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Energy Automation Specialist

Okosis Automation & Control Systems



Okosis

Automation & Control Systems

About Us

Okosis Automation and Control Systems Industrial & Commercial Corporation was established in 2007 the purpose of producing hardware and software solutions for automation sector, providing professional engineering services and producing customer oriented solutions.

Okosis has initiated its high potential which is coming from combination of many years of experience and power of energetic engineer team to provide customer oriented, qualified and efficient solutions. Okosis has highly professional practice which is mainly based on highly experienced and qualified technical staff.

Our company has completed many very important projects especially in Energy Transmission and Distribution sector. Our company is a leading company with successfully completed projects in this field. We develop applications with standard SCADA software; we design and produce customer oriented and high efficient solutions with economical, user-friendly interfaces in short times.

We do research and development works on Energy Automation and SCADA sector and produce user-friendly and cost effective hardware and software solutions. We are excited and proud of hardware and software solutions which have been commissioned by our staff and used all around the World.

Every successful job can keep up with a continuous and high qualified support. We believe in that fact and we provide training services in our sector as well as technical support and maintenance services.



Management System Policy

We adopt ISO 9001 Quality Standard, Occupational Health & Safety and Environmental Management Systems Standards as our life style to provide the most perfect services with occupational health & safety, environmental conscious & care, customer satisfaction and zero mistake principles in our automation and control systems design and engineering services.

We place and spread this very important occupational health & safety and environmental conscious to all our units systematically to improve our efficiency, customer satisfaction, perfection of our services and products.

We provide the best working conditions and we support to continuous learning and improvement for our employees to achieve sustainable improvement and reviewing continuously suitability of quality circumstances.

We commit to prevent health corruptions with the help of occupational health & safety and environmental conscious, to improve continuously management systems performance and to obey all the other rules and regulations which we are responsible.

