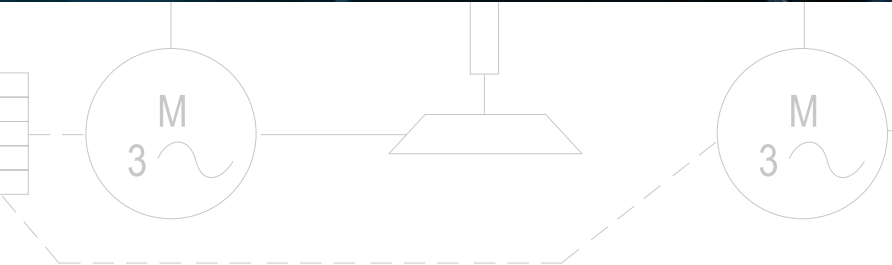
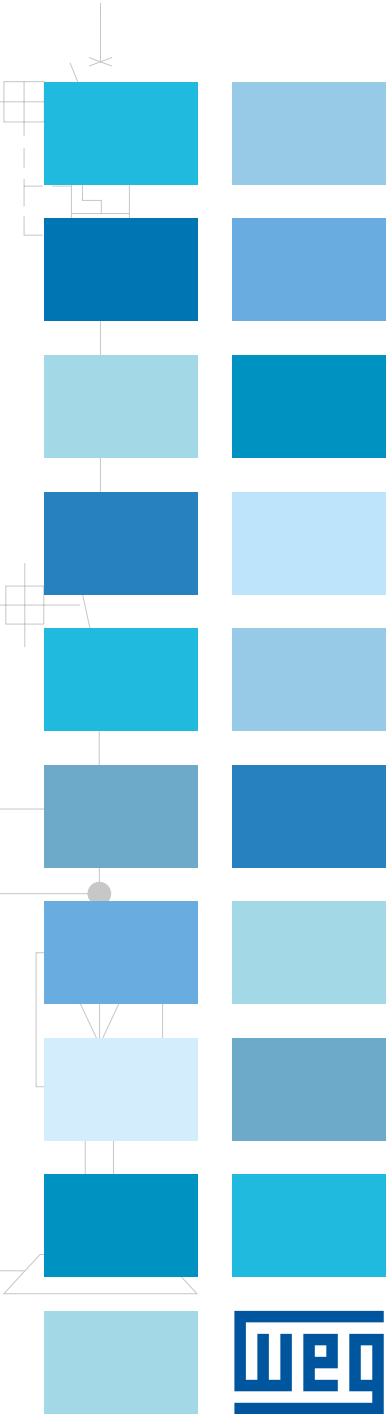


# Automation

## System Automation Solutions

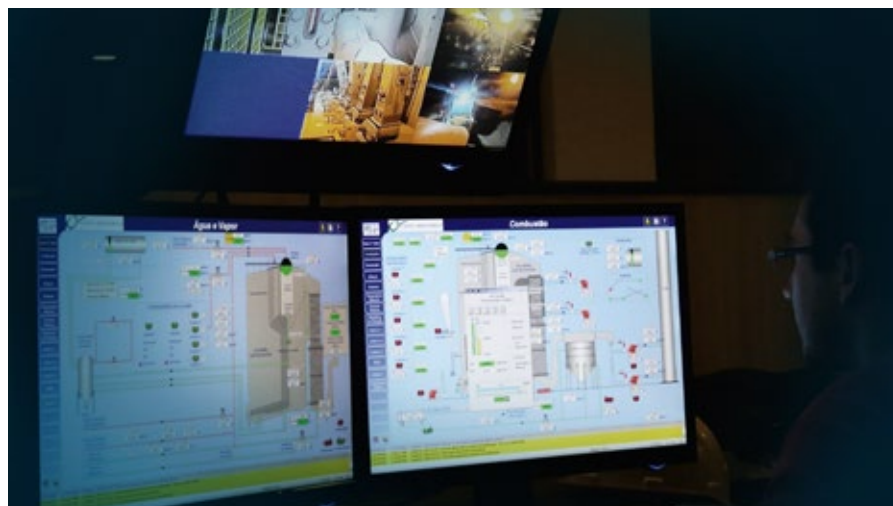


# System Automation Solutions

WEG control systems ensure high performance for industrial processes, ease of operation and productivity gains through cutting edge technology.



