



Solutions for Mining

Open Pit Excavation
Underground Excavation
Material Handling Systems
Material Loading System
Crushing System
Ventilation System
Auxiliary Systems
Facility Management

Solutions in Mining!



Open Pit Excavation



Underground Excavation



Material Handling Systems



Material Loading System



Crushing System



Ventilation System

We design and implement system solutions with brandname equipment and know-how process expertise which we integrate through our automation solutions. Our long experience in servicing equipment and plants, is built into the plant design.

ELCOM engineering services are tailored to suit the requirements of our customers and can either involve into the design and optimization of the total process or be focused on a particular section of the process.



Automation & Controls

Distributed Control System
SCADA & Telemetry

Power Distribution

LV and MV Power Distribution
Electrical Substations

Continuous Excavation

Bucket Wheel Excavators
Excavation Supervision & Control

Material Handling System

Belt Conveyor Systems
Conveyor Bridges

Material Loading System

Train Loading System
Truck Loading System

Crushing System

Crushing & Grinding Solutions

Ventilation System

Mining Ventilation System

Auxiliary Systems

Water Treatment Plant
Pumps and Drives
Instrumentation Solutions

Facility Management

Electrical Power Systems
HVAC, Security
Central Plant
Facility Management System

Services and Support

Solutions for Mining

ELCOM is a **System Integrator** and our solutions for Mining, from raw materials excavation and transport to process managing and flexible mine operation with automated process control are there to provide maximum flexibility and efficiency.

We offer comprehensive operation and maintenance services including:

- Engineering
- Manufacturing
- Delivery
- Integration and tests
- Full commissioning
- Training
- Support
- Lifecycle extension

Solutions in Mining!

In order to use the fossil fuels to the full capacity it is essential to organize all steps from extraction and transport up to refining in effective and cost efficient way. Excavation Supervision & Control system will be a crucial segment in achieving maximum efficiency and safety in onground or in uderground excavation.

Distributed Control System (DCS)

ELCOM DCS for Mining is a complete and powerful Distributed Control System designed to cover all needs during the entire mine life-cycle. We focus greatest attention to selection of component parts with high reliability, redundancy and diagnostic checks for all those elements and/or components which are relevant for the purposes of the safety integrity. The redundancy of the modules and of the communication bus is always provided as a basic functionality of the system. A careful audit of the operator actions and a flexible and precise management of the mine alarms, carried out by the control room operator workstations, enables customers to focus daily operations on both functional and security aspects. Our DCS manages various type of LAN and WAN connectivity (wired and wireless) in order to link all system control nodes, all other field equipment and other interconnected systems.

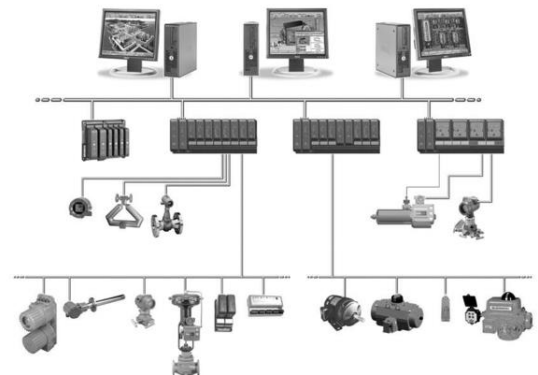


Completely scalable, flexible and tailor made product suitable for various implementations and easy to adapt to customer needs and requirements both in terms of system architecture and in terms of I/O size, as well as performing control and regulation functions, DCS can be equipped with proper add-on to cover in a fully integrated solution specific requirements in terms of security (SIL 3, according to IEC 61508 and IEC 61511), fire detection and gas leakage detection (F&G) and fire extinguishing.

SCADA & Telemetry

Our SCADA & Telemetry system offers maximum functionality and a user-friendly user interface. With this configurable and scalable system, you have the advantage of absolute openness to both the office environment and to production. An integrated process database and mine Intelligence, for example, ensure transparency in production. Numerous options and add-ons extend and expand the scope of performance.

