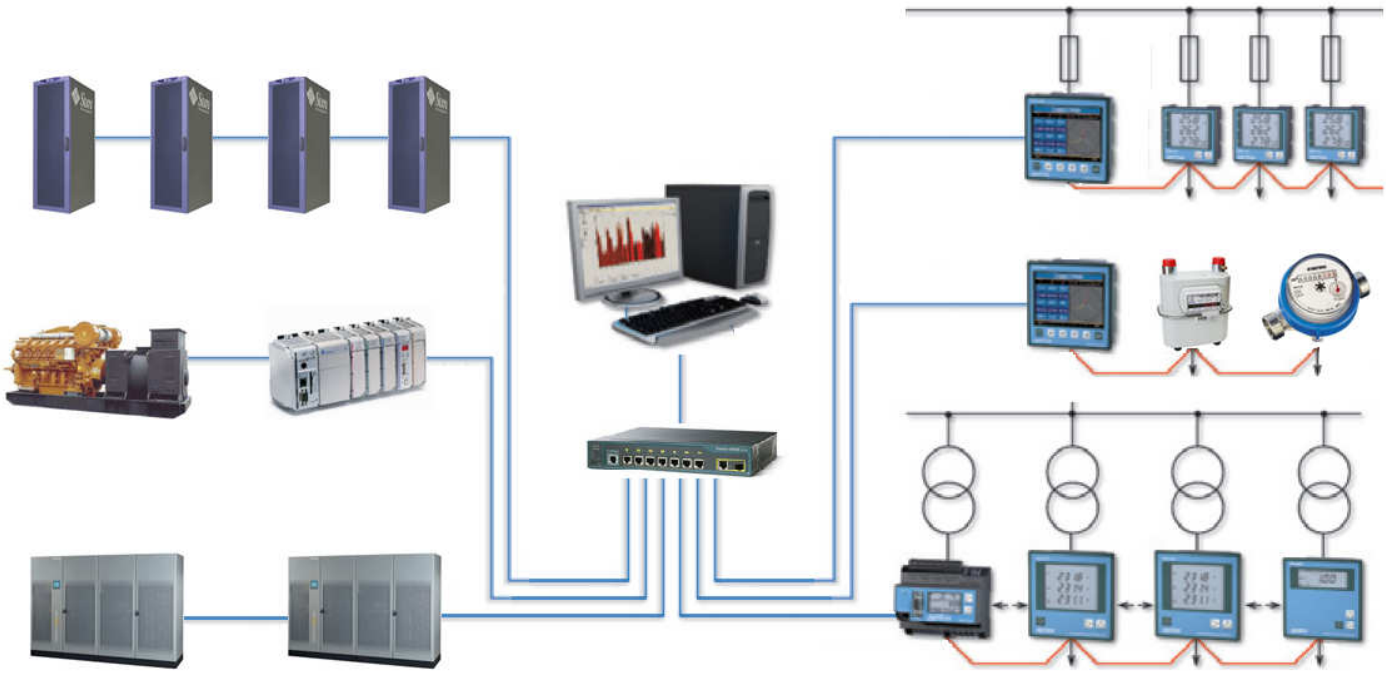
Complete Energy Management with e-Power

e-Power Studio overview

Rev 1.03

E-TEC
POWER MANAGEMENT

Product Overview



Monitor & Control Your Entire Building

Product Overview

E-TEC's e-Power Monitoring & Control Solution is a unique, flexible & scalable system that consolidates both an Energy Management System (EMS) & Power Quality System (PQS) into one complete user friendly system, with the extended benefits that a SCADA System offers.

Encompassed Infrastructure

- Power/Energy Monitoring System
- Power Quality System
- UPS Monitoring (including Battery Monitoring)
- Generator Systems
- Power Control System
- LV Switchgear
- HV Switchgear
- Intelligent & Traditional PDU's
- CAB Monitoring (including Power, Environment & Data Collection/Presentation)
- Chillers & Associated Cooling/Air Handling Systems
- Lighting Systems
- Surveillance Systems
- Capacity Planning Tool

Why Choose e-Power?

- e-Power is a resilient & modern system that monitors the complete data centre 24/7. The system monitors & logs all infrastructures, from the HV Incoming supply down to final CAB Distribution
- Record & review harmonics, flickers, Voltage peaks & similar effects that disturb the Power Quality
- Assists with achieving Building Regs Part L2, Cibse TM39:2009, Power Usage Effectiveness for Data Centres – PUE, CRC Energy Efficiency Scheme
- Full management & control of all electrical networks
- Demonstrates a commitment & compliance to energy awareness

Who Can Benefit From e-Power?

