Kontrolmatik is one of the leading company in Turkey in the fields of Process, Energy and Transportation. Thanks to dynamism and experience of our team, Kontrolmatik has accomplished plenty of very significant domestic and foreign projects in a relatively short time. In order to grow steadily as a multidisciplinary engineering firm and in the aim of extend our service sectors, we have formed partnerships with our solution partners who are expertise in their fields.

Thanks to this structuring, we ensure total solutions for Chemistry, Refinery, Oil&Gas, Energy, Petrochemistry, Food&Beverage, Environment, Information&Communication Sectors. We have flexible approach from Single Disciplinary Services up to Turn-key Projects. We provide a broad spectrum of services to industry including; consulting, feasibility studies, project management, multidisciplinary engineering design, construction management, procurement services, advanced process control, computerized plant information systems, software projects and support, plant start up and commissioning.

Being client oriented, high professional standards, total commitment, high efficiency make Kontrolmatik an ideal partner for your projects.
Kontrolmatik provides comprehensive project services: EPCM (Engineering, Procurement, Construction supervision and project Management), as well as TURNKEY projects. Whether it is design and construction of a new plant, modification or extension, we adjust our services to meet with the specific requirements of worldwide procurement, international financing and computer communication networking.

**Engineering**
Kontrolmatik brings together professionals with numerous years of consulting and engineering experience in: process, civil, structural, mechanical, piping, instrumentation and computer sciences. Stepping beyond our traditional strengths, we provide a high level of engineering and construction services to various market segments.

Modern techniques and computer aided engineering design tools play an important role in Kontrolmatik's engineering projects, facilitating the provision of unique engineering solutions.

**Procurement**
Kontrolmatik provides procurement services as required for project execution, in close coordination with its clients. The extent and scope of procurement services provided by Kontrolmatik are closely matched to project needs and client requirements.

These may include:
- Requests for quotation
- Evaluation of proposals and bids
- Preparation and follow-up of purchase orders
- Desk and field expediting
- Completion of recommended suppliers list
- Negotiations of final terms of purchase orders and contracts
- Contract implementation, including approval of interim and final invoices
- Expediting and quality control
- Supply coordination and transport

**Construction**
Kontrolmatik schedules construction activities to start concurrently with the design effort.

Kontrolmatik manages all aspects of construction site operations, providing tight contractor supervision and quality control. Construction is scheduled for execution in the shortest time and at minimum cost.

Kontrolmatik offers construction management or supervision solely in the construction phase of the project, as well as part of engineering services within the frame of overall EPCM responsibility.

**Management**
Project management and coordination are key factors in ensuring the successful execution of projects, and guarantee their completion within budget and schedule. Kontrolmatik’s project managers provide a focal point of authority and communications for the client's team and have prime responsibility for achieving project goals. Kontrolmatik’s project manager monitors progress and coordinates all efforts in engineering, procurement, construction, schedule, cost control, quality and risk management.

The combination of Kontrolmatik’s experienced, multi-discipline professional staff and advanced engineering methods, under the close monitoring of a project management system, ensure that plant start-up smoothly, provide quality products, are safe to operate, utilize raw materials and energy economically, easy to maintain, and friendly to the environment.
Kontrolmatik a multi discipline engineering organization

Kontrolmatik combines teams of experts in the following engineering disciplines:

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<td>Energy and power</td>
<td>Electrical design</td>
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Close coordination under a well established project management system enables Kontrolmatik’s engineering teams to achieve project objectives.

Process Design
- Feasibility studies.
- Process development.
- Process flow diagrams.
- Engineering flow diagrams (P&I).
- Equipment data sheets.
- Interlocks design.
- Controls definition.
- Safety requirements.
- Risk analysis.
- Operating instructions.

Instrumentation and Control
- Instruments specification.
- Panel's design.
- Loop diagrams.
- Hook up’s.
- Instrument layouts.
- Control system specification.
- Control system programming.