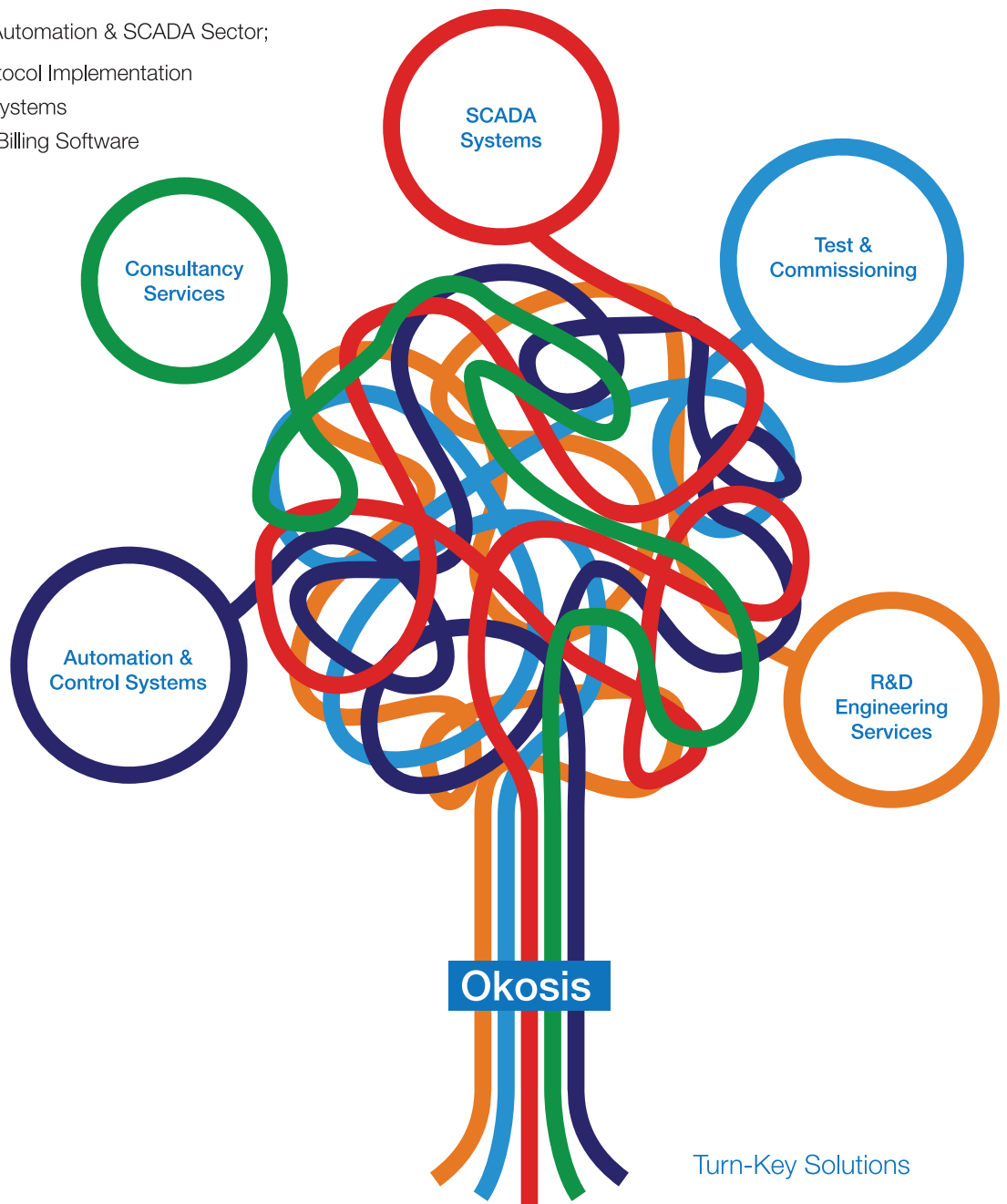


"We commit to present our products and services with the highest quality, the lowest prize and zero mistake principles, to improve and control our products and services with management system circumstances which are created according to ISO 9001, ISO 14001 and OHSAS 18001 standards".

quality

Main Activities

- Establishing Automation and Control Systems, Supervisory Control And Data Acquisition (SCADA) Systems,
- Projecting, Designing, Testing & Commissioning Of;
 - SCADA Systems
 - Remote Terminal Units (RTUs)
 - Automation & Control Devices (PLCs)
- SCADA Systems Infrastructure & Adaptation Works
- Engineering Calculations, Mathematical Modeling & Fault Analysis Services
- Adaptation, Mounting, Configuration, Testing & Commissioning Of Electrical Protection Relays
- Primary and Secondary Field Testing & Commissioning Services
- Preventative & Predictive Maintenance Services
- Consultancy Services
- R&D Activities In Energy Automation & SCADA Sector;
 - Communication & Protocol Implementation
 - Protocol Conversion Systems
 - Reporting, Analysis & Billing Software
 - Simulation Software



Energy Automation Systems

It is critical to produce the energy with less cost, environmental friendly and using recyclable sources as well as delivering to customer safely by monitoring and controlling in every stage and using efficiently.

To achieve this aim, we are in a technology race, making so many energy investments with high costs and trying to create qualified people who can use these systems effectively all around the World.

The cost of losses caused usage of conventional and inappropriate technology is quite high.

Despite that, investments which are made on energy automation and SCADA systems recompense themselves quickly and provide several great advantages.



Producing energy with the most efficient ways and using the recyclable sources, monitoring and controlling parameters of production, transmission and distribution systems with real time and minimizing losses can only be achieved by establishing Energy Monitoring Automation and Control Systems and operating them successfully.



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Advantages Of Energy Automation Systems

Transmission and distribution systems, which are continuously monitored and controlled, have so many advantages. Automation and Control Systems minimize the risk and provide effective and safe operating opportunities. With the help of automation systems which are programmed according to operating and working principles, field equipment's can be correctly controlled without human mistakes and they provide much safer and risk free working opportunities.

With the help of optimized controlled algorithms, correct and accurate controls can be done in minimum time and with minimum energy consumption. Also with these secured and economical controls, equipment's can be used longer and more efficient.

To manage and operate energy production, transmission and distribution systems quickly, easily and effectively with much less educated staff can be provided.

Thanks to automation system which monitors electrical values in real time, preprogrammed automatic actions like load shedding can be achieved. Load shedding system calculates actual consumption and sources and optimizes energy consumption and prevents expensive shutdowns.



Defected equipment in the system can be monitored continuously by automation system so the information about source, reason, place and accurate time of these defects can be determined definitely and corrected without losing time.

Monitoring energy parameters continuously provides capability of reviewing the actual and historical consumption. It provides required important data which is required to plan energy investments to achieve the goal of controlling energy consumption and using it in the most economical way. With the help of reporting and making detailed analysis of this data, the performance of the system can be observed and necessary precautions can be taken in time.