Any business wanting to achieve higher energy savings, avoid utility penalties and where a higher reliability and efficiency is required, including:

- Data Centres
- Banking Sector
- Industrial Building
- Commercial Buildings
- Water Authorities

e-Power Key Benefits

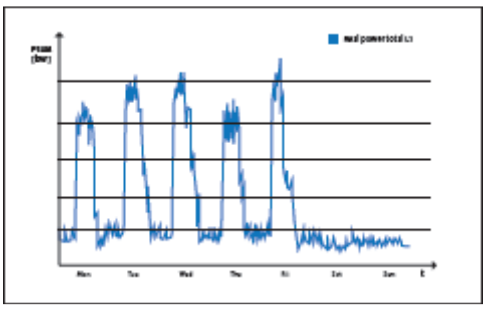
- Flexible, scalable & reliable monitoring of the complete building infrastructure
- Virtual simulation of field equipment
- Custom solutions available with powerful logic & display options
- Waveform Capture Power Monitors – data stored in a SQL database
- Communications into third party systems via all industry standards (Modbus, SNMP, Industrial Ethernet etc)
- Not dependant on locked and/or proprietary hardware or software
- No field device licence costs
- Web-based – remote visibility
- Capacity Planning Tool
- Reporting: preconfigured & custom reports
- User manuals, service records & drawings imbedded
- Training aid for users

Types of e-Power Systems

- Light EMS/PQS System - Ethernet capable Power Monitors that present data to connecting devices via the inbuilt web server

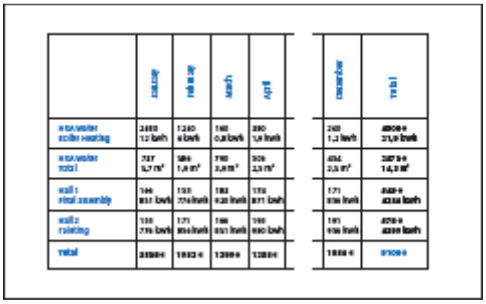
- Standard EMS/PQS System – Monitors all types of Power Monitors & associated inputs/outputs. Information is displayed on client devices and is stored in a SQL database

- Professional EMS/PQS System – Full monitoring of the complete building, with SCADA benefits. Includes advanced alarm, reports & graphics



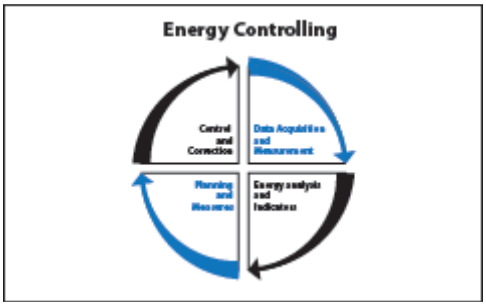
Energy Data Acquisition & Load Profile

With the help of e-Power, detailed acquisition of energy data and the load profile is a simple task within the scope of energy analysis. This is essential for tracking energy efficiency and the safe design of the energy distribution systems.



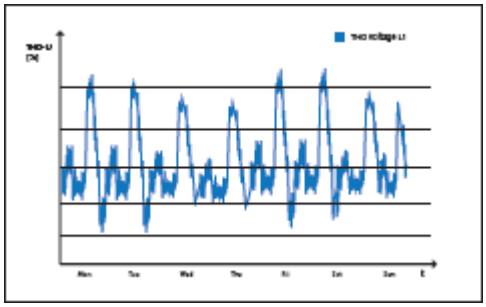
Cost Centre Analysis

It is becoming increasingly important in industrial enterprises to be able to breakdown, allocate and assign energy costs to particular products, in order to charge them to individual processes, cost centres and consumers. This also allows employees to focus on specific cost optimisation and conservation of energy.



Energy Management Systems (EN 16001/ISO 50001)

Energy Management Systems, as per standard EN16001, are essential for continuous improvements in energy efficiency and cost reduction. Universal measurement devices from the e-Power range are an important constituent part of Energy Management Systems, which can also secure tax breaks amongst other benefits.



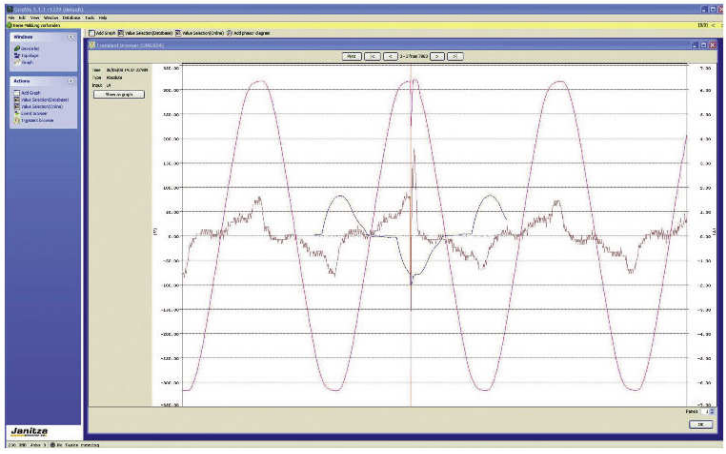
Power Quality Monitoring

e-Power gives indispensable information about insufficient power quality and enables measures to be undertaken to address grid problems. The result is the prevention of production drop-outs, significantly longer service life for the manufacturing resources and thus an improved sustainability for the associated investment.

