



E+I ENGINEERING GROUP

# ENERGY MANAGEMENT SYSTEMS

BESPOKE MONITORING & CONTROL SOLUTIONS



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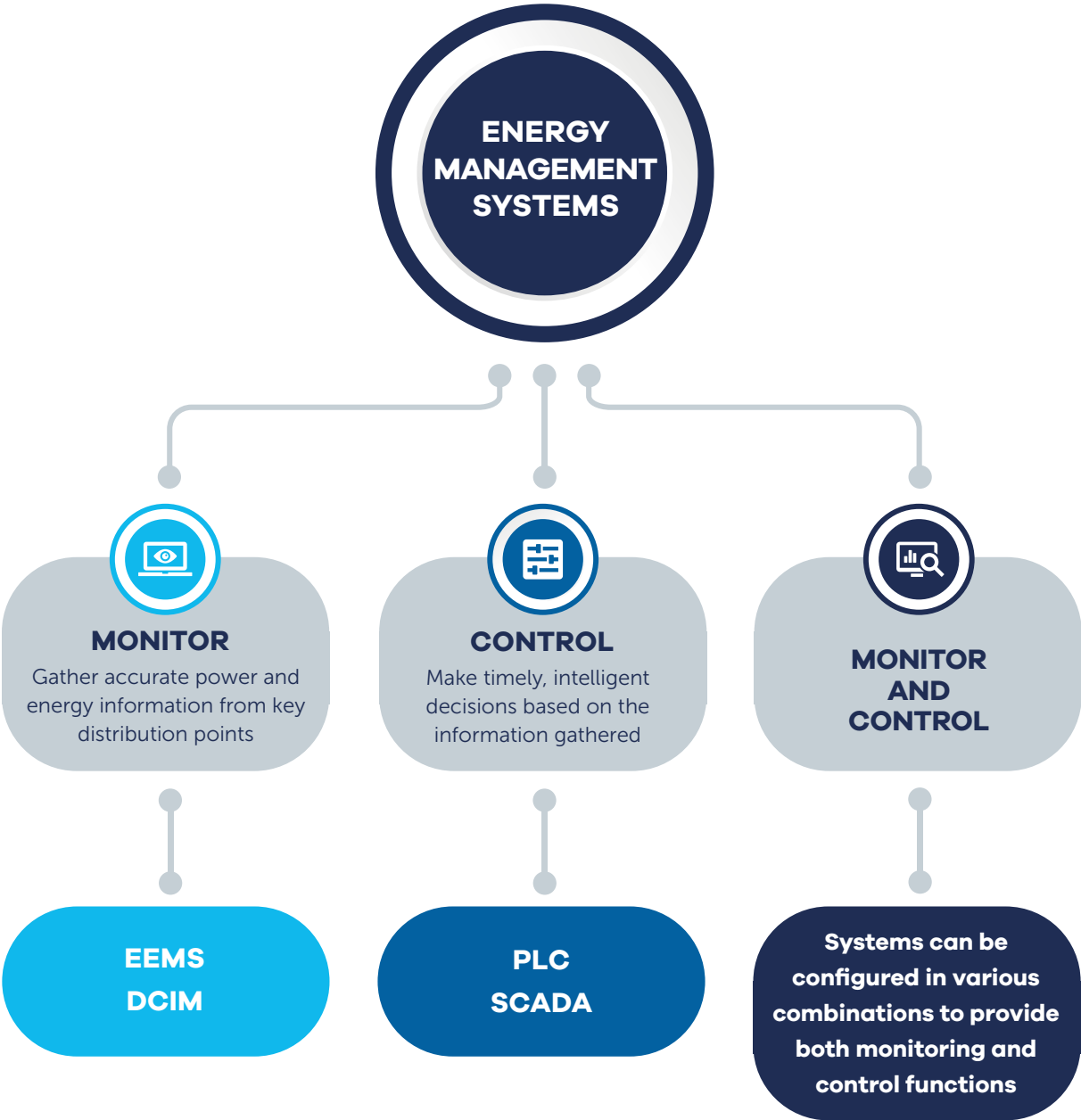


# ENERGY MANAGEMENT SYSTEMS

## Monitor, control and optimise the efficiency of your electrical system

E+I Engineering offer a complete energy management system tailored to meet all client specific requirements. An energy management system will lead to improved productivity and a reduction in energy costs.

Each system can be standalone or can function in any of the following combinations:



## BENEFITS

Businesses are faced with multiple challenges relating to power distribution including unpredictable power quality, unplanned outages, and unstable energy prices. Installation of an EMS will maximise the availability and reliability of your critical processes while optimising energy usage and operational efficiency. The benefits of installing an energy management system in your facility include:

### 1. Cost Savings

Meeting your sustainability obligations doesn't have to come at a financial expense. In fact, many companies are finding that improving your company's efficiency and decreasing wasted energy consumption is leading to annual cost savings of up to 20%. On average 30% of a building's costs are energy related; reductions in this energy consumption will go straight to the bottom line.