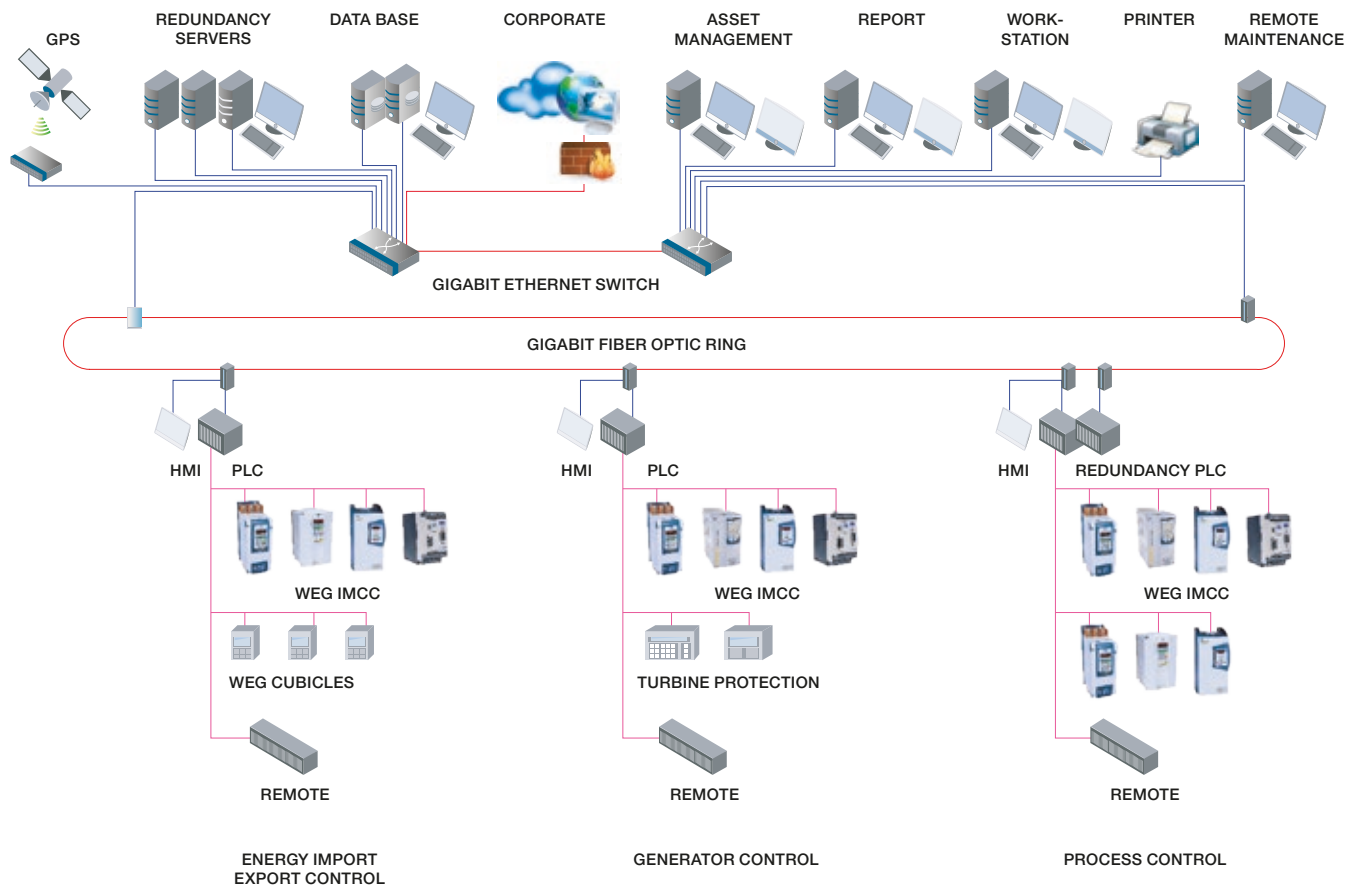
Currently the control of industrial processes requires automation systems with high degree of reliability and availability, a clear and objective operation and ease for maintenance teams regarding asset management. With 30 years of experience as a system integrator, developing software for PLCs and SCADA system, we rely on a solid team of engineers and specialists in industrial automation. The systems supplied by WEG fit a wide range of industrial activities, including: mining, energy, Sugar & Ethanol plants, chemical plants, steel, shipbuilding, machinery, Pulp & Paper. Modern and optimized solutions for a perfect integration at all levels of automation. There are more than 1,600 projects developed and commissioned throughout the world.



## Performance and Reliability for Industrial Process Automation

The increasingly competitive scenario in industry requires effective actions for increasing productivity and reducing costs. The key factor to achieve this goal is the availability of real-time process information. To meet these requirements WEG provides fully integrated systems, from field instrumentation to managerial levels of processes.

### Integrated Automation Architecture



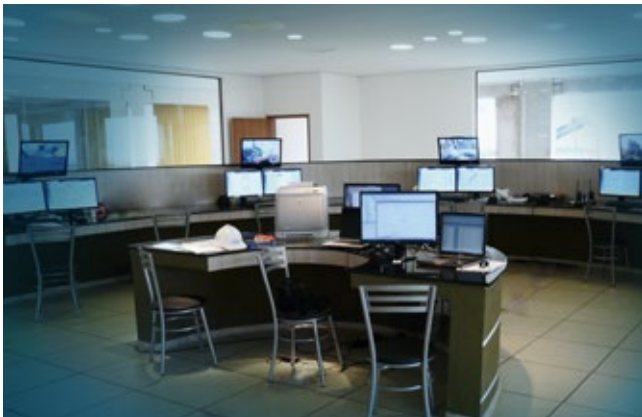
The success of this integration is in the synergy of WEG products, where motors, drives, generators, MCCs and cubicles are integrated using cutting-edge technology.

A solid automation engineering team with experience in various industries develops systems that meet the requirements of each customer with excellence.