Real-Time & Historical Transients, Events & Power Logs

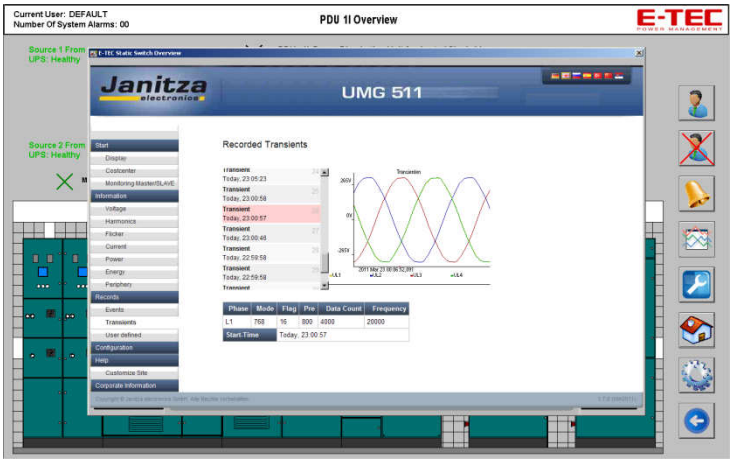
Power Quality

- Detection of transients >50µs and storage with up to 16.000 samples
- Measurement of power quality according to DIN EN 61000-4-30, Class A
- Records transients, events, flicker and harmonics
- Automatic analysis and reporting features
- SMS, email and local alarm notification triggered by any disturbances



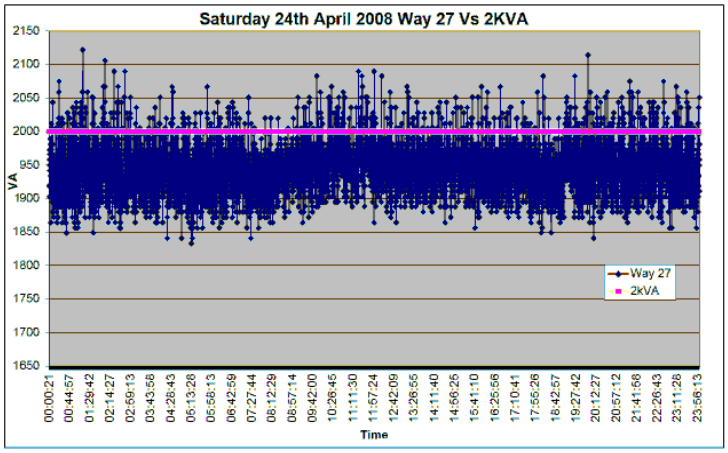
Integrated Power Quality

- The Power Quality Analysis tool is integrated into the wider Power Monitoring System environment, allowing easy user interaction
- Integrating the Power Quality Meter into the relevant equipment page allows users to visually understand the wider impacts that may have occurred as a result of disturbances



Long Term Recording & Automatic Reporting

- Trending of supplies over long term durations: hours, days, months and years
- Trends for single or multiple supplies allows different supplies to be grouped and changed as required by users
- Custom reports are automatically generated and emailed to customers
- High data logging rate: typically data is logged at periods less than 1 second, ensuring accurate supply recording even over long durations



Cost Comparison

Product Description	e-Power Product (£)	Competition Equivalent (£)
Advanced Power Monitor with Transient, Event & Waveform Recording Functions. Ethernet & Modbus Communications. Onboard I/O with Programmable Logic	£2,200	£5,202
Advanced Power Monitor Device Licence	£0	£165
Standard Power Monitor with Basic Transient, Event & Waveform Recording Functions. Ethernet & Modbus Communications. Onboard I/O Basic Programmable Logic	£575	£1,425
Standard Power Monitor Device Licence	£0	£110
MID/OFGEM Approved Power Monitor with Modbus Communications	£290	£1,918
MID/OFGEM Power Monitor Device Licence	£0	£110
Additional Client Licence	£0	£942
Third Party Interface Licence (per Device)	£0	£156

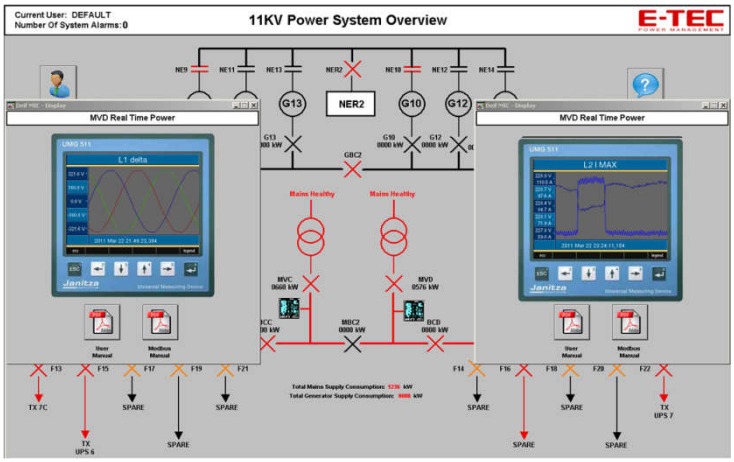
All prices are list price, prices correct at time of print
All products are like-for-like where direct equivalent exist