### 2. Increased Productivity

Powerful monitoring capabilities provide real time analysis of your building's electrical systems. The software will send alerts to potential capacity bottlenecks allowing you to act before an outage. In the event of an outage, an energy management system can provide accurate, real time information as to where in the system the failure is, resulting in time saved and a rapid restoration of service. Automated reporting, centrally stored data and integration with other systems will save time and reduce errors, allowing your team to focus on system improvements rather than time consuming administration.

### 3. Optimisation of equipment

An energy management system will provide valuable insights into equipment usage and productivity. It may uncover maintenance or upgrades that are needed in order to boost performance, and it can highlight areas of the system that are underused. Acting on the information gathered from an energy management system can help you to streamline and optimise your electrical systems, leading to further cost savings for the business.

### 4. Environmental benefits

Governments and shareholders alike are pushing for companies to become more sustainable. While government regulations require businesses to report on carbon emissions and environmental impact, shareholders too are asking for sustainability to play a bigger role in long-term business strategies. Using an energy management system will allow you to cut back on wasted resources and better allocate power and energy efficiently. Additionally, implementing an EMS will have a positive impact on your Corporate Social Responsibility (CSR) and can set your business apart from your competitors.

## Electrical Energy Management System

An EEMS monitors and analyses the electrical flow within a building. Data is collected from electricity meters and presented as actionable information in a single location. A dedicated EEMS is essential in any installation that is required to comply with any government energy regulations.

E+I Engineering's EEMS provides the data necessary to increase operational efficiency whilst meeting energy saving targets and reducing costs.

Advanced metering capabilities can be integrated within E+I Engineering's EEMS to provide a more in-depth analysis of the electrical network.

### These include:

- power quality analysis
- frequency fluctuation analysis
- voltage sag/swell analysis
- harmonic analysis

E+I Engineering's energy management systems can be fully integrated with various third party hardware to give a full system overview. Some of the systems that our EEMS is typically integrated with include:

- Third party electrical meters
- Mechanical meters (Water, Air, Gas, Electricity, Steam)
- Automatic transfer switches
- Active harmonic filters
- UPS systems
- Building management systems
- Generator control systems

### Features:

- Alarms can be configured to notify the user of any system issues that have arisen.
- Billing features can be utilised by landlords to monitor individual tenant usage and apply associated costs to these. MID approved meters are used in any application where tenant billing is a requirement.
- System status reports can be generated using either predefined report templates or client specific custom reports. These are especially effective for multiple tenant or high energy usage applications.
- Web access can be granted to allow access to the system from a remote location.

### Applications:

E+I Engineering's EEMS is engineered for use within data centers, healthcare, utility, commercial and industrial facilities.

### The system can be utilised for:

- Load management
- Harmonic studies
- Preventative maintenance
- Cost allocation for multiple occupancy buildings
- Energy efficiency monitoring
- Analysis of supply disturbances



## PLC'S

### Programmable Logic Controllers

E+I Engineering use market leading PLC's to provide the most efficient and reliable control for your facility.

A PLC continuously monitors the state of input devices and uses this information to control system circuit breakers and many other devices.

**E+I Engineering offer both standalone PLC's and hot/standby PLC's depending on the critical requirements of the project:**

- Standalone PLC - a single PLC system is used for the automated control of system circuit breakers.
- Hot/ Standby PLC's - offer the same function as a standalone PLC but with a higher level of redundancy. These are typically used in healthcare or data center applications where backup control is necessary.

#### Options:

- Monitor and control additional hardware components e.g. automatic transfer switches, active harmonic filters, generators and DRUPS.
- Utilise remote Input/Output modules to allow one PLC to monitor and control multiple switchboards over various locations. The input modules monitor the status of any circuit breakers and send the data back to the PLC. The output modules receive commands from the PLC to control the circuit breakers.
- Human Machine Interface's (HMI's) communicate with PLC's to visualise the electrical network. These password protected touch screen computers are placed on a switchboard or within a substation to facilitate the opening and closing of any linked electrical feeds.



## Supervisory Control and Data Acquisition

A SCADA is a highly reliable control and monitoring system that operates by sending coded signals across an installation's communication network.

E+I Engineering's SCADA is used in tandem with a Programmable Logic Controller to offer system wide monitoring capabilities and control of remote equipment throughout a facility. A SCADA can be built on a standalone server or with an additional level of redundancy to meet all client requirements.

E+I Engineering's in-house network specialists design the communication network for each individual SCADA system. Both Ethernet and Fibre Optic networks are available depending on installation size and scale.

