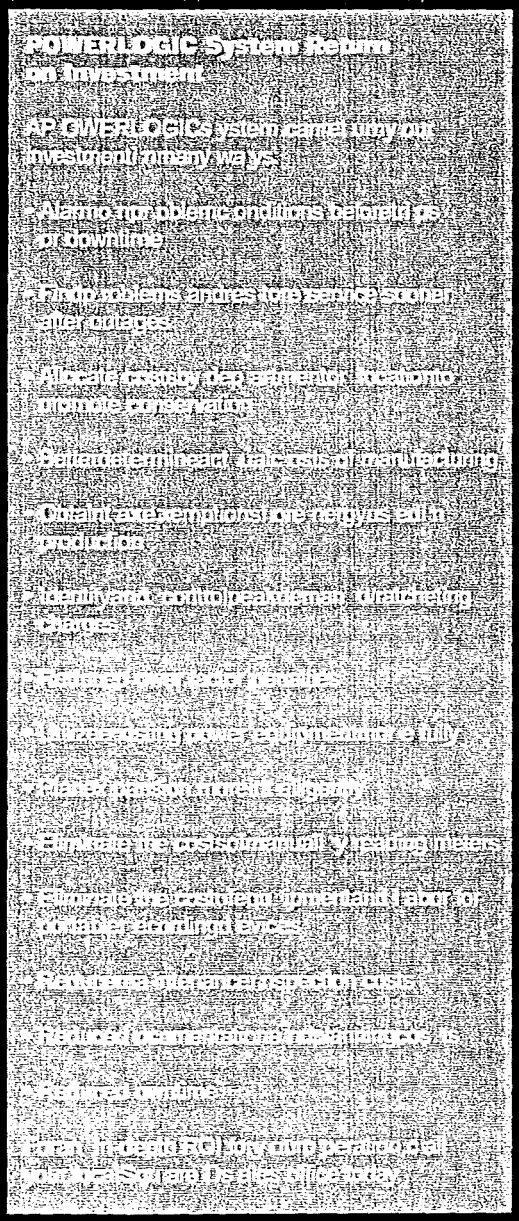
The Benefits of Both a Big and Small Company

The SquareD Power Management Operation offersy ou the resourcesof an industry leader in electricaldi stribution, Square D, withth e individualized attention ofani ndependent businessuni t. Our *entire* focusis on providing youwith the most innovative, effective power solutions available.



Analysis bySqu areD professional engineers helps find rootc auseof problemsas wella s savingsop portunities.

POWERLOGIC Success Stories



POWERLOGICsy stemshav eapr oven trackr ecord.W e've designedandi nstalledt housandsof so lutionsf orcus tomers whichha vedel iveredr ealcos tsavi ngsand improvements inen ergyef ficiency.

College Finds Knowledge of Power Is Power

Durham College, arap idlygrow ing, multi-campusin stitution wantedto createa baselineto gauge the successo f itse nergy-savingp rograms as well as a systemto id entify cost-savingo pportunities across its 485,000 square feet of facilities. Powerq uality problemswe re also a concern due to the proliferation of personalcom puters and electronic ballasts for lighting.

Startingw ith just af ew POWERLOGIC circuit monitors,th e college has gradually increased its powerm anagementsys tem to include 16 monitors, Windows-basedS ystemM anager Software, 11 POWERLINK® AS lighting controlp anelboards and 41 Square D variable speedd rives, all communicating overth eirexi stingE thernet LAN.

In 1998, theco llege saved $400,000 in reduced demand charges and energy consumption. Circuitm onitord ata also uncoveredu tility overcharging,by 26% on demanda nd 28% on consumption, whichle d to a *significant* refund. Andw ith POWERLOGIC'sp atented waveform capture feature, the college was ableto isola te harmonic problems caused by PCs and take proactive stepsto co ntrol thep ower qualityp roblem, including sizingth e appropriate Square Dn on-lineartran sformers andv oltage conditioners.