Typical Project Price Comparison (Hardware Only)				
Product	**Qty**	**e-Power (£)**	**Competition (£)**	**Customer Saving (£)**
Advanced Power Monitor	10	£22,000	£52,020	**£30,020**
Advanced Power Monitor Device Licence	10	£0	£1,650	**£1,650**
Standard Power Monitor	30	£17,250	£42,750	**£25,500**
Standard Power Monitor Device Licence	30	£0	£3,300	**£3,300**
MID/OFGEM Approved Power Monitor	20	£5,800	£28,260	**£32,560**
MID/OFGEM Power Monitor Licence	20	£0	£2,200	**£2,200**
Additional Client Licence	2	£0	£1,884	**£1,884**
Third Party Interface Licence (per Device)	3	£0	£468	**£468**
			Total Saving	**£97,582**

HV Infrastructure

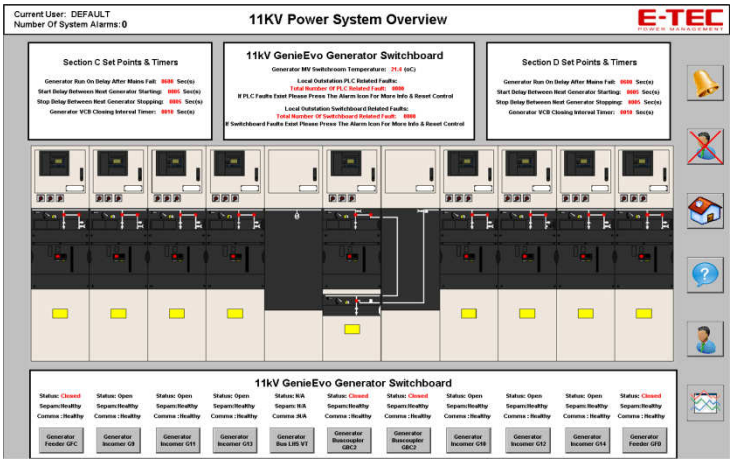
Animated Single Line Overview

- Fully animated single line overview of the complete HV System
- Busbar and cable colour animation
- Full rotation, visibility, colour, touch and movement control
- Earthed cables appear earthed (Earth symbol and cable becomes green/yellow)
- Allows users to see if the power system is healthy at a glance



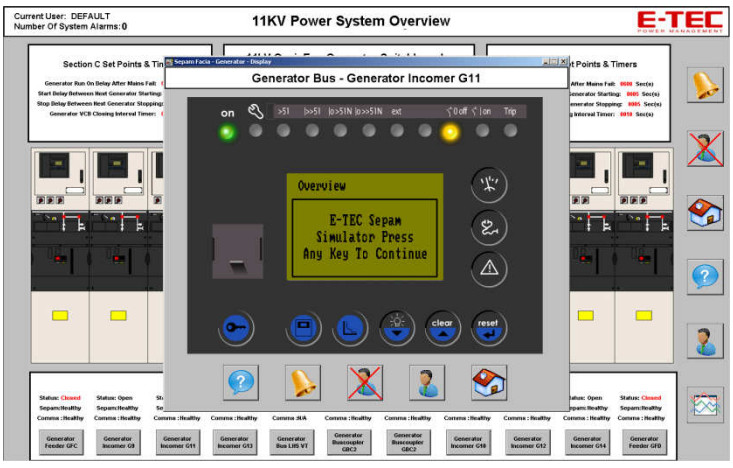
Site Specific Infrastructure

- The site specific HV Infrastructure is shown using our standard parts libraries and site drawings, helping reduce user training time and creating a user friendly environment
- Critical data is shown below each HV section – if more detailed information is required, users can press each section to see the range of monitored points



Virtual Simulation of Field Equipment

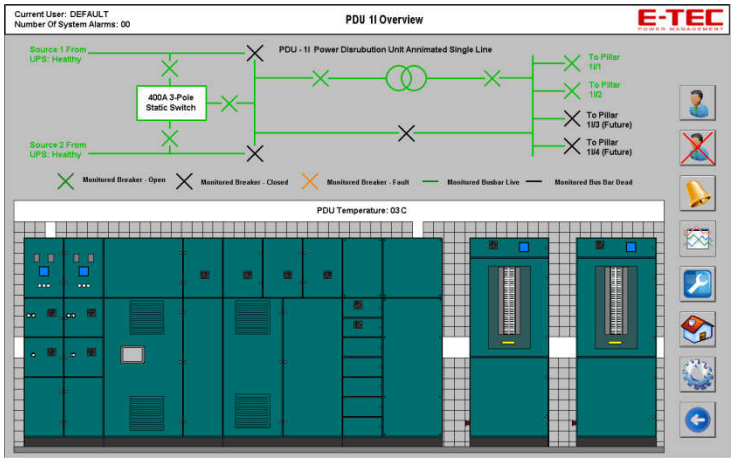
- Virtually simulating the field equipment using high level communications provides users with the same functionality as if they were at the equipment
- Simulating the functionality reduces the training time required to become familiar with e-Power
- The simulated device can be used to give users training before operating the field equipment
- Reading of equipment within restricted areas is possible through e-Power



