AKAY
# SCADA

Company Profile

AK-AY's experienced team of engineers, business consultants and systems developers have delivered innovative solutions to reputed organizations in various segments including Manufacturing, Facilities & Utilities, Commercial and Educational Institutions and service based organizations.


Importantly, through a broad range of projects both in public works and the private sector, AK-AY offers a challenging and stimulating environment for its staff, and an attractive opportunity for potential employees. With highly qualified engineers, programmers, project managers, designers, and technicians on staff, we consider the professionalism, diverse skills and experience of our employees to be AK-AY's most valuable resource.
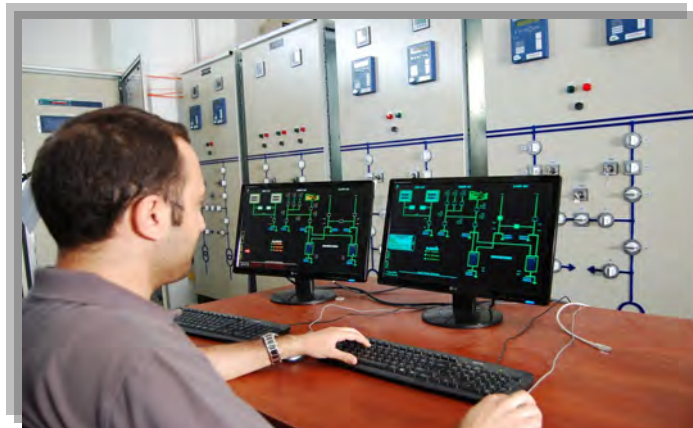
Our mission is to provide quality products and services with complete customer satisfaction. We are committed to offering the very best in engineering principles and practices to deliver state-of-the-art technology with safety, performance and efficiency.

AK-AY designs, develops, tests and implements Supervisory Control and Data Acquisition (SCADA) systems (or Distributed Control Systems - DCS) consisting of Human machine interface (HMI), Remote Terminal Units (RTU), Programmable Logic Controllers (PLC). AK-AY provides various system sizes ranging from simple to complex networked systems
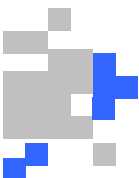
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Energy Management Systems

AK-AY is always conscious of slightly different context EMS, can refer to a system in an organization to achieve energy efficiency through well laid out procedures and methods, and to ensure continual improvement, which will spread awareness of energy efficiency throughout an entire organisation

An energy management system (EMS) is a system of computer-aided tools used by operators of electrical utility grids to monitor, control, and optimize the performance of the generation and/or transmission system.

The computer technology is also referred to as SCADA/EMS or EMS/SCADA. In these respects, the terminology EMS then excludes the monitoring and control functions, but more specifically refers to the collective suite of power network applications and to the generation control and scheduling applications.
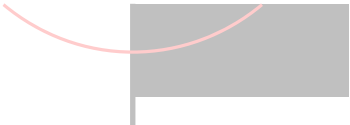

As a result of pressure on costs, current price trends in liberalized energy markets and environmental demands, power utilities and energy-intensive industries are being forced to adopt a sustainable approach to the use of energy. On the basis of their many years of experience in the energy markets and with energy related processes, our experts are skilled at developing and implementing solutions for optimizing the energy process chain.

AK-AY offers a comprehensive range of services for achieving economic efficiency in the areas of energy procurement, plant deployment (power generation) and energy sales such as:

- **Load forecasts**
- **Optimization of power plant deployment**
- **Energy data management**
- **Accounting grid management**
- **Load schedule management**
- **Portfolio management**

Features

- *Real time Operating System*
- *Economic Dispatch*
- *Load Frequency Control*
- *Contingency Analyzing*
- *Accident Analyzing*
- *Scenario Reconstructing*

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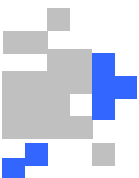
Additionaly, EMS provides control, monitoring, fault tracking of Transformers, Generators, LV Panels Contacs, MV Circuit Breakers and Disconnect Switches. Measuring currents, power, power factor, active-reactive power and monitoring protection relays by energy analyzers and power converter devices is also possible with EMS.

AK-AY's management system is the most flexible, robust, cost-effective, and comprehensive system available for power management and control. The system performs advanced wide-area control using reliable, field-proven SEL hardware devices and universally accepted IEC 61131-3 software
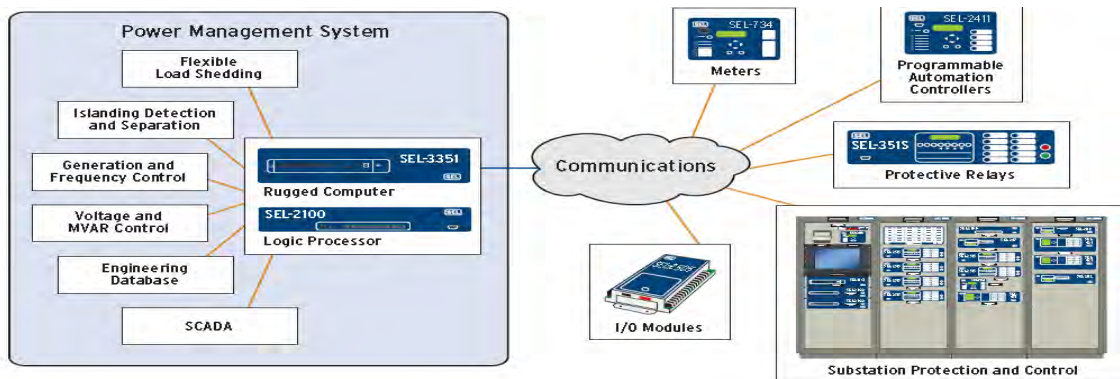
Flexible, High-Speed Load Shedding
Proactively prevent frequency-based blackouts by shedding non-critical load within a few milliseconds of lost generation or utility ties. The system continually calculates the amount of load necessary to shed for every possible supply loss. All loads are prioritized and only shed when necessary to satisfy the contingency. Control thousands of loads with high-speed communications and Crosspoint Switch Advanced Application Logic in Logic Processors. Customize your system parameters using the specialized interface to maximize economy, stability, or both.

## Islanding Detection and Intelligent System Separation
Detect dangerous power conditions, and island your power system to avoid blackouts. Detect separation using synchrophasor state information, 4 ms detection of remote and local breaker openings, and supervised protection elements. Perform separation using distributed logic in devices, and preserve the stability of each island using intelligent load shedding.

Frequency and Generation Control
Automatically control generators for optimal, economic dispatch. Control system for either maximum system stability under islanded operation or optimal economic benefit.

MVAR and Voltage Control
Mitigate many forms of voltage-induced blackouts using voltage and MVAR control. Optimally control all voltage- and MVAR-controlling components in your power system. Manage load tap changers, generator-field exciters, large synchronous-motor exciters, STATCOMs, static-var compensators, and capacitor banks to maintain system intertie and bus voltage set points.

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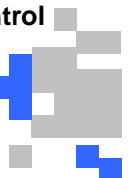
Power Monitoring Solutions

In an improving electric industry, monitoring power supply and power quality are critical to ensuring optimal performance of power systems. Monitoring can provide information about power flow and demand, as well as the quality of the power. Monitoring can be a vital diagnostic tool, identifying problem conditions on a power system before they can cause disturbances or interruptions.

AK-AY offers software and hardware systems to help you set up and administer power monitoring programs to meet any application.

