

# Maximizing the reliability and energy performance of data centers

PowerLogic® energy and power management systems

Make the most of your energy<sup>SM</sup>

**Schneider**  
Electric

# Improving both reliability *and* energy efficiency

Power availability and reliability are critical to your operations. A disruption or unplanned downtime can seriously impact your profitability and competitiveness. Additionally, customer demands for increased computing power expands load density and cooling requirements, resulting in higher energy needs, power consumption and operational costs.

Our Square D® PowerLogic® systems from Schneider Electric allow you to improve electrical network stability and drive down energy costs without compromising power availability or reliability.

## Data Center Solutions

With the world's largest, most advanced range of software, meters, breakers and relays, PowerLogic systems work to help reveal reliability risks and new cost-saving opportunities by:

- Detecting the direction, magnitude and duration of voltage disturbances to take action to prevent future occurrences and minimize downtime
- Reducing energy costs by understanding peak usage, allocating energy costs and optimizing utility contracts
- Improving reliability through transparency of root causes of interruption with precise sequence of events alarming



### Key PowerLogic Benefits:

- Reduces energy usage and costs
- Optimizes equipment utilization
- Increases reliability
- Minimizes unplanned outages
- Streamlines root cause analysis
- Improves cost allocation

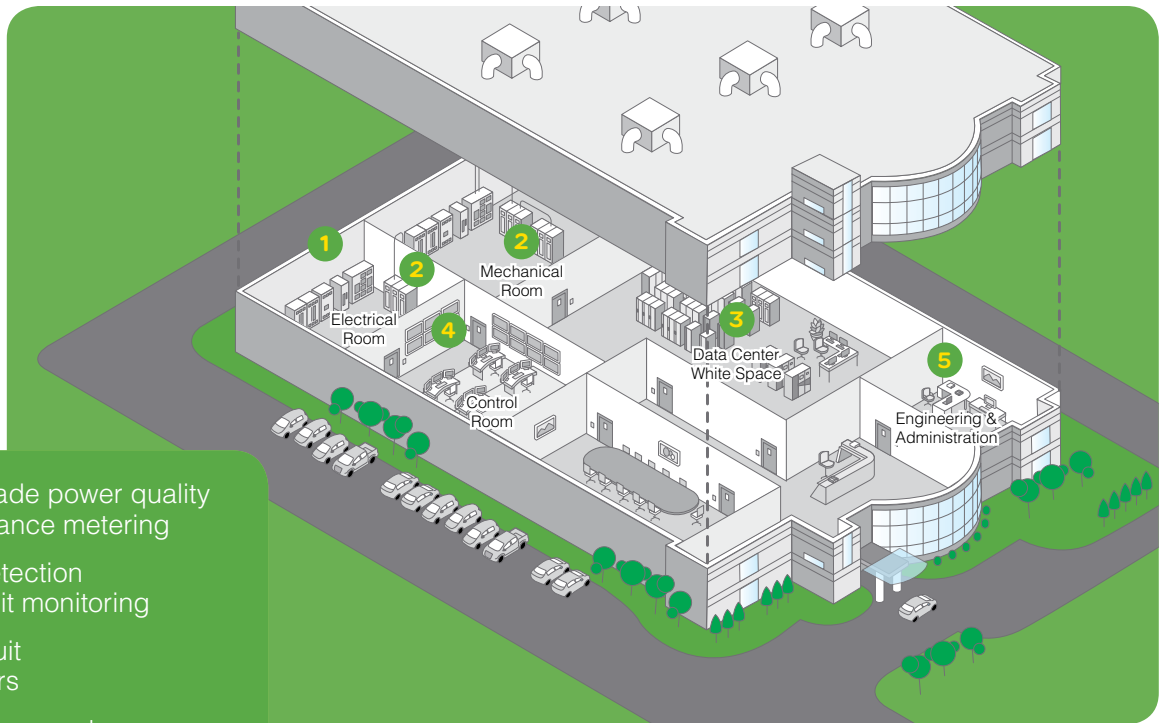
# Meeting your operational challenges with energy intelligence

Square D® PowerLogic® systems are the industry's most comprehensive energy and power management solutions. Schneider Electric offers a complete range of products deployed by experienced engineers to help you achieve your energy efficiency, reliability and cost-saving goals. Acting like a layer of intelligence across all your energy assets, PowerLogic technologies span your power, building and facility systems to deliver timely, relevant data to increase power system reliability, improve energy efficiency, reduce costs and boost overall productivity.