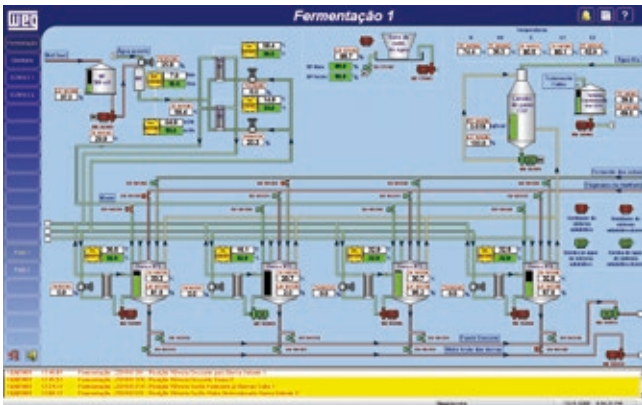
## Sugar & Ethanol

With a team of experts in the Sugar & Ethanol segment, the WEG solution allows a high level of integration between all areas of the plant, from the preparation of sugar cane, whether it is processed with diffuser or from the mills, through the treatment of the broth, steam and energy generation, as well as the whole process of manufacture of sugar, ethanol and biodigestion of vinasse. Automation with a focus on the needs of each client allows the creation of customized and integrated systems that facilitate the operation and maintenance of the plant, generating process indicators with significant relevance in the analysis of production.



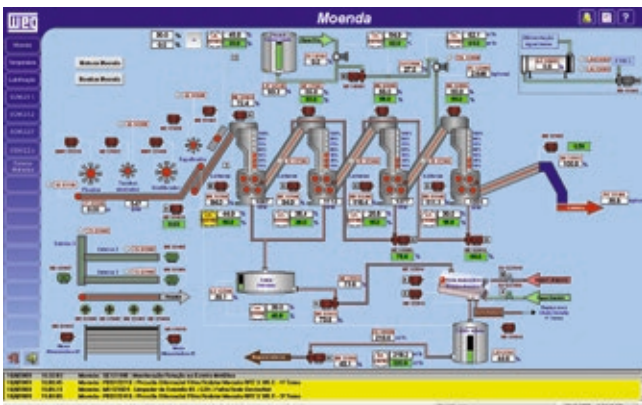
### Main Services of WEG Engineering

- PDA - Automation Master Plan
- Automation & Network Architecture
- R & D Flowcharts
- Electrical and instrumentation interconnection diagrams
- Description of meshes and control interlocks
- Detail of control variables
- Instrumentation data sheets
- Field project with routing and bill of materials
- Typical instrumentation details
- Instrument control description
- Memories of calculation for communication networks
- TAF - Factory Acceptance Tests
- TAC - Field Acceptance Tests



### WEG Architecture Features

- High performance network architecture
- Redundancy servers
- Dedicated database for the whole process
- Remote units and MCCs interconnected by network
- Field instrumentation in fieldbus network
- Stabilized voltage system with high availability
- Complete control of the power generation system and substation



### Control of Mills and Diffuser

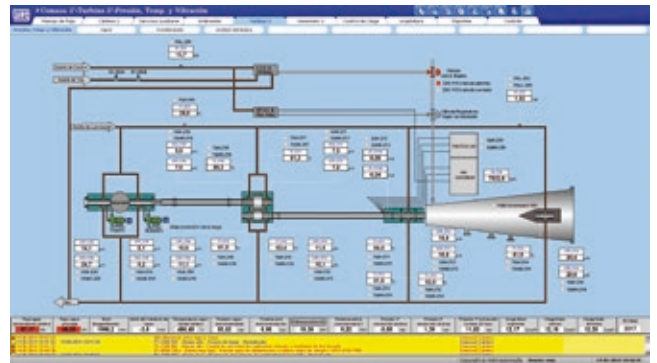
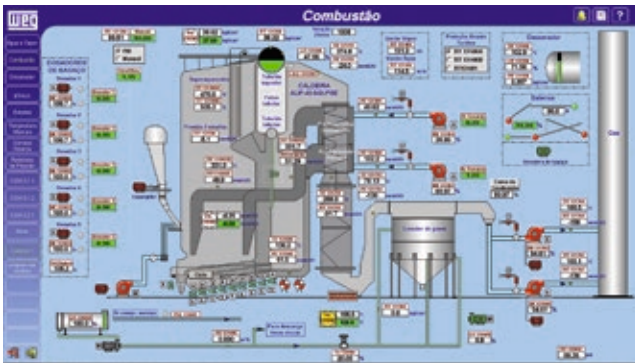
- Speed synchronization between rollers
- Load distribution control
- Supervision of auxiliary subsystems
- Cascade control for thermal levels
- Supervision and local operation via HMI
- Automatic control for soaking
- Production indicators and totalizer

## Energy Co-Generation Systems

WEG's automation systems for the electricity sector comprises the whole cycle for energy generation: transport control and biomass preparation, automatic control of boilers, as well as automatic operation of the turbine and generator. Currently hundreds projects in the energy sector are operating with WEG control systems.

