Energy Management System (EMS)
Comprehensive Power Quality Analysis
Customer Billing and Invoicing
eXpertPower™ software solution provides comprehensive energy management, billing, demand response, Power Quality analysis and generator control. eXpertPower™ is available either as an on-line service (Service Edition) or as a stand-alone package (Pro Edition). SATEC’s complete solution includes our wide range of analyzers combined with eXpertPower™ software, providing the information and analytics to improve the efficiency, reliability, security and profitability of our customers’ energy system.

eXpertPower™ uses a standard web browser as user interface, for both local installation and Internet remote installation. This reduces the total cost of ownership (TCO) by eliminating the need for training and special client hardware and software. With eXpertPower™ Service, there is no need for server hardware and software or on-site IT experts, while the standalone Pro version reduces monthly charges.

With installations of over 10,000 managed devices at one site, eXpertPower™ is the most powerful energy management solution in the market. Its scalability allows you to start with small installations and to expand as your business grows.
Main Features

Data Collection
- Automatic data collection from energy meters (electricity, water, gas etc.), Power Quality analyzers and substation automation controllers
- Complex calculations from two or more devices
- Easy configuration of new devices, communication server and Modbus mapping

Presentation
- View all data in your browser—no software installation, no employee training
- Customized dashboards, single line diagrams with real time data, graphs with status indications (color, icon)
- Multi-user, multi-security level

Historical information
- All data is logged in the database
- Graph any parameters
- Monitor trends to identify potential problems

Reports
- Manual, automatic or scheduled reports
- Preconfigured or customized reports
- HTML, Export to MS Excel and PDF formats

Alarms and Events
- Multi-level thresholds for complex criteria
- Messaging, emails and SMS alarms
- Log all alarms
- Request user acknowledgement

Connectivity & Interoperability
- Integrate all energy management, automation system and billing into one web based system
- Built-in data export to different formats (Excel, PDF etc.)
- Web interface optional module allows integration with third party enterprise applications (BMS, SCADA, ERP, CRM, Accounting)

Architecture
- Complete web based design with multi-browser support (Internet Explorer, Firefox, Chrome, Opera, Safari)
- Grow as you go architecture—from single device to thousands
- Distributed servers—support for server virtualization technologies such as VMWare
- Local or remote MS-SQL database
- Supports express, standard and enterprise MS SQL editions
Energy Management & Power Monitoring

Allows monitoring your power and energy consumption in complex sites.

- Collects data from SATEC and other Modbus products
- Single-line diagrams with real time data updating
- Graphic maps, icons and color status indications
- Virtual devices—real time calculations such as summation, subtraction and more
- Historical data, trends and detection allow for identifying unnecessary load operation
- Advanced compare wizard— to select multiple devices, parameters and time periods
- Fully user-editable customized dashboards for each user
Billing & Subtenants

Enables monitoring the consumption of sub-tenants and manage the billing process.

- Dynamic tariff definition including prices, usage and seasons
- Accurate cost calculation
- Complete submetering solution
- Tenants management
- Flexible invoicing options
- Invoice comparison
Power Quality

- Compliance reports to international standards (EN50160, IEEE1159, GOST 13109) or customer contract
- Accurate harmonics measurement, including THD, TDD, K-Factor, Crest Factor, harmonic power/direction and symmetrical components
- System-wide events, waveform and phasor plotting

![Power Quality Compliance Report](image)

![Multiple Synchronized Waveforms](image)

![Detailed Event Analysis](image)

![Harmonics Analysis](image)
Automatic and manual operation of generators to reduce peak demand according to schedule, incentives and availability

- Power stations load management, production tracking, consumption monitoring with out-of-plan usage and production
- Control of substation automation bay controllers

Power Plant Management

- Predict customers’ consumption, generate daily production plans based on different algorithms, send/get daily production data from a CDC (Central Dispatch Center)
- Manage power plant statuses such as: availability, startup duration, interruptions, outage and more
- Data validation flows
- Energy and cost balance calculations based on import & export energy, operational parameters, plant statuses and different tariffs
- Complete billing solution, including invoices and a large set of configurable billing reports and tariffs
Applications & Case Studies

Commercial

Commercial Buildings | Shopping Centers
Universities | Hospitals | Hotels
Chain Stores | Residential Buildings

ENERGY EFFICIENCY & COSTS
- Reduce energy consumption
- Reduce surcharges and penalties (power factor, peak demand, etc.)
- Initiate corporate level saving plans
- Increase green star rating

SUBMETERING & BILLING
- Complete billing solution for reselling energy (electrical, water, gas and air condition) to sub-tenants
- Web access for tenants, to view their bills and on-line data

POWER RELIABILITY
- Proactive maintenance for maximum system availability
- Analyze demands to help utilizing existing infrastructure and prevent over design
Utilities | Smart Grid | Renewable
Generation | Power Plants
Transmission | Distribution | Smart Grid

Renewable: Solar | Wind | Waste Water

Data Centers

ENERGY EFFICIENCY & COSTS
- Reduce energy consumption
- Reduce surcharges and penalties (power factor, peak demand, etc.)
- Initiate corporate level saving plans