PowerLogic enterprise software not only reports on key performance indicators, but also provides utility bill verification, cost allocation, advanced analytics, data modeling and load forecasting.

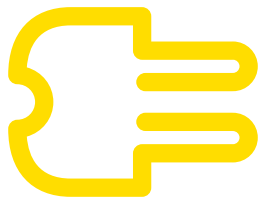
It allows you to track the success of your energy efficiency measures and to fully utilize existing assets. With our supervisory monitoring and control capabilities, you can improve efficiency and maintain reliability by efficiently monitoring current system status and reacting to real-time power system information. Energy managers can identify waste, benchmark their facility and integrate energy management with other business practices.

PowerLogic enterprise software removes guesswork and helps you to discover which efficiency opportunities offer the quickest or highest payback potential. It can help increase reliability and can optimize your system, making the most efficient use of your power distribution system.



- 1 Revenue grade power quality service entrance metering
- 2 Transient detection critical circuit monitoring
- 3 Branch circuit power meters
- 4 Power management supervisory software with sequence of events recording
- 5 Enterprise energy management software with GHG and PUE reporting

# Enhancing reliability and power quality



Power systems in today's data centers represent the highest level in optimization for reliability. Quite simply, downtime costs money and reduces customer confidence. When data centers experience an outage, it is typically due to one of four categories: human error, improper failover, power quality issues and overloading. Power quality issues, like power sags/swells, transients and harmonics, can reduce performance, damage equipment and interrupt operations. When problems occur, root cause analysis, disaster avoidance and quick recovery are key.

PowerLogic data center solutions help to reduce unplanned outages, diagnose and resolve electrical issues, perform power quality analysis, engage load preservation, and enable emergency power system testing for improved power system reliability and operation.

## Reducing unplanned outages and downtime

Without a power monitoring system, 60% to 70% of data center downtime is typically spent identifying and finding the problem after an incident occurs. The remaining 30% to 40%

is used to actually fix the problem. PowerLogic systems can help improve your reliability and decrease downtime by proactively monitoring your electrical distribution system down to the circuit level to detect potential anomalies before they happen. The system captures precise sequence of events and electrical information for root cause analysis to determine where the outage was initiated and to isolate the fault to bring the power back on-line as quickly as possible.

## Data center downtime:

60%-70%

time spent identifying/  
finding the problem



30%-40%

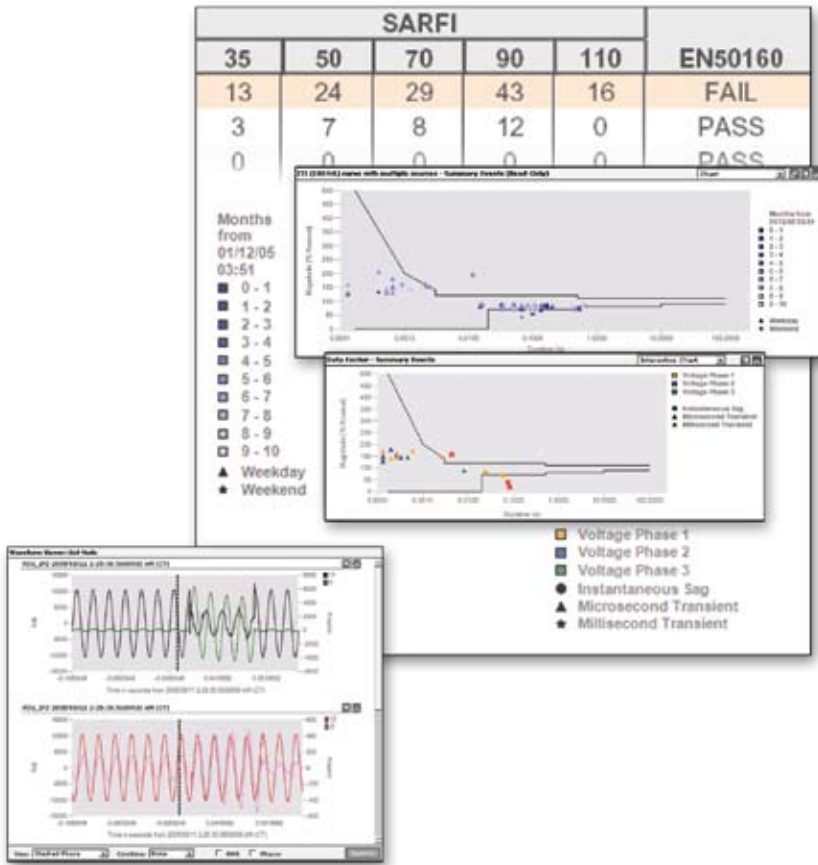
time spent fixing  
the problem



This increases system reliability by:

- Monitoring tolerances of critical points – service entrance main, generator, auto transfer switch, UPS, STS, PDU, CRAC, etc.
- Identifying the root cause of power quality and system events
- Rapidly communicating critical conditions before they escalate
- Measuring number of 9s for uptime
- Visualization of equipment and power system status with graphical diagrams to coordinate and validate the proper operation of backup power systems
- Providing early warning on conditions before an incident occurs such as overload alarm monitoring for PDU branch circuit monitoring
- Performing a detailed post event analysis for prevention of future disturbances with patented disturbance direction detection to aid in locating whether the source of the event is upstream or downstream

Analog and digital alarm conditions can be viewed remotely through a web browser or sent to e-mail, mobile phones or pagers, reducing the time it takes to get to the root cause.



## Power quality analysis and compliance

Reliable and high-quality power is essential to your bottom line, but power-quality-related issues are becoming much more complex. Using a range of powerful tools to support our detailed root-cause analysis, PowerLogic systems help you quickly track the propagation of disturbances and isolate problem sources. This could include transients caused by capacitor bank switching or a malfunctioning static transfer switch caused by a shorted capacitor in a UPS. Accurate monitoring, analysis and reporting of power quality information helps increase the power reliability and availability for your data center. PowerLogic technology can help assure you receive the proper level of power quality and availability specified in your utility contracts and needed by your systems.

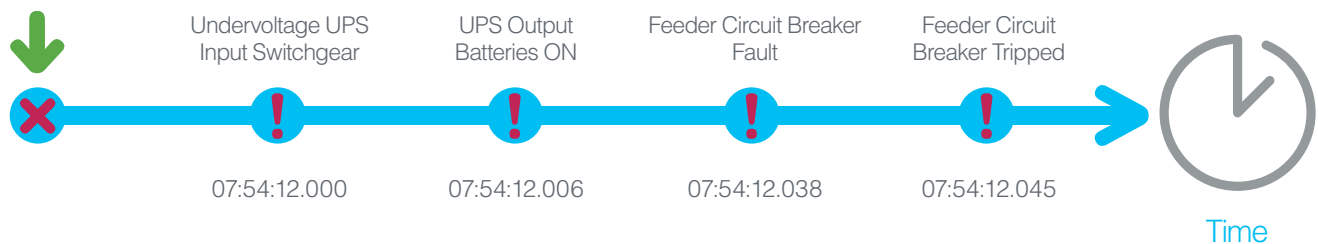
## Sequence of Events Recording

Sequence of events recording consolidates system-wide, high-speed alarms and events to quickly pinpoint the root cause of an outage even in very large, complex power systems. This means it is possible to properly restore a power system much more rapidly and give you insight to take corrective action to clear up persistent problems and avoid future occurrences.

- Records GPS synchronized time-stamps, and logs two-state electrical or operational events
- Provides clock sync accuracy to 100µs and +/-1 millisecond accurate time stamps for events
- Permits viewing, filtering and sorting of events to pinpoint problems