We offer SCADA systems on different platforms of different manufacturers such as Siemens, ABB, Schneider-Electric...It is up to customer or us to decide which platform is the best for each specific case.



Low and Medium Voltage Systems and Solutions

ELCOM offers complete engineering, supply, manufacture, delivery to site, installation, commissioning, testing, and ensure the quality of the complete control and electrical system of your power facility is at the highest level. We offer complete Low and Medium voltage solution compiled with IEC standards with instrumentation, control and electrical system integration for mines. We use innovative brand name products in low and medium voltage electrical range of equipment for producing a reliable and safe system for distribution of electrical power.

Low Voltage Systems & UPS

ELCOM low voltage switchgear provides centralized control and protection of low voltage power equipment and circuits in industrial, commercial, and utility installations involving generators, motors, feeder circuits, and transmission and distribution lines. In the range of Low Voltage and UPS we offer by compiling the (IEC) standard for supply system in the range of 50–1000 V AC or 120–1500 V DC and extra low voltage for AC < 50 Vrms and DC < 120 V with turn-key solution.



Medium Voltage Systems

Medium voltage systems are custom engineered for distribution over wide range of medium voltage switchgear as for starting, synchronizing and paralleling power sources and motor control. Compact and quiet modular design assures easy application for any needs. Our systems are available for Medium Voltage applications from 1 KV up to 35 KV.



Substations with Automation & Control

Our prefabricated substations and automation system ensures grid stability and protects and controls substations with IEC 61850 protocol. We use brand name protection relays and measurement devices for integration into complete substation Power Control System (PCS).



ELCOM solutions for **Electrical Systems** and **Power Distribution** are precisely tailored to your requirements. We offer individual services and complete range of Power Management Solutions for LV and MV distribution systems.

To find more about our references visit:
www.elcom.ba

Solutions in Mining!

Whether open pit or underground, continuous excavation requires relentless, dependable control and flexibility. Our extraction solutions deliver dependable and flexible productivity.

Bucket Wheel Excavators

Bucket Wheel Excavators are continuous cutting machines for soft to semi hard materials like clay, sand, gravel, marl and their blending's as well as lignite and hard coal. The excavator can be found at the first place of conveying chain and is connected to a belt conveyor system with or without a Mobile Transfer Conveyor intermediately installed or a cross pit spreader transferring the material to the waste dump or the raw material stockpile. ELCOM excavator control system is used for the automation of the excavation process with bucket-wheel excavators.

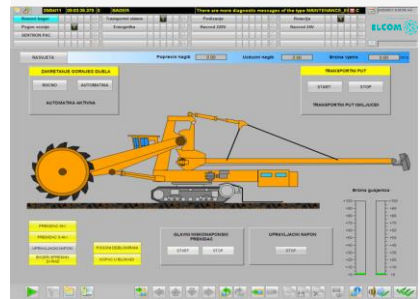
Bucket Wheel Excavators usually function at their best when they can rapidly extract high volumes of material, but without exceeding their mechanical stress limits. Only experienced operators are capable of precisely fulfilling these processing goals. ELCOM has succeeded in automating the whole process of digging. Process parameters need to be entered by the operator only at the beginning. Then a computer model directs the bucket wheel to follow the optimal track, thereby helping the operator to increase his productivity. The objectives are: even loading of the conveyor belt, minimum of idle operation forming of stable slopes, even subgrade.

We engineer and implement customized solutions and during the project development our team prepares solutions with shortest possible times for retrofitting mining equipment.

Within the scope of the project the whole electrical and mechanical engineering, equipment is reconstructed and modernized. There are retrofit activities including the replacement of the medium-voltage and low-voltage switchgear as well as the control system. The basic structure of the of the machine is kept, and the electrical and control equipment is replaced by new systems. as well as regulated drive technology.

The decentralized sensor system is completely replaced and made suitable for PLC. Hoisting gears, slewing gears and travelling gears are equipped with frequency converters. Bucket wheel and belts are adjusted to drive technology on the basis of slip ring motors and robust cast-iron binary-coded motor starters.

In order to alleviate the operating of the excavator the new operator cabin is equipped with ergonomic operating units, flat screens as well as video equipment and air conditioning.



