ESTheorm

Enterprise-Wide Energy Performance and Advanced Business Energy Analytics Suite

Empower Your Energy Future with Precision and Control: Unleash the Potential of Our ESTheorm Energy Management Software

Crafting Energy Vista

ESTheorm software serves as a comprehensive Energy Management solution designed for both energy-generating companies and industrial or commercial energy users. Its primary objective is to empower power plant personnel with the necessary information to optimize UI revenues. For energy users, the software provides insights into areas of energy losses and the contributing parameters, enabling the formulation of effective strategies to mitigate these losses.

The ESTheorm software offers the flexibility to develop the following applications at any time, incurring minimal additional costs:

1.Automatic Meter Reading System
2.Targeting, Benchmarking and Cost Allocation
3.Enterprise Energy Management System
4.Distribution Management System
5.Integration with any Substation Automation Applications
6.Planning, Forecasting & Scheduling
7.Renewable Energy Management System
8.Demand Response
9.Asset Management
10.ABT/DSM Applications for power plants, Renewable Energy and Open Access
11.Plant performance and Analysis
12.Electronic Energy Billing Systems

Networking Energy

This versatile software is compatible with a wide range of network medias, including RS 232, RS 485, Ethernet, and wireless technologies. It facilitates the automatic collection and storage of data from metering devices or control devices. The Web-enabled access of ESTheorm allows for flexible sharing of Energy Information across various plant departments, such as electrical maintenance, operations, top management decision-makers, O&D, engineering, and commercial departments.

Energy Insight

ESTheorm enables real-time monitoring, analysis of power conditions and quality, and quick response to alarms, preventing critical situations. It allows examination of historical trends for insights into energy generation versus capacity and validates efficiency improvements. Customized query services empower customizable arithmetic and logical data analysis.

ESTheorm

key components of the ESTheorm Software

Network Management and Configuration Module

Calculation Engine

Viewer for Front-end GUI

Schedulers for Report Generation and Distribution

Reporter Module

Analytical services

Alarm Module

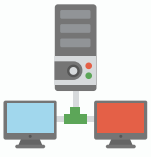
Data Management Services

Query Wizard Processor

Data Acquisition Services

SMS & Email Server

Forecasting Module



Web Server for operations

User Management

These components collectively empower users to seamlessly implement various applications, enhancing the overall functionality and efficiency of energy-related operations.

Data Acquisition System

ESTheorm

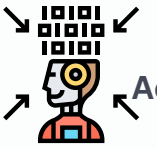
EnergiSpeak's ESTheorm software, designed for Windows as well as open tools, is a robust application with a range of functionalities inclusive of

Supported Field device types

- Multi Function Meters (MFM)
- Intelligent Electronic Devices (IED)
- PLC, RTUs or DCUs
- Revenue Meters
- Process Control & Instrumentation
- OPC devices
- Numerical Relays
- Water and Gas Meters

Server Integration

- OPC Server
- PI system
- SAP/ERP System
- Web Server
- MMS server
- SCADA system
- DAS system
- SAS System



Accept Data inputs from

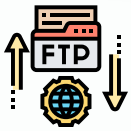
- Manual Feeds
- Web Feeds
- Microsoft Excel CSV
- Open Spread sheets
- Xml/Text feeds
- Mobile App feeds

Support Data Networks

- RS 232 & RS 485
- TCP/IP & UDP
- GPRS
- Internet
- RF Mesh & LORA
- Bluetooth

Data Management

- Standard and Specific VEE services
- Data Cleaning & Archiving Services
- Data Backup and Restoration Services
- Data Storage and Retrieval services
- Data Security, Access and Concurrency control services
- Auto Database scalability services



Protocols

- MODBUS RTU & MODBUS TCP
- DLMS
- IEC 104 & IEC 61850
- BACnet
- TCP
- WiSUN
- HTTP/HTTPS & FTP
- MQTT

This comprehensive suite of features ensures effective monitoring, analysis, and reporting of energy-related data, contributing to enhanced operational efficiency and informed decision-making. Users can effortlessly develop a variety of Energy Management applications at any time using the software, equipped with all the necessary tools for additions.