In modern technology, automation systems are highly open systems with standard SCADA software which are working on standard computer hardware. Standardized communication protocols provide several integration and interoperability opportunities. Automation systems can be extended by the integration of multi vendor hardware according to further requirements appeared in time. Highly precious data of energy automation and SCADA systems can be easily transferred to international information platforms by data integration methods like ODCB, DDE, OLE and OPC. These systems provide wide integration opportunities like publishing data via web servers, transferring to high level management systems and generating detailed reports.

Monitoring & Control Systems – SCADA

Monitoring and control (SCADA) systems consist of several server and client computers organized in a special network inside the authorization zone to control and monitor the system from control center.

In some conditions, there are more than one server computers working as redundant partners. The special software works on these computers for monitoring and controlling of the system as follows;

- Supervisory Control And Data Acquisition (SCADA)
- Human Machine Interface (HMI)
- Man Machine Interface (MMI)
- Supervisory Control & Management System (SCMS)

Operators monitor and control the system through server and client computers according to their authorizations. SCADA software presents the online data which is received from PLC/RTU through communication network. The data is represented to the operators on the screen as mimic diagrams, event/alarm lists and saved to databases, printed and performed high level automation functions by using well organized and prepared software codes.

SCADA - Supervisory Control And Data Acquisition



Monitoring & Control Systems – SCADA

Mimic Diagrams and Visual Presentation

With the help of high visual presentation opportunities of SCADA systems, general condition of the system can be monitored through several diagrams as main screen, single line diagram, and diagnostic views and conditions of field equipment's can be monitored easily. HMI screens provide several control capabilities and system can be controlled easily and effectively by sending commands.

Event and Alarm Monitoring

Actual and previous warnings, faults and alarm conditions can be monitored in detailed form through the Event/Alarm lists screen. All the critical changes, which occur at field, are transmitted to higher system as time stamped on the source of the signal and they are presented and saved as time chronological lists with 1 ms resolution. Events and alarms can be formatted and grouped according to several criteria. Alarm/Event data can be monitored with all required information detail (as source, reason, time, place, operator, description) and archived in databases for the inspection of authorized staff and can be easily reviewed and printed out. It is possible warn operators by visual and audio warnings. Remote users can be informed by web integration, cell phone and mobile systems.



Reporting and Billing

Different measurement information can be monitored and saved on hard disk or database as actual and cyclic values. Records within particular cycles can be inspected. Saved values can be monitored as actual time or historical trends which can contain one or more values. Detailed reports can be created for several periods and criteria. Energy consumption of subunits can be billed with different unit prices and parameters. Also, all data can be transferred higher systems and authorized people by wide communication opportunities as online.

Trends and Database Integration

Actual and historical trends of values in the field with respect to time can be monitored and saved. Besides, values can be transferred to standard software (like MS Office products) and web servers or higher management systems through network.

Effective Data Transfer with Standard Communication Protocols

Energy automation systems provide effective communication opportunities through standard communication protocols like IEC 60870-5-101 / 102 / 103 / 104, IEC 61850. Not only the event/alarm lists but also supporting facts like type, time and reason of event/alarm can be transmitted. Secure communication channels can be established.

Monitoring & Control Systems – SCADA

Open and Flexible Systems - Expandability and Working Together

Automation SCADA products are open systems which support several products of RTU/PLC manufacturers through standard communication protocols and integration opportunities as ODBC, OLE, OPC, DDE. With the help of flexible configuration opportunities, it is possible to extend automation systems from small configurations to huge automation systems which can monitor and control very large facilities from one or more points. With the help of standard data communication protocols, manufacturer independent integration opportunities are wide. Protection relays and SCADA systems, which are produced by different manufacturers, can work together without any problem. Integration to auxiliary software's like web applications and office software's can be created with the transmission of data to the standard software's like ODBC, OPC, and DDE. Maintenance team can be informed and can be directed immediately by integrating with user interfaces as mobile devices and smart phones. Higher systems and remote users can be informed with actual data by the online integration with web servers and higher level management systems. Authorized staff can be informed in details and operators can use the system efficiently by integrating with auxiliary platforms as simulation systems and geographical information system.

