

Monitoring AC Power Usage at Remote Sites

Managing and monitoring AC power usage at remote sites (cell sites, communication huts, substations, cabinets, etc.) is becoming increasingly important. Service providers around the world want to understand if power companies are delivering reliable power and if the power they are being billed for is accurate. For instance, most hard-to-reach sites will not have actual meter readings taken on a regular basis, and the electric utility company may overcharge based on an estimate of usage.

The Power Management solution from Kentrox enables service providers to obtain detailed analysis of AC power quality, availability, and consumption using Remote, Optima, and an external AC power monitoring device. The Remote monitors the power levels being delivered to ensure it is within specification. If power levels fluctuate, it could damage sensitive site equipment resulting in "brown out" conditions or potentially consume additional power.

The Remote collects data both as a series of measurements and thresholds on relevant measurements for autonomous alarm reporting. Remote can also identify when site equipment may not be operating efficiently. For example, an unbalanced load may cause a multi-phased system to operate inefficiently, leading to higher power consumption resulting in an increased electric-ity bill. In other cases, accurate measurements of power usage at the site will help identify cases where generators, batteries, or other components may be under- or over-sized for a given site design. The operator can use this data to streamline operations by selecting new equipment to more closely match the site power requirements.

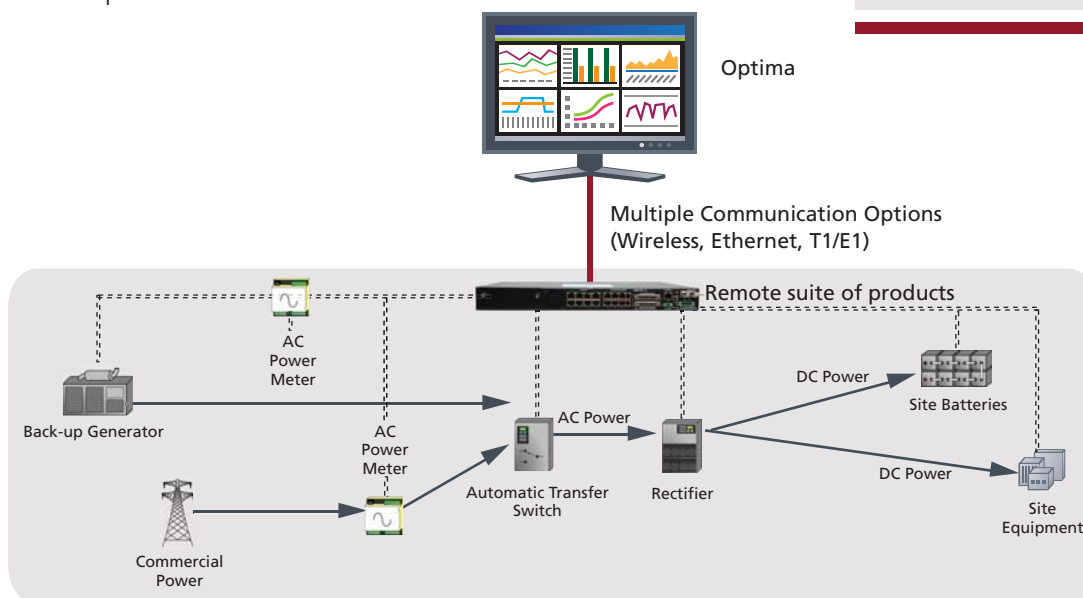
The AC power sensor and transducers are used to monitor AC power feeds, generator power feeds, or both. This allows the operator to obtain a complete picture of power usage and generation at the site.

AC power monitoring provided by Kentrox obtains the following measurements:

- 3-Phase AC Voltage
- 3-Phase AC Current
- Average Current
- Average Voltage
- AC Frequency
- Calculated Real Power
- Imported Energy (kilowatt-hour or kWh)

Benefits of AC Power Monitoring

- Obtain detailed information of AC power quality, availability, and consumption
- Monitor AC power feeds, generator power feeds, or both
- Automatically switch to batteries, generator, or other hybrid power sources based on time of day or specific power profiles
- Ensure remote sites are operating properly and efficiently and suppliers are providing what is expected



Kentrox AC power monitoring solution

These measurements can be collected, graphed, and analyzed within Optima. For example, actual kWh usage can be graphed over a given time period, such as a 30 day billing cycle, in an automated report and then sent to the relevant personnel for analysis.



Three phase AC input displaying voltage, current, frequency, and energy consumed

In addition to these measurements, the Kentrox solution also provides metering of monthly kWh usage. This detailed data may be used for side-by-side comparison with utility billing statements to ensure local power utilities are actually delivering the amount of power that is being billed. In some geographical locations, power can be more expensive based on time of day, load characteristics, or both.

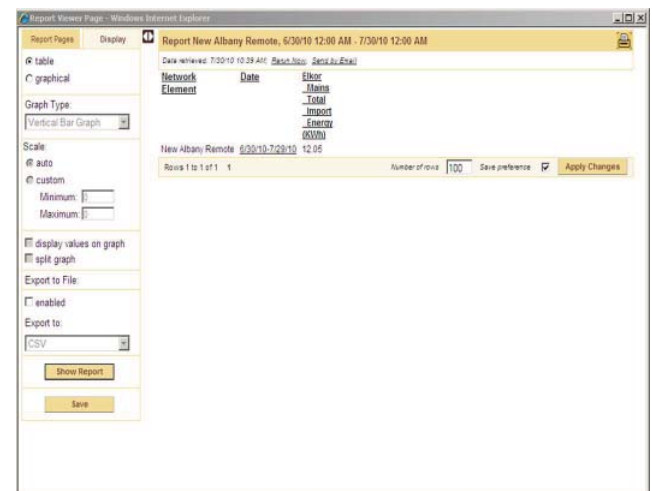
The Remote can also act as a hybrid power manager, switching to batteries, generator, or other hybrid power sources based on time of day or specific power profiles to help the service provider reduce related power expenses. Metering AC power sources at the site will give providers detailed consumption information regarding when and how much power each monitored device is using to identify potential cost savings.

Kentrox also measures on-site power generation to determine the amount of power that may need to be purchased or that can be sold as revenue. By integrating detailed AC power monitoring capabilities with the full site management solution from Kentrox, service providers can ensure that remote sites are operating properly and efficiently and their suppliers are providing what is expected.

Comprehensive power management

In addition to monitoring AC power, the comprehensive Power Management solution from Kentrox offers:

- Commercial power monitoring: proactively receive notification of failures with specific site-affecting conditions
- Battery monitoring: identify weak or underpowered battery plants by providing continual site battery life analysis
- Generator management: monitor fuel levels to facilitate timely refills, perform remote power cycle as part of regular preventative maintenance routines, meet environmental and government imposed emissions regulations and other mandates through accurate measurement of generator runtime
- Hybrid power management: makes "intelligent" and automated decisions in situations where commercial power has failed, is unreliable, or in off-grid locations and then optimizes generator run time
- Complete network view and history reporting: gain a single, consolidated view of all primary and back-up power systems status while meeting the need for accurate reports



Monthly report provided by Optima showing how much energy in kilowatt-hour (kWh) was consumed

For more information, visit www.kentrox.com, email info@kentrox.com or call 800 733 5511 or +1 614 798 2000.