Key Features of ESTheorm

1 Scalability and Flexible Architecture

- Scalable in network size and number of devices
- Flexible architecture allowing the addition of hundreds of metering points, secondary servers, and workstation clients as needed
- Utilizes MS Excel interface for complex data processing and control functions

2 Data Collection

- Collects data from power and energy meters using various communication methods (RS232, RS485, Ethernet, wireless - GSM/GPRS, and other industry-standard networking methods)
- Integrates seamlessly with third-party meters, equipment, and web services

3 Integration and Compatibility

- Shares data with third-party SCADA, Plant automation, and Commercial business systems (e.g., PI servers, SAP/ERP)
- Compliant with ODBC and OPC standards

4 Intranet Web Access

- Accessible over intranet web for customized system data screens, real-time and historical data, status indicators, and alarm messages

5 Reporting

- Modules for preconfigured and custom reports
- Supports Microsoft Excel and other third-party reporting tools
- Reports can be scheduled for distribution via email or web

6 Online/Offline Trends

- Provides online/offline trends, allowing the graphing of any combination of measured parameters and aggregate loads

7 Alarm Management

- Built-in Alarm Manager to trigger on complex conditions
- Generates alarm messages and logs all relevant event data

8 External Device Control

- Built-in functions to trigger an application to control an external Modbus device
- Set points can be operated manually or automatically

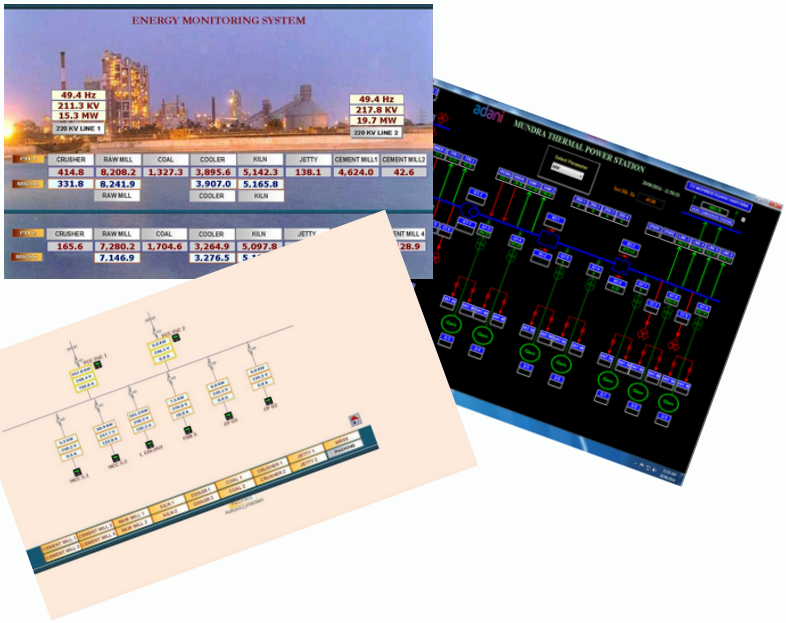
9. Data Base

- Utilizes postgre SQL / Mongo DB for efficient and reliable data storage

ESTheorm offers a comprehensive suite of features, ensuring adaptability, compatibility, and efficient management of power and energy-related data

Real-time Monitoring Features

ESTheorm



SINGLE LINE DIAGRAM VISUALIZATION

- Display Single Line Diagrams (SLD) that visualize the main distribution system across one or more substations or PCCs.
- Accessible from any workstation PC, both locally and over the intranet.

POWER AND ENERGY MEASUREMENTS

- Display real-time power and energy measurements using meter templates or group-wise representations.
- Access historical data with selectable queries and data logs.
- Monitor alarm status and load status (on/off, temperature, pressure, etc.) through selectable menu items.