LV Infrastructure & Branch Monitoring

Equipment Overview

- Using a combination of high level interfaces and prime contacts, the complete system can be monitored
- Each system has a fully animated single line diagram to provide an instant overview
- The site specific equipment is shown using our standard parts libraries and site drawings
- More detailed information can be obtained by pressing each section to see the range of monitored points



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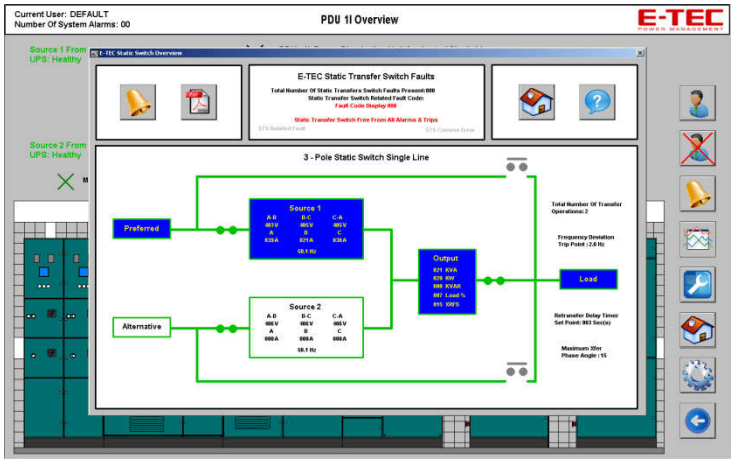
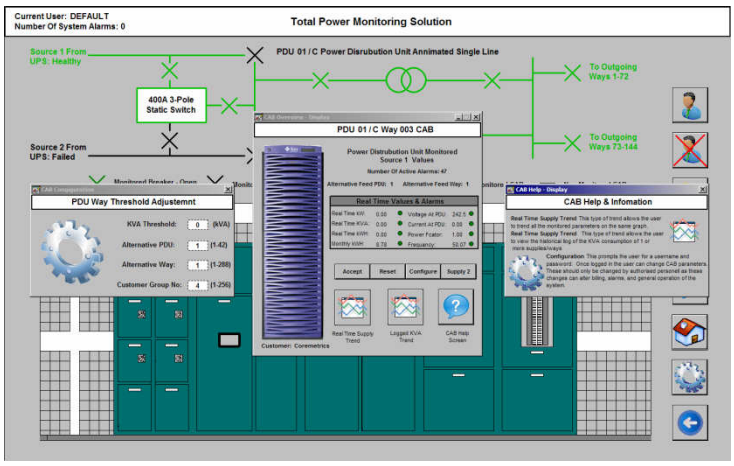


Branch Circuit Monitoring

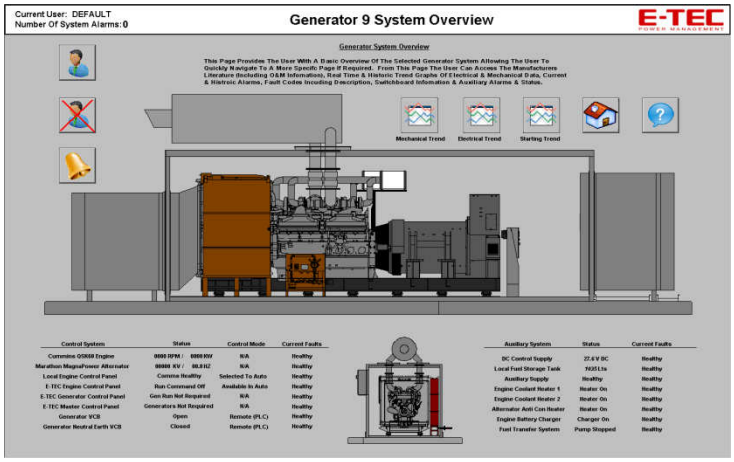
- e-Power provides a comprehensive branch monitoring solution that is able to monitor individual and grouped circuits across the complete data centre
- Users can group specific circuits, set CAB/Customer limits and assign multiple single or three phase feeds to cabinets
- Data can be stored for Voltage, Current, KVA, KW, KVAR, P.F and more
- CAB Environment data can also be combined into the Branch Circuit Monitoring Solution



