

European Consultancy & Engineering Company

We make the world better



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We make the world better

EC&EC works on development of the whole scope of design work in electrical and automation section of projects of buildings and facilities.

The highest quality of work, elaborate consideration of all details and optimality of each solution are ensured by expertise of the company's staff. Use of modern technologies, best practice in the market and skilled specialists on the staff allow the company to successfully develop large-scale and long-term projects.

The basis of our work is a highly professional solution of the most difficult logistical and technical issues in the management of projects. The result of our work is successfully implemented projects.

We are working on development of the following systems:

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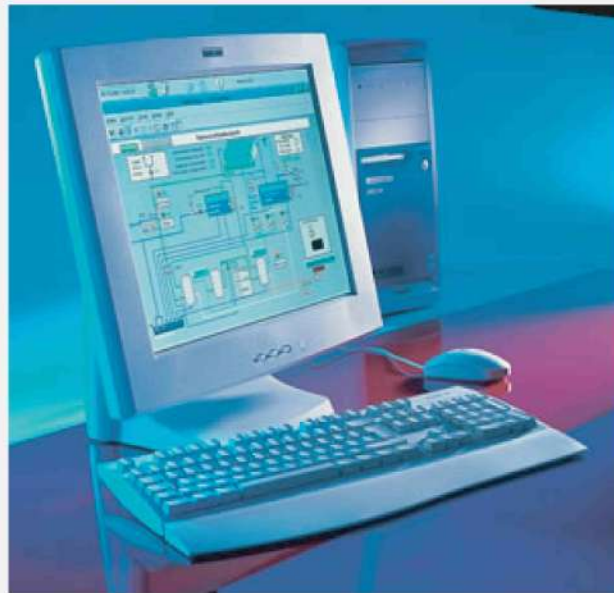
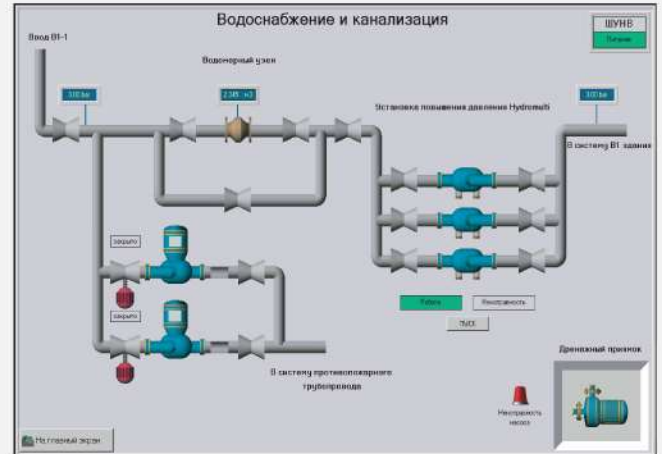


1. Building Management System

Company EC&EC develops building management systems. BMS - Building Management System - is a system created on basis of program-technical means intended for:

- monitoring of technological processes and processes providing for operation of technical equipment directly in the buildings and facilities;
- creation of efficient highly effective infrastructure for complex operation meeting the requirements of users and owners of the building;
- transfer of information on the state of equipment via communication channels to monitoring services of such buildings for further processing;
- warnings and rectification of the consequences of destabilizers in real time.

The main aim of providing technical equipment with management systems is resources saving achieved due to:



- reduction of resource consumption since management systems allow to control energy, water and other resources consumption and centralized management of these processes;
- reduction of staffing costs since management systems allow to control the work of various types of equipment from a single control station;
- reduction of maintenance costs since management systems allow early failure identification and its removal before occurrence of disastrous effects.

Use of building management systems allows:

- to efficiently make decisions in case of emergencies (fire, flood, water leakage, unauthorized access to secure facilities);

- to provide for timely fault isolation;
- to receive objective information on the state of all systems in the building and their operation;
- to introduce optimal technical equipment control mode to reduce costs for resource consumption of the building (hot and cold water, energy, air, etc.);
- to introduce objective analysis of equipment operation, actions of engineering services and security units in case of emergency due to documentation of the decisions made on basis of automated databases.



