

Total Electrical Energy Management Network System: eLAN™

The PC-based energy monitoring system (eLAN™) is networked to a wide range of instrumentation such as the Smart Demand Controller, Power and Energy Monitors, Trivector Monitors, Universal Power & Energy Meter, Power Analyser (CVM 96 & CRMk) and Digital Energy Meter. eLAN™ would enable the user to monitor the energy consumption of the entire plant including the various subsections of the plant in real time.

The eLAN system has the following features:

- Continuous real-time energy audit to localize process inefficiencies
- Monitoring and benchmarking specific energy consumption ability.
- Optimising cost of electrical energy inputs
- Monitoring electrical system health, T & D losses, harmonic distortions
- Managing demand and power factor by analyzing data
- Providing customized MIS reports of energy usage
- Availing 100 per cent depreciation
- eLAN™ enables collection of data, viewing of data in graphical and tabular formats and processing of data as desired using standard, widely-used packages such as MS Excel, etc. The software generates reports on measured as well as calculated parameters
- The eLAN™ software runs as an application under MS Windows and reports can be generated on the network
- It is expandable
- Offers multilevel security

Some of the major advantages of the eLAN system are:

- The instrumentation provided at the incomers help in monitoring and verifying the billing readings of the Electricity Board (EB), as well as track the demand profile as seen on the EB lines and Diesel Generator (DG) incomers. This would enable the user to control demand by suitable strategies. The benefit being avoidance of demand penalties and optimal utilisation of internal generation.
- The instrumentation provided at various load centres and major loads enables the user to monitor the energy consumption at these points. The eLAN™ system computes the energy balance at various nodes, and the system losses to enable formulation and implementation for loss elimination or reduction schemes, thereby effecting energy conservation.
- The eLAN™ system also computes the specific energy consumption of the plant and the sub-processes, enabling the user to identify process inefficiencies and improve them, leading to energy conservation. The specific energy consumption also helps the user benchmark the process energy efficiency within the industry.
- The instrumentation and eLAN™ system enables the user to monitor the electrical system and major equipment health through a run-hour log. This would help in better, cost-effective and need-based maintenance compared to the open loop-time based systems, thereby improving equipment availability and overall up-time of the plant.

System Requirements for eLAN™

The eLAN™ can network several PCs provided licenses are available on each PC.

Alarms

The Alarm and System message records and archives events such as alarms, faults and operating status, which can be visualized chronologically on message displays or printouts of message logs. Different alarm messages are possible for set points for different signals. The message comprises signal names, message, date, time of occurrence, etc.

Mimics

During configuration, dynamic points can be assigned and stored with user-defined functions. The electrical values can be displayed alpha-numerically as well as in the form of dial gauges, trend windows, bar graphs, etc. Attribute change such as colour, blinking, etc., cant be incorporated.

Trends

Trends screens display electrical parameters in a graphical form. Trend pages can be selected with up to four trend curves for desired parameters on each page as per the requirements of the application.

History

Past data too can be displayed in a graphical form where the time period of the graph and parameter selection for the display is user-determined.

Reports

Reports show data on an hourly, shiftwise, daily, monthly basis, etc. The same cab be enabled for logging, too.

Communication Network

The energy monitoring system utilises an Rs. 485 as the backbone network. The PC is connected to this network through ENERCON's data converter (RS 485/RS 232). The multifunction meters are connected to the network in multidrop mode through connector kits. The communication protocol used for eLAN™ software is MODBUS-RTU.

The eLAN™ system has been installed and operational in some of the leading companies such as Hindustan Aeronautics Ltd. (HAL) Hyderabad; Ashok Layland Ltd., Hosur; Lucas TVS, Kancheepuram; Asea Brown Bovery, Faridabad; Jindal Iron & Steel, Navsari; Asian Paints India Ltd, Pattancheru; Hindustan Lever, Pondicherry; and Taj Bengal and Indian Tobacco Company, Kolkata, among others.

According to D. K. Rajan, Manager Plant, Engg, Ashok Leyland, Hosur, "The System is very useful in timely identification of inefficiencies and wastage in energy. It provides excellent support for implementing control measures."

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Reference book:

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