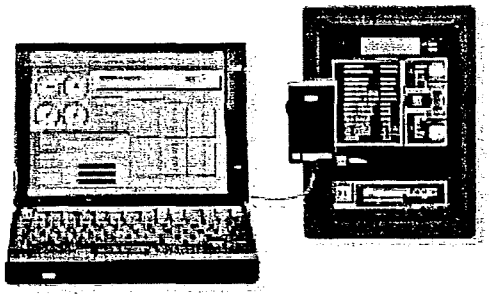
POWERLOGIC Helps Refinery Refine Electrical System

The EIS egundo refinery,a huge,2 4-hourop erationw itha 188MW connected load and 66kV backbone,n eededto d oa major upgradeo fitsd ecades-old electrical equipment ande lectricalin formation system to reducetrip s and expensive downtime.

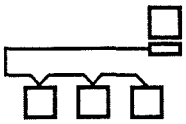
TheP OWERLOGICsolu tion we recommended was sophisticated and highly customized. It included1 24 circuitm onitors, five high-speedev ent recorders synchronized to within1 ms.,G PScloc ks andtwo workstations loadedw ith System Manager Software. Everything was linked over an Ethernet communications network to their facility automationsy stem andu tilityre motete rminal units.

With waveform capture data from the system, there fineryh as been able to ascertain the cause of a nuisance trip whichwo uld have costa s much as $270,000in lo st production without a promptso lution. Newlo ad control strategies also preventeda turbine from being taken off-line during a demand peak, saving $400,000. And the refinerycon tinues to identifyn ew waysto u se thep ower data for improvements to theire lectricaln etwork andm oree fficient operations.

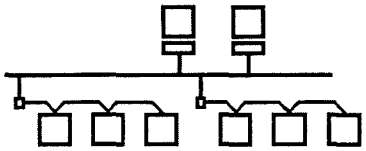
YourP OWERLOGIC™ SystemD oesn'tN eed tob eC omplex tob eP owerful.



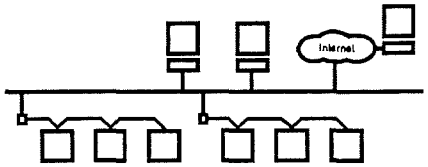
Ane asy-to-installsmall systemma y consist of monitoringd evicesco n-nectedtoaPCu sing a twistedpair and ope n communicationpr otocol. Softwareon th ePCc ol-lectsda taa ndhe lpssho w howy ourpo wersyste m isfu nctioning.



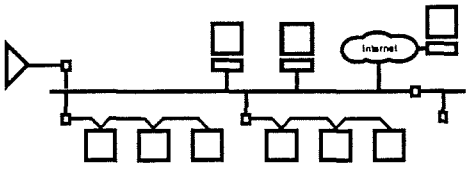
Largersyste msma yu se ahig hspe edb ackboneto collectinf ormation from manymo nitorsan dto allow theda tatobe sharedb ymultipleu sers ondif ferent PCs. Ethernetisthetypic al backbone. Itm ay be dedicatedtopow er monitoringo rshar ea n existingEthe rnetLAN .



Usingthe internetallo ws datato besh arede nter-prise-wide, evenar ound theg lobe. Large users canm onitorma nyfac ili-tiesf romon e location anda t high speeds withoutde pendingon dial-upl ines. Pooling ofda tac an beuse dto improvee lectricity purchasingde cisions.



Automaticc ontrolc an bea dded tosystem s ofalmo st anysiz e. The controlsc an beuse dto implementco st-saving practices fromloa d preservationtope ak shavingtolighting control. Thec ontrols can besimple , set-point basedope rationsata single deviceor co mplex, system-wideoper ations.



For more information about the POWERLOGIC powerm onitoring and control system or our entirel ine of powerm anagement products, callyour local Square D sales officeor ne arbySquare D authorizedd istributor. You can alsovi sit our Web site at POWERLOGIC.com.