With the electric industry undergoing change, increased attention is being focused on power supply reliability and power quality. Power providers and users alike are concerned about reliable power, whether the focus is on interruptions and disturbances or extended outages. One of the most critical elements in ensuring reliability is monitoring power system performance. Monitoring can provide information about power flow and demand and help identify the cause of power system disturbances. It can even help identify problem conditions on a power system before they cause interruptions or disturbances

Advantages of System Monitoring

Effective monitoring programs are important for power reliability assurance for both utilities and customers. While power quality problems can and do occur on utility power systems, many surveys have shown that most customer power quality problems originate within the customer facility. With this in mind, it is clear that monitoring is essential for both power suppliers and users to ensure optimal power system performance and effective energy management.
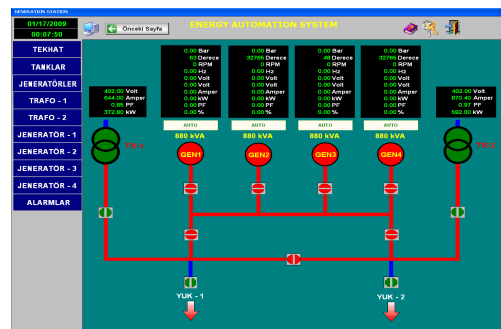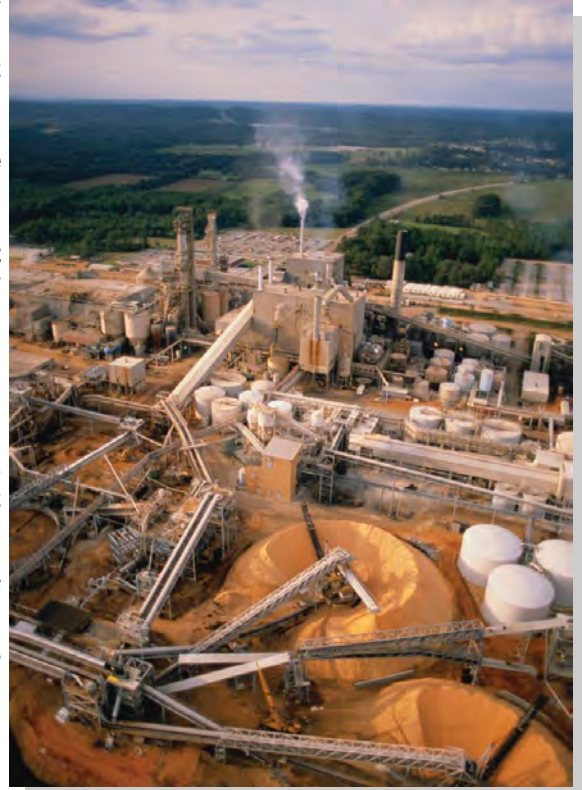
Key to the success of an effective monitoring program is flexibility, powerful data processing, understandable reports, and easy access to information. The emergence of the Internet and intracompany intranets has made this possible, allowing quick viewing of data that assures effective decision-making and fast response time. Event notification and program scalability are also critical for addressing the ever-changing environment of the energy business.
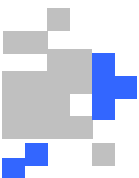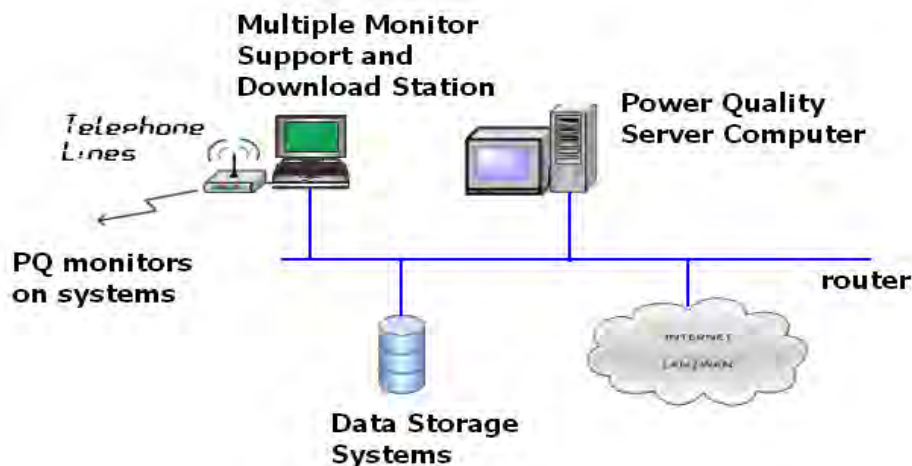
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AK-AY offers solutions with strong and experienced technical partners to help you monitor and manage your power system. These solutions provide powerful access and analytical capabilities along with event notification, with a high degree of flexibility. Regardless of the application and program size - whether a few monitoring devices or a few hundred - we can provide software, systems, and services to meet any requirement and budget.

Monitoring Program Components

Power monitoring systems or programs are structured using a set of basic components including;

- Power quality and/or energy demand monitors
- Data storage
- Download computers
- Web or company Intranet server

Critical functions include data acquisition and downloading, data processing, and delivery of results and reports. Traditionally, separate computers have handled these functions, but new technology is enabling them to be handled either from a central station or from stations throughout a monitoring network.

Monitoring Tools

AK-AY offers several power monitoring tools that focus primarily on power quality. All have the capability of using the Internet or a company intranet to display collected data and analysis results.

Power Monitoring Support Services

AK-AY offers a range of services to assist you in setting up and running a power quality monitoring program. These include installation support and training, along with customized analysis and reporting development.

With our partnerships, AK-AY also offers latest technology. AK-AY handles day-to-day administration of the monitoring program, handling tasks such as data downloading, management, and analysis. You may contact us to receive e-mail and pager notification of events, reports on power system performance, and recommendations on cost savings and system enhancements. Standard and enhanced service options, involving expert assistance and phone and e-mail support, are available. This service is the best way to tap AK-AY's recognized expertise, and make the most of your monitoring program.

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Substation Automation Systems

The challenges can be very tough when managing a substation. Anything from unknown equipment status to unexpected outages can turn decision making into guesswork.

AK-AY has an improved solutions for your substation automation needs. The total return on investment for your substation automation will be even greater with integrated solutions from AK-AY,

In view of the increasingly competitive arena where power providers are facing significant pressure for greater system reliability, and improvement of customer satisfaction, the focus is usually placed on cost reduction and better performance.
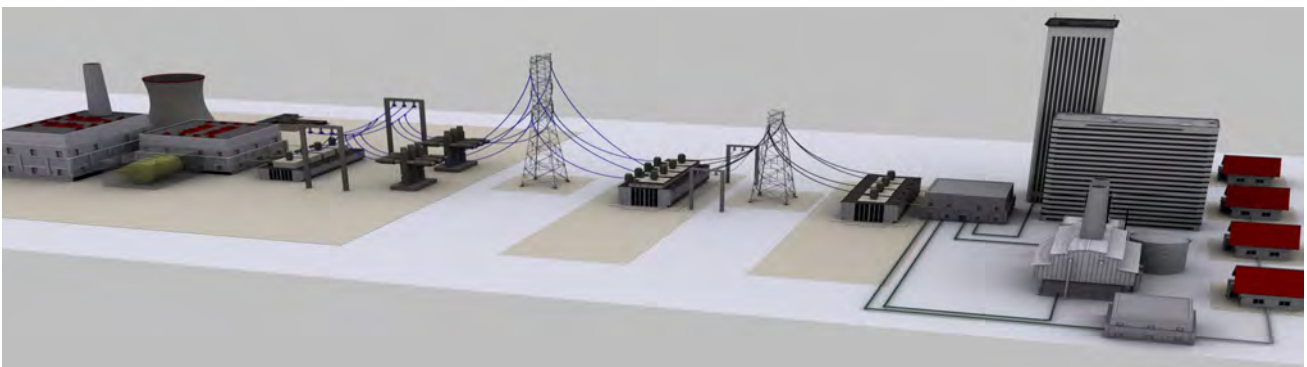
Substation Automation Systems provide remote control and monitoring functions in real time, promptly acquiring the information of facilities for all kinds of unnamed substation ranging from distribution to extra high voltage substations, which may be applied to Intelligent Electronic Devices for protection and control and to the facility security devices of the unnamed substation.