### Event Example:

UPS Feeder Cable Fault



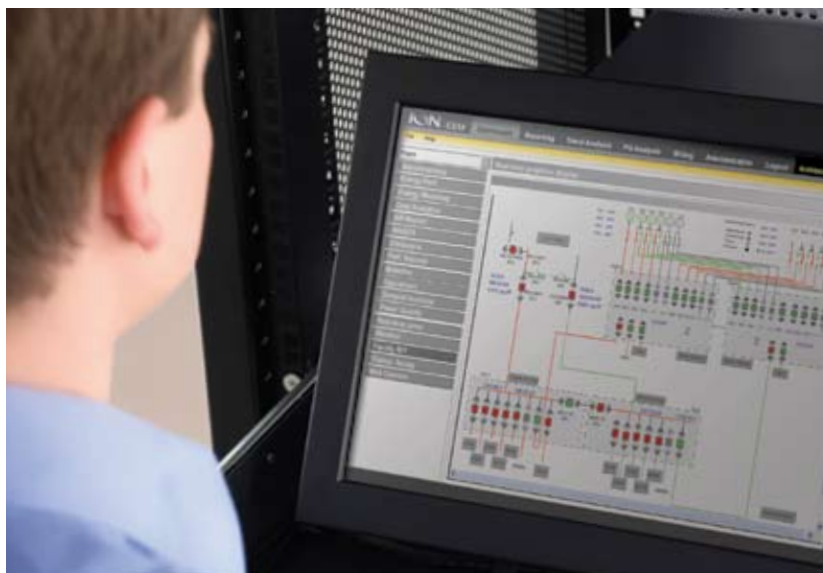
### Event Log

| Time                    | Source                  | Event                  | Type          | Status       | Priority | Quality      |
|-------------------------|-------------------------|------------------------|---------------|--------------|----------|--------------|
| 09/07/2009 07:54:12.045 | Side A Main SWTGR       | Feeder Circuit Breaker | Status Change | Tripped      | High     | Good +/- 1ms |
| 09/07/2009 07:54:12.038 | Side A Main SWTGR       | Feeder Circuit Breaker | Status Change | Fault        | High     | Good +/- 1ms |
| 09/07/2009 07:54:12.006 | Side A UPS Output SWTGR | Batteries              | Status Change | ON Batteries | High     | Good +/- 1ms |
| 09/07/2009 07:54:12.000 | Side A UPS Input SWTGR  | Voltage                | Status Change | Undervoltage | High     | Good +/- 1ms |

# Leading the way in energy efficiency

As energy costs rise, energy management has become a central issue for data centers. With electricity usually being the single largest data center operating expense, a recent Department of Energy study noted that typical data center energy efficiency improvements save 20-40%, and up to 50% with aggressive strategies. To improve overall efficiencies and reduce costs, a more strategic approach to energy management is required. Schneider Electric can help you in the evaluation of current performance, identification of opportunities for efficiency gains, implementation of energy-saving actions and methodologies for tracking and measuring results.

Accurate and relevant data is a key element to the success of any energy efficiency project. PowerLogic technologies help you monitor key points throughout your data center, from equipment such as generators and transformers to HVAC, transfer switches and PDUs. It provides a detailed view of how energy is used by the operation. With this information, you can reduce and allocate energy costs, maximize equipment usage, facilitate capacity planning and determine energy efficiency metrics.



## Extend equipment life

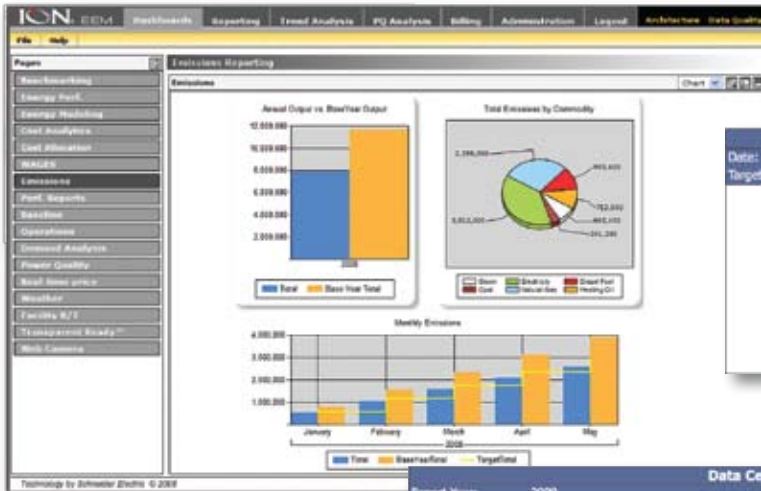
Well-maintained equipment uses less energy, is more reliable and contributes to improved productivity. PowerLogic systems support preventive and proactive maintenance for a wide variety of your energy assets.

- Determine the optimum timing and frequency of maintenance instead of using an arbitrary schedule
- Automatically track relay or breaker trips, UPS operations or charge remaining in batteries
- Alarm on transformer temperatures, motor performance parameters and other wear indicators
- Reduce maintenance and labor costs

# <20-40%

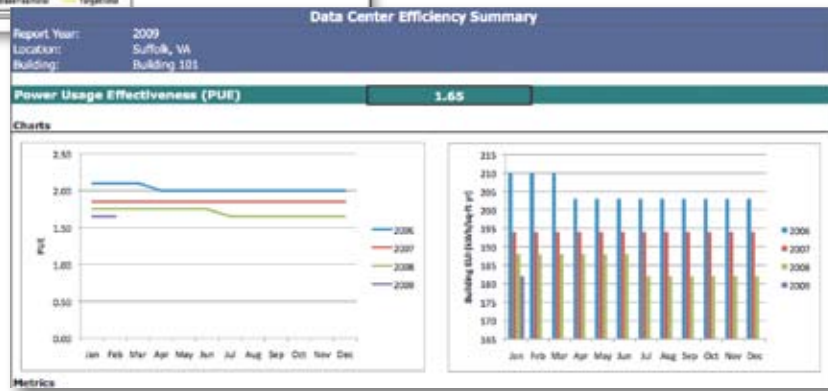
energy efficiency savings  
in a typical data center.