Order Number 300BR9901 10/99 Printed in U.S.A.

SQUARE D
Schneider Electric

Powerlogic Power Monitoring

In this Area

What's New

Documents

Area Home

Printer-friendly format

Related Documents
Brochure
-

Saving Money
How Much Can You Save?
Cutting Electrical Costs
Power Quality Is Free
Justifying a System
Benefits Examples
-

Go POWERLOGIC
Save Money
How to Start
Why POWERLOGIC
Site Map
Home
-

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control
-

Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com
-

How Much Can You Save?

Some customers have paid for their power monitoring systems almost instantly. For some facilities, unplanned outages are so expensive, that avoiding a single one can pay for the modest cost of a system. Other cases, of almost instant recovery of costs, result from finding errors in the utility bill, which the utility reimburses. More commonly, pay back comes over a period of time as demand charges are reduced or monitored energy conservation efforts pay off.

A POWERLOGIC system can return your investment in many ways:

- Alarm on problem conditions before trips or downtime
- Find problems and restore service sooner after outages
- Allocate costs by department or location to promote conservation
- Better determine actual costs of manufacturing
- Obtain tax exemptions for energy used in production
- Identify and control peak demand/ratcheting charges
- Reduce power factor penalties
- Identify utility metering errors
- Utilize existing power equipment more fully
- Plan expansion more intelligently
- Eliminate the costs of manually reading meters
- Eliminate the cost of equipment and labor for portable recording devices
- Reduce maintenance inspection costs
- Reduce documentation and planning costs
- Reduce downtime

For an in-depth ROI for your operation, call your **local Square D sales office** today.

Many customers at facilities like yours have benefited from their power monitoring systems.

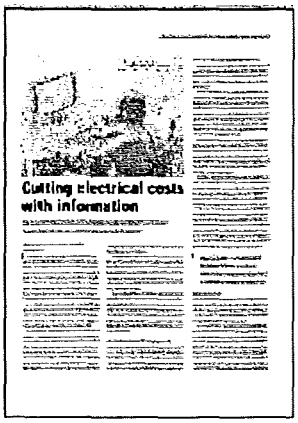
PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

In this Area

What's New
Documents
Area Home

Printer-friendly format



Cutting Electrical Costs With Information, #3000HO9401

Electrical costs can he a major expense of doing business. Electrical costs include the monthly utility bill, of course, but they also include costs that usually are overlooked, such as the cost of buying and maintaining electrical distribution equipment and the cost of down time when electricity fails due to poor power quality or other undetected problems. These true costs of electricity have been ignored because, until recently, there was no cost-effective way to measure them. But power monitoring and control systems changes that, giving facility engineers the tools to identify and control these hidden costs. With power monitoring and control systems, an engineer can identify exactly where a facility's power dollars are being spent—and where they're being wasted. A power monitoring and control system warns of overloads or other problems, helping to prevent downtime. It plots trends of plant parameters, allowing maintenance to be anticipated and scheduled. And it tells a facility engineer exactly how much capacity is available at each point in a distribution system, eliminating guess-work about accommodating major plant expansions and capital improvements.

Saving Money
How Much Can You Save?
Cutting Electrical Costs
Power Quality Is Free
Justifying a System
Benefits Examples
-
Go POWERLOGIC
Save Money
How to Start
Why POWERLOGIC
Site Map
Home
-
Examples
Benefits Index
Application links
POWERLOGIC Solutions
Energy Savings
Power Quality
-
Start to Savings Links
Home
Monitoring
Communications
Software
Analysis

Ignorance Is Expensive:

How Electric Plant Information Can Save Money

- Find ways to cut utility demand charges.
- Promote energy accountability and conservation.
- Provide information needed to negotiate best possible power agreement with utility for a plant given situation. Take advantage of interruptible demand or peak shoving if available.
- Track energy content/cost of products so that better pricing and marketing decisions can be made.
- Reduce plant down time down time by anticipating overloads or failures.
- Identify problems caused by poor power quality and evaluate solutions.
  Reduce maintenance costs by carefully monitoring equipment performance.
  Reduce capital expenditures by more effectively using existing electric plant equipment.
- Obtain state sales tax rebate for electricity used in production.
- Take advantage of any state enterprise zone concession.

