KYBERNETIKA, s.r.o., Košice
Company Profile

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## Basic Information

<table>
<thead>
<tr>
<th>Office:</th>
<th>Orgovánová 4</th>
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<tbody>
<tr>
<td></td>
<td>Košice</td>
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<tr>
<td></td>
<td>Slovakia</td>
</tr>
<tr>
<td>Established:</td>
<td>1992</td>
</tr>
<tr>
<td>Employees:</td>
<td>90</td>
</tr>
<tr>
<td>Goal:</td>
<td>Design, development and delivery of information, control and measurement systems, equipments and ensuring service</td>
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</table>
## Products

### Hardware
- Automatic assembly and test lines and devices
- Measurement and calibration systems
- Camera based inspection, measuring and monitoring equipment
- Computer networks
- Digital and analog electronics boards and systems
- Prototypes of special equipment

### Software
- Information systems
- SCADA systems
- Geographical information systems
- PLC control and HMI systems
- Diagnostic systems
- Intelligent communication systems
- Security systems
- Image processing software and camera systems
## Supported Technologies

### PLC level
- Rockwell Automation
- Siemens
- Schneider Electric
- Omron
- ABB
- Mitsubishi
- Honeywell
- BaR
- Panasonic

### Visualization level
- Wonderware (InTouch, Historian)
- Siemens WinCC
- Rockwell software
- Schneider Factory Link

### Databases
- Oracle
- MS SQL
- Ingres
# Main Partners

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>Customers</th>
</tr>
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<tbody>
<tr>
<td>Rockwell Automation</td>
<td>U.S. Steel Košice</td>
</tr>
<tr>
<td>Siemens</td>
<td>SSM Stražske</td>
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<tr>
<td>Schneider Electric</td>
<td>Magneti Marelli</td>
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<tr>
<td>Honeywell</td>
<td>Chemosvit FOLIE</td>
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<tr>
<td>Sick</td>
<td>U-shin Slovakia</td>
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<tr>
<td>Keyence</td>
<td>Mondi SCP Ružomberok</td>
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<tr>
<td>Festo</td>
<td>Stroptel Stropkov</td>
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<tr>
<td>Rittal</td>
<td>Volkswagen Slovakia</td>
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<tr>
<td>Weidmuller</td>
<td>SEZ Krompachy</td>
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</tbody>
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Activities

KYBERNETIKA, s.r.o., KOŠICE – areas of interest

Basic activities

- Research
  - Development
  - Design
- Services
  - Maintenance
- Production

<table>
<thead>
<tr>
<th>Basic and Applied Research</th>
<th>Integration of information, Communication and Control Systems</th>
<th>Information and control systems Application Software</th>
</tr>
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<tbody>
<tr>
<td>Cooperation with Research Institutes and Universities</td>
<td>Integration of Heterogeneous Distributed Systems</td>
<td>Systems for Product Quality Inspection</td>
</tr>
<tr>
<td>Design Equipment and Complex Systems for Production, Measurement and Product Inspection</td>
<td>Software, Hardware and Mechanical System Maintenance</td>
<td>Production and Testing Lines and Special Equipments</td>
</tr>
</tbody>
</table>
Areas of Interest

**Areas of interest**

- **Metallurgical industry** (U.S. Steel Košice, SSM Stražske, Obal-servis Košice)
- **Engineering industry** (Ocekon, Sigma Invest Olomouc, Metalex Brezno)
- **Electrical Engineering** (Invensys Trnava, Stroptel Stropkov, SEZ Krompachy)
- **Automotive** (Magneti Marelli, U-shin Slovakia, Getrag Ford, Volkswagen Slovakia)
- **Power engineering** (EVO Vojany)
- **Transport** (STD Donivo Vranov, tunnel Branisko)
- **Chemical industry** (Chemosvit Folie Svit, Henkel)
- **Ecology** (U. S. Steel Košice)
- **Telecommunication** (Czech Telecom, Slovak Telecom)
- **Pharmaceutical Industry** (Imuna Pharm)
- **Education and research** (TU Košice, STU Bratislava)
Examples of projects
Information systems
Company Kybernetika implements projects for all levels of information systems.
Usage
• Manufacturing information systems
• Registration information systems
• Sales information systems
• Special applications

Technologies
• client/server architecture
• thin client / thick client (ASP, PHP, JAVA, .NET, C#, VB…)
• third level architecture (database level, application level, presentation level)
• SQL databases (Oracle, MS SQL, DB2, Ingres, Informix)
• Oracle Designer, Oracle Developer
Process Information System KYVIS