2. Smart Building

The last decade has dramatically changed our views on a comfortable house or apartment. With introduction of new building materials and technologies considerable progress in design of dwellings became evident. Availability of various household appliances has considerably increased. Presence of a microwave oven and a dishwasher, air cleaner or exhaust system, air-conditioning system, security system, electrical appliances for communication and entertainment in an apartments or a villas is a usual thing.



But time zips along and finds new standards providing for the level of comfort worthy of the XXI century and allowing equipping a house, an apartment or an office with management systems. Any object of your environment could be automated with the help of a Smart Building system – lighting, ventilation, climate control, video surveillance, security, blinds, shutters, doors, projection screens, etc. It allows you to be physically in one room, but “virtually” in another one, remotely controlling household appliances. Thus, you may choose a desired source of information from any spot: satellite or common tuner, CD or DVD player, VCR,

PC, video surveillance system, etc.

Company EC&EC offers a wide range of designed Smart Building systems depending on the number and level of integration of controlled engineering systems and services provided for by the system.

Smart Building engineering systems:

Ventilation and air-conditioning

- Management of systems of various types
- Cost optimization for air-conditioning

Lightning

- Communication with presence of people
- Management in time and lightning level
- Scenario management
- Scenarios of outdoor lightning

Power supply

- Parameters monitoring
- Optimization of power consumption

Water supply

- Water leakage control in all facilities
- Management of water treatment systems

Security

- Access control
- Perimeter control
- Imitation of presence
- Access restriction



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3. Lightning Management System

Lightning management system ensures intellectual management of lightning in the building in correspondence with the desires of its owner, and creation of maximum comfort and energy saving.



Company EC&EC develops designs of lightning management systems allowing to:

- fade the light using a dimmer;
- automatically change the level of lightning depending on the level of outdoor lightning and presence of people in the room;
- increase or decrease the level of lightning gradually;
- provide for independent management of separate light sources in the group using DALI interface;
- record several states of dimmer and immediately switch on the necessary level of lightning without selecting it all over again;
- control a group of light sources from a single switch providing for scenario management;

- automatically switch on/off lightning and lightning scenarios using motion and presence sensors;

- manage external lightning and architectural illumination by the astronomic timer depending on the time of sunset and sunrise;

- provide for integration with other management and control subsystems;

- widen and modify the system in future in correspondence with the changing requirements of the owner;

Lightning is managed both utomatically and forcibly: switching the light on and off in the halls, stairs and other premises where people come and go is automated. In studies and bedrooms lightning is managed from the remote control, switch or a touch panel.



4. Power Supply

A special attention in development of the projects is given by the company to aspects of reliable and safe external and internal power supply.



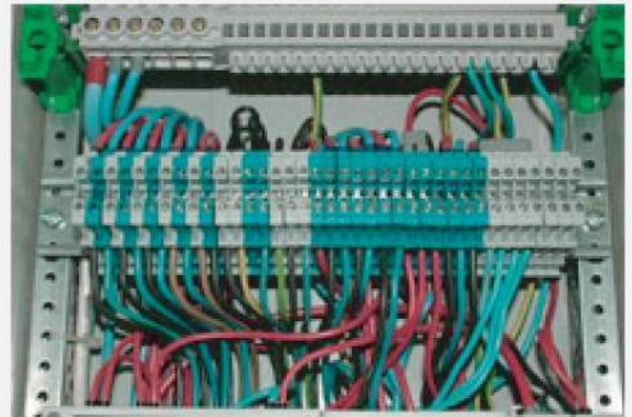
Contemporary solutions used for projects development allow both developing a necessary level of power supply network use and eliminating initial causes of unstable operation of electrotechnical and technological equipment.

The company's scope of work includes solution of the following issues in development of projects:

- Load calculation
- Connection to medium voltage system
- Connection to low voltage system

- Distribution in low voltage installations
- Electric shock protection
- Circuits and switching equipment protection
- Surge protection
- Power factor increase
- Detection and filtration of harmonics
- Special supply sources and loads
- Control of power energy quality and power consumption regulation.