Article - Cutting Costs.pdf

PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

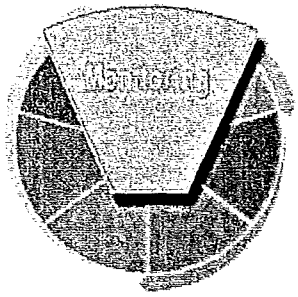
In this Area

What's New

Documents

Area Home

Printer-friendly format



Meter Family
Meter Family Selection Guide
-

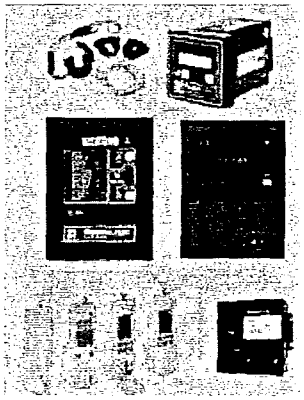
Monitoring Devices
Monitoring Home
Metering Family
4000 Circuit Monitor
2000 Circuit Monitor
Power Meter
Enercept® Meter
Energy Meter
Protective Devices
-

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control
-

Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com
-

Monitoring Devices

The first step in finding ways to cut electrical costs is to gather data about electrical consumption. This includes:



- Energy consumption information that pinpoints waste
- Power quality information that will shed light on causes of downtime
- Loading and power factor information that will allow fuller utilization of switchgear and other capital equipment
- Electrical equipment diagnostic information that will reduce maintenance costs
- Cost data that can be used to track and reduce production costs

Electronic metering is the source of most of this information. Square D is the market leader in developing the finest electrical meters with advanced features. These meters can be installed in new or existing electrical gear made by any manufacturer.

However, monitoring goes way beyond meters in the state-of-the-art electrical system. For example, Square D circuit breakers and trip units can provide status and diagnostic information, all the way down to the branch circuit level. Transformer temperature can be monitored. Variable speed drives can provide data over the same electrical network.

Square D can provide a means of collecting from anywhere in your electric plant the data needed to control the reliability, cost, and quality of your electric power.

PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

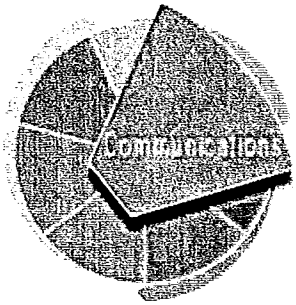
In this Area

What's New

Documents

Area Home

Printer-friendly format



Communication Systems

Data that will help you control the reliability, cost, and quality of your electric power may be collected from many places in your electrical system. Getting that data to someone who can use it to find ways of cutting costs is often overlooked.

Yet if the data is not communicated back, it will not be used. And if it is not used, there was little reason to collect it in the first place.

Square D has long been in front in offering reliable and fast ways of communicating from field devices to those who use the data to cut costs.

Square D offers:

- Industry standard, non-proprietary connections as standard, including: RS-485, Modbus®, Ethernet, and Modbus/TCP
- An upgrade path that allows small and simple power monitoring systems to grow into large and capable systems
- High speed backbones for large system installations that would choke low speed networks
- Systems that do not require programming or data concentrators
- The ability to use existing equipment and building LANs where appropriate
- Multiple options for long distance links, from simple modems to the internet
- Long expertise and a successful track record in helping customers make the right choice for their installation and getting the system operational

Square D communications expertise makes the system work.