Technical key data

- Medium-voltage switchgears**
- Power transformers**
- Low-voltage switchgears**
- Controls and visualisations**
- Field bus systems**
- Decentralised periphery**
- Frequency converter/cast iron**
- Binary-coded motor starters**



Material Handling System

ELCOM supplies complete Belt Conveyor Systems. We offer complete scope, from mechanical, hydraulic and electrical systems to full Raw Material Handling system.

Raw Material Handling systems are an integral part of a complete material flow and quality management system. Raw Material Handling at utilities requires specialized technology and equipment from unloading and transport control to fire protection.

With fully automated operation from a central control room where operator knows at any time how much material, in real time, is going to stockpile and by tracking tonnage and quality he has a complete overview of the process.

By controlling transporter speed and knowing the state of the conveyor belts with measurements and sensors which send a feedback to the control system with closed control loop a complete system gives outstanding performance.

Raw Material Handling System overview:

- Belt Conveyor Systems
- Conveyor Bridges
- High Precision Electric Belt Scale
- Automatic Sampling System
- Spraying & Dust-suppression System
- Antifreeze Spraying System
- Dust Inhibitor Spraying System
- Stockpile Activ Feeder
- Stockpile Monitoring System
- Drives and Measurements



Train & Truck Loading System

Train & Truck Loading Systems are systems for loading particulate material such as clay, sand, gravel, marl or coal into trains or trucks which can handle a variety of rail wagons or trucks of different capacities and types. Loading process is with high accuracy with tolerance 0,1% and allows a variation in material size and bulk density. Loading system pre-weighs each load prior to depositing the load into the moving wagon or standing truck with integrated calibration system, which operates via a SCADA system. Our loading facility is equipped with complete electrical, mechanical and hydraulic systems .

Surge Bin

The surge bin is a cylinder-cone structure lined with slide promoting, wear resistant plates ensuring smooth mass flow while preventing caking and clogging.

Charging Gate

The charging gate under the surge bin is a hydraulic quad-parting slide gate.

Weigh Bin

The Weigh Bin is connected with the steel structure through 4 digital load cells.

Load cells

The Load Cells are digital components with a high anti-interference capacity and precise weighing capabilities.

Discharge Gate

The discharge gate under the weigh bin is a fully sealed hydraulic bi-parting slide gate with misaligned upper and lower blades.

Horizontal Sliding Telescopic Chute

This Horizontal Sliding Telescopic Chute has the function of flattening the coal surface. The telescopic chute is controlled by a digital hydraulic cylinder with a built in linear displacement sensor which monitors the chute height and ensures the system's safety.

Control System

ELCOM automation and control system is done with visualization and monitoring over the PC operator station which have uninterrupted power supply. Automation and control system is based on PLC's with industrial communication and networks which integrate every part of the coal handling and coal loading systems.

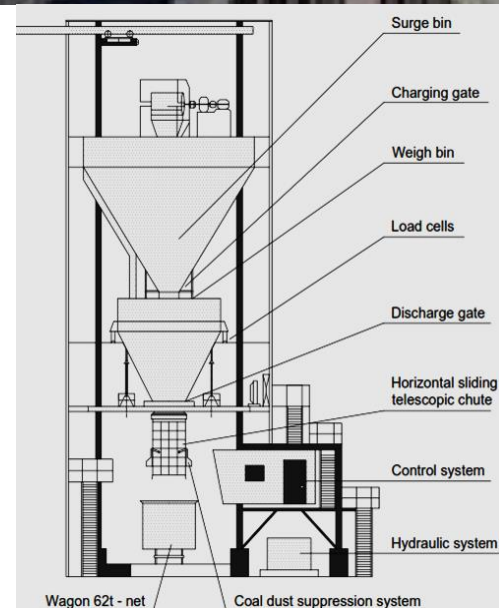
Control system is centralized and process is controlled from one central command room. Monitoring of the entire load out process from a remote location is also available. ELCOM provides full automation that require no additional human intervention once the loading process has been initiated. The control system monitors and consistently loads each rail car automatically. ELCOM can combine the control for the load out and reclaim into one common and well-engineered system.