**Basic modules**
- Power supply controlling
- Documentation management
- Digital Registry
- Customer
- Managerial information system
- Technological preparation production
- Purchase
- Sales
- Stock holding
- Production planning
- Quality controlling
- Controlling and evidence of production
- Cooperation
- Shipping
- Reports generation
- Communication with other systems
- System administration
Process Information System KYVIS

Merits
- Improvement of production evidence
- Saving of cost
- Survey about state and profitability of orders
- Survey and checking of material flow
- Survey about production capacities
- Increasing of operators and workers checking
- Survey about actually state of stocks
- Surety of data consistency
- Making better survey of information flow
- Improvement of documentation management
- Manager management
- Application of advantage technology
- The one system for production control
- System openness and possibilities to exceed
- Possibilities of connection with other systems
- Better time management
- Effective production planning
- Continuous production monitoring
- Minimization of „paper work“
Transport Information System

Basic modules:
- Trade - CRM (Customer relationships management),
- Contracts
- Dispatch module (board, GIS)
- Management, registration and evaluation of orders
- Fleet management
- Management of drivers
- Module for technical provision
- Digital map integration
- Digital archive
- MIS (Management information system)
- Link with surrounding systems (economic SW, Echotrack, UNICODE)

Standard client-server application on the basis of Microsoft SQL database technology, Microsoft.NET technology with utilization of map server from the company ESRI
Analytical and statistical systems

Output form

- measurement values process in a form of tables, diagrams and print records

- statistical evaluation and analyse of measured values
Manufacturing Information system

- production records
- root data
- business plan
- economy/management
- quality management
- production scheduling
- warehouse economy/management
- maintenance
- weighing server
- equipment supply point
- production evaluation process
Manufacturing Information System

Business plan
Manufacturing Information system

Production planning
Manufacturing Information system

Production scheduling
Manufacturing Information system

Warehouse economy/management
Manufacturing Information system

Production records
Manufacturing Information system

Workflow
Manufacturing Information system

Weighing server
Manufacturing Information system

SCADA
Material Flow Monitoring Systems

**Interfaces for database systems**
- Oracle
- MS SQL
- IBM – DB/2
- Ingress
- FoxPro
- AS400

**Diagram:**
- SCADA PL CRD
- SCADA GL CRD
- SCADA CS&SL CRD
- SCADA FPShop CRD
- SCADA SP CRD
- Ingres II
- Open VMS
- FoxPro
- Novell
- DB/2
- AS400
- Cisco Switch
- Router
- Level 3
- Level 2
- Connection to DATABASES
Geographic Information Systems
(Transport IS)

Advantages:
• Access within the entire intranet (access possibility via the internet)
• Multiuser access, individualization
• Unified and central data management
• Data integrity
• Information sharing and unification from all branches
• Access to the map with up-to-date location of vehicles
• Complete registration of drivers with driver’s current position/condition
• Monitoring of driver’s work time and work discipline
• Complete vehicle registration with monitoring of:
  - vehicle breakdowns and repairs
  - regular inspections
  - tyres with the number of km ridden at a given position
• Registration and monitoring of driving fuel consumption
• Registration of insured events
• Overviews of order condition and profitability
• Increased supervision of workers
• Overview of current condition of resources
• Making information flow more transparent
• Minimisation of paper work
The DCS data flow

- ALICE on-detector electronics
- Detector sub-systems
- External sub-systems

DCS data processing farm:
- 3000 values/s
  - Injected into PVSS

DCS data storage (ORACLE, fileservers):
- 1000 values/s
  - Written to ORACLE

Offline (GRID):
- >200 values/s
  - Sent to consumers

Operator UIs
SCADA Systems

Structure of the SCADA system
mutual relations, communications, combinations and requisite data accessing
SCADA Systems

Signal presentation
SCADA Systems

Outlines and statistics
SCADA Systems

Immediate dispatch note

Advanced dispatch note
SCADA Systems

Reports and visualization

Mapa zvitku pozitkovene / Card scrolls zindification

Onen, line: 012/4904073/198
Length: 70 mm
Width: 3,5 mm

Administration: A

Pozitkovene: 1,1-1,25
Pozitkovene: 2-1,25
Pozitkovene: 3-1,25
Pozitkovene: 4-1,25

Teplota prehriatych zon / Heat
sliding furnace

Polozenie akupaca / Input Brand: 510

Graf rýchlosti Reby / Line speed graph (m./min)

Graf oxidacnej pace / Oxygen furnace graph

Graf chlorovaci zon / Oxygen and moisture ace graph (m./min)