### Main Features of Steam and Energy Production

- Full automation of gas and biomass boilers (wood, gleaning, rice husk)
- Automatic control of import and export of energy
- Complete monitoring of steam turbines
- Automatic control of gas and diesel oil burners
- Integration of the water treatment system and biomass forecourt
- Integration of medium-voltage cubicles with high performance networks
- Control of process variables by means of PID algorithms and advanced control

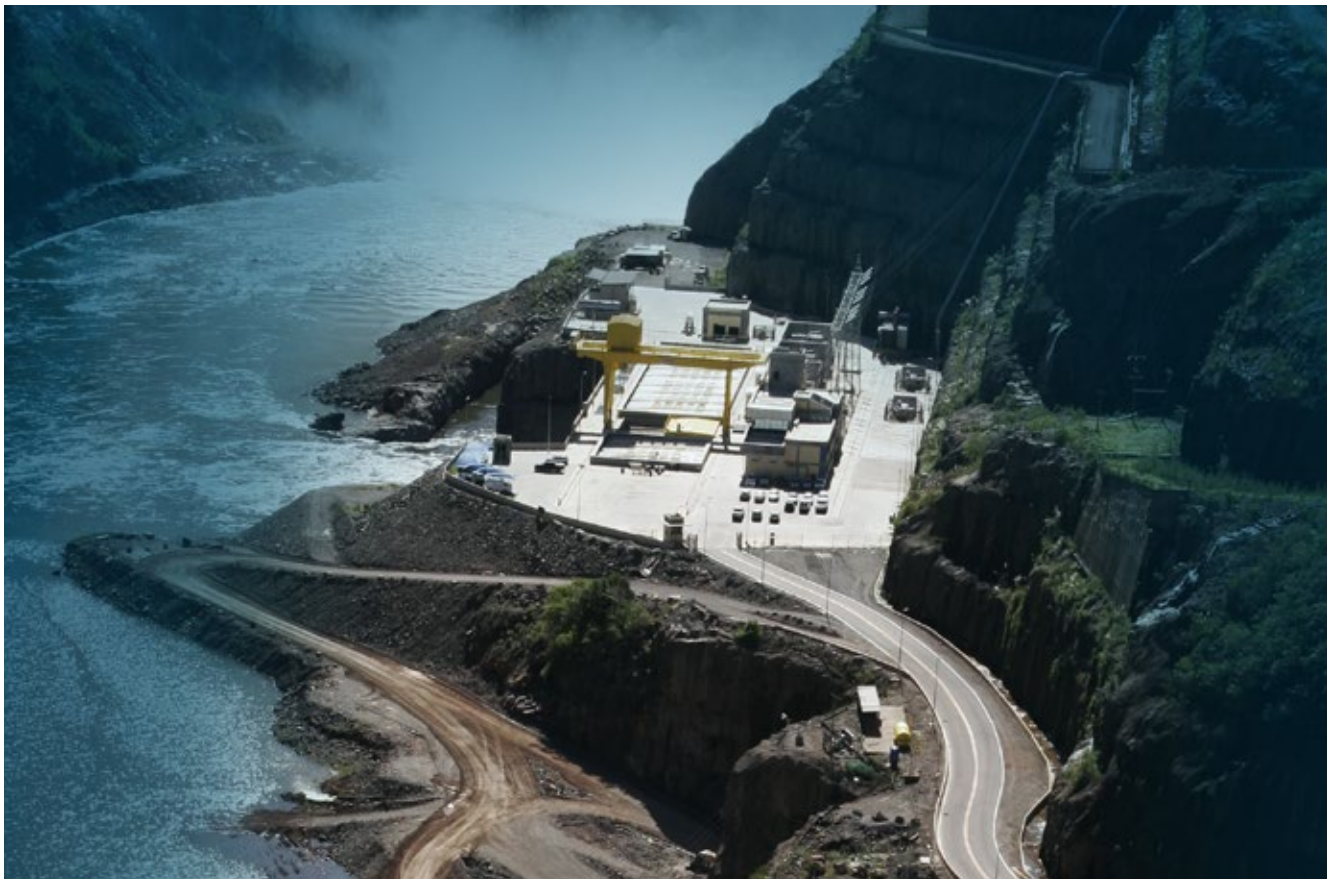
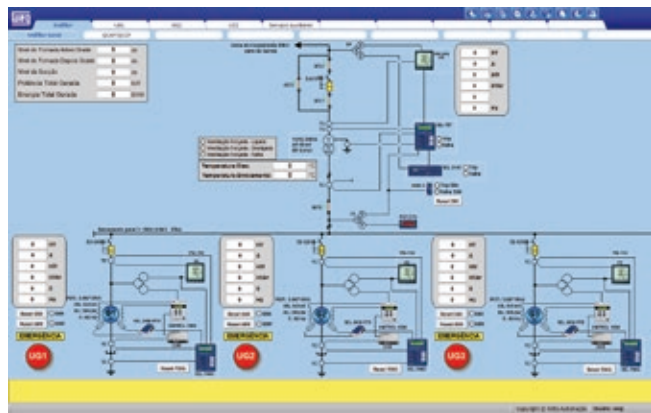
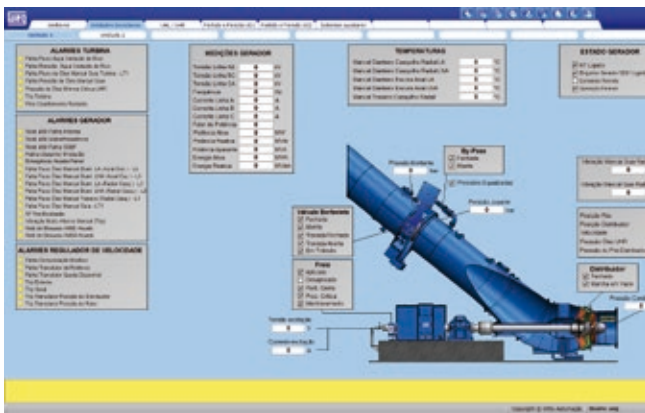


## Small Hydropower Plants - SHPs

WEG solutions are present in the control of small hydropower plants (SHPs), providing the full package, including control panels, transformers, switchboards, generators, supervision system and hydraulic turbine.