Mechanical and Equipment Design
- Equipment specifications.
- Detailed design of:
  - Distillation columns.
  - Storage tanks and pressure vessels.
  - Heat exchangers.
  - Process reactors.
  - Finite elements analysis.
  - Bulk materials handling systems.

Civil and Structural
- Infrastructure.
- Site development.
- Foundation and buildings.
- Steel and concrete structures.
- Industrial drainage systems.
- Sanitary and sewage.

Piping
- Piping studies.
- Plot plans equipment layout.
- Plans and elevations (3D model).
- Isometrics.
- Piping stress analysis.
- Materials take-off.

Energy and Power
- Feasibility studies.
- Heat and power calculations.
- Consulting and performance analysis.
- Energy saving studies.
- Energy conservation projects.
- Energy systems simulation and optimization.
- Utilities systems design.

Electrical
- Power supply systems.
- One-line diagrams.
- M.C.C design.
- Lighting systems.
- Grounding and lighting protection.
- Power generation.
- Public address systems.

Computer Aided Engineering
- Kontrolmatik operates a great number and variety of state-of-the-art computer programs, to assist its engineers in providing optimum engineering solutions in every discipline.

The principal computer engineering programs in use at Kontrolmatik:
- 3D Piping design: “Autoplant”, “Cadam”
- Piping stress analysis: “Simflex-S”, “Ceasar”
- Civil structure: “Atir”
- Process equipment: “Fabricator”
- Instrumentation design: “CIMS”
Kontrolmatik with his solution partners provides service in oil refineries industry and gained experience in the design of most refinery operating units:
- Atmospheric/vacuum crude units
- Visbreaking
- Reforming (Conventional and CCR)
- Hydrodesulpherization
- FCCU
- Sulphur recovery and TGT
- Alkylation
- Isomerization
- Dimersol unit
- Tank farm and blending
- LPG storage unloading/loading stations
- Utilities and others

We have successfully implemented instrumentation and control modernization and revamp projects of entire refineries and gas industries in several countries.

Kontrolmatik offers specific know-how in:
- Tank farm design, including sophisticated controls and monitoring systems
- Expert consultation on overall refinery and production unit layouts, and detailed design
- Advanced control of refinery units using multi variable predictive constraint control algorithms
- Gas storage facilities, off-gas compression
- Natural Gas Pipeline transportation and distribution stations

The increasing demand in the plastics industry for raw materials has led to growth in the petrochemical industry, to supply this demand.

Kontrolmatik team has gained substantial experience in design of various petrochemical and polymers processes.
- Ethylene revamp and de bottlenecks
- Polypropylene
- Propylene/Propane super-fractionation and purification
- VCM (Vinyl Chloride Monomer)

A considerable number of projects have been carried out under EPCM and TURNKEY contracts.

Among the carried and engineered large variety of production facilities and plants, we can list:
- Inorganic & organic chemical processing plants
- Continuous & batch operations
- Herbicides and Pesticides
- Bromine compounds
- Bleached phosphoric acid
- Sodium
- Various fertilizers
- Animal food additives
- Fragrances
- Clean rooms for pharma
- Sterilization & clean piping systems
Kontrolmatik has gained proficiency in energy systems evaluation, design and construction, and places this experience at the disposal of its clients. Kontrolmatik provides services for small energy plants as well as for large electricity production units.

Kontrolmatik has executed a considerable number of successful energy conservation studies and projects. Kontrolmatik’s experience encompasses systems such as:

- Energy saving studies
- Steam boilers
- Compressed air
- Cooling systems
- Electricity productions units
- Automation Systems (PLC, DCS, SCADA, BOP)
- Waste Heat Recovery Technologies

The company has significant capability on the following power plants:

- Single cycle
- Combined cycle
- Co-generation
- Gas
- Oil
- Coal
- Renewable

Kontrolmatik have realised many electric & automation systems in energy transmission and distribution with success by using reliable products, intelligent electronic devices. We are capable to do following items.