Features
- Various IED Implementation
- Real Time OS & TCP/IP
- IEC 61850 Supporting Devices
- Innovative HMI Designs
- Full redundant Control & Protection Systems

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Substation Automation Systems

Upgrading aged protection and control systems with AK-AY substation automation systems offers new opportunities to reduce your operation and maintenance costs and to operate substations with enhanced schemes as well as condition monitoring for circuit breakers, power transformers, etc.
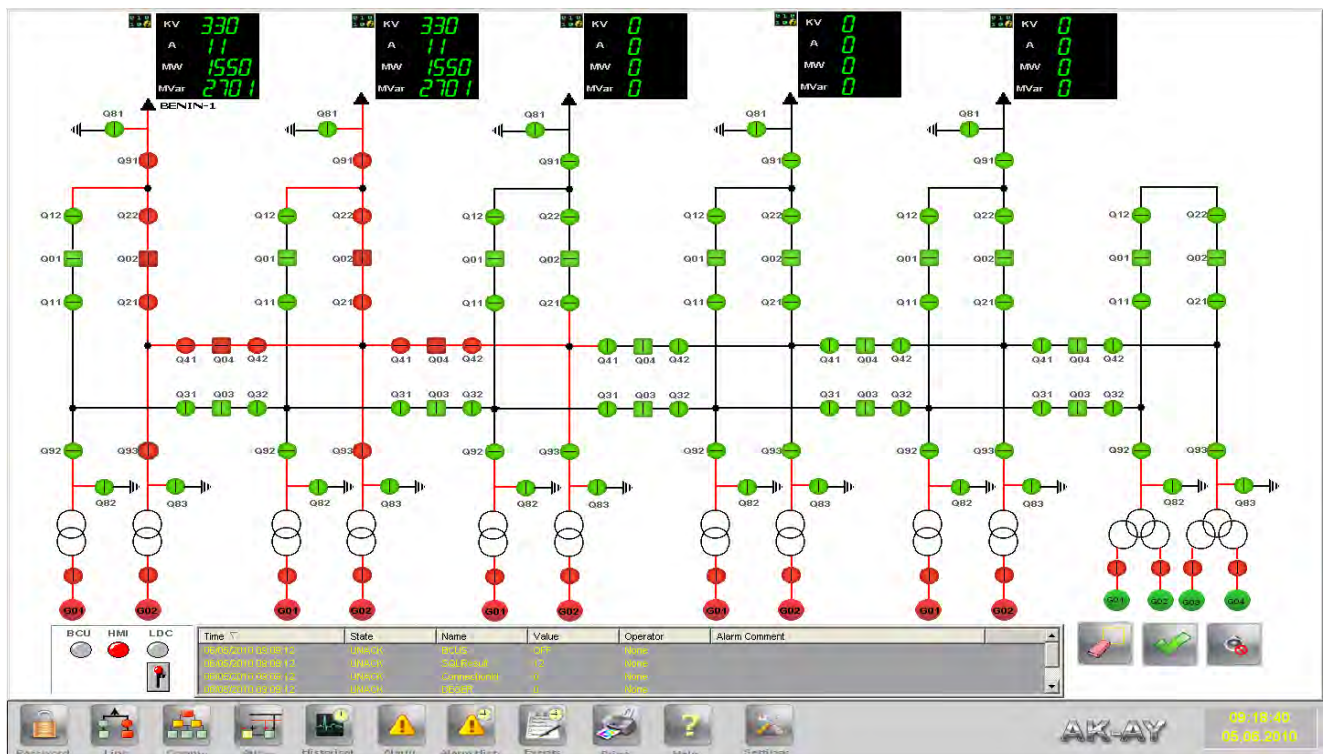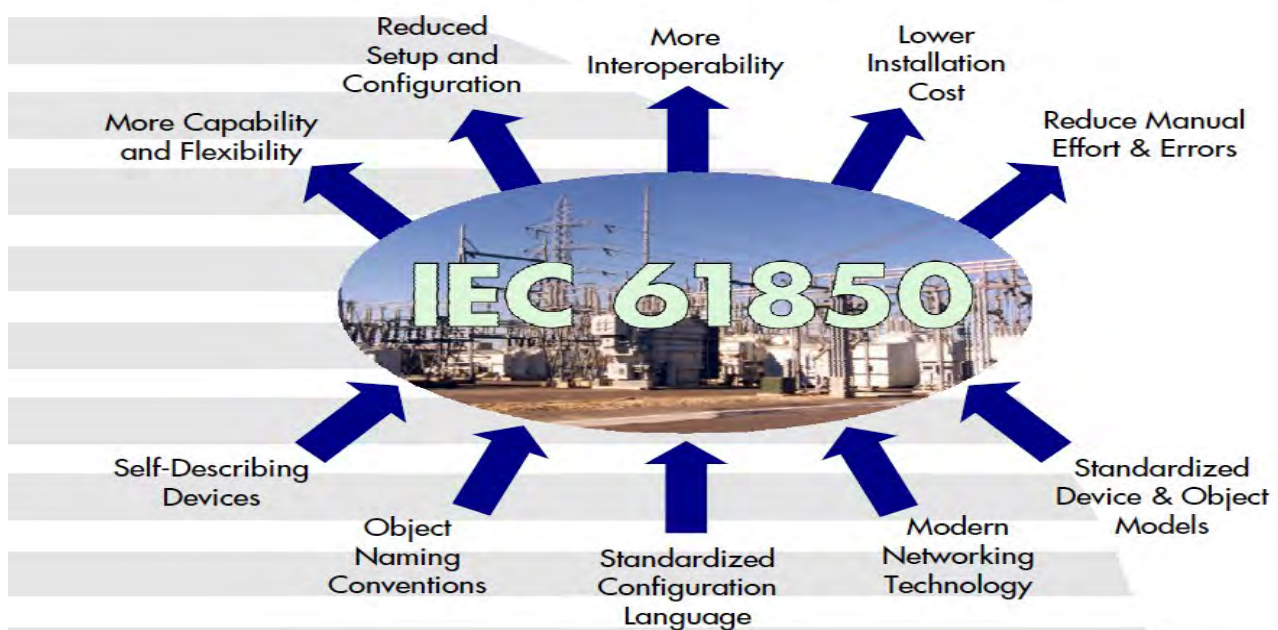

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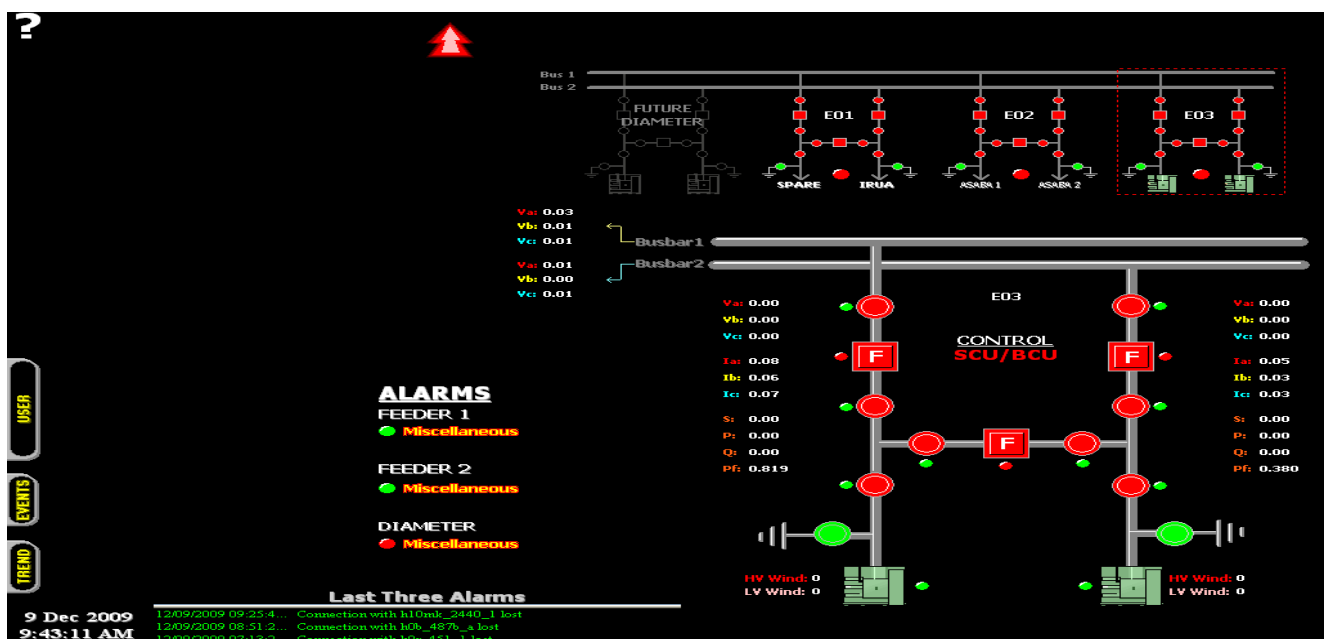
IEC 61850

IEC 61850 is the international standard for substation automation systems. It defines the communication between devices in the substation and the related system requirements. It supports all substation automation functions and their engineering. Different from that of earlier standards, the technical approach makes IEC 61850 flexible and future-proof. The ideas behind IEC 61850 are also applicable in areas of automation such as control and monitoring of distributed generation. The use of IEC 61850 in areas of water and gas is being discussed.