### Main Features

- Supply of systems for remote operation
- Starting and automated synchronization of generating units
- Time synchronization of PLCs and protection relays by GPS
- Events sequencing (SOE)
- Integration of all SHP auxiliary systems
- Integration and automation of substation
- Load division

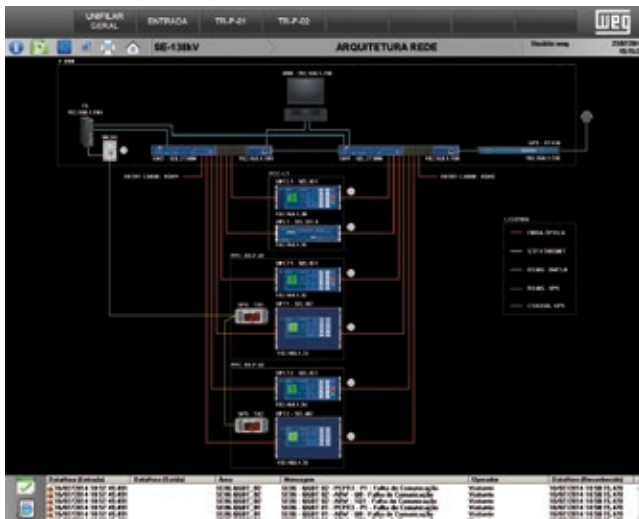


## Substations

WEG solutions are also present in the control and supervision of substations for industries and utilities, with automation of substations using the latest technology on the market.

### Main Features

- Integration using IEC 61850 protocol
- Time synchronization using GPS
- Remote monitoring via internet
- Oscillography tools



## Solar Energy

The SCADA system is WEG's solution for the monitoring and operation of photovoltaic solar plants, with collected data storage functions, as well as monitoring the plant's electrical and meteorological variables.

### Main Features

- Measurement of voltage and current for each individual string of the solar power plant
- Possibility of individualized operation failure detection by string
- Signaling of burning of surge protector
- Acquisition of meteorological data for analysis of power plant performance
- The historical record of the characteristics of the solar power plant operation
- Automatic detection of performance loss of power plant's generation with configurable alarm control and management
- Interface developed specifically for each client and project, taking into account individual situations

The SCADA system facilitates the activities of operation and maintenance of solar plants through a fully integrated system. In addition, it allows communication between the main equipment of the plant, ensuring monitoring and visualization of the operating conditions at all times.





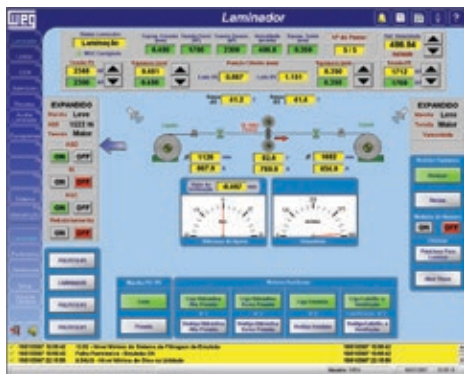
## Iron & Steel Industry

Seeking, among other things, to improving the quality of material produced and increase the productivity of laminators, WEG provides its clients with the complete solution in automation systems and a full electrical package: transformers, motors, electrical and operation panels, static converters, PLCs and remote controllers, plus the software for control and supervision of the equipment.



### Activity Areas in the Iron & Steel Industry

- Hot rolling laminators
- Cold laminators
- Reheating furnaces
- Drawing
- Control of blast furnaces
- Overhead cranes



### Among the Control Functions are

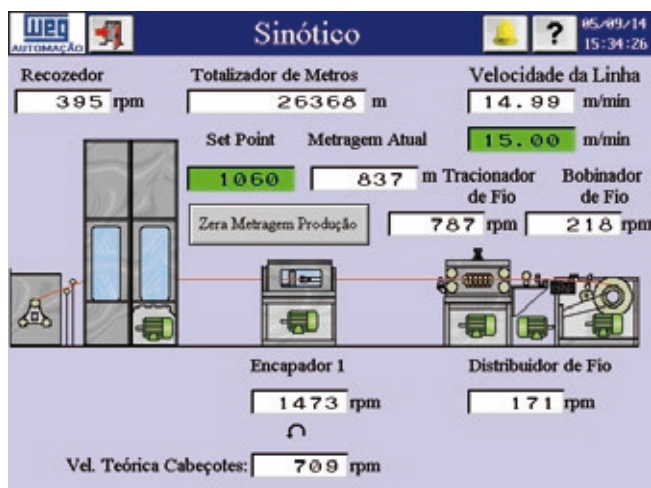
- WGC (WEG Automatic Gauge Control)
  - Traction control with compensation of diameter
- ASD (Automatic Slow Down)
  - Automatic shutdown of the laminator
- Automatic calibration of rolling cylinders
- Horizontal and vertical ties control
- Control of cutting head, tail and division
- Tension control of rolling seats