**Automation Systems**

- Up to 500 KV substation automation
- SCADA systems
- Remote Terminal Unit (RTU)
- IEC61850 applications
- Power plants TEIAS and RTU communication solutions

**Electric Systems**

- Protection on energy transmission & distribution lines
- Primary/secondary field performance tests

**Transportation**

In transportation below services have been given for many significant metro and tunnel project.

- Automation Systems
- DCS, PLC, SCADA
- Jet fan air conditioning systems
- Control systems for lightening, traffic signalization
- Energy supply and control with medium voltage units
- I/O panels & equipments
- Field supervision
- Commissioning

**Environmental & Waste Water Treatment**

- Solid & Underground Water Treatment
- Industrial Waste Water Treatment Plants (vWTP)
- Process Control for WWTP
- Industrial Solid Waste Treatments
- Aqua Pure Technologies (Innovative non thermal plasma technology solution for advanced oxidation process)
- Air Pollution
- Lextran (Advanced clean air solution)
- Biological Treatments with Activated Sludge
- Waste to Energy Units
- Water Desalination Projects
- Environmental Surveys: Risk Assessment, Professional Literature Surveys

**Center of Excellence**

**Team Spirit**
Control Systems

With its ability to work on standard computer hardware, in addition to control systems such as DCS, PLC as well as capability to convert all control parameters into visual control tools, SCADA software makes it possible to expand the system to meet changes in future requirements.

Based on open protocol, SCADA is hardware and manufacturer independent and therefore capable of expanding to meet future requirements. It contributes to facilitating reporting and detailed analysis, minimizing faults, evaluation and improvement on energy efficiency and system performance.

PLC Systems

PLC offers maximum speed and efficiency in production processes and an ideal solution for a multitude of automation needs; from simple to complex that require high performance, low cost and flexibility. ABB’s ACS500 automation platform for PLC applications is capable of meeting these ever increasing customer requirements. With its scalable architecture, ACS500 secures your investment. Managing more than one field bus with a single control system, user-friendly structure, easy configuration and ample communication possibilities are other significant advantages provided by ACS500 PLC to our customers.

Compact DCS Systems

Compact and scalable DCS systems—in addition to providing powerful automation functions—present low cost advantage for hardware and software. Ensuring minimum engineering and maximum automation facilities, ABB Freelance compact DCS systems have open and modern system architecture. With its distributed architecture installed at the field by controllers, it can effectively reduce cabling costs. Freelance requires single software for application engineering, commissioning and fault finding and therefore can be fully integrated into field bus management control system. Visual components pre-engineered for operators are one of many advantages to users.

Advanced DCS Systems

Advanced DCS systems are used for accessing multiple applications and multiple data from any workstation located at any point at the power plant. ABB System 800xA advanced DCS systems increases productivity as well as decreasing risks and costs.

Integrated engineering infrastructure of the System 800xA minimizes complexities from planning to configuration and from library management to commissioning, and offers savings by supporting lifespan of automation projects. Compliant with IEC 61508 and IEC61511, System 800xA provides security for the entire system and minimizes the risk ratio. Powerful reporting feature enables reporting by processing any process related information. The advanced planning feature of System 800xA allows a multitude of different requirements for increasing production, to be identified beforehand. Also, continuously monitoring the state of equipment in a power plant with System 800xA allows for preventive maintenance which is important to achieve investment optimization.

Advantages offered by System 800xA in energy production

- A platform that can meet future process and electrical systems requirements
- Capable of meeting IEC 61850 requirements
- User-friendly user interface
- Ability to access from any point outside the facility
- Quick fault analysis capability
- Outstanding engineering skills and quality
- Law budget operation and management
- Simple system architecture
- Unique technology and integration with existing systems

Advanced DCS Systems

Base System

- servers

System Workplaces

- Panel 800

Extended Operator Workplaces

- High Integrity Controller

ABB and 3rd party PLC & DCS

Fire & Gas

Shut-down

Variable Speed Drive

Motor Controller

Power Automation

Process Electrification

Process Instrumentation

Safety

PLC & DCS

Extended System

Plant Network, ERP, CMMS...