Benefits in Substations and Bays

IEC 61850 protocol training and implementation consulting
With more than 10 years experience in implementing protocols, providing consulting and training for IEC 61850 for the last 3 years and developing hardware and software products, AK-AY's experience in IEC 61850 is un-rivaled. Today AK-AY has more experience on IEC 61850 Implementations.

IEC 61850 source code library and OPC/DDE servers
AK-AY together with its principals, provide IEC 61850 Source Code, OPC servers and IEC 61850 design and testing tools. Our libraries, software and implementation services are field proven with a strong reference base globally.

IEC 61850 SCADA drivers
AK-AY provides packaged SCADA drivers with integrated engineering environment for most popular SCADA software like IFix, Wonderware, WinCC and others. These drivers are integrated drivers, which not only provide IEC 61850 Client/Server support, but also is tightly integrated into the engineering tool, and provide data engineering and SLD creation integrated into the SCADA

IEC 61850 substation engineering services
AK-AY has extensive experience in engineering and commissioning IEC 61850 substations. Our engineering services team, are experienced with various vendor SCADA / RTU / IED products and are also very well versed in IEC 61850. They shall be the best partner for your IEC 61850 substation engineering and migration projects.
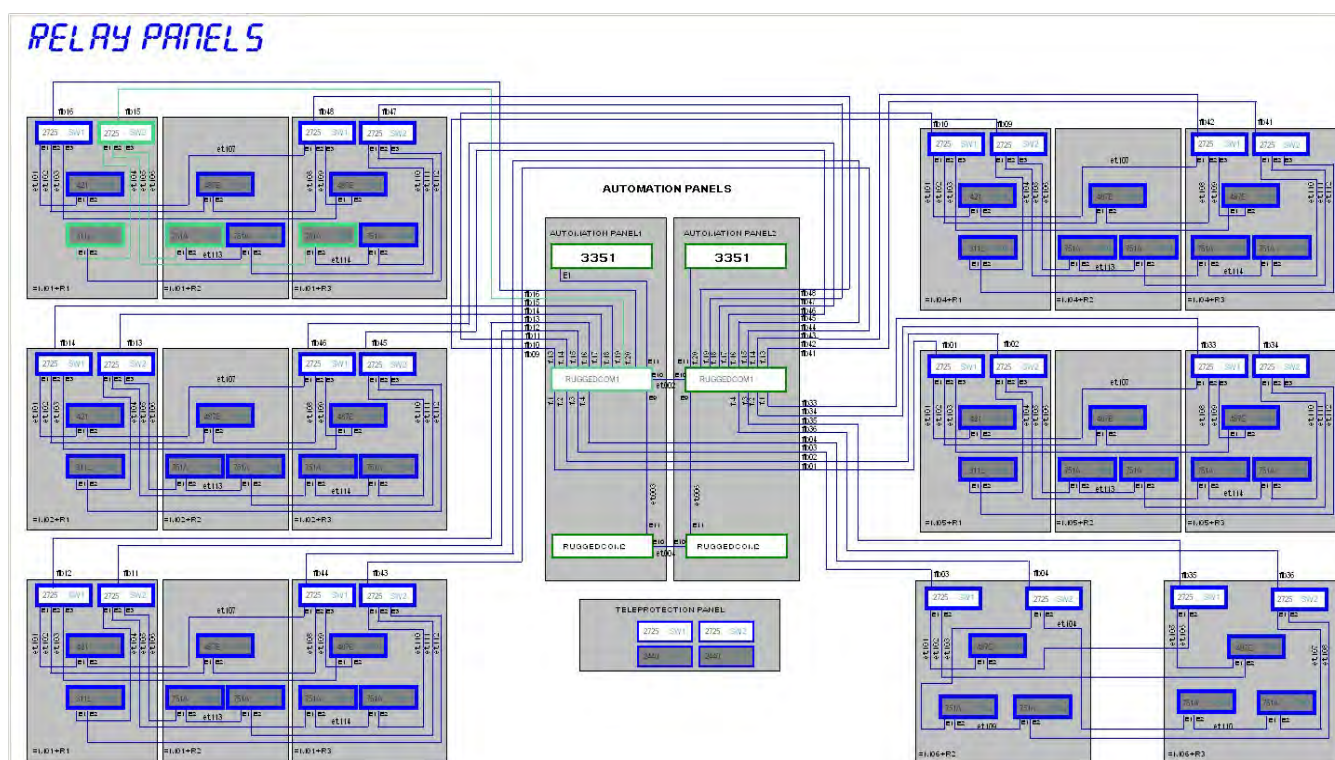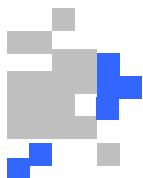
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Electrical Equipment Control and Monitoring System

We are capable of serving our customers in our solutions regarding monitoring, control, alarm, self diagnostics, metering, measuring, fault analysis and remote controlling functions.
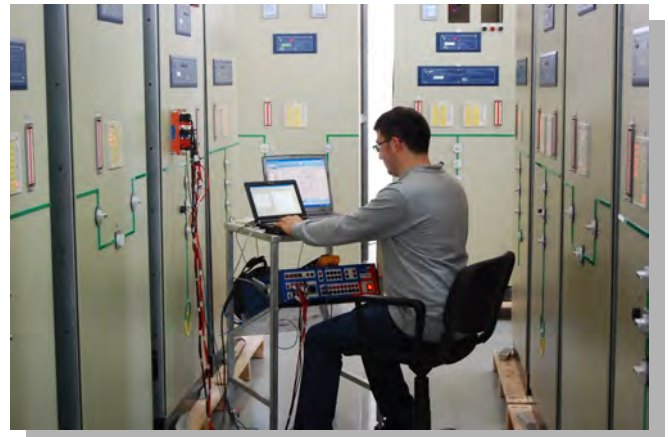

- **Relay and breaker self-test.**
- **Display status change**
- **Real time system status and control**
- **Execution - Interlock**
- **Displays the inspection status**
- **Synchronism Check**
- **Record and store all events in the server.**
- **Sound and display the alarm at time of fault**
- **Eliminate causes of non-operation in advance**
- **Minimize outages by faster troubleshooting**
- **Voltage, current, active power, reactive power, power factor**
- **Trend, Power Qualty Analysis, Historical Message Management**
- **Totally manage various system operation events and the history of system operation.**
- **Store and record events to check management status**
- **Fault detection**
- **Fault analysis**
- **Oscillography**
- **Remote-setting of protective relays**
- **Monitor protective relays**
- **Identify changes of electrical systems**
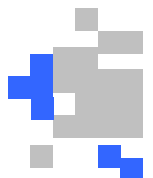
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Energy Management Systems