SUBMETERING AND BILLING
- Complete billing solution for reselling energy to customers at cabinet or even computer resolution
- Web access to customers to view their bills and online data
- Power reliability
- Proactive maintenance for maximum system availability
- Analyze demands to help utilize existing infrastructure and prevent over design

SMART GRID
- AMR/AMI complete solution including billing
- Comprehensive substation automation
- Monitor and reduce energy losses

POWER QUALITY
- Analyze source of Power Quality issues to allow isolation

ENERGY EFFICIENCY & COSTS
- Manage customers’ Power Quality

NETWORK SECURITY
- Proactive maintenance for maximum system availability
- Analyze demands to help utilizing existing infrastructure and prevent over design

Industrial
Process Industry
Semi-Conductors
Pharmaceutical
Process Industry
Mining
Automotive

ENERGY EFFICIENCY & COSTS
- Reduce energy consumption
- Reduce surcharges and penalties (power factor, peak demand etc.)
- Initiate corporate level saving plans

POWER RELIABILITY
- Proactive maintenance for maximum system availability
- Analyze demands to help utilize existing infrastructure and prevent over-design

POWER QUALITY
- Effectively monitoring Power Quality to prevent failures
- Verify the quality of the supplied voltage
- Compliance report according to international and local regulation
System Structure

Accounting Software
BMS / SCADA / Management System
End User / Owner / Facility Manager

LAN / WAN
Pro Edition

INTERNET
eXpertPower™ Service

Servers
System Operator

Phone & email Service

Tenants TOU Bills
Printed Utility Bills

Automatic Bill Data Retrieval
Utility Vault

ETC2002

ETH RS485 Profibus

SATEC Meters

Digital Pulse / 4-20mA

Modbus / M-BUS (via converter)
Air-Conditioning Meters

Water / Gas Meters

Digital Pulse / 4-20mA

Cellular Provider Gateway

RF

TCP/IP

GPRS

Modbus / M-BUS (via converter)

ETC2002

ETH RS485 Profibus

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SATEC Meters

Digital Pulse / 4-20mA

Modbus / M-BUS (via converter)
Service or Pro Edition?

eXpertPower™ is offered in two versions: Service and Pro edition. In the Service model, SATEC owns and manages the servers, and is responsible for configurations, backups, etc. In the Pro edition, the customer owns the servers and all the operation of the system while SATEC provides support when required according to agreed SLA. The great advantage of the Service edition is that it saves the customer software installation, expensive computer purchases and upgrades; and the system is continuously managed by SATEC. The benefit of the Pro edition is that the information remains inside the organization. The Pro edition may be used in a local area network or over the Internet (requires static IP addresses).

Both editions may require setup, customization and configuration, such as graphic screens and tariff building (if your utility tariff is not already among the many tariffs we already support, we will carefully analyze the tariff and configure the software accordingly).

Service Edition

Licensing

In the Service edition data services are rented as follows:

**ONE TIME CHARGES**
Basic setup fee for setting the account and communication plus optional configurations (graphic screens, single line diagrams etc.)

**MONTHLY CHARGES**
The monthly charges are per device (for BFM136 it is per load):

- **Basic data**: access all your data with update rate of 6 minutes or slower
- **Power Quality**: if your device has Power Quality information, you may want to add this option to see it. This is an add-on—must have basic data
- **Frequent readings**: for places where the 6 minute update rate is not fast enough, we allow up to 2 minute update rate
- **Virtual device**: calculation of metering point without having physical devices, such as summing parallel transformers (basic data only—no Power Quality).
- **Billing service**: issue monthly bills (in PDF format) based on meter data, providing help desk for your customer questions and on-site technical assistance (not offered in some countries).

This is an add-on—must have basic data or Virtual device.
- **Generator control**: automatic activation of backup generators according to utility incentives to reduce peak demand

Pro Edition

Licensing

In the Pro edition the software is purchased (with optional modules); device and user licenses can be added as follows:

**OPTIONAL MODULES**
In addition to the basic functionality we offer billing, web services, demand response and power plant management modules.

**DEVICE LICENSE**
There are three device licenses. Each license allows communication to one device as follows:

- **Basic meter license** (order code LIL): supports EM132, EM133 and PM130 PLUS Series
- **Mid level meter license** (order code LIM): supports PM172, 3rd party devices and virtual devices
- **Power Quality multi-feeder license** (order code LIH): supports all Power Quality devices (automatically enables Power Quality options) and BFM136 (one license per BFM136, regardless of number of channels used)

**BILLING LICENSE**
Generation of a bill requires billing license per bill. Each bill requires a license (i.e., a BFM136 connected to 3-phase loads will require 12 licenses; a PM130EH PLUS that monitors a water meter with digital input would require 2 licenses).

**LICENSEING PER CONNECTION/USER**
The basic package allows installation of the software on one computer (the server) and setting up to 10 users. For accessing the data from another computer, a user license is necessary (order code LIU). Each LIU allows additional 10 users and 1 simultaneous connection (i.e., Basic plus 2 LIUs allows 30 user names and access from two computers at a time).