Automation Systems

Innovation, skill, expertise in automation and information technology

A team of skilled engineers able to supply hardware, software, start-up and services for every type of automation in Steel industry.
The partner in all the phases of the automation development

Through its OTO Systems Division, Fives designs, supplies and executes the commissioning of complete automation systems for brand-new plants or for existing ones as part of refurbishing projects.

Our extensive process knowledge combined with the application of cutting edge automation technology allows us to propose the most cost effective solutions that lead to increased productivity and improve quality while saving energy.

HARDWARE DESIGN

Fives’ OTO Systems Division utilizes primary brands hardware components available on the market and selected in accordance with the Users country standards.

The automation and the supervision systems are created with the aid of a wide set of hardware and software products from among the most widespread in the world, integrated with some products entirely designed and made by the OTO Systems Division.

SCOPE OF SUPPLY

- Power switchboards
- MCC switchboards
- Control desks
- Control & supervision software
- Diagnostic and troubleshooting software
- MES software

Complete systems hardware design using an advanced CAE System
SOFTWARE DEVELOPMENT

A turnkey system - programming using different hardware platforms.
We have experience with all the main types of hardware on the market.
Design of state-of-the-art PLC software to control the plant process with the use of customized algorithms and to manage sequences and cycles tailored to fully meet the users needs.

<table>
<thead>
<tr>
<th>PLC</th>
<th>Siemens</th>
<th>Simatic S7-400, S7-300, Simatic TDC, S7-1200, S7-1500, Safety CPU</th>
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<tbody>
<tr>
<td></td>
<td>Rockwell Automation</td>
<td>Compact Logix, ControlLogix L3x, L6x, L7x and Safety CPUs</td>
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<td></td>
<td>Mitsubishi</td>
<td>Melsec</td>
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<td>Pilz</td>
<td>PNOZ Multi</td>
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<tr>
<td>Remote I/O</td>
<td>Siemens</td>
<td>ET200S, ET200M</td>
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<td></td>
<td>Rockwell Automation</td>
<td>Point I/O, Flex I/O</td>
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<td>Fieldbus</td>
<td></td>
<td>Profibus, Profinet, Ethernet IP, Controlnet, DeviceNet</td>
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<td>Ethernet TCP/IP</td>
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<td>Programming Software</td>
<td>PLC</td>
<td>Simatic S7 Manager, Drives ES, Simatic NET, Tia Portal</td>
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<td></td>
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<td>ControlLogix 5000, RSlinx, Drive Executive</td>
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<td>SCADA</td>
<td>Wonderware Intouch, Siemens Wincc, Rockwell Factory Talk and RSView32</td>
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<tr>
<td>Programming language</td>
<td></td>
<td>KOP, AWL, CFC, SCL, VB, C++, Microsoft NET</td>
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TEST, START UP & AFTER SALE SERVICE

Internal technicians for all the phases of automation. A support to maintain the efficiency of your system:
— Technical assistance
— Spare parts
— Remote connection
— Revamping proposal
— Training for customers in classroom or on site
— Supervision of installation
Level 0-1
— Automation and Technological Control (Master Reference, Servo-Diameter, PIDs, etc.) and process parameters regulations.

Level 1-2
— HMI (Human Machine Interface) with customized mimic diagrams and guided troubleshooting of the entire plant failures.
— Adoption of Client-Server architecture making the system extremely reliable in case of any failure in the Client Hardware.
— Protection against Server data loss in case of hard disk failure by proper redundancy policy solution.

Level 2-3
MES – Manufacturing Execution System connecting shop-floor to Company ERP for:
— Production integrated management
— Materials Traceability
— Process Tracking
— Quality Management
— Document Management
— Warehouse Management
— Business Intelligence & Reports
**TUBE MILL AND TUBE FINISHING LINE**

- Hundreds of lines all around the world
- Packing line, handling of large diameter tubes, beveling, cut-to-length
- From 1 up to 24 inches

- The higher skill for top-level tube mills
- Drives
- Logics PLC
- HMI & SCADA system
- Cut Off Controller
- Tracking of tubes with interface to level 2 and ERP

**COIL CONTINUOUS PROCESSING LINE**

- Stainless and carbon steel pickling line, galvanizing line, coating line
- Turnkey system: Drives, Level_1, Level_2
- Up to 9000 I/Os and 163 drives per line

- Supply of the whole control system
- The highest level in integration
- Large DC-bus solution
- Structured Field Wiring with concentration into PLC remote I/O units
- Master Reference
- Production Tracking
- Line setup
SLITTING LINE

More than 50 complete lines supplied of various producers

Complete with strips packing lines & level 2

Full digital control automation with tension and speed regulation

High specialization from a long experience

Interface with all available machine and bundling equipment.
Integration with blade warehouse
Cut Assembly Plan tool option

Design state-of-the-art PLC software to control the plant process using customized algorithms

COLD ROLLING MILL

4 Hi-Mill, 6 Hi-Mill and Skin Pass Mill

Mathematical pass scheduling program, level 2 and MES

Roll Gap Control
Elastic Modulus
Thickness Feedback regulator
Feed-forward Regulator
Tension Compensation
Mass Flow Control

Large AC and DC motors application.
Revamping of existing mills
High Speed controllers and PLC integration

Mathematical Model and Recipe management.
Fast Data Acquisition and Data Base storage
APPLICATIONS EXAMPLES

**Six High Mill**
- 6 Hi CRM
- Max Exit Speed 1,000 m/min
- Entry Thickness 1.5 to 3mm
- Exit Thickness 0.25 to 0.8mm
- Width 835 to 1,100mm
- PLC I/O 2,700
- Main Drives 8
- Field cabinets 6
- Control Desks 6
- Control Boxes 14
- Supervision Clients 6

**HACPL - Continuous Pickling Line**
- Manufacturing capacity 500,000 tpy
- Thickness 0.4 / 6.00 mm
- Width 700 / 1,500 mm
- Coil Max Weight 35 t
- Quality pickled, skinpassed
- PLC I/O 9000
- Main AC Drives 163
- Remote I/O Cabinets 20
- Command Pulpits 6
- Command Boxes 68
- Fixed Speed AC motors 450

**CCL - Continuous Color Coating Line**
Manufacturing Capacity 240,000 tpy
- Strip Thickness 0.25 / 2.00mm
- Width 600 / 1,500
- Max Speed: 180 m/min - Process
- 240 m/min - Entry/Exit
- Inputs/outputs: 3,600
- Main Drives: 49
- Field Cabinets: 6
- Control Desks: 3
- Supervision Clients: 5
AUTOMATION DIVISION PROFILE

The OTO Systems Division was created in 1988 as an independent company from a wealth of varied and consolidated experience in the sector of industrial process automation with particular reference to metal processing.

Since then, the company has had continual technological growth, until achieving the state of the art technology.

Today it is a fundamental part of the Tube and Pipe Business Line, as a division dedicated primarily to the study and realization of automation for production plants in the metallurgical industry. It has considerably facilitated the acquisition and development of technological process know-how, enabling the formulation of decidedly innovative solutions.

In addition to providing automation systems, the OTO Systems Division offers proven experience focused on the design and manufacturing of measuring and control devices for laminated and tubular products aimed at improving the quality of the final product.

The OTO Systems division also boasts an IT division dedicated to the development of MES solutions for managing the flow of production data, the quality control system, product traceability, through to warehouse stock management (raw materials, semi-finished and finished products).