An energy management system consists of computer-control tools used by operators of electrical utility to monitor, control, and optimize the performance of the generation and/or transmission system.
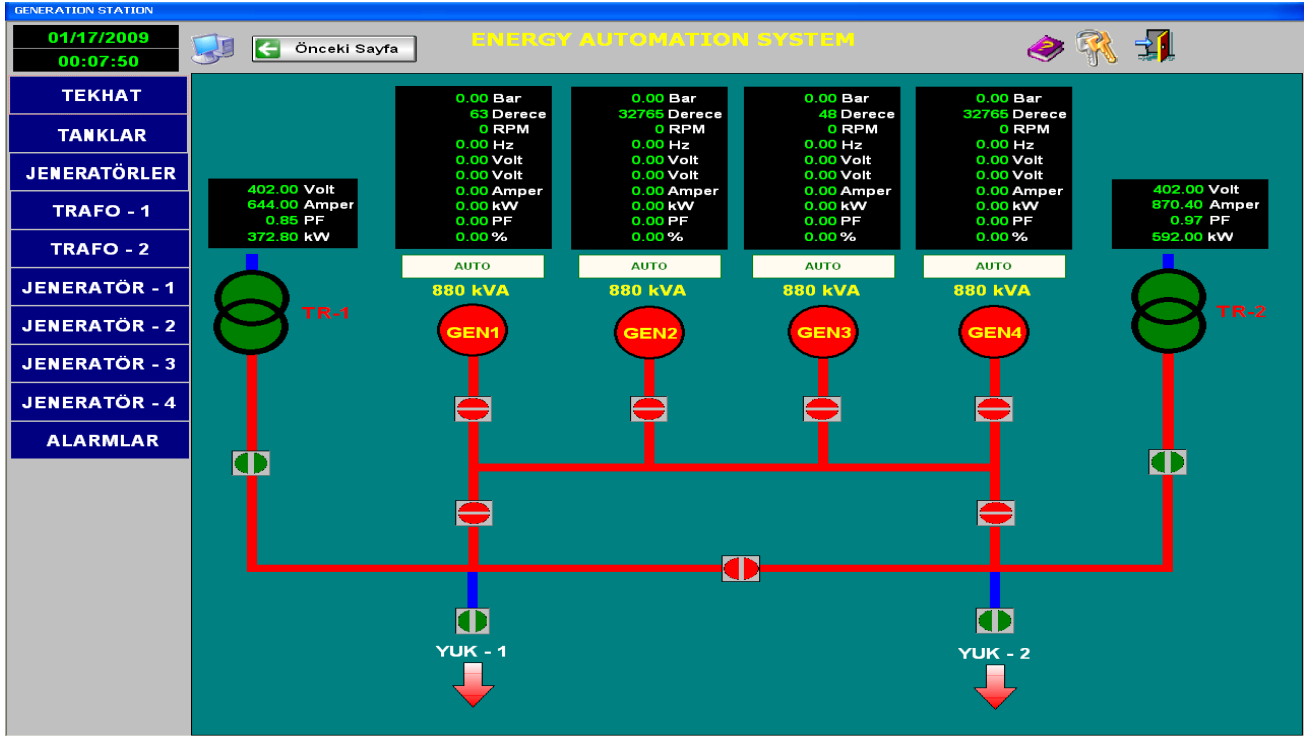
AK-AY develops solutions with his experienced engineers to help you monitor and manage your power system. These solutions provide powerful access and analytical capabilities along with event notification, with a high degree of flexibility.
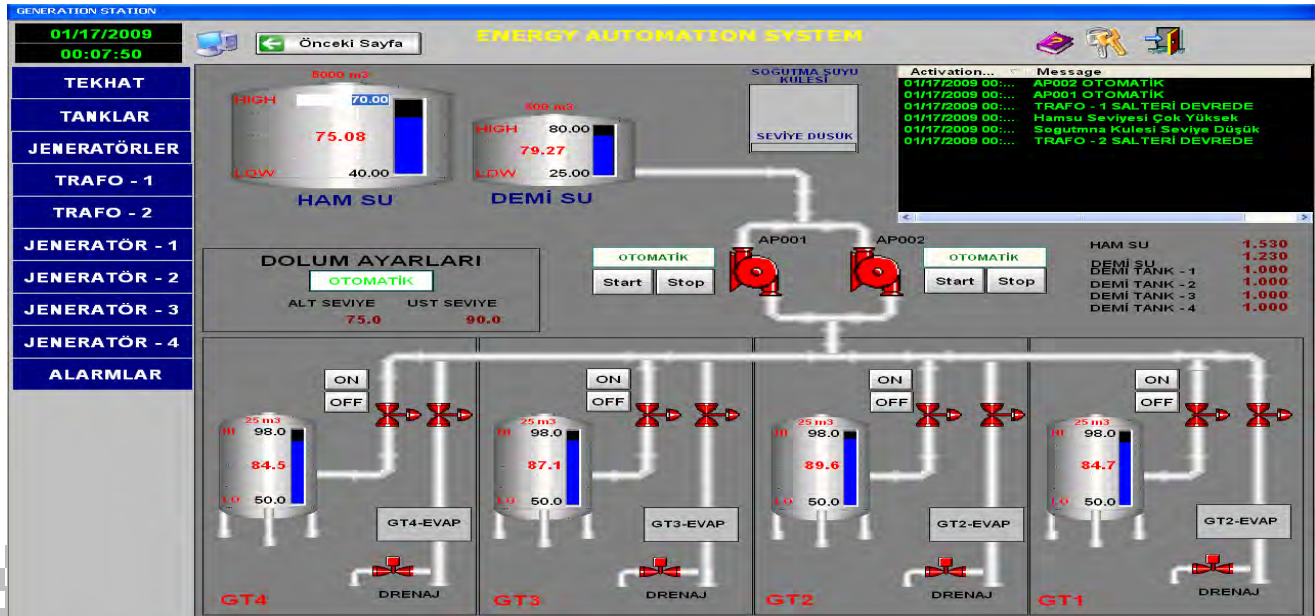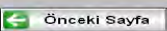
Energy Management Systems

Monitoring power supply and power quality are critical in an improving electric industry to ensure optimal performance of power systems. Monitoring provides information about power flow and demand and the quality of the power and identifies problem conditions on a power system before they can cause disturbances or interruptions.

Building Automation

An intelligent building automation system enables a facility manager to better manage resources, improve building safety, and reduce energy costs. With AK-AY building automation technology, an intelligent building can be created, allowing managers to control virtually every system from a central location.
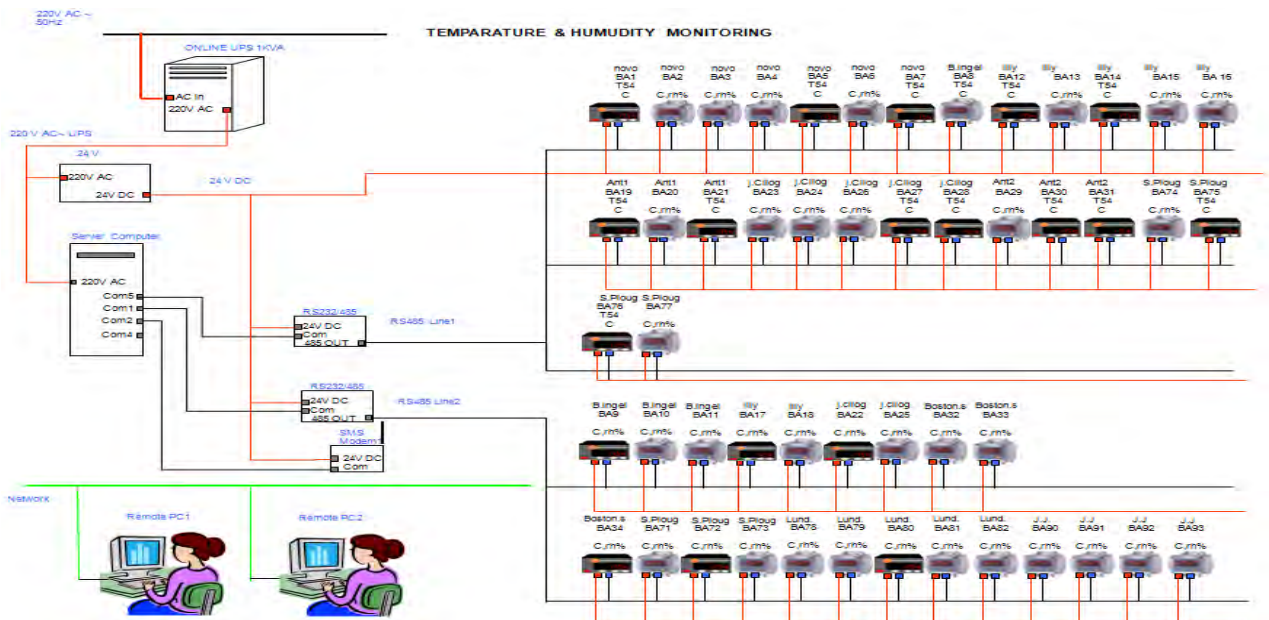
By network-enabling electronic devices quickly and cost-effectively, AK-AY building automation products make it possible to integrate building sub-systems (including security, HVAC, lighting, elevators and safety systems) into a single, efficient building management network. For example, a facility manager at a large corporate campus can control everything from electrical and water metering to building access from a single terminal, and can even diagnose system problems remotely
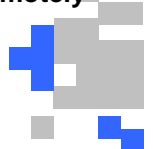
Industrial Automation

AK-AY provides a total industrial automation solution whether you require single or multi-station automation or a turnkey manufacturing system integrating third-party equipment. We offer single-source capability that ensures control over every aspect of system development and cost. We provide a comprehensive range of value-added engineering services to achieve innovative manufacturing solutions that deliver the highest productivity at the lowest cost.

Automation Solution
We offer single-source capability that ensures control over every aspect of system development and cost. The result of this approach is automation systems that deliver the world's leading performance and reliability, with exceptionally fast payback.