Communications
Communication Home
Comm Interfaces
Etherner
Communication Card
Ethernet Gateway
Ethernet Module
Ethernet Demo
Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control
-
Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com
-

PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

In this Area

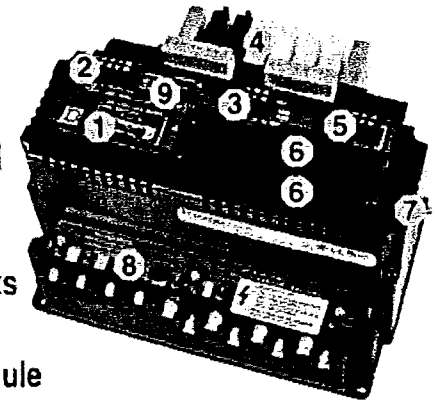
What's New
Documents
Area Home

Printer-friendly format

Related Documents
Digest Page
Specification
Press Release
-
Series 4000 Circuit Monitor
Series 4000 Home
Key Benefits
Power Quality
Utility Monitoring
Equipment Utilization
Install and Use
Platform Tour
Display
-
Monitoring Devices
Monitoring Home
Metering Family
4000 Circuit Monitor
2000 Circuit Monitor
Power Meter
Enercept® Meter
Energy Meter
Protective Devices
-
Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control
-
Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com
-

Platform Tour: Series 4000 Circuit Monitor

① Control Power
② RS-485
③ RS-232
④ Optional Analog and Digital I/O Modules
⑤ KYZ Output
⑥ Accessory Card Slots
⑦ Security Seal Tab
⑧ Current/Voltage Module



The Series 4000 Circuit Monitor was designed with the future of your facility in mind. The platform is flexible enough to accommodate improvements in microprocessors, software, and algorithms, as well as evolving needs for metering and power analysis. Key items to note about the Series 4000 platform:

Current/Voltage Module Connect CTs, PTs • Optional **transient detection** version • Field interchangeable. • Swap to upgrade transient detection when needed or to confirm calibration	**Standard Communications** • Industry standard RS-485 2 or 4 wire • MODBUS® protocol • Up to 38.4 k baud
Accessory Card Slots • Communications - Ethernet, MODBUS® • I/O Cards	**Standard RS232 Connection** • Modem or local connection • Up to 38.4 k baud
Optional Analog & Digital I/O Modules • Field installable • Up to eight modules	**Security Seal Tab** • Protects revenue settings • Required by some jurisdictions
Control Power Wide range to give you many options	**KYZ Output** • Pulses for building automation and other

• 90-305 Vac • 100-300 Vdc • 24 or 48 Vdc with optional module	systems

Square D Home Page | Square D Site Map | Square D Site Search | Square D Contact Us | Square D Products | Square D Tech Library | Square D On-line Digest

PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

In this Area

What's New
Documents
Area Home

Printer-friendly format

Related Documents
Digest Page
Specification
Press Release

Series 4000 Circuit Monitor
Series 4000 Home
Key Benefits
Power Quality
Utility Monitoring
Equipment Utilization
Install and Use
Platform Tour
Display

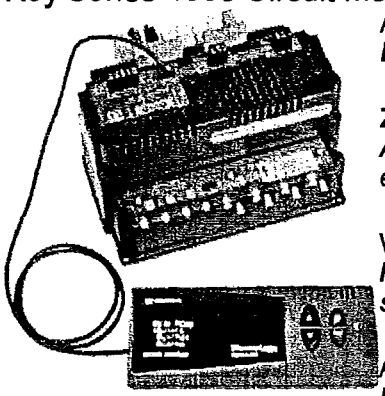
Monitoring Devices
Monitoring Home
Metering Family
4000 Circuit Monitor
2000 Circuit Monitor
Power Meter
Enercept® Meter
Energy Meter
Protective Devices