As a rule, plants and industrial enterprises are equipped with expensive production lines, control and automation systems.



Unexpected halt of such equipment in the middle of an operation cycle could lead to defects in the produced products, in some cases to breakage of the production line itself, as well as jeopardize the safety of the staff. Electronic management systems on basis of programmable logic controllers are rather particular to provision of safety parameters. That is why special attention is given to requirements to development of electrical equipment projects of plants and industrial enterprises, such as development of system of guaranteed power supply, automated control of power consumption parameters, etc.



5. Low-current Systems

We have a vast experience in creation of low-current systems in aggregate with knowledge of new technologies and application of advanced equipment of leading world manufacturers in the projects.



Low-current network infrastructure provides for the operation of systems of an “intellectual building”:

- local area network (LAN);
- telephone-communication system;
- complex safety system;
- system of life-support equipment management;
- CATV system.

Structured cable system (SCS) is the basis of low-current network infrastructure.

SCS is intended for creation of a common informational infrastructure within the administrative building of the customer. It is a compound hardware-software complex of interrelated systems. SCS is cost-effective since it is created with a view to the big picture and eliminates the need of additional cable-laying in case of changes in the requirements to the system of communications, connection of new and movement of existing equipment.

Peculiarities of SCS:

- topology of hierarchical star;
- modularity;
- operation simplicity;
- minimum operating costs;
- correspondence to world standards;
- compatibility with modern technologies of data transmission (capacity of SCS corresponds to the requirements of modern systems of data transmission Fast Ethernet and Gigabit Ethernet);
- transmission of signals of various protocols, notification, and signals of low-frequency and broadcasting television (using additional adapters).



WiFi Elements

To provide for mobility of some users structured cable systems could be amplified with WiFi technology. Modern methods of radio signals modulation and carrier frequency rise allow creation of a bandwidth sufficient for wireless connection (up to 54 Mbit per second). Appearance of new Intel® Centrino™ processors and cellular IP-phones has substantially widened the range of wireless technologies' application.

Wireless technologies are convenient in use in break-out rooms, conference halls, internet cafes, medical facilities, storehouses and malls.

Advantages of WiFi use:

- mobility of users;
- possibility of network connection in places hard to reach for cable-laying (storehouses, workshops, shop floors, operating rooms);
- possibility of fast network creation in facilities without SCS.



6. Fire and Security alarm systems

Fire alarm systems are intended for detection of seat of fire and creation of a message about certain flash point, fire alarm in the building, creation of control signals for automated fire-fighting systems.



Security alarm systems are intended for timely notification of security unit of penetration or attempted penetration into the building or its premises, capturing the fact itself, place and time of penetration.

Security and fire alarm is intended for timely notification of unauthorized penetration (safety alarm) and fire (fire alarm). System of security and fire alarm is integrated into a complex uniting safety systems and engineering systems of the building providing reliable information to the safety systems: alarm systems, fire-fighting system, smoke removal system, access control system.

Technological tools of security and fire alarm include security and fire sensors, security and fire control and indicating equipment, fire alarm actuating devices, fire control devices, security and fire devices and special power supply equipment.

Control and indicating equipment is used for power supply of safety and fire sensors via security and safety alarm cables, reception of alerts from sensors, creation of messages "Fire", "Alert", "Failure", and transmission of such messages to central surveillance desk, creation of fire-fighting signals, etc.

Security detectors are primary technological tools in penetration or attempted penetration detection into the protected zone. Security and fire detectors along with security function are capable of detection of physical factors accompanying fire – open fire, smoke, etc.



Light and sound detectors could be supplemented with informational signs prompting on what to do in a certain situation. Systems of automated fire detection and fire-fighting (security and fire alarm) are equipped with emergency power supplies for uninterrupted system operation in case of primary power failure.

For sensors control floor plan of the building is displayed on the operator's terminal with indication of fire and alarm detectors. In case of alarm he will see which detector, when and where detected fire or penetration. In case of unauthorized access or fire the system could use a sound signal (alarm switching on, voice message delivery through the loudspeakers, etc.).