CUSTOMIZED USER DIAGRAMS

- Easily design user diagrams for customized views, representing readings in numbers, bar or trend graphs.
- Incorporate one-line diagrams with background elevation diagrams, maps, photos, and animations.

- Displays and logs derived values based on real-time data.
- Effortlessly switch between diagrams for different perspectives.
- Group devices and parameters together for convenient display
- Extract and analyze selected ranges of information
- Move to further levels of detail, starting with a substation overview, then opening a feeder diagram, and finally viewing a device template for real-time data

Report Features

Manual and Scheduled Report Generation

- ESTheorm Reporter includes a manual report generator for on-demand report generation.
- Schedule report generator allows users to configure reporting schedules for automated generation.
- Scheduled reports can be distributed automatically via email and saved into a folder accessible over the plant intranet.

Microsoft® Excel™ Integration

- ESTheorm generates reports through Microsoft® Excel™, providing a familiar interface for users.
- Excel sheets can be formatted according to user requirements based on queried data.

Variety of Predefined Reports

- Offers a range of predefined reports such as Daily EMS Reports, Shift-wise EMS Reports, Negative UI Analysis Report, and EMS GAP reports.
- Reports are modifiable to cater to specific user needs.

Flexible Time Ranges

Reports can cover a wide range of time intervals, including Block-wise, Hourly, Daily, Weekly, Monthly, Quarterly, or Yearly based on parameter logs.

Customization Options

- Reports are further customizable using VBA (Visual Basic for Applications) or any SQL Server reporting tools.
- Integration with other databases is possible, allowing the combination of ESTheorm data with external sources for advanced energy management reports.

These reporting features provide users with the flexibility to generate, schedule, and customize reports, ensuring that the information is presented in a way that meets their specific needs and preferences.

Energy Analytics Unveiling Efficiency with Detailed Energy Consumption Reports

ESTheorm

This software provides a versatile platform for users to conduct in-depth analyses, generate insightful reports, and optimize energy consumption across various operational scenarios.

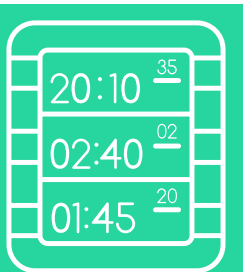
Some potential Energy Reports

1. Equipment-Wise Energy Consumption Analysis
2. Effect of Electrical/Mechanical Maintenance on Energy Consumption
3. Reports on Comparison of Like/Different Types of Electrical Drives' Electrical Consumption Analysis
4. Comparison of Energy Consumption Reports of Equipment with Respect to Varying Operating Conditions
5. Finding of Energy Consumption Norms Based on Previous Data Analysis with Respect to Operating Conditions
6. Study of Energy Consumption Norms Based on Set Limits
7. Selection of Suitable Transformer Tap Position Based on Load Analysis and Existing Voltage Profiles to Reduce Losses in Partly Loaded Motors
8. Automatic Fixing of Energy Consumption Norms to Electrical Loads Considering the Lowest Past Occurrence for Similar Operating Conditions
9. Finding the Duty Cycles of Dynamic Loads like Compressors

Trend Analysis

01 Multi-Parameter Diagrams

- View a single diagram, with multiple parameters display.
- Display parameters on separate graph scales or on a single scale for comprehensive analysis.



02 Graph Generation

- Generate graphs for any measured or derived parameter, providing a visual representation of trends and patterns.

03 Aggregate Load Profiles

- Create graphs that aggregate load profiles from multiple metering points.
- Compare related parameters from different areas or aspects of your enterprise.

04 Usage Profiles

- Develop usage profiles to uncover demand peaks, identify overload trends, or assess unused plant capacity.
- Track and analyze energy-related costs on a plant-wide basis, breaking down the information for each substation, feeder, process, equipment, or specific area.

These trend analysis features empower users to visually interpret data, identify patterns, and gain insights into energy usage and performance across various parameters and areas within the enterprise.