Generator Systems

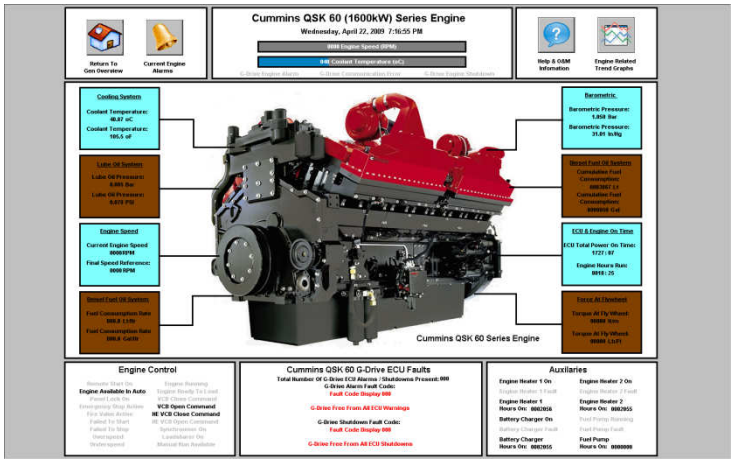
Equipment Overview

- Using a combination of high level interfaces and prime contacts, the complete system can be monitored
- Each system has an array of critical data to provide an instant overview
- The site specific equipment is shown using our standard parts libraries and site drawings
- More detailed information can be obtained by pressing each section to see the range of monitored points



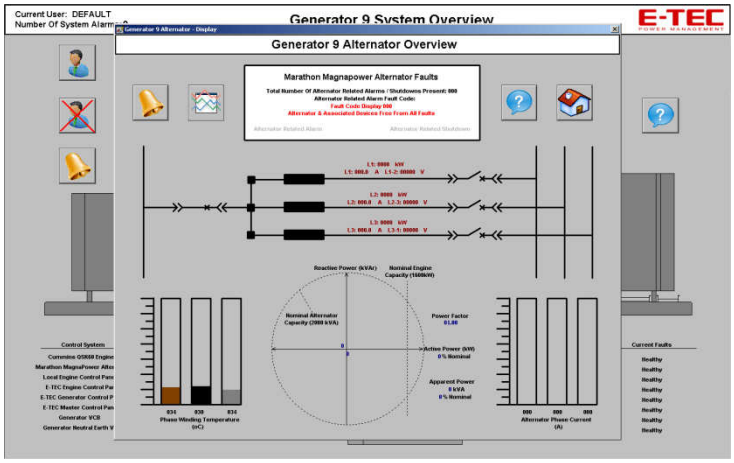
Engine Overview

- Using high level communications, the ECU data is extracted and displayed in a user friendly page
- Bar graphs of critical parameters are displayed to check engine performance
- ECU Fault codes are extracted and displayed with user friendly translations, helping faults to be diagnosed with specialists quicker, leading to shorter down time of critical equipment
- Mechanical & electrical trend graphs can be setup, automatically generating load test reports after each run



Alternator Overview

- The alternator can be monitored for all alarms and real time values, providing a user friendly overview of the alternator performance
- A fully animated vector diagram allows the user to see the alternator performance and remaining spare capacity
- Phase winding temperature bar graphs show the real time temperature and alarm/shutdown levels
- Alternator Fault codes are extracted and displayed with user friendly translations, helping faults to be diagnosed with specialists quicker, leading to shorter down time of critical equipment



UPS Systems

Equipment Overview

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- Each system has an array of critical data to provide an instant overview
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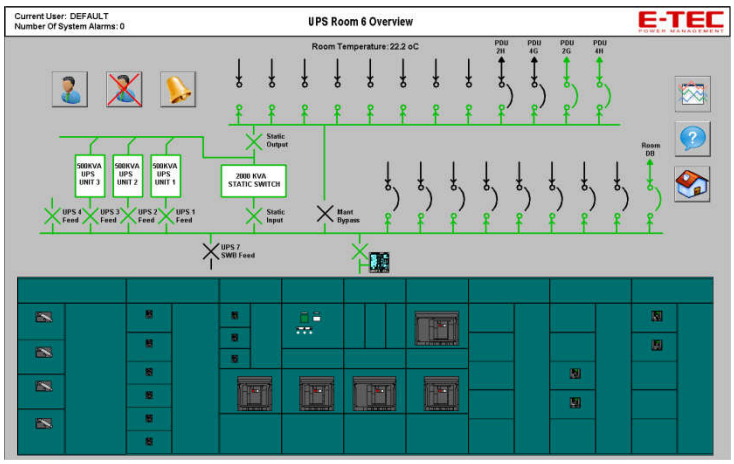
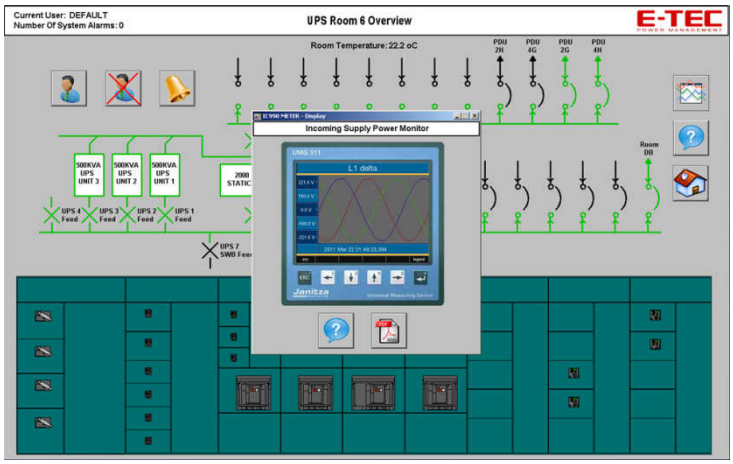