## Machine Automation

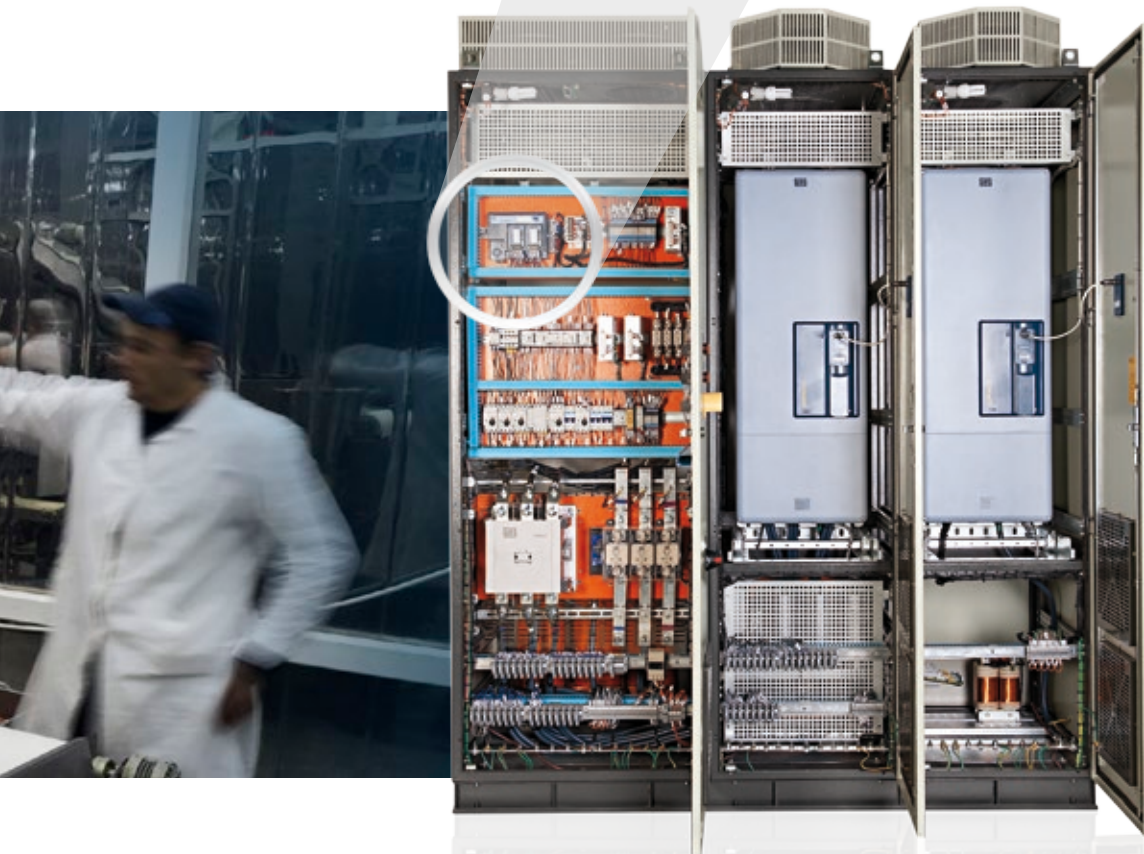
With applications developed for the widest variety of machines, WEG is able to assist clients in maximizing their production using the most modern solutions on the market.

- Software solutions for small machines implemented directly in WEG drives, eliminating the use of external PLCs
- Experience in software migration for retrofitting/modernization in older systems with obsolete drivers. Supply of a full electrical package for machine automation



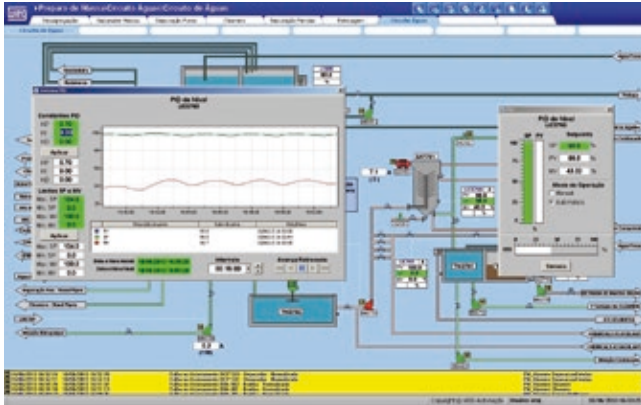
## Machine Automation

Programmable Logic Controllers (PLCs), HMIs, frequency inverters, soft-starters, smart overload relays, servo-actuators and IO remote linked in networked communication to meet the control and supervision requirements of various types of machinery and equipment, whether for the Sugar & Ethanol, chemical, Pulp & Paper, mining, Oil & Gas industries, metallurgy, construction, sanitation, electrical traction and propulsion, food and drink, plastic, among others.



## Pulp & Paper

WEG has innovative solutions for Pulp & Paper sector, including the automation of mass preparation, paper machine and rewinder, among others. In addition to the system of control and supervision, WEG offers a full electrical package: transformers, motors, electrical and operation panels, static converters, engineering and commissioning services.