Communication and Control Systems - RTU / PLC

Critical automation functions are realized in PLCs (Programmable Logic Controllers). These devices are robust and can work continuously under tough conditions. PLCs can perform the predefined critical functions perfectly without any mistakes. They can manage securely non-stop time critical activities with their robust industrial control hardware infrastructure. RTUs (Remote Terminal Unit), which have strong communication and data transmission opportunities as well as control functions, are also used for similar purposes. These devices have limited automation functions on the other hand various communication opportunities. They can communicate with Telecontrol Centers (TCC) by using remote communication protocols.

Control systems achieve error free and time critical control operations with the well designed programmed and tested PLC/RTU software. They can transmit the data which contains all the required information related operation as evaluation and result to the higher systems with the help of their supreme speed and communication capabilities. RTU/PLC hardware is long-lived, does not require maintenance, occupies less space, can work under tough circumstances without any mistake, has great performance and can be extended easily thanks to its flexibility properties. Revision can be done easily and quickly with the configuration and parameterization software. It provides so many opportunities like backup, copy, simulation and testing in office environment. In modern technology, all the information's related to the feeder can be taken from the protection device, the bay control device and the energy analyzer, which are placed in feeder control cubicle, by wide communication opportunities like IEC 60870-5-103, Modbus and IEC 61850. Integration of the feeder to the system can be completed by laying out only communication cable between the feeders which provides effective, economical and secure communication opportunities.



Engineering Calculations Mathematical Modeling & Fault Analysis

Our company achieve electrical engineering calculations and mathematical modelling in every energy production, transmission and distribution facilities, industrial facilities and factories. With the help of model of the system, all the fault conditions can be simulated and further probable faults and technical losses can be predicted and corrected in advance. Besides, mathematical analysis of the whole system can be done very fast and sensitive and system stability analysis and evaluations can be done. Also, all fault expertise are done by our expert staff. With the help of generated detailed reports, process losses are prevented by providing proper solutions.

There are titles for the analysis and calculations, which we can achieve, below:

- Short Circuit analysis & calculations acc. to ANSI, IEC 60909, 61363 Standard
- Stable, unstable and optimum level load flow calculations and analysis
- Protection & Plant Grounding calculation and simulations
- Arc Flash analysis
- Detailed Grid Stability analysis
- Relay coordination and set values calculation
- Motor Starting & Grid Stability analysis
- Grid Parameters determination
- Cable Short-Circuit current curves and calculations
- Transformer Power Assignment
- Field Equipment's Reliability Analysis
- HV, MV, LV Energy Transmission & Distribution Line electrical calculations
- Harmonica Filtration Calculation & Analysis
- Power Supply System's sizing and discharging calculations
- Grid Analysis by using online line parameters
- Relay Coordination
- Grounding Calculations
- Cabling Route & Distance Calculations
- Integration With Geographical Information Systems
- Control Systems Optimization
- Detailed Analysis, Table & Graphic Presentations, Reporting