Equipment Details

- All Systems (Switchboard, UPS, Static Switch & Batteries) are monitored to ensure the complete UPS system is visible
- Breakers within the switchboard can be interrogated for real-time status, as well as user manuals, discrimination studies and as built drawings
- Power Quality Meters can be added to ensure UPS Input & Output Supplies
- Battery systems can be monitored down to cell level



Virtual Simulation of Field Equipment

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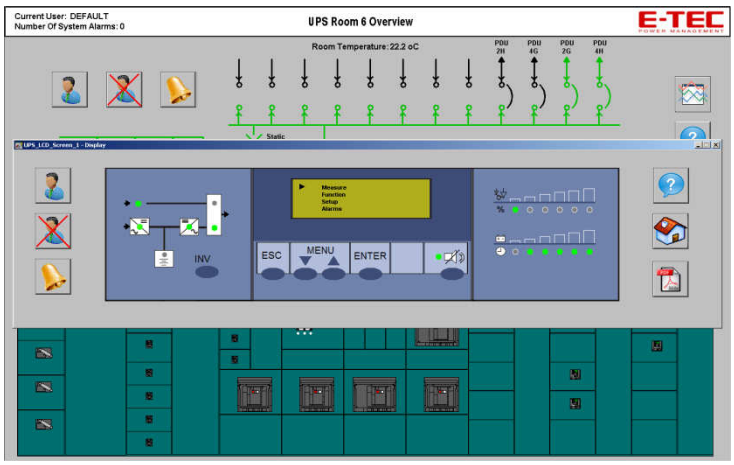
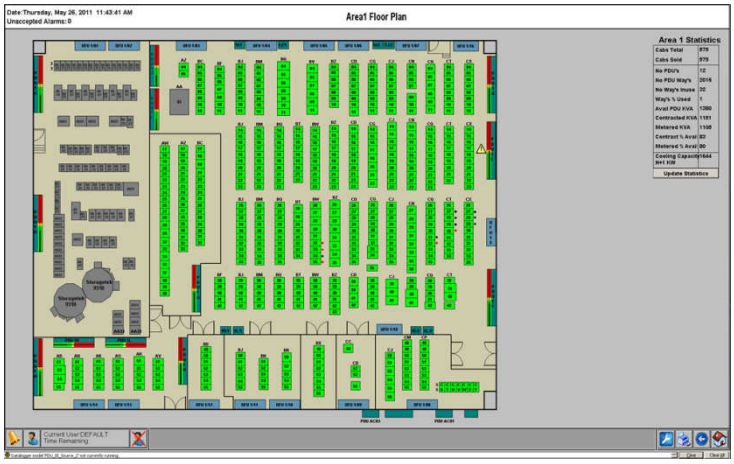


Other Infrastructure

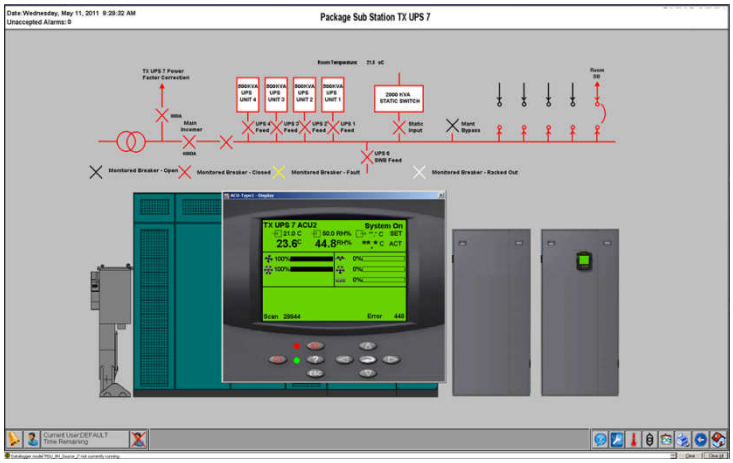
Capacity Planning

- The Capacity Planning tool continuously monitors critical equipment to ensure it is not approaching design limits
- As equipment reaches design limits warnings are sent out via alarms
- Should the equipment reach design limits, additional alarms are raised
- A simple colour coding system ensures the system highlights any problems at the overview level