The mass preparation process is automated using PLCs and supervision screens that perform tasks such as:

- Control of process variables (pressure, level, flow, consistency, etc.)
- Diagnosis and safety interlocks
- Automatic cycles of equipment operation
- Record of graphs, alarms and events



In kraft paper or tissue machines and rewinders, using WEG frequency inverters, PLCs and supervisory, the following functions can be performed by the automation system:

- Speed synchronization control
- Load division control
- Jet/wire ratio control
- Control of hardness, NIP and tension of the sheet
- Diagnosis and safety interlocks
- Use of recipes
- Monitoring of images
- Record of graphs, alarms and events



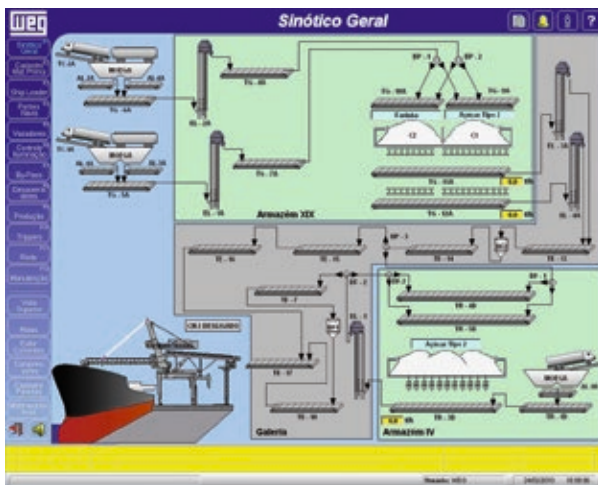
## Cargo Handling

In the area of cargo handling WEG has experience in developing control systems for the transportation, storage and shipment of bulk solids, sugar and sacks.

### Main Features - Ports

The WEG System provides agility, reliability and complete control over the equipment involved in the process, as well as the volume transported/shipped.

- Automatic activation of equipment and transport routes
- Control of productivity per shift
- Control the volume transported and shipped



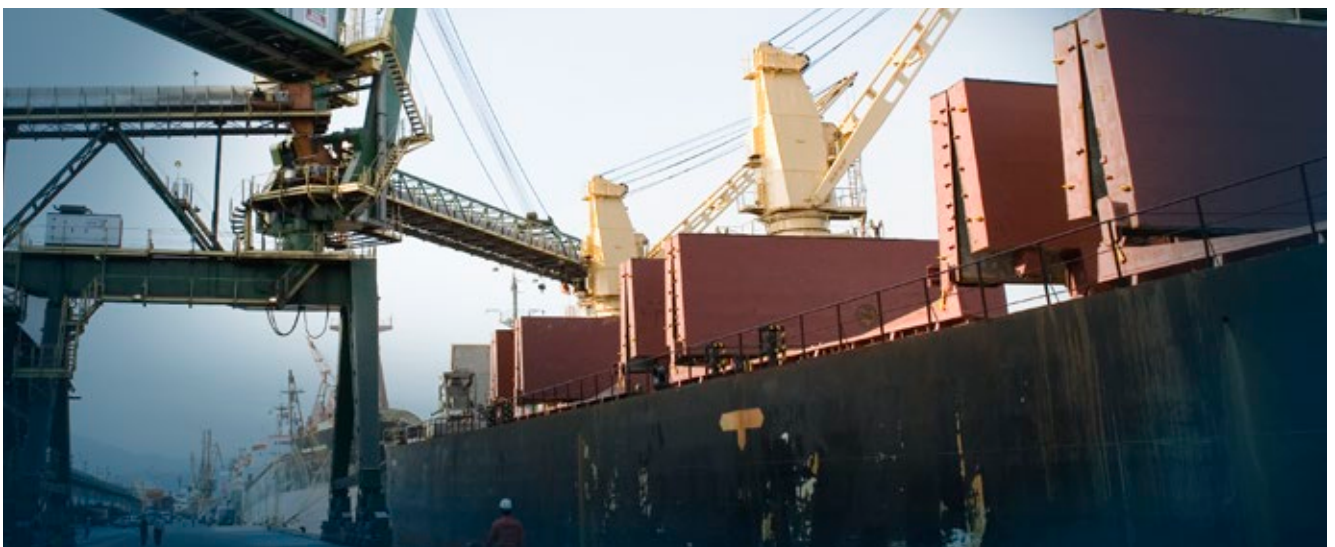
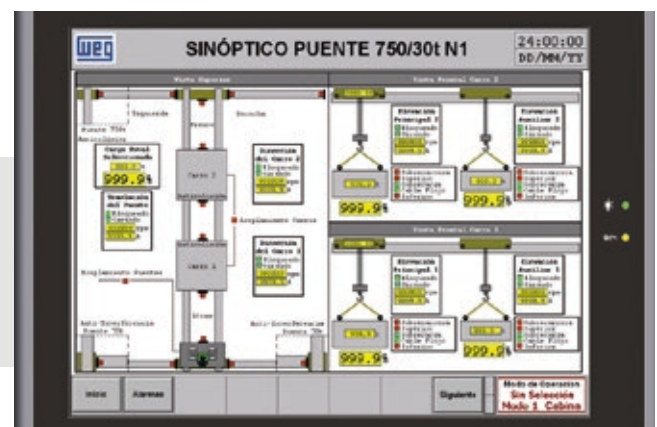
### Conveyor Belts

WEG provides the complete solution for automation of conveyors in various capacities. Among the main features are cargo division and configurable start/stop profiles.