Hydraulic System

The Hydraulic System is a closed tank structure and cannot be influenced by the external environment. The system possesses complete real-time monitoring of pressure, level, temperature and clogging while communicating with the Control System.

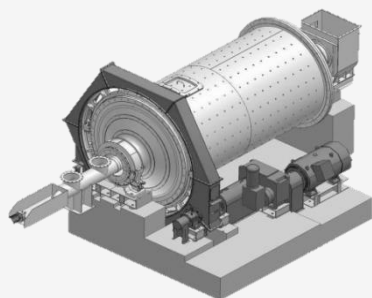
Coal Dust Suppression System

The system is widely utilized for the spraying by large spray guns, dust protection and suppression for transport vehicles and coal yards, coal stockpiles, raw material fields.

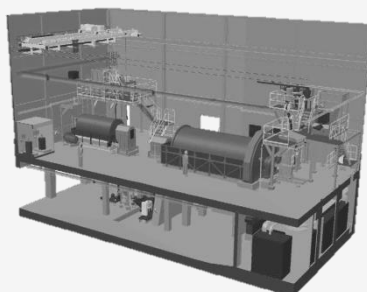


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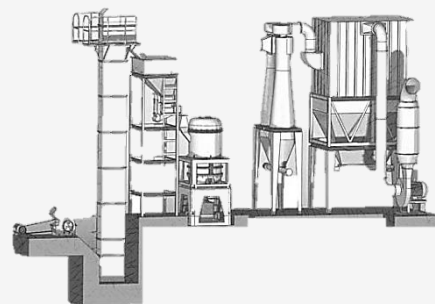
Crushing & Grinding Solutions



Product upgrade



Equipment



Engineering

Automation

Services

We study and analyze the process requirements and operational data which may require a process audit to assess key parameters and process dynamics. Motor control (MCC) facilities need to be designed, to ensure motors for conveyors, pumps and different drives can be controlled with high reliability and for better energy efficiency most of motors require variable speed drives. Control of drives is based on mass balances.

The instrumentation which is required to effectively control your process is chosen. This step requires engineering experience in process control and process instrumentation, so chosen instruments are fit for purpose as they may vary greatly in price and performance. We recommend advanced instruments only where we know it is required for effective process control. We have supplier agreement with several leading suppliers, allowing us to offer instrumentation at competitive prices. Our process control system ensures the choke feeding of crushers, camera and software instruments for particle size measurement of crusher feed and product, power draw measurements, automatic crushing gap monitoring, the detection of screening deficiencies, all contribute to maximizing the plant performance. Milling is normally the highest cost of the entire process and grinding efficiency decides mineral recovery. ELCOM has the know-how in controlling them, whether they are large autogenous mills, ball mills or the latest generation of fine grinding equipment with maximum grinding efficiency, followed by grinding size distribution measurements with the classification system.





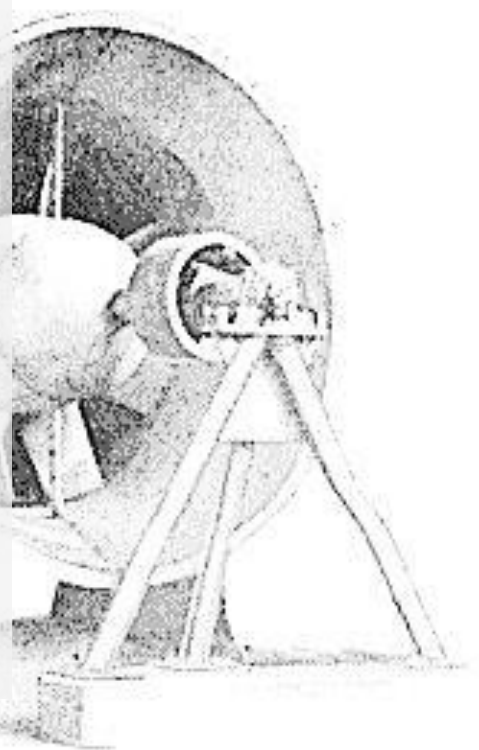
Mining Ventilation System

A well designed and properly implemented ventilation system will provide beneficial side effects that enhance employee safety, comfort and health.