7. Industrial Automation and Process Control Systems

Staff of the company has a vast experience in development of industrial automation systems in MEP sections of projects and Process Control Systems (PCS).

PCS is a complex of programme and technical tools used for control automation of technological equipment of enterprises. PCS usually means a complex solution providing for automation of main production operations in general or in some section of it producing a relatively finished product.



Depending on complexity of technological objects control systems could be developed on basis of:

- PLC (*Programmable Logic Controller*) – to control the sequence of technological operations in the production process.

Typical tasks of PLC systems:

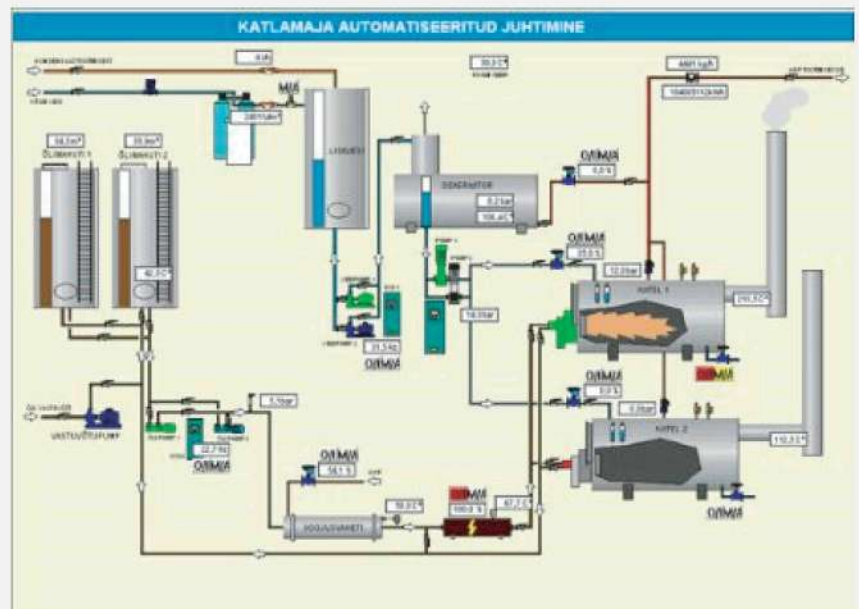
- Line production control
- Robotics control
- High-speed drives control
- Positioning devices control

- Positioning devices control
- Alarm, alerting
- Complex production machines control.

- SCADA (*Supervisory Control and Data Acquisition*) – control and monitoring of objects with operator's participation.

The main issues solved by the SCADA-systems are:

- Data exchange in real time with computer-process interface
- Information processing in real time
- Human Machine Interface
- Maintenance of technological information database in real time
- Alarm system and alarm message control
- Process data acquisition and reporting
- Technological information archiving (history taking)
- Ensuring connection with external applications (DBMS, electronic tables, text processors, etc.).