### Main Features - Cranes

WEG overhead crane systems come with complete solutions, from simple systems with on board logic on WEG drives up to complete systems with coupling of cranes and position timing.



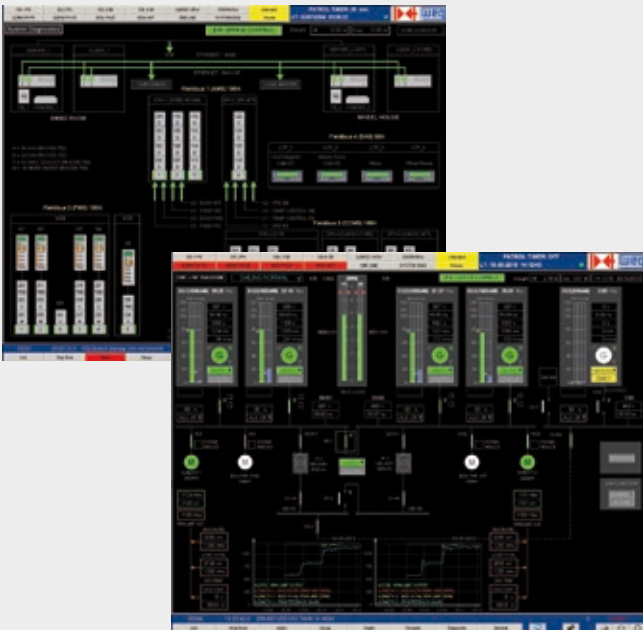
## Naval

WEG's automation system for ships is an extremely flexible solution with user-friendly interface, which allows the user to monitor and control various equipment of the vessel through a simple touch on the computer.



### Characteristics of the Solution

- Integration engineering
- Commissioning and start-up
- Power management system (PMS)
- Alarm monitoring system (AMS)
- Vessel positioning control
- Vessel loading management
- Propulsion monitoring and control



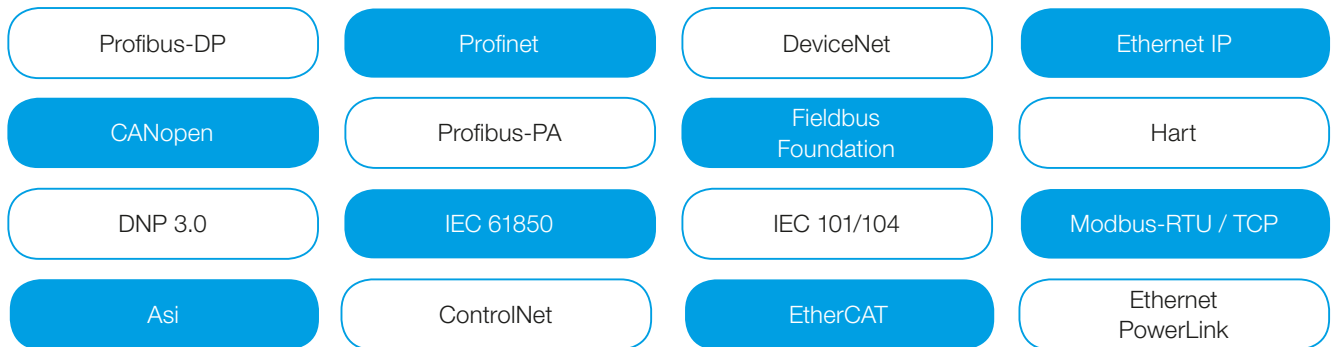
### Control Features

- Automatic synchronization
- Automatic load sharing
- Automatic frequency control
- Black-out monitoring
- Start/stop control for consumers
- Automatic trip for non-essential loads
- Reactive control
- Reduction of the propulsion power to avoid overload in the generation



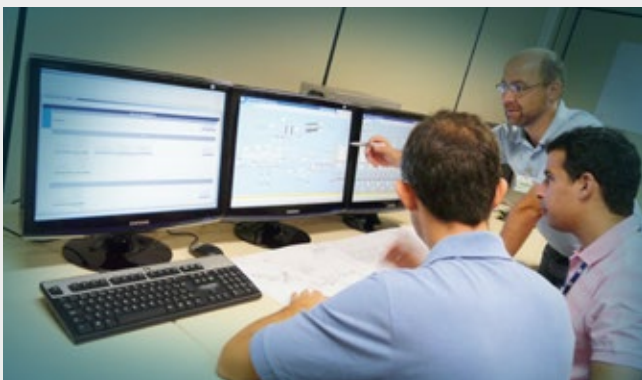
## Networks and Instrumentation

With engineering specialized in the main industrial protocols, the WEG solution meets the necessary standards for an industrial network to operate safely, providing all the necessary data for perfect plant operation and control of asset management.



## Differentials of WEG Supplies

- Team of continuously trained experts, dedicated exclusively to software development and commissioning of industrial processes
- Validation of the developed software directly at the control panels and MCCs supplied by WEG
- Solution provider partnership with leading global suppliers of programmable logic controllers (PLCs) and supervisory systems
- Dedicated laboratories for the validation of complex automation architectures
- Applications developed for various countries, using each country's local language.
- Software development based on current standards
- Diagnosis and remote maintenance via the internet



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