Alarms and Events

with Manual & Automated Controls

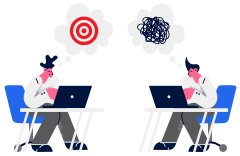
ESTheorm

Alarm Manager

Utilize the Alarm Manager to generate alarms for various events such as blockouts, outages, load tripping, and equipment downtimes.

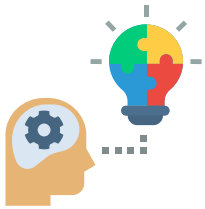
Configurable Alarms

Empower users to configure alarms based on specific conditions, including power outages, power supply variations in voltage and frequency, overloads, and underload limit crossings. Configure alarms for equipment conditions, ensuring timely notifications of any deviations.



Communication Failures

Generate alarms for communication failures from metering devices or network component failures, ensuring prompt awareness of potential issues.



Combinational Logic Alarms

Configure alarms using combinational logic in MS Excel to generate alerts based on complex or summary conditions derived from logged data. Automatically generate notifications and upload all associated event data to create a comprehensive report.

Alarm Distribution

Distribute alarm messages through operator workstations, email, and SMS, allowing for multiple channels of notification. Customize pre-configured message texts to convey specific information related to the alarms.

Event Logging

Log complete information for each event with accurate timestamps, providing a detailed record of occurrences and facilitating post-event analysis

These features ensure that users are promptly informed of critical events, allowing for swift response and detailed analysis of incidents, contributing to overall system reliability and efficiency.

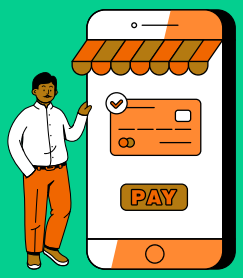
.

Manual and Automated Control

Key Features

01 - Manual Control

- ESTHEORM provides the capability to manually send control signals through on-screen command buttons.
- Users can operate remote breakers, relays, and equipment using Modbus-communicated I/O devices.



02- EMS Calbook Feature

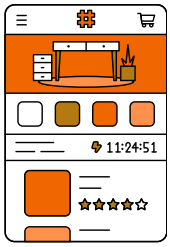
Utilize the EMS Calbook feature for automated control over distributed equipment, streamlining operational processes

+

03- Wide Range of Applications

Support a diverse range of applications through manual and automated control:

- Switch on/off non-priority loads to maintain demand within limits.
- Control remote loads for operational adjustments



04 - Capacitor Bank Control

Automatically switch On/Off capacitor banks to:

- Correct power factor.
- Optimize demand.
- Avoid penalties associated with power factor deviations.

Energy Management System Software
ESTheorm - Advantages

1. **IED/MFM Independence:**
Independent of IED/MFM types, utilizing meter templates for data collection. Allows flexibility in collecting data from various types and makes of IED/MFM.

2. **Protocol Integration:**
Integrates seamlessly with meters communicating on MODBUS RTU , DLMS, IEC 104 etc, providing versatility in data integration.

3. **DI, DO, AI, and AO Module Integration:**
Integrates with DI, DO, AI, and AO modules using the mentioned protocols, expanding the system's compatibility with various devices.

4. **Control Signal Generation:**
Integrates meter data and status data of DI/DO modules to generate control signals, enhancing the system's control capabilities.

5. **Upgradability and Configurability:**
Easily upgradeable, allowing for fiels changes in network configurations. Configurable for various applications like demand management, PF optimization, power quality, etc., without incurring extra costs.