Integration With Telecontrol Center & RTU Systems

Remote Terminal Units (RTU) Systems

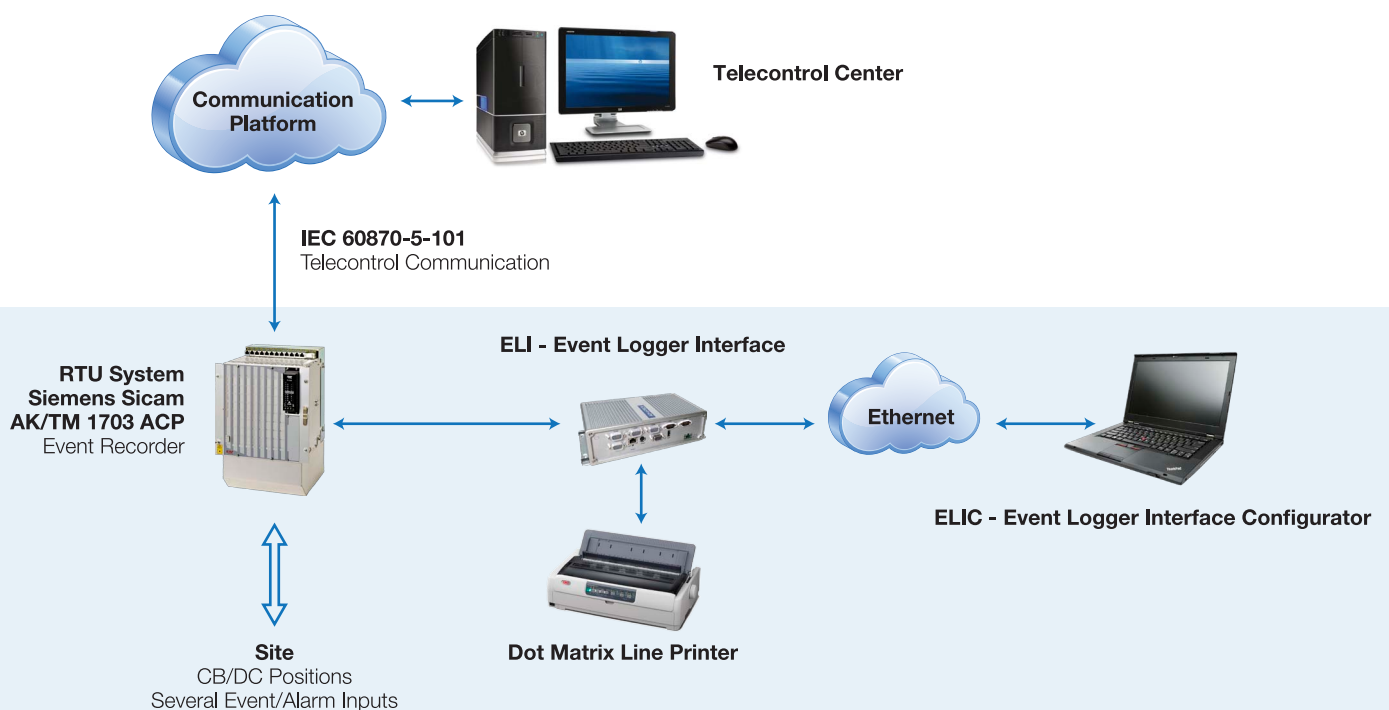
We constitute Remote Terminal Units (RTU) to stations for monitoring energy production and transmission stations from Tele Control Centers. Also, reading Intelligent Electronic Devices (IED), transferring information's to Tele Control Center and transmitting the commands, which are coming from control center, to the hardware's and devices are provided. We present standard solutions which are using communication protocols like IEC 60870-5-101, IEC60870-5-104, IEC 61850, Modbus RTU, Modbus TCP, IEC 62056, DLMS, Industrial Ethernet, and Profibus.

Our company as solution provider for Siemens Company is raised to leader position in its sector by completing the integration of thousands of energy stations, which contain high, medium and low voltage switchgear with telecontrol center communication.



Event Recorders

Beside the integration of RTU systems with telecontrol centers, we offer another solution as an RTU system to serve as Event Recorder as well. All the events occur in the substation are printed by the dot matrix printer as chronological event lists containing information lines given in precise timestamps with 1 millisecond time resolution. On the other hand, with the help of web interface, it is possible to monitor and save all of the event records through the remote computer.