Industry-leading Capabilities
Breaking through the limitations of conventional thinking, we provide a comprehensive range of value-added engineering services to achieve innovative manufacturing solutions that deliver the highest

- **Simultaneous Engineering**
- **Prototyping**
- **Process Verification**
- **Specification Writing**
- **Automation Simulation**
- **Continuous Improvement**
- **Equipment Design & Build**
- **Design to Specification**
- **Retrofit Automation**
- **Build to Print**
- **Large scale factory automation**
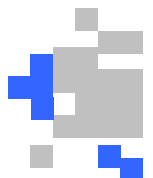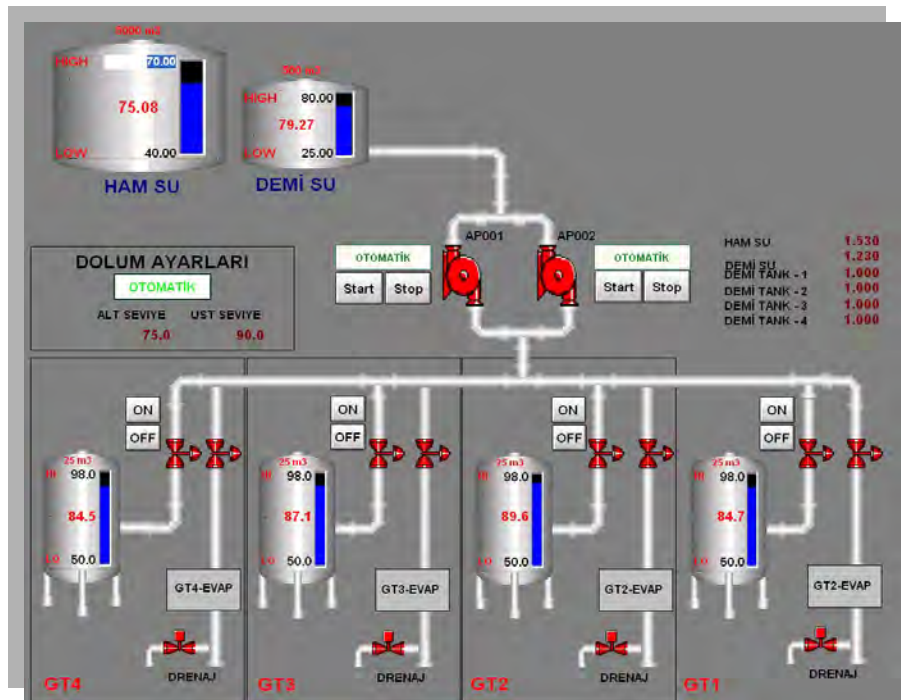
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SCADA Systems

AK-AY's SCADA (Supervisory Control And Data Acquisition System) systems include hardware and software components used to gather and analyze real-time data for automation and process control with IEC 61850. Our SCADA systems are used to monitor and control hydroelectric power plants and equipment in industries such as telecommunications, water and wastewater control, energy, oil and gas refining, and transportation. Our customers use our systems for hydro automation, substation automation, industrial automation, and process control.

SCADA stands for Supervisory Control And Data Acquisition. It generally refers to an industrial control system: a computer system monitoring and controlling a process. The process can be industrial, infrastructure or facility based as described below:

- **Industrial processes include those of manufacturing, production, power generation, fabrication, and refining, and may run in continuous, batch, repetitive, or discrete modes.**
- **Infrastructure processes may be public or private, and include water treatment and distribution, wastewater collection and treatment, oil and gas pipelines, electrical power transmission and distribution, and large communication systems.**
- **Facility processes occur both in public facilities and private ones, including buildings, airports, ships, and space stations. They monitor and control HVAC, access, and energy consumption.**

A SCADA System usually consists of the following subsystems:

- **A Human-Machine Interface or HMI is the apparatus which presents process data to a human operator, and through this, the human operator, monitors and controls the process.**
- **A supervisory (computer) system, gathering (acquiring) data on the process and sending commands (control) to the process.**
- **Remote Terminal Units (RTUs) connecting to sensors in the process, converting sensor signals to digital data and sending digital data to the supervisory system.**
- **Programmable Logic Controller (PLCs) used as field devices because they are more economical, versatile, flexible, and configurable than special-purpose RTUs.**
- **Communication infrastructure connecting the supervisory system to the Remote Terminal Units start-up costs and affording relatively**

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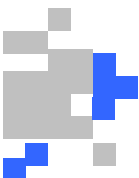
There is, in several industries, considerable confusion over the differences between SCADA systems and Distributed control systems (DCS). Generally speaking, a SCADA system usually refers to a system that coordinates, but does not control processes in real time. The discussion on real-time control is muddied somewhat by newer telecommunications technology, enabling reliable, low latency, high speed communications over wide areas. Most differences between SCADA and DCS are culturally determined and can usually be ignored. As communication infrastructures with higher capacity become available, the difference between SCADA and DCS will fade.

Remote data monitoring is required in many industries and applications such as oil & gas, power, waste water treatment, and environmental monitoring. In these applications, a fairly large number of RTUs in remote and/or hazardous locations collect data from devices and send log data and alarms to a SCADA terminal in a central control room (CCR). Telemetry devices installed between the RTUs and the SCADA system send and receive the data. Some big concerns about using telemetry are cost (initial expenditure and communications fees) and communications stability. SİL BURAYII T network infrastructure improves in remote areas, commodity network infrastructure can be more readily SİLL
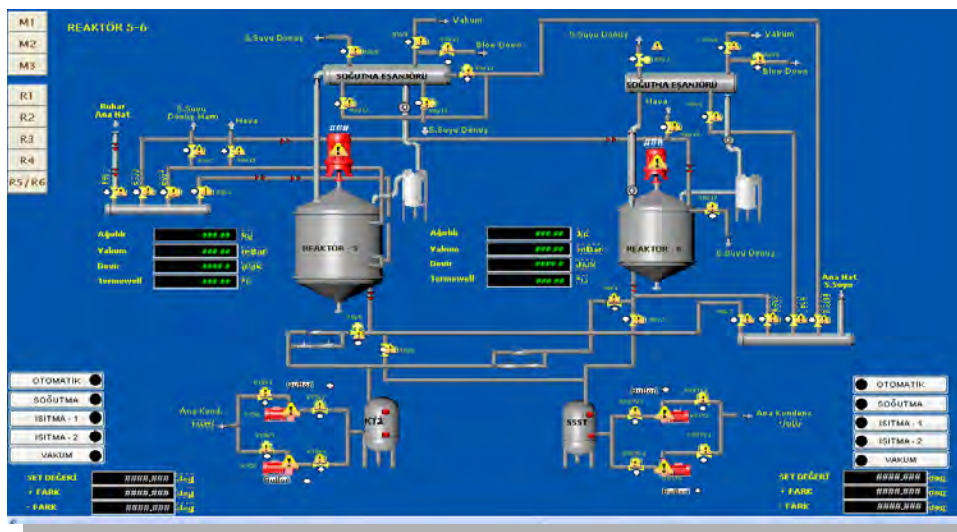

We prefer Wonderware Intouch Software on our HMI Solutions. InTouch software provides graphic visualization which takes your operations management, control and optimization to a whole new level.

Key Benefits
Truly legendary ease-of-use enabling developers and operators to quickly and easily be more productive
Unequaled device integration and connectivity to virtually every device and system
Stunning graphic visual representation and interaction with your operation brings the right information to the right people at the right time
History of uninterrupted software version migration path that means your HMI applications investment is protected

Key Capabilities
Resolution independent graphics and intelligent symbols that visually bring your facility to life right on your computer screen
Sophisticated scripting to extend and customize applications for your specific needs
Real-time distributed Alarming with historical views for analysis
Built-in, real-time and historical trending
Microsoft ActiveX controls and .NET controls integration
Extensible library of over 500 pre-designed 'intelligent' and customizable graphic and object symbols
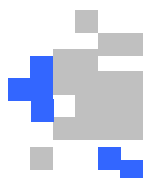
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Wireless Automation Systems