6. **Flexible Application Enablement:**
Applications can be enabled or disabled based on operating conditions or manually operated soft keys, providing adaptability to different scenarios

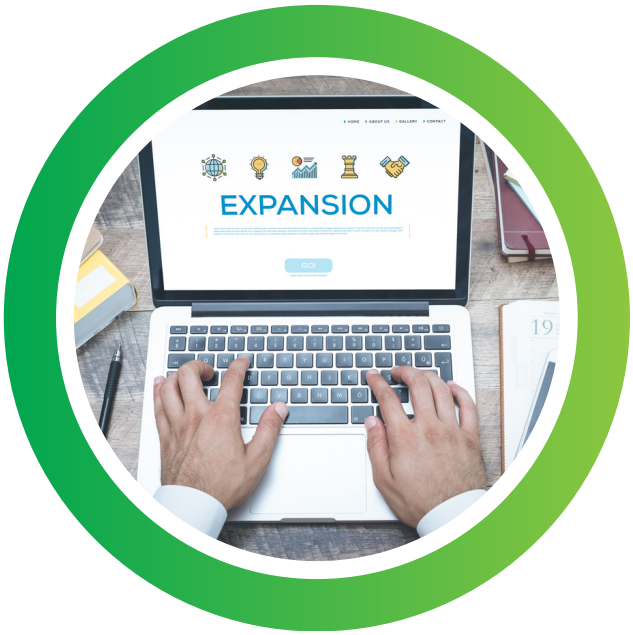
7. **Energy Consumption Limits:**
Enables the setting of limits for energy consumption, supporting efficient energy management practices.

8. **No Tag/Meter Limits:**
No limitations on the number of tags or meters, offering scalability to meet varying requirements.

9. **Redundancy and Data Integrity:**
Can run simultaneously on another server for redundancy purposes and can switch between servers without data loss, ensuring data integrity and system reliability

10. **Readily Available Web Server & OPC Server**
Includes a readily available web server at no extra cost, facilitating easy access and data sharing. Optional OPC Server for exporting data to other DCS & SCADA systems.

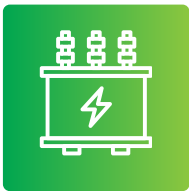
11. **User-Definable On-Screen Formats and Multi-Level Password Protection:**
On-screen formats are user-definable at any time, enhancing user customization and experience. Incorporates multi-level password protection, ensuring data security and access control.



Possible Future Expansions with ESTheorm Software

Online Energy Auditing

The software's capability to read various energy meters and integrate with third-party devices allows for the implementation of online energy auditing. This feature enables continuous monitoring and analysis of energy consumption patterns, supporting proactive energy management strategies.



Distribution Transformer Metering

ESTheorm software can be expanded to include distribution transformer metering without incurring additional software costs. This expansion facilitates detailed monitoring and analysis of energy usage at the distribution transformer level, contributing to improved operational efficiency.

Energy Cost Allocation

The software's flexibility enables the implementation of energy cost allocation without extra software expenses. This application allows for the accurate distribution of energy costs among different departments, processes, or users, enhancing transparency and accountability

Distribution Loss Analysis

ESTheorm software can be utilized to perform distribution loss analysis as part of its future expansions. This feature allows for the identification and assessment of energy losses in the distribution system, aiding in the implementation of measures to optimize efficiency and reduce losses.

These potential future expansions of EnergiSpeak ESTheorm software provide users with the capability to adapt and expand their energy management capabilities without additional software costs.

ESTheorm Main Aspects

EnergiSpeak's ESTheorm based Systems are software and hardware solutions designed to help organizations monitor, control, and optimize their energy consumption and efficiency. These systems help immensively large enterprises with complex energy needs, as they provide a centralized platform for managing and analyzing energy data.