(according to DOE Data Center  
Efficiency Program - April 2009)



**Data Center PUE Comparison**  
 Date: Jan 1 2009 to Feb 1 2009  
 Target PUE: 1.75

| Location       | Building         | PUE  | vs Target |
|----------------|------------------|------|-----------|
| Fort Worth, TX | Fort Worth North | 1.58 | -10%      |
| Marietta, GA   | Marietta - 1     | 1.68 | -4%       |
| Fort Worth, TX | Fort Worth 500   | 1.72 | -2%       |
| Marietta, GA   | Marietta - 1     | 1.68 | -4%       |
| Fort Worth, TX | Fort Worth South | 1.79 | 2%        |
| Suffolk, VA    | ODC              | 1.82 | 4%        |
| Fort Worth, TX | Fort Worth 501   | 1.86 | 6%        |
| Marietta, GA   | Marietta - 2     | 1.89 | 8%        |
| etc.           | etc.             | 1.91 | 9%        |



## Maximize energy usage

Power monitoring and energy management systems help you determine where excess capacity exists, identify where equipment is being over-stressed, and balance loads on substations, panelboards and other power equipment, to help maximize and extend the life of your investments.

- Reduce capital expenses associated with poor power distribution system utilization
- Design power systems according to actual usage patterns
- Automatically generate load profiles
- Determine if your existing infrastructure will accommodate new processes

## Determine efficiency metrics

With more efficient energy projects, your data center's ongoing operational costs will be reduced. To ensure the accurate measurement of these results, you need access to detailed power data to calculate your total cost of operations. The PowerLogic KPI solution helps you to evaluate the success of green initiatives by determining energy-saving opportunities with the ability to compare efficiency information with other data centers through:

- Information to determine your data center's efficiency by Power Usage Effectiveness (PUE)
- Load disaggregation of total energy billing into costs for individual loads
- Review of historical information to determine effectiveness of energy efficiency programs
- Greenhouse gas reporting and trending to help reduce emissions

# Integrated data center solutions from a leader in energy, power, automation and security

Schneider Electric delivers the industry experience, technical knowledge, application expertise and market-focused product and service solutions to help you manage the total life cycle of your data center. From new construction through daily operation, we can optimize the reliability, safety and efficiency of your building systems.

We are your single source for energy, power, automation and security solutions through our global brands:

|   |  |   |  |
|---|--|---|--|
|    | <ul style="list-style-type: none"> <li>■ Integrated equipment</li> <li>■ Lighting control</li> <li>■ Metering and monitoring</li> <li>■ Power quality solutions</li> </ul> <p><a href="http://www.squared.com">www.squared.com</a></p>               |    | <ul style="list-style-type: none"> <li>■ Building automation systems</li> <li>■ Environmental control</li> </ul> <p><a href="http://www.schneider-electric.com/buildings">www.schneider-electric.com/buildings</a></p> |
|   | <ul style="list-style-type: none"> <li>■ Indoor lighting</li> <li>■ Outdoor lighting</li> </ul> <p><a href="http://www.junolightinggroup.com">www.junolightinggroup.com</a></p>  |   | <ul style="list-style-type: none"> <li>■ Video monitoring and security</li> </ul> <p><a href="http://www.pelco.com">www.pelco.com</a></p>  |
|  | <ul style="list-style-type: none"> <li>■ InfraStruXure® integrated architecture</li> <li>■ Cooling solutions</li> <li>■ Uninterruptible power supply</li> <li>■ Racks and accessories</li> </ul> <p><a href="http://www.apc.com">www.apc.com</a></p> |  | <ul style="list-style-type: none"> <li>■ Renewable energy solutions</li> </ul> <p><a href="http://www.xantrex.com">www.xantrex.com</a></p>   |

## > Put our experience to work for you.

Find out how PowerLogic products and system solutions can make a difference for your data center. To learn more, visit [www.powerlogic.com](http://www.powerlogic.com) or contact your local sales representative for ordering information.

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