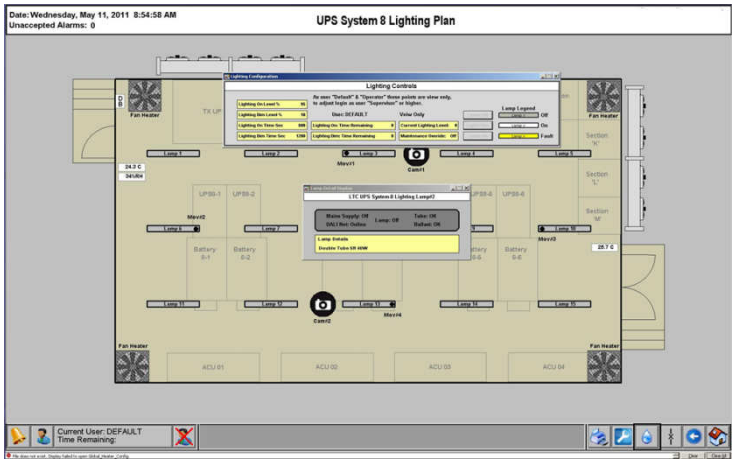
Cooling

- Using a combination of high level interfaces and prime contacts all cooling systems can be monitored (Chillers, DX Units etc.)
- Each system has an array of critical data, providing an instant overview
- The site specific equipment is shown using our standard parts libraries and site drawings
- More detailed information can be obtained by pressing each section to see the range of monitored points



Intelligent Lighting

- A full range of intelligent lighting can be offered, ranging from addressable ballasts to independent, intelligent ballasts
- Savings are displayed within the page. These can be displayed as cost savings, CO^2 saved etc.
- Addressable ballasts report to a PLC which detects the state of individual ballasts. Alarms can then be sent out for failed ballasts, failed lamps or power failure



e-Power Selection Guide

Software Package	Light	Standard	Professional
Software Package	Web Browser	GridVis	SCADA
Devices			
Janitza Power Monitor Range	✓	✓	✓
Janitza MID Power Monitor Range	✓	✓	✓
Power Monitor Device Licence Cost	Free	Free	Free
Power Monitor Network Speeds (Max)	100Mbps	100Mbps	100Mbps
Number Of Device Connections	Unlimited*1	Unlimited*1	Unlimited*1
Device Visibility	Local	Local/ Remote*2	Local/ Remote
Communications			
Janitza Power Monitor Range, Modbus TCP/IP & Modbus RS232/485	✓	✓	✓
Modus RTU 232/485 Third Party Devices	✓	✓	✓
Modus TCP/IP Third Party Devices			✓
SNMP Third Party Devices			✓
Ethernet IP Third Party Devices			✓
Additional Communications (DF1, Profibus, DeviceNet etc)			✓
Email/SMS Notification		✓	✓
Database & Storage			
Internal Data Storage	✓	✓	✓
External Data Database (SQL Or Similar)		✓	✓
Database Limit	Limited By Hardware		
Automatic device file upload		✓	✓
Historical Alarm & Event Viewer		✓*4	✓
Users			
Server Licence	Free	Initial Cost	Initial Cost
Additional Local User Licence	Free	Free	Free
Max Additional Local User Licence	Unlimited*3	Unlimited*3	Unlimited*3
Additional Remote (web) User Licence	Free	Free	Free
Max Additional Remote (web) User Licence	Unlimited*3	Unlimited*3	Unlimited*3
Power Monitor Functions			
Transients	✓	✓	✓
Events	✓	✓	✓
Harmonics	✓	✓	✓
Flicker	✓	✓	✓
Logic & Control			
Basic Programmable Local Control (PLC)	✓	✓	✓
Advanced Programmable Local Control (PLC)			✓
Monitoring & Control			
Load Shedding	✓	✓	✓
Advanced Load Shedding		✓	✓
Custom Reports			✓
Third Party Device Simulation			✓
Branch Circuit Monitoring			✓
CAB Environment Monitoring			✓

PDU Monitoring			✓
UPS Monitoring			✓
Battery Monitoring			✓
LV Switchboard Monitoring & Control			✓
LV Switchboard Monitoring & Control			✓
Generator Monitoring & Control			✓
Power System Monitoring & Control			✓
BMS Interface			✓
PUE Monitoring			✓
Additional Features			
Fully Interactive Training Tool			✓
Integrated PDF Service Manuals			✓
Integrated PDF Commissioning Manuals/Reports			✓
Integrated PDF Drawings			✓
Mechanical Plant Monitoring & Control			✓
Electrical Plant Monitoring & Control			✓
Lighting Monitoring & Control			✓
Cooling Systems Monitoring & Control			✓
Chiller Systems Monitoring & Control			✓
IP Surveillance Camera			✓
Capacity Planning Tool			✓
Leak Detection			✓

*1 - Limited by network capacity restraints
*2 - Network for remote visibility and associated programming by Third Party (VPN etc)
*3 – Limited by network and associated hardware
*4 – Limited alarm and event viewer

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