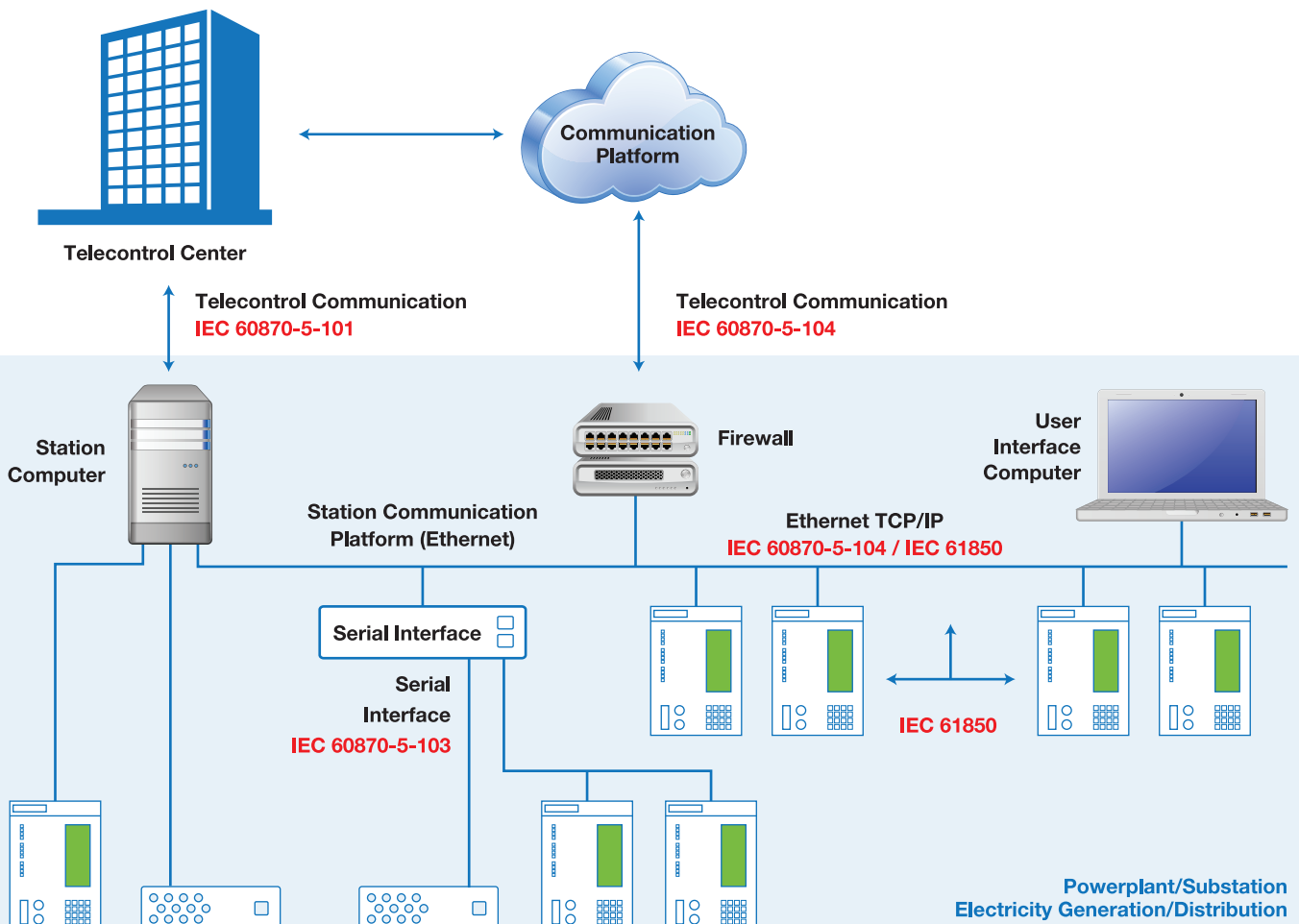


Research & Development Studies

Our R&D Engineering office is established in Marmara TÜBİTAK Technology Development Zone.
We are producing solutions for Energy Automation and SCADA systems interoperable with industrial standards.

There are the software & hardware solutions which are developed by our company below:

- Telecontrol Center Event Recorder Systems (UKM-OKS)
- TCC Online Alarm Monitoring, Station Analysis and Reporting System (UKM-ARS)
- Energy Monitoring and Control System SCADA (PMCS)
- Energy Automation Protocols Applications and OPC Server Interface Software:
 - IEC 60870-5-101/104, IEC 61850, IEC 62056
 - Modbus RTU / Modbus TCP
 - OPC Server Software according to hardware
- Energy Automation SCADA and Web Interface Software
- Data Acquisition and Analysis Software
- Reporting, Analysis and Billing Software
- Simulation Software
- Gateway Systems based on PC104
- Special solutions for industrial communications
- Data Acquisition Systems



IEC 61850 & New Generation Energy Automation Systems

IEC 61850 standard which provides the integration of SCADA systems, RTU systems and protection relays in the same environment, becomes increasingly popular and it presents perfect advantages in many point of views.

IEC 61850 standard combines IEC 60870-5-101 protocol which is defined between telecontrol center and substation RTUs with IEC 60870-5-103 communication protocol which is defined between RTU and protection relays. Also, instead of old generation serial communication infrastructure, it made an important step by choosing economical, fast and popular Ethernet communication platform. Besides, with the help of new generation device and data definition logic opportunities, telecontrol center, RTU and protection relays can share data between each other.

IEC 61850 systems have so many advantages like standardized device and object models, automatically self-definition system, standardization on equipment naming and constitution of more flexible and efficient systems with less costs.

All the equipment which has simple, cheap and common Ethernet protocol implementation and hardware can be integrated to the system, can provide data to the system and can get data from the system to the user in high performance and cost effectively manner. IEC 61850 standard contain detailed communication definitions which can cover all the communication requirements inside the station and with the telecontrol center.