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control

Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com

Series 4000 Circuit Monitor Key Benefits

Key Series 4000 Circuit Monitor Features and Benefits



ANSI C12.20, .04% accuracy
Billing and auditing with confidence

Zero blind time, meter to 255th harmonic
Accurate data in challenging electrical environments

Waveform capture to 255th harmonic
Find tough power quality problems, fix sooner

Adaptive Waveform Capture
Look at events up to 60 seconds long

Sag/swell and disturbance detection
Detect the cause of equipment shutdown

Impulsive Transient Detection
Capture extremely short duration events to find cause of problems
Detect the cause of equipment shutdown

Log at up to 10 times/second
Trend motor starts for predictive maintenance

8 Meg of on-board data logs
Capture all data and waveforms to find problems

Power Statistics
Quickly find trends in electrical service

English, Spanish, French display
Support for global sites and diverse work force

Look at data with Web Browser
Share information to improve efficiency

Send alarms to e-mail or pager
Fast notification of problems for fast correction

The Series 4000 Circuit Monitor was designed to be the ultimate electrical power analysis tool. It is packed with leading edge features that will be

needed in the evolving world of electrical power purchasing and critical loads.

Square D Home Page | Square D Site Map | Square D Site Search | Square D Contact Us | Square D Products | Square D Tech Library | Square D On-line Digest

PowerLogic® Power Management From Start to Savings℠

Powerlogic Power Monitoring

In this Area

What's New

Documents

Area Home

Printer-friendly format

Related Documents
Digest Page
Specification
Press Release

Series 4000 Circuit Monitor
Series 4000 Home
Key Benefits
Power Quality
Utility Monitoring
Equipment Utilization
Install and Use
Platform Tour
Display

Monitoring Devices
Monitoring Home
Metering Family
4000 Circuit Monitor
2000 Circuit Monitor
Power Meter
Enercept® Meter
Energy Meter
Protective Devices

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control

Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com

Power Quality Capabilities of the Series 4000 Circuit Monitor

Why is the Power Out?

When will it be back on?

How are you going to make sure this doesn't happen again?

If you think electricity is expensive, try running without it. Lost production. Scrap. Clean up. Idle resources. Frustration. Pressure.

Many of these problems can be avoided and repeats prevented. But you have to know what causes problems with electricity supply, and monitor for these quality problems early.

The Series 4000 Circuit Monitor is designed to be the uniquely powerful tool you need to tackle power quality.

Monitor Harmonics
All current and voltage inputs are sampled 512 times per cycle, resolving to the 255th harmonic.

Sag/Swell Detection
Detect sags and swells less than 1/2 cycle long. Log and record waveform at 512 samples per cycle.

Disturbance Monitoring
Detect and record very brief cycle to cycle changes such as oscillatory switching transients.

Transient Detection
With the optional transient CVMT module, detect and record voltage transients lasting less than 100 microseconds.

Adaptive Waveform Capture
Taylor waveforms to your needs - length, pre-event cycles, resolution,

ITIC/SEMI Curves
Plot disturbances and compare to industry susceptibility curves. Analyze power quality versus equipment sensitivity.

Drill Down to Increasing Detail
Start with flexible general data logs and event logs. Increase resolution with high speed 100 msec event recorder. Focus in with actual high resolution waveform.

Sequence of Events
Reconstruct events to the millisecond with time stamps. Keep time between monitors in synch using GPS 1 msec or Ethernet 5 msec Visually overlay digital inputs (relay action) with waveform.

Alarms
Watch for troublesome conditions. Set alarm setpoints, multi-level

file size.

60 Second Waveforms
Capture waveforms of events lasting up to 60 seconds, like motor starts and recloser operations

(caution/urgent), and conditional alarms.