AK-AY offers Bluetooth and IEEE 802.11b/g enabled "Wireless Automation" systems for all facets of building control, HVAC, remote monitoring/control systems and data-aquisition. With the help of radio emitter now it is possible to transfer the signal of any equipment like flow switch, pressure switch, temp. gauges etc. on / off signal as wireless to the distance of 1 to 5 K.M.
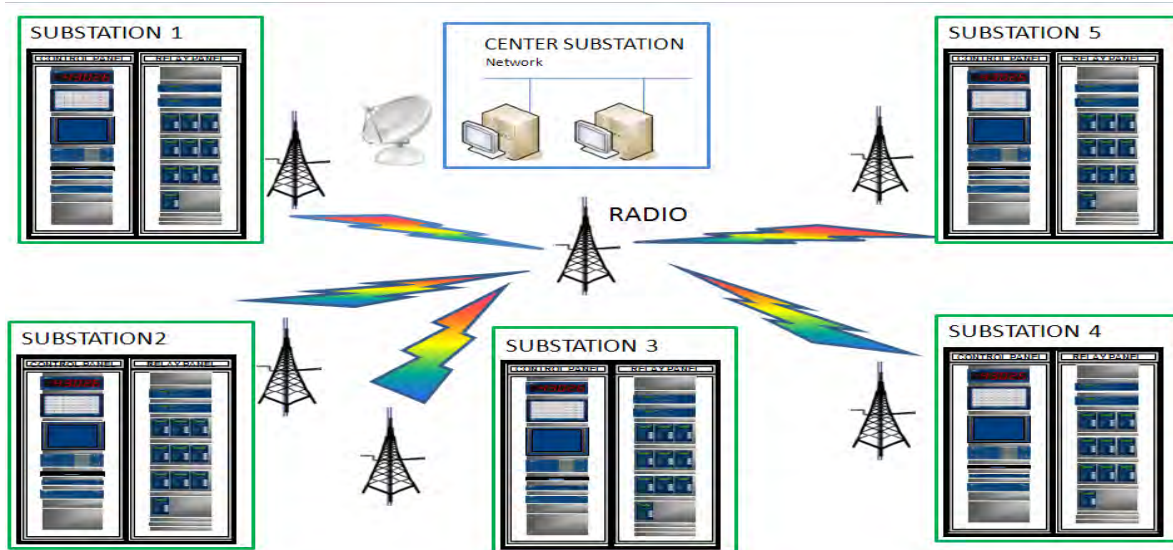
Applications for Wireless Automation

Installation of wireless devices provides a very cost effective solutions with features which are even not possible in wired systems. Wireless smoke alarms and wireless smoke detectors can be programmed in any zone between 1 to 999 nos. The power radio emitter attached with it gets activated by presence of smoke and then it sends radio waves to the panel. The panel automatically displays the same zone in which it has been programmed. If required, the programmed zones can be changed to another zone. There is also a inbuilt hooter in the detectors as well as radio emitter that functions with call button (manual call point).
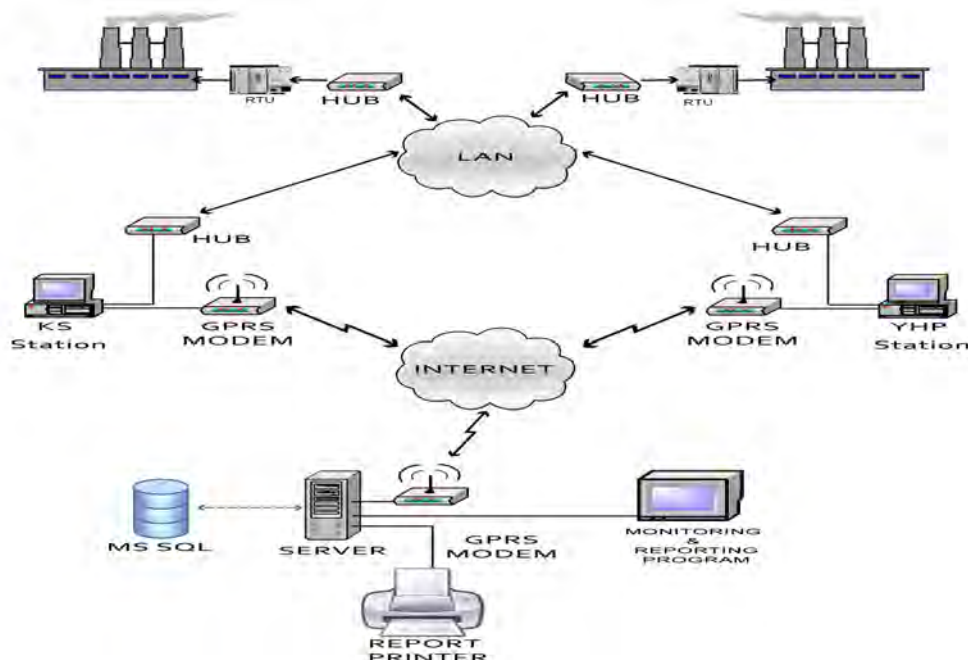
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# Automatic Meter Reading & Load Management Systems

Electricity metering automation at all the stages, from production to consumption, becomes fundamental to effective energy network operation in the modern market environment.

AK-AY offers customers the whole range of services in automation of metering:
- **initial investigation of sites;**
- **AMR system development planning works;**
- **supply of metering devices, including AMR system components;**
- **equipment mounting;**
- **initial testing activities and AMR complex introduction into service.**
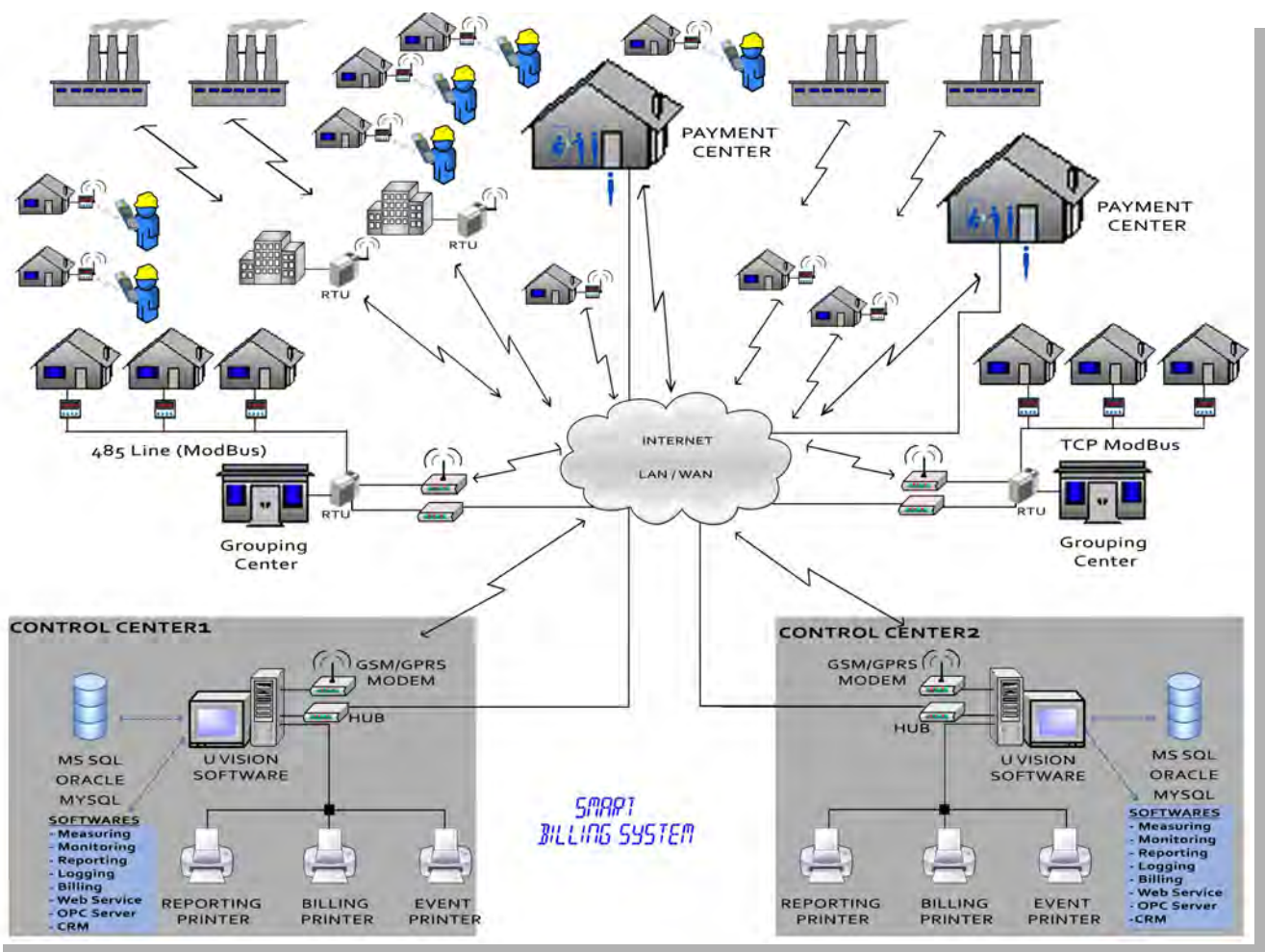
Industrial Enterprises AMR Systems
- **Electric energy metering automation for organization of accurate and true-to-fact calculating under several tariffs.**
- **Business units power consumption control.**
- **Price-functionality optimum relationship.**
- **Digital interface meters installation for commercial settlements organization and telemetric output meters for technical metering organization within the enterprise.**
- **Possibility of supervisory sensors plug-in.**
- **ATU (acquisition and transmission unit) data acquisition and transmission to information processing center via cable line at the distance of up to 1 km.**

Telemetry typically refers to wireless communications but can also refer to data transferred over other media, such as a telephone or computer network or via an optical link. AK-AY is able to design Telemetry Ground Station, Data Acquisition. Agriculture, water management, defense, resource distribution, medicine are somee of the applications of Telemetry Systems.