In planning of ventilation system, ELCOM scope extends across the entire chain. It begins with base and detailed design, engineering, project management, installation and commissioning of complete ventilation system for mines. The quantity of air which needs to be to circulate to meet all health and safety standards must be calculated by a study. Once the quantity required has been fixed, the correct size of shafts, number of airways, and fans can be determined. As fresh air enters the system through the intake airshaft(s) or other connections to the surface, it flows along intake airways to the working areas where the majority of pollutants are added to the air. These include dust and a combination of many other potential hazards, such as toxic or flammable gases, heat, humidity, and radiation. The contaminated air passes back through the system along return airways. In most cases, the concentration of contaminants is not allowed to exceed mandatory threshold limits imposed by law.

Monitoring system for underground excavating gives a high importance to safety. The emergencies that may affect or be affected by the ventilation system are mine fires, sudden gas outbursts and power failures. It is common to provide a diesel-powered backup fan to ensure a small airflow through the mine under these conditions.

Ventilation surveys which include airflow, contaminant and temperature measurements are undertaken on a routine basis to meet both statutory requirements and to provide a continuing measure of the effectiveness of the ventilation control methods used. Important parameters such as main fan operation are monitored continuously. Some degree of automatic control is possible where a critical contaminant is monitored continuously and, if a pre-set limit is exceeded, corrective action can be prompted. More detailed surveys of barometric pressure and temperatures are undertaken less frequently and are used to confirm airway resistances and to assist in planning extensions of existing operations. This information can be used to adjust the network simulation resistances and reflect the actual airflow distribution. Refrigeration systems can also be modelled and flow and temperature measurements analysed to determine actual equipment performance and to monitor any changes.



Water Treatment Plant

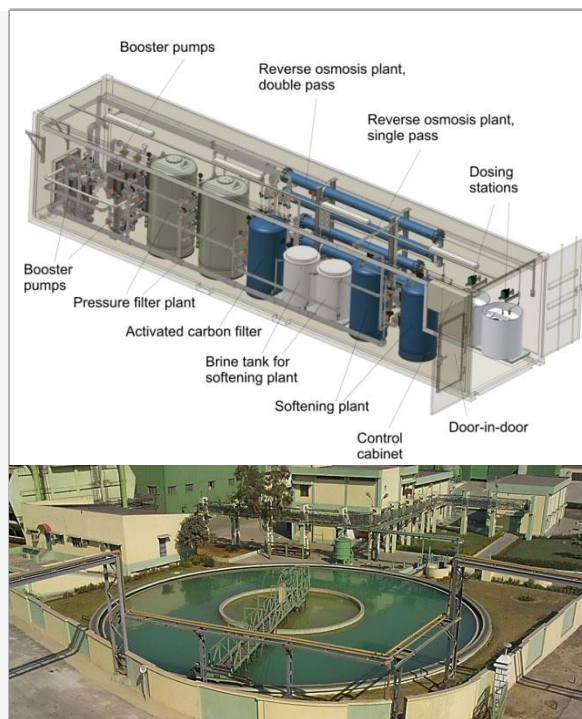
Hardness, salt and all minerals which are a threat for the mechanical parts of the mine need to be removed from the water which is going to the boiler and that is done by a water demineralizing treatment mine (DM).

A DM mine generally consists of cation, anion, and mixed bed exchangers. Any ions in the final water from this process consist essentially of hydrogen ions and hydroxide ions, which recombine to form pure water.

Industrial Wastewater Treatment

covers the mechanisms and processes used to treat waters that have been contaminated in some way by anthropogenic industrial or commercial activities prior to its release into the environment or its re-use. Most industries produce some wet waste although recent trends in the developed world have been to minimize such production or recycle such waste within the production process.

We offer complete system solutions for Water Treatment .