Reference Projects On Energy Automation

TÜPRAŞ İzmir Aliğa Refinery Energy Automation & SCADA Project



TÜPRAŞ İzmir Aliğa Refinery Energy Automation & SCADA Project, which was projected under the responsibility of Siemens A.Ş. Company, was completed with the support of our engineers.

The below services were provided by our engineers in the project:

- Energy Automation & SCADA System constitution
- Preparation of SCADA pages, commissioning of SAS/RTU systems, testing & commissioning
- Cabling/Montage, necessary adjustments for SCADA System background
- Relay testing & commissioning
- Load shedding system modernization
- Gas turbine integration, SS100, SS200 additions integration
- Service & Maintenance

Airports Energy Automation & SCADA Systems



Our company gave engineering services on İstanbul Atatürk Airport and Sabiha Gökçen Airport Energy Automation and SCADA System Projects.

- Energy Automation & SCADA System constitution
- SCADA addition & adaptation works
- SAS/RTU parameterization & commissioning
- Relay parameterization, testing & commissioning
- Load shedding system constitution, testing & commissioning
- Service & Maintenance



City Energy Transmission & Distribution Network Automation

Our company has worldwide references on establishing city energy transmission distribution networks SCADA Systems. Our company has also references on commissioning of RTU Systems in many cities of Turkey. We have completed successfully so many projects in foreign countries like United Arab Emirates, Dubai, Abu Dhabi, Egypt, Saudi Arabia, and Qatar.

- SCADA Systems constitution
- RTU/SAS Systems constitution
- Testing & commissioning
- Service and maintenance



MV Energy Distribution Systems



As part of integration of medium voltage energy distribution stations with telecontrol centers, thousands of Siemens 1703 AK RTU systems have been commissioned by our engineers in many places of Turkey.

Reference Projects

2014	Meram EDAŞ MV Energy Distribution System MV Energy Distribution System RTU Commissioning Protection Relay Replacing, Testing & Commissioning
2014	Akdeniz EDAŞ MV Energy Distribution System MV Energy Distribution System RTU Commissioning Protection Relay Replacing, Testing & Commissioning
2014	Manisa Organized Industrial Zone MV Energy Distribution System MV Energy Distribution System RTU Commissioning Protection Relay Replacing, Testing & Commissioning
2011-2013	BEDAŞ Ankara MV Energy Distribution System MV Energy Distribution System RTU Commissioning Protection Relay Replacing, Testing & Commissioning
2012-2013	Tüpraş İzmir Aliağa Refinery Load Shedding System Modernization, GT Integration SS100, SS200 Additions, Service & Maintenance
2012-2013	Çerkezköy Organized Industrial Zone MV Energy Transmission Distribution SCADA System Constitution Siemens Sicam 230 SCADA System
2011-2012	İSU Kocaeli Clean Water & Waste Water Scada System Constitution Siemens WinCC OA SCADA System Constitution Sicam 1703 RTU Programming, Testing & Commissioning
2010	TEİAŞ Erzurum / Seyhan / Kepez Regions Energy Distribution & Monitoring System. RTU Programming, SAT, Testing & Commissioning
2010	Sabiha Gökçen Airport Energy Automation System SCADA & Energy Automation System constitution, SCADA adaptation works on existing system, RTU Parameterization & Commissioning, Relay Parameterization & Commissioning
2009-2010	Oyak Renault Autocar Factories A.Ş. Bursa SCADA & Energy Automation System Constitution Siemens Sicam 230 SCADA System
2009-2010	BEDAŞ Ankara MV Energy Distribution System SCADA Adaptation Works Protection Relay Replacing, Testing & Commissioning
2007-2010	Abu Dhabi City Energy Transmission & Distribution Network Automation SCADA System Project Designing, Programming, Testing & Commissioning
2005-2009	Tüpraş İzmir Aliağa Refinery SCADA & Energy Automation System Constitution Cabling/Montage, Adaptation Works, SCADA System Relay Testing & Commissioning
2001-2004	TEİAŞ Load Shedding & Monitoring System At Several Regions In Turkey SCADA & PLC Programming, FAT, SAT, PAT, Testing & Commissioning, Engineering Services
2004	Qatar QVC Plant Energy Automation System Maintenance & Troubleshooting, Engineering Services
1999-2010	Atatürk Airport International Terminal Energy Automation & Control Systems Constitution Siemens A.Ş., Anel, Okosis



Okosis

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