1. **Monitoring and Data Collection:**
- It collect data from various sources, such as utility meters, sensors, and building management systems, to track energy consumption in real-time. Its advanced metering infrastructure (AMI) help to capture detailed information about energy usage at different levels of an organization.
2. **Data Analysis and Reporting:**
- ESTheorm analyze the collected data to identify patterns, trends, and anomalies in energy consumption. Its customizable reports and dashboards provide insights into energy usage; help organizations make informed decisions about energy efficiency measures.
3. **Energy Efficiency and Optimization:**
- It helps organizations identify opportunities for improving energy efficiency and reducing consumption. It has features such as demand response, load forecasting, and predictive analytics to optimize energy usage and reduce costs.
4. **Integration with Building Management Systems (BMS) and IoT:**
- Integration with BMS and Internet of Things (IoT) devices allows EEEMS to control and monitor various energy-consuming assets within a facility, such as HVAC systems, lighting, and equipment.
5. **Carbon Emission Tracking and Sustainability Reporting:**
- It includes tools for tracking and reporting on carbon emissions, helping organizations monitor their environmental impact and comply with regulatory requirements.
6. **Compliance and Regulatory Reporting:**
- EnergiSpeak's EEEMS assist organizations in adhering to energy-related regulations and standards by providing the necessary data and reports.
7. **Cost Management:**
- By monitoring energy consumption and identifying areas of inefficiency, EEEMS contribute to cost reduction strategies for organizations.
8. **User Engagement:**
- EEEMS include features that promote awareness and engagement among employees, encouraging them to adopt energy-efficient behaviors.
9. **Scalability and Customization:**
- EEEMS are designed to be scalable to accommodate the diverse needs of large enterprises. They often offer customization options to adapt to specific industry requirements.
10. **Security and Data Privacy:**
- Due to the sensitive nature of energy data, EEEMS prioritize security measures to protect against unauthorized access and ensure data privacy.

Implementing EnergiSpeak's ESTheorm System can lead to significant cost savings, improved sustainability, and enhanced overall operational efficiency

ESTheorm Operational Features

ESTheorm was developed to align with the goals of enhanced energy efficiency programs. In brief, Operational features include:

1. **Detailed Energy Analytics:**
- ESTheorm includes detailed energy analytics, allowing organizations to analyze energy consumption patterns comprehensively. This is crucial for identifying opportunities for improvement and optimizing energy usage.
2. **Operational Maintenance:**
- ESTheorm addresses the need for timely operational maintenance by providing insights into energy data on a day-to-day basis. This proactive approach helps prevent issues and ensures the smooth operation of energy-related assets.
3. **Performance Against PAT Scheme:**
- ESTheorm solution is designed to meet the requirements of the Perform, Achieve, and Trade (PAT) scheme, indicating a focus on regulatory compliance and adherence to energy efficiency standards set by authorities.
4. **Timely Information Delivery:**
- ESTheorm system ensures that the right information is delivered to the right person at the right time. This is achieved through various means such as reports, alerts, and data signatures, enhancing decision-making capabilities within the organization.
5. **Real-Time Data Presentation:**
- ESTheorm targets near real-time presentation of meter data, refreshing at a rate of 2-5 seconds per meter. This real-time capability is valuable for organizations seeking immediate insights into their energy consumption, allowing for quick responses and interventions.
6. **Data Granularity:**
- ESTheorm aimed at Gathering meter data at a 2-3-second refresh time which indicates a high level of data granularity. This fine-grained data can provide a more accurate and detailed picture of energy usage patterns, enabling organizations to pinpoint areas for improvement with precision.
7. **User-Friendly Information Presentation:**
- ESTheorm offer information in the form of reports, alerts, and data signatures, the system aims to present data in a user-friendly manner, making it accessible and actionable for stakeholders.
8. **Comprehensive Monitoring:**
- ESTheorm capability to present information in near real-time suggests that it provides continuous and comprehensive monitoring of energy-related metrics, supporting organizations in maintaining optimal performance.

ESTheorm is a robust and proactive solution that aligns with industry best practices for energy efficiency and management. It addresses key aspects such as analytics, maintenance, compliance, and real-time monitoring, which are essential for organizations looking to optimize their energy usage effectively.

ESTheorm

EnergiSpeak Pvt. Ltd.

Human Ability
- Expertise and Decision-Making
- Training and Awareness

Energy Domain
- Optimization Strategies
- Monitoring and Analysis

Technology Integration
- Data-Driven Insights
- Automation and Smart Systems

Innovate & Collab
- Technological Advancements
- Collaborative Partnerships

+91 9920995656

es@energispeak.co.in

www.energispeak.co.in