Field Networks

PROFIBUS / PROFINET / Modulebus / DeviceNet

PROFIBUS / Foundation Fieldbus / Modulebus

MODBUS

Panel 800

KONTROLMATIK Energy, Process, Transportation

Energy, Process, Transportation KONTROLMATIK 13
SCADA (Supervisory Control and Data Acquisition) system basically consists of human-machine interfaces (HMI), host and client computer systems, remote terminal units (RTU), DCS and PLCs, various communication structures, and different instruments.

HMI is the interface that provides process data to the operator and therefore allowing the operator to monitor and control the process. RTU is the unit that provides connection with sensors in the process, converts sensor signals into digital signals and sends these signals upstream to the system. PLC is a configurable and flexible field device that performs similar functions locally.

Created as a visual control platform intended for all supervision, control and monitoring, SCADA can be present on one or more networks together with sub-systems mentioned above. This structure allows SCADA quick and easy access to process data and helps taking precaution against potential faults.

The entire control architecture covering a number of systems can be transferred to SCADA over DCSs; such as turbine and boiler control, cooling systems control, monitoring coal transportation line, switchyard and MCC panels, controlling condensers and analysing gases in a power plant etc.

In addition to control functions, SCADA offers many facilities such as monitoring events and alarms, examining and reporting information retrospectively, providing information to remote operators via GSM networks. Production report drafts required by electric utilities companies can be prepared beforehand with reporting function and automatically created at desired intervals (daily, weekly, monthly, etc.). Also, “predictive maintenance” can be made by monitoring operation times and alarms of actuators such as breakers, engines, pumps, valves located in the field.

In this way, faults which may occur can be estimated, and down times may be shortened. With Thin Clients or Web Clients, state of the system can also be monitored from any remote point outside of the plant.
Electric and automation systems in energy transmission and distribution

Sustainable & Innovative Technologies

Switchyards enable transmission of energy generated with quality electric infrastructure and automation, in an uninterrupted and secure way with minimum losses. Monitoring and control of the status of LV switches and power supplies, all MV circuit-breakers and disconnectors in main and sub-stations of distribution systems, monitoring the whole switchyard from a single central point controlling via SCADA are essential for security and continuous operation of the system.

Protection and control solutions we use in our systems are products that we choose for secure power transmission and distribution. ABB’s Relion product family provides the broadest product range for protection, control, measurement and supervision required for IEC and ANSI applications in power systems. Specific solutions have been used for various applications such as transformer protection, line protection and breaker protection.

Main elements forming the system
- Transformers
- High voltage panels
- Medium voltage panels
- Medium voltage relays
- Medium voltage breakers

Main applications
- Transformer protection
- Line protection
- Medium voltage panels
- Breaker protection
- Power system automation

System architecture

Protected & Innovative Technologies

KONTROMATİK Energy, Process, Transportation
MCC panels are panel systems where engine main feeding units and control devices are located. Control devices such as PLC and DCS and other devices required for SCADA and communications infrastructure are found in control section of the MCC panel. Panels are important components of the system and are supplementary in projects we implement. For all systems that we install, Kontrolmatik can produce type-tested distribution panels including form 4-B, MCC Panels (Motor Control Panels) and Motor Driver Panels up to 400 Kw within our own capacities. In accordance with IEC 60439-1 standard, we separate functional sections from each other within the panels with form applied LV Distribution and MCC panels, in order to increase the safety of personnel and facilities. For custom applications, we can produce panel applications with IP66 protection class as well as UL50 certified panel applications in accordance with American standards. We use RAL7035 and RAL7032 colours as standard. We use custom-designed bus systems for power distribution systems and especially MCC panels.