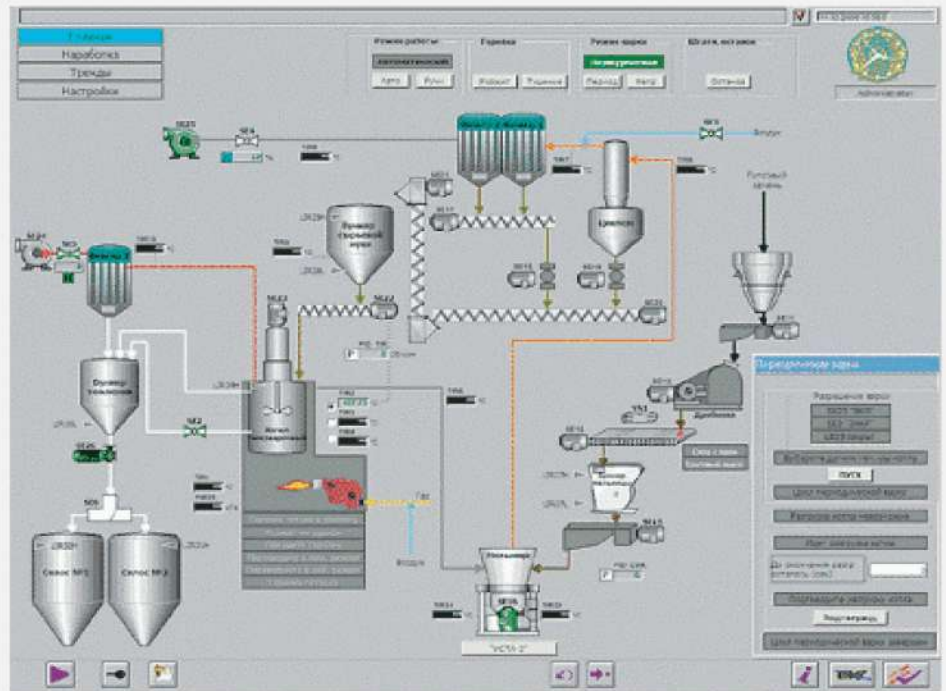


In the system of enterprise management such applications are usually applications related to the MES level. Systems of such grade have a certain designation – they give an opportunity of monitoring and controlling of various distant objects (from 1 to 10,000 control points, sometimes situated hundreds kilometres from each other) or one multi-pillar object.

Classic examples are:

- Oil pipelines
- Gas pipelines
- Water pipelines
- Remote switchyards
- Diesel-generator

stations, etc.



• DCS (*Distributed Control System*) used for continuous processes control. The main requirement to such systems is fault tolerance. High fault tolerance is achieved by backup of software and hardware elements of the system, use of high-reliable components, implementation of comprehensive diagnostic facilities and maintenance and constant human control.

Scope of DCS is numerous:

- Chemistry and petro chemistry
- Oil refining and oil production
- Glass industry
- Food industry
- Gas extraction
- Metallurgy
- Energy supply, etc.



8. Green Building



Over the last years, there has been a lot of discussion and debate about the concept of a “green building.” The essence of this concept is the definition of an intellectual building – the use of technology and process to create a building that is safer and more productive for its occupants and more operationally efficient for its owners.

Creating a project that is environmentally friendly and energy efficient ties in closely with many of the intelligent attributes. Intelligent buildings are designed for long-term sustainability and minimal environmental impact

through the selection of recycled and recyclable materials, construction, maintenance and operations procedures. Providing the ability to integrate building controls, optimize operations, and enterprise level management results in a significant enhancement in energy efficiency, lowering both cost and energy usage compared to non-intelligent projects.

Intelligent buildings are intended to be the preferred environment for occupants. This requires focused attention to environmental factors that affect occupants’ perception, comfort, and productivity. An intelligent design finds the balance, providing a superior indoor environment and minimizing energy usage and operating labour. This is where the technology becomes valuable. Using integration and automation we are able to implement solutions that both provide a superior environment and minimize energy.

FEATURE	BENEFIT
Dimmable fluorescent lighting integrated with sun blind control	Optimal lighting level and quality can be determined by the occupants.
Lighting control with motion sensors integrated with security	Only provide lighting as needed. Reduces energy use and increases security.
Natural and displacement ventilation.	More efficient and effective distribution of ventilation.
Use of economizers for free cooling.	Energy efficiency.
Individual temperature and lighting control.	Improved comfort is shown to improve productivity. Addresses the number one concern of tenants as found in BOMA surveys.
Radiant heating and cooling.	Improved comfort, reduced energy use.
Optimized control algorithms.	Reduce energy use with little or no impact on comfort.
Combined heat and power plants.	Improved energy efficiency and sustainability.
After hours control of lights and HVAC integrated with security.	Improved security while reducing energy use.
Monitoring of IAQ and contaminants.	Improved comfort, safety, and productivity

The LEED® program provides an excellent mechanism to promote, measure, and quantify environmental and energy efficiency in both new and existing projects. There is a very strong synergy between an intelligent building design and a LEED-certified design. Intelligent buildings demand reduced energy usage through optimization, system integration, and enterprise applications. LEED certification requires energy efficiency, monitoring, validation, and control of all building systems.

The goals and benefits of LEED and intelligent building design go together arm and arm. An intelligent building program should start with LEED certification and work to improve the building beyond that.



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