Fast Notification
Find out about alarm conditions by pager or e-mail, directly from the monitor

Square D Home Page | Square D Site Map | Square D Site Search | Square D Contact Us | Square D Products | Square D Tech Library | Square D On-line Digest

PowerLogic® Power Management From Start to Savings℠

Powerlogic Power Monitoring

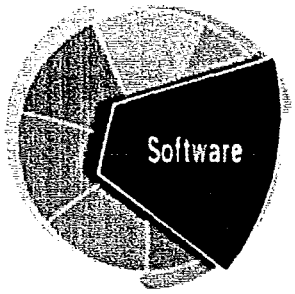
In this Area

What's New

Documents

Area Home

Printer-friendly format



PowerLogic® Software

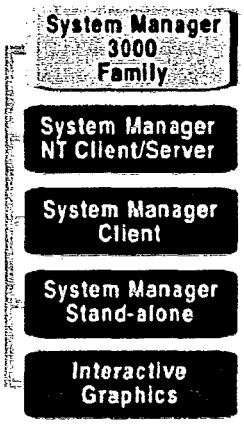
Once electrical system data has been gathered, the real work can begin. The mountains of raw data must be sifted and analyzed so that trends and problems can be brought to the surface. Computer software can perform this task.

POWERLOGIC® software was developed specifically for this task by a large team of talented programmers who understand power systems. This team continuously improves on their efforts to make sure that customers have the best analytical and control tools.

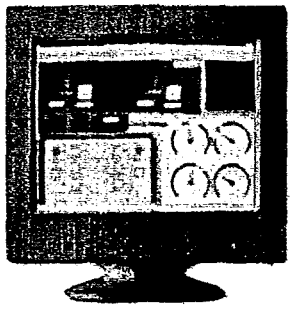
Related Documents
Descriptive Bulletin
Instruction Bulletin
Digest Page
Software
Software Home
Client/Server
Client
Stand-Alone
Graphics
Add-On Modules
SMS 3.2 New Features
On-Line Registration
Web Server Demo

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control

Internet
POWERLOGIC
POWERLINK
REACTIVAR
squared.com



- Windows® based
- Supports multiple protocols - POWERLOGIC, Modbus, Internet
- Multiple language support - English, Spanish, French
- Easy user set up
- No complicated tags, models, objects, or virtual components
- Security
- Energy management, disturbance monitoring, demand profiles
- Year 2000 compliant



Advanced software has been a hallmark of Square D. Square D introduced graphical Windows based software to power monitoring industry, and remains the industry leader. Rather than repackaging software intended for process control, Square D designs, programs, and tests software optimized for helping organizations save money on their energy expenses.

PowerLogic®
Power Management From Start to Savings℠

Powerlogic Power Monitoring

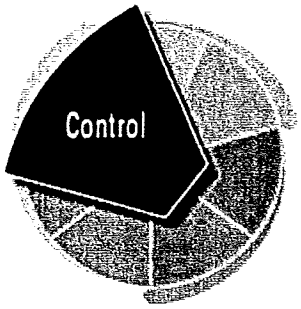
In this Area

What's New

Documents

Area Home

Printer-friendly format



Control and Problem Correction

Ultimately, all of the electrical system information and analysis in the world cannot save money or produce improvement by itself. Action is required.

The Square D POWERLOGIC Power Monitoring and Control System allows you to take control at almost any level of your electrical system. Control may range from fairly simple manual control to sophisticated automatic control of functions like lighting, harmonics, or load shedding.

Square D can help you analyze the information from your Power Monitoring System and, working with you to understand the specific needs of your facility, make money saving recommendations. These recommendations could include items like:

- Operational changes - to avoid high demand peaks, for example
- Setting up alarms to warn of costly problems, and procedures to take upon alarm
- Utilizing a different utility tariff available to you
- Setting up logs to acquire baseline loading information
- Redistributing loads
- Correcting grounding problems
- Correcting power factor to release system capacity
- Installing surge suppression equipment
- Using AC Drives or Energy Efficient Transformers to save energy
- Controlling lighting or small loads to conserve energy
- Using automatic controls to reduce downtime

The range of control options includes:

- Analog and digital I/O on metering devices that can be controlled by manual command over the network
- Automatic or manual control of individual branch circuits in Square D panelboards
- Control of main or feeder circuits by control of electronic trip units or protective relays
- Automatic power factor correction
- Automatic harmonic control through reactive compensation systems
- Surge Protection to mitigate problems caused by transient overvoltages
- Sophisticated control through engineered systems that control load shedding, generator paralleling, and similar tasks. These systems are typically implemented using high reliability Modicon PLCs and I/O products available from **Schneider Automation**.