- E+I Engineering use market leading, high quality, reliable network switches.
- Ethernet is commonly used for smaller installations where data has smaller distances to travel to reach the primary system server.
- A Fibre Optic Ring is used on larger systems where data has further to travel, and on systems spanning multiple buildings.

### Features:

- Individually tailored graphics display data for the entire power distribution network including each individual switchboard.
- Reports can be generated using predefined system templates or by using client specific custom templates.
- Alarm and event notifications can be sent via email or text message.
- Secure web logins allow access to the system from a remote location.
- Integration with all third party hardware including, but not limited to UPS, PDUs, generator systems and building management systems to provide a more complete facility overview.
- The system can be configured to monitor/control other hardware components e.g. Generators, automatic transfer switches, active harmonic filters and DRUPS.
- Protocols supported include, but are not limited to, Modbus RTU, Modbus TCP/IP, M-Bus, SNMP and DNP3.

### Applications:

- Alarm management
- Load shedding/reinstatement
- Network management
- Operator performance
- Equipment performance and energy efficiency
- Custom reports for all required parameters
- Data extraction

## DCIM

### Data Center Infrastructure Management

E+I Engineering's DCIM solution presents data from multiple global sites on a single, user friendly platform.

Critical system data is presented in real time giving data center managers reliable and actionable information from any global location to provide a holistic view of a data center's performance.

**Data can be compiled from any/all of the following sources:**

- IT equipment including server racks
- Mechanical devices
- Electrical equipment
- Utility power providers
- Generators
- EMS
- SCADA
- Building management systems
- UPS systems

Alarms from all integrated systems can be presented on a single user interface.

Users are provided with views into all critical systems from the individual rack circuits to a complete view of the entire data center infrastructure. This ensures that the data center is performing at optimum efficiency.

Data can be presented in a range of formats to suit client's needs.

#### Applications:

- Automate the commissioning of new equipment
- Forecast for system upgrades and expansion
- Reduce energy consumption and energy costs
- Enterprise network management
- Maximising capacity and reliability of data center rack power

E+I Engineering's DCIM is fully scalable; additional global sites can be added to an existing system platform at any time.





# WORKING WITH E+I ENGINEERING

When implementing your energy management system, it is vital to work with a trusted supplier who can deliver a robust system that will meet all of your needs.

## 1. Experience

E+I Engineering have experience in implementing energy management systems across a wide range of sectors including data centers, commercial buildings, airports and stadiums. All hardware and software systems are industrially proven and certified to the most exacting standards of quality and performance.

## 2. Global Power Solutions

E+I Engineering is globally recognised as a leader in the power distribution industry. With manufacturing facilities in Ireland, USA and UAE, with over 1000 employees we are able to complete projects anywhere around the globe.

## 3. Complete Power Distribution Solutions

E+I Engineering is the leading provider of electrical switchgear, busbar systems and energy management systems in Europe. With over 30 years of cross-sector experience, E+I Engineering offer industry leading expertise at every stage of the power life cycle. Our integrated approach reduces the overall risk to our clients, allowing them to deal with one supplier for the entirety of a project.

## 4. EcoXpert Critical Power Master

E+I Engineering are one of twelve companies in the world to have been certified by Schneider Electric as an **EcoXpert Critical Power Master**. The EcoXpert badge is given to companies who have demonstrated excellence through ongoing business accomplishments and expert development of staff. EcoXpert Critical Power Master companies have access to expert training on the range of Schneider Electric software including Power Monitoring Expert and PowerSCADA. This title validates E+I Engineering's high level of electrical knowledge, including power measurement and power quality understanding.



# PROJECT IMPLEMENTATION METHODOLOGY

E+I Engineering work with the client on every step of the project; from initial tender stage, through to final commissioning of the system.

- A full network diagram and functional design specification is provided for each project. E+I Engineering agree the specifications directly with the client/consultant and carry out any necessary consultations with other third party installers, which includes assigning all relevant I/O.
- At the development stage all system hardware and software is configured and system screens and user interfaces are developed.
- Once development is complete, E+I Engineering carry out a full range of tests on the entire system to ensure it is fully functional before it leaves the factory.
- E+I Engineering staff manage the installation of the system on site. Once installed, all products undergo an Integrated System Test to ensure effective communication with other on-site systems.
- E+I Engineering carry out training of selected operational staff to ensure that the system is used effectively.

## **Maintenance**

E+I Engineering's energy management systems are serviced by a 12 month maintenance contract.

### **The contract comprises of site visits to complete the following:**

- Operational checks on the system including all networks, meters and sensors
- Review of any critical alarms
- Backup and management of databases
- Secure software updates to maximise system health and security
- Any minor system adjustments
- Additional operator training can also be provided

A full service report is provided after every visit

E+I Engineering's integrated maintenance contract is essential to accelerate issue resolution and minimise the risk of outages. A rapid call out service can also be provided upon request.





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