Graf oxidacnej pace / Sliding furnace graph

Graf oxidacnej pace / Sliding furnace graph

Graf oxidacnej pace / Sliding furnace graph

KYBERNETIKA s.r.o.
Automation systems Slovakia
Examples of projects
Monitoring, Inspection and Measuring Systems
Camera Systems for Products Inspection
Camera Systems for Products Inspection

**Basic properties:**
- Mitsubishi PLC controller
- Line CCD camera
- System resolution 0.01 mm
- Automatic detection of product inaccuracy
- Automatic shut-down control
- Communication with superior control system
KybVision general purpose camera vision system for inspection
KybVision General Purpose Camera Vision System for Inspection

Fuel lock assembly check system
Strip 3D Profile Monitoring Systems

Output visualization in SCADA

2D view

3D view
Examples of completed projects
PLC control and HMI
Reconstruction and system modernization

- inverter fed with 3 phase voltage 3X400V
- integrated technological card T400 with specialized software
- PLC and the inverter communication via PROFIBUS
- control touch panel Siemens TP-270 also communicates via PROFIBUS
Reconstruction and modernization of flying shears control system

Configuration of flying shears control system

- PLC system embedded in two racks
- two independent PROFIBUS networks for the inverter and for the touch panel – for the sake of safety
- there is an integrated technological card T400 in the inverter with specialized software
- four IRC sensors:
  - position of shearing mechanism
  - speed of balance wheel
  - position of pendulous mechanism
  - speed of motor for pendulous mechanism
Measuring and control of argon and nitrogen flow on transport vehicles

Visualization and control
Reconstruction and modernization of filling station for blast furnaces

- Control system PLC TSX Premium extended by a new rack
- I/O Peripherals Advantys communicating with PLC through TCP/IP
- Factory Link visualization communicating with PLC through Ethernet using EthWay protocol
- Operator station, serving to:
  - controlling technological devices (fans, pumps and clinkety-clanks)
  - Processing measurements of technological parameters in the blast furnace cooling system

Main screen
Modernization of thick shearing line

- Thick shearing line control
- PLC Siemens S7-300 control system with distributed peripherals and the control panel on Profibus
- Communication of PLC and PC on the Ethernet
- Servicing, management and configuration of the inverters using RS485
- Remote desktop management of the control system via modem connection
- Control and entering of requested parameters in technology using the control panel Siemens
Modernization of thick shearing line

- proposal of majority of mechanical parts (modification of decoiler and shears, centring cylinders, drawing and throwing cylinders, accelerator, piler)
- proposal and realization of electric installation of the entire line, installation of d.c. and a.c. drive, control system, control panels, position sensors
- application software (program) for line control and cutting with flying shears
- setting and drive optimization
Modernization of thick shearing line

Installation of contactors and softstarters for hydraulic pump and balance wheel

Inverter SIMOVERT for shears drive
SIMOVERT has installed a technological card for flying shears T400
Examples of completed projects
Production and Testing Lines
Assembly and testing line

Control System for Mobile Phone Testing Line
Label Lines for Mobile Phone Keyboards
Final Assembly and Testing
Final Assembly and Testing
Final Assembly and Testing

Final Assembly and Test Line
Final Assembly and Testing
SQUIB 90 Final Connector Assembly and Tester

Final Assembly and Test Line
Vision System for Product Inspection
Vision System for Product Inspection
Vision System for Product Inspection

Heat exchangers assembly check system
Production Line – Special Transformers
Production Line – Special Transformers
Stroptel Stropkov
Production Line – Special Transformers
Production Line – Air Intake Manifold
Production Line – Air Intake Manifold
Production Line – Air Intake Manifold
Lamination Line Marks Synchronization
Universal Test Equipment UTE PCB

Testing of Printed Circuit Boards
Telecommunications Devices Monitoring

Operator PC
- Third party app. using virtual port
  - Web Browser

MMI Server
- Web server
- Database
- MMI Server application
- Serial ports
- Network cards
- Modems

TCP/IP
- Helper PC
  - TCP <-> Serial port converter
  - MUX 32 (opt.)
- PSTN
Telecommunications Devices Monitoring

- System for telecommunication devices management and data gathering
- Working with Alcatel and Telspec PCM devices or new devices with plug-ins.
- Running on Windows Server
- Supports multiprocessor hardware
- Data are saved in SQL database
- User interface is standard web browser
- Working with new (by add-on modules) or built-in devices
- Adaptable to any SQL database
- Easy localization to other languages
- Devices are connected by modems, serial lines or TCP/IP network
- Creates virtual COM ports and path from operator PC to device for third party software
Telecommunications Devices Monitoring

Single phone line

Multiplexor MUX 32

Switches 1 serial line to 32
Power supply: 28V – 60V DC

Modem

Up to 32 monitored devices
Thank you for your attention