Applications for Telemetry Systems:

Agriculture
Most activities related to healthy crops and good yields depend on the timely availability of weather and soil data. Therefore wireless weather stations play a major role in disease prevention and precision irrigation. These stations transmit back to a base station the major parameters needed for good decisions: air temperature and relative humidity, precipitation and leaf wetness data (needed for disease prediction models), solar radiation and wind speed (needed to calculate evapotranspiration), and sometimes also soil moisture, crucial for proper irrigation decisions in order to understand the progress of water into the soil and towards the roots.
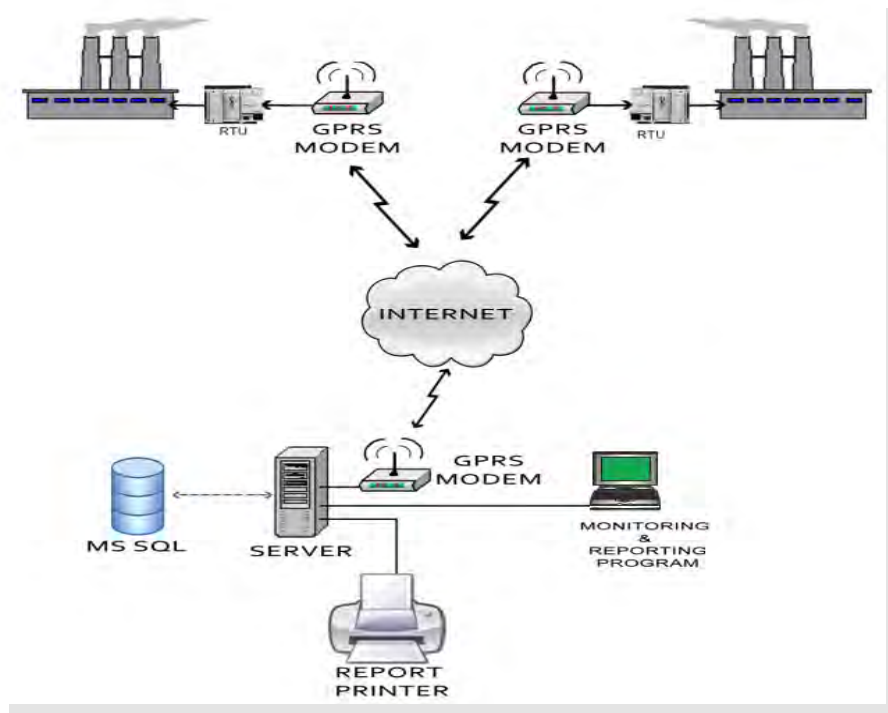
**Defense, space and resource exploration systems**
Telemetry is an enabling technology for large complex systems such as missiles, RPVs, spacecraft, oil rigs and chemical plants because it allows automatic monitoring, alerting, and record-keeping necessary for safe, efficient operations. Space agencies such as NASA, ESA, and other agencies use telemetry/telecommand systems to collect data from operating spacecraft and satellites.

Resource distribution
Many resources need to be distributed over wide areas. Telemetry is essential in these cases, since it allows the system to channel resources to where they are needed.

Medicine
**Telemetry also is used for patients (biotelemetry) who are at risk of abnormal heart activity, generally in a coronary care unit. Such patients are outfitted with measuring, recording and transmitting devices. A data log can be useful in diagnosis of the patient's condition by doctors. An alerting function can alert nurses if the patient is suffering from an acute or dangerous condition.**
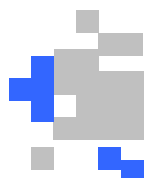
AK-AY

Natural Gas RMSA, RTU, SCADA

AK-AY ; Design and develop Total automation system & Local SCADA for Natural gas reduction & metering station for BOTAS (Natural Gas Distributor in Turkey) (RMS-A, RMS-B, MS) by Using Motorola MOSCAD RTU and SCADA.

- **Gas flow calculation by AGA NX19 Connects all models of Gas chromatographs and All model off Flow Computers Improved Alarm history in RTU and Local SCADA**
- **All calculated flow data are sorted in RTU memory and SCADA 3 modem connection (2 for BOTAS Master SCADA link and one for service dial-up modem)**
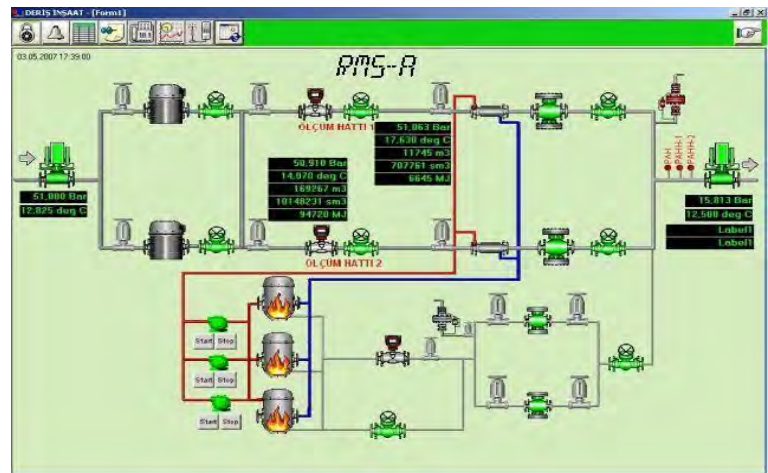
Water & WasteWater Management

The collection, treatment and distribution system for a metropolitan water and wastewater treatment and monitoring system typically covers hundreds or thousands of square miles. Water levels may need to be monitored on distant reservoirs and lakes, chemical treatments and flow rates controlled in multiple tanks and lagoons, pumps operated at lift stations and regulatory reports generated for local and national authorities. AK-AY has proven to be a leader in the design and integration of these systems throughout the world. It has the proven ability to operate over large networks with different types of communications. AK-AY's methodology is to utilize non-propriety, off-the-self components and deliver the system from our facility to yours ensuring a smooth transition.

AK-AY offers expertise and experience in all facets of:

Water supply SCADA and telemetry

- **Water treatment instrumentation and process control**
- **Sewage treatment instrumentation and process control**
- **Integrated control systems for water utility automation**
- **Hydrocarbon detection and industrial waste water treatment**
- **Tank, reservoir and basin control and instrumentation**
- **Flood warning systems**
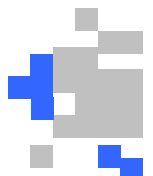
AK-AY

AKAY
SCADA

ENERGY MANAGEMENT SYSTEMS
POWER MONITORING SOLUTIONS
SUBSTATION AUTOMATION SYSTEMS
ELECTRICAL EQUIPMENT CONTROL/MONITORING
DISTRIBUTION AUTOMATION SYSTEMS
BUILDING AUTOMATION
TUNNEL AUTOMATION SYSTEMS
INDUSTRIAL FACILITY AUTOMATION SYSTEMS
SCADA SYSTEMS
WIRELESS AUTOMATION SYSTEMS
TELEMETRY SYSTEMS
OIL&GAS,NATURAL GAS, PRESSURE, MONITORING
WATER & WASTE WATER MANAGEMENT
AUTOMATIC METER READING SYSTEMS
LOAD MANAGEMENT SYSTEMS

AK-AY ELEKTRIK DIS TICARET KOLLEKTIF SIRKETI

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