

# Lumel Automation Systems



## Only **BENEFITS!**

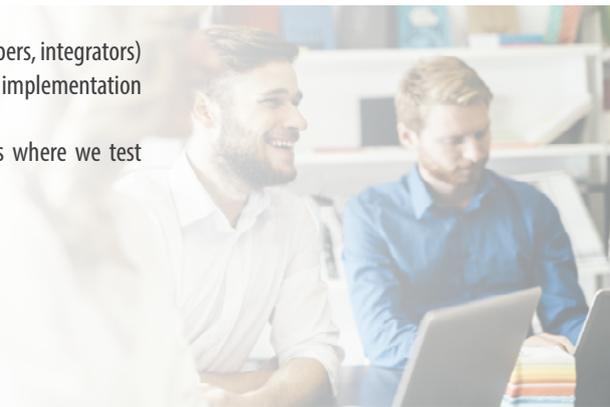
For many years we have known that automation users appreciate a comprehensive offer. Therefore, in addition to the supply of equipment, we offer design and implementation of automation systems, which:

- will be time and cost effective,
- will raise productivity,
- will improve work quality and safety.



## Who **ARE WE?**

- A team of engineers (designers, constructors, developers, integrators)
- We have over 50 years of experience in project implementation in Poland and abroad.
- We have modern development laboratory facilities where we test our solutions.



## How **DO WE WORK?**

We offer a comprehensive approach to the project, starting with a thorough analysis of the needs, providing custom made solutions for system implementation in facilities, throughout training and warranty and after-warranty service.



## WE CAN DO THIS FOR YOU:

- Design and implement a dedicated control system for industrial processes.
- Design and implement a control and transmission system in industrial environments.
- Create applications to visualize and control in SCADA programs.
- Design and manufacture power and control cabinets and laboratory work stations.

And everything:

- at competitive prices,
- based on certified and modern product and communication solutions,
- with guarantee of reliability and post-implementation service.



## Energy Monitoring Systems - OUR SPECIALTY!



Because of the possibility of large savings and environmental protection, the systems which currently are the most popular ones are our systems for energy consumption monitoring and for the control of power supply network parameters. These systems can be easily extended with additional measuring points or other utilities. What is important, the license for the software to manage these utilities is indefinite and unlimited in terms of the number of parameters read out from the devices.

## Facts and figures LIGHTING MONITORING IN LUMEL S.A.

- **power bills are lower by 18%**
- monitoring of costs in many departments at the same time
- effective sector management of lighting
- a thorough analysis of the most costly places

**18%**  
of savings

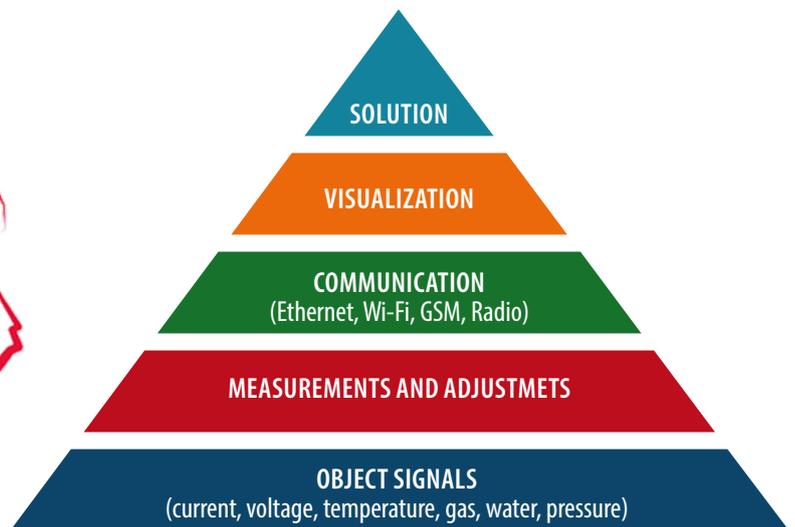
## COMPLEXITY OUR RANGE OF DEVICES AND SOFTWARE

We have a comprehensive offer of hardware and software to implement monitoring and control systems:

- devices to measure object signals (sensors, current transformers, shunts, transducers)
- devices for measurement and control such as meters, analyzers, controllers
- devices to ensure adequate communication (converters, I/O modules, hubs)
- our own software of Scada type to visualize, archive and process control

**THE MOST  
POPULAR BRAND**

#lumelno1inpoland



# Electricity Monitoring System

## Investor's problems

- Uncontrolled shutdown of production lines
- Downtime and power overruns at production lines
- Periodic temperature increases in switchgears.
- Lack of load monitoring and penalties
- Voltage dips in the supply and machine downtime
- Harmonic distortion and hung up controllers
- No possibility of energy accounting by individual departments or lines
- Lack of on-line management information
- High production costs

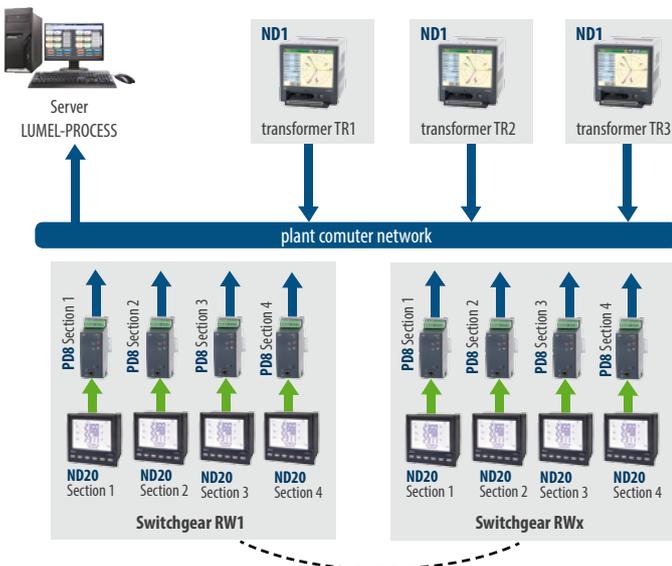
## Solution

The purpose of the system is to monitor power quality (voltage dips and rises) in 3 MV transformer stations, the transformer temperature at 40 LV stations, energy consumption during the process and its appropriate accounting. To this end, we installed the appropriate meters and network analyzers in each switchgear. The data from devices is collected over the network and archived on the company's servers. Special software allows the operators to monitor and manage energy to maintain and ensure adequate quality of production.

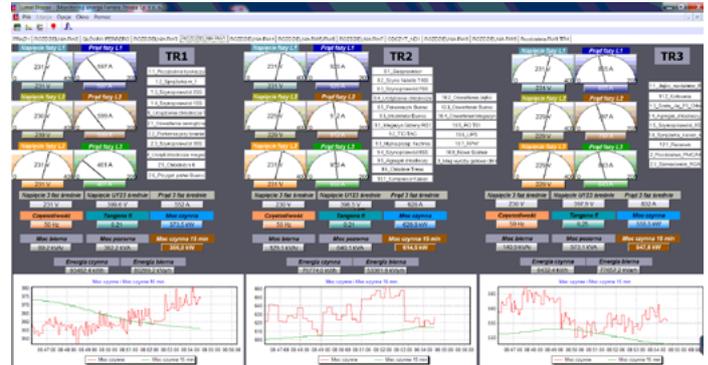
## The effects and benefits of the implementation

- Continuous supervision of the line load
- Lack of penalties for exceeding power
- Improving the quality of power supply
- Effective management of electricity
- Early detection and quick information on alarms
- Improving production efficiency