Automatic Control
Automatic Control
Load Preservation
Load Shed/Follow
GPS Time Synch
Generator Interface
Sequence of Events

Square D Solutions
Lighting Control
Power Quality Correction
Non-Linear Panelboards
K-Rated Transformers
Energy Efficient Transformers
AC Drives
Modicon Automation
Equipment Upgrades

Start to Savings Links
Home
Monitoring
Communications
Software
Analysis
Design
Implementation
Control

Internet

POWERLOGIC
POWERLINK
REACTIVAR
squared.com

- Integration with existing building automation or process control systems that could benefit from the extensive electrical data and control available from the POWERLOGIC system

Sophisticated control can take care of many of the issues confronting a facility engineer or manager. However, analyzing the needs and solution and designing the control system is sometimes beyond the resources of the facility staff. In those situations, Square D can provide the engineering and design services needed to augment the in-house staff and successfully complete the project. Square D can also supply any level of support needed in implementing and integrating the solution. This gives you one point of responsibility to make sure that the project is done to your complete satisfaction.

Square D Home Page | Square D Site Map | Square D Site Search | Square D Contact Us | Square D Products | Square D Tech Library | Square D On-line Digest

Power Quality Correction

Solutions For Power Quality Problems

In this Area

What's New

Documents

Area Home

Printer-friendly format

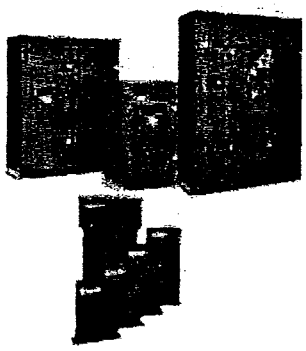
Merlin Gerin
Modicon
Square D
Telemecanique

Related Documents
Brochure
DigestPlus Selector
Tech Library
Tools

Solutions
Application Tree
Solution Cycle

Products
LV Products
Fixed
Automatic
Anti-Resonant
Passive Filters
Active Filters
Transient Free
Real Time
Sag Protection
MV Products
Fixed
Automatic
Real Time

Related Products
POWERLOGIC



- Power factor correction systems
- Harmonic filtering solutions
- Transient Free switching
- Voltage & flicker control
- Year 2000 compliant

Ask yourself the following questions. Would you like to reduce your power bills? Do you need to add more load to your transformer, but it is already at it's maximum capacity? Do you have power quality problems associated with harmonics? If you answered yes to any of these questions, power factor capacitors or harmonic filtering equipment is the solution.

Many Utilities effectively charge a penalty for low power factor. Power factor correction capacitors supply the reactive power (kVAR) required by inductive loads. By correcting poor power factor, capacitors reduce kVA demand, thus off-loading transformers, switchgear and other equipment. The reduced kVA demand results in lower utility power bills, cooler equipment operation and longer equipment life.

Applying power factor capacitors used to be straight forward. Today, with the proliferation of harmonic generating loads such as variable frequency drives, soft starters and welders, careful attention must be paid to proper application power factor correction and harmonic filtering equipment to avoid misapplication problems. As a leader in the field of power factor correction and harmonic filtering equipment, Square D and the ReactiVar family of Power factor Correction and Harmonic Filtering Equipment provides solutions to many power quality problems experienced in today's industrial facilities.

Schneider Electric