Pumps and Drives

We deliver Pumping Solutions for Water Applications from brand name manufacturers .Based on our experience, we help you to transport and treat water and wastewater according to most stringent requirements. Pumping solutions for water transport and supply, desalination, water reuse and waste water treatment.

Everywhere where large drives and electric actuators are required in Mining and infrastructure, ELCOM offers the ideal solution with precise calculations and experience that are combined to offer an optimal drives system.



Instrumentation Solutions

ELCOM offers wide portfolio of measurements, including standalone instruments, smart sensors and integrated measuring and analyzing systems from brand name manufacturers.

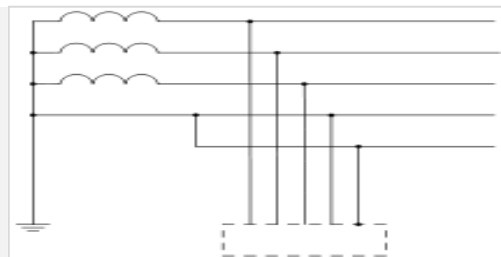
Analytical Instruments and Sensors, Field Instruments Configuration Tools and Accessories, Flow Meters, Pressure Transmitters, Process Level Sensors Recorders and Data Acquisition, Temperature Transmitters & Sensors.



Facility Management is a system designed to monitor and control the Electrical Power Systems, security, fire and flood safety, lighting (especially emergency lighting), HVAC control and ventilation systems in a facility.

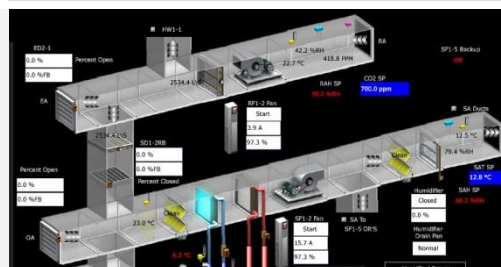
Electrical Power Systems

Power Distribution in Facility
Lighting
Cable and cable trays
Communication and telephones
Paging and loudspeakers



HVAC

HVAC Units
Air handlers
Constant volume air-handling units
Variable volume air-handling units
VAV hybrid systems



Security

Video surveillance
Access control
Security alarms
Fire safety system



Central Plant

Chilled water system
Condenser water system
Hot water system



Facility Management System

Centralized control center
for management of the facility



To find more about our references visit:
www.elcom.ba

Solutions in Mining!



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Services

Our scope extends across the entire chain. It begins with base and detailed design, engineering, project management, installation and commissioning. This incorporates all the electrical, control and instrumentation equipment, from the electrical balance of mine to the substation and grid connection, and from the instrumentation and field devices to the distributed control system. Our unique engineering combines the understanding of process properties with a detailed knowledge of materials and equipment. These services help our clients minimize costs, improve efficiency, meet safety standards, and ensure that installations conform to operational and design parameters. We have carried out a wide range of projects, building large scale systems and using the best brands and the latest equipment for the mining industry.

We offer complete **Turn-Key System Solutions** with advanced and integrated technical solutions in the field of electrical, hydraulic, pneumatic and mechanical systems.

One of the specialties of ELCOM is engineering and realization of complete process control systems.

ELCOM expertise and system products are offered in next segments:

- Automation & Controls
- Power Distribution
- Continuous Excavation
- Material Handling System
- Material Loading System
- Crushing System
- Ventilation System
- Auxiliary Systems
- Facility Management

We offer comprehensive operation and maintenance services including:

- Engineering
- Manufacturing
- Delivery
- Integration and tests
- Full commissioning
- Training
- Support
- Lifecycle extension

Support

All of our support services can be combined into a tailor-made contract with a fixed-fee to help you meet your specific budget and service requirements.

We ensure the support you need when you need it.

Online support

- 24/7/365 Phone intervention for guidance and technical information.
- Remote desktop connection for urgent actions.

On-site support

With our On-site Services, ELCOM engineers can assist your maintenance staff with preventative and reactive tasks. Our team of experts is available as needed, regularly scheduled, or on a full-time basis to meet your specific needs and maintenance strategy.



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OHSAS 18001:2007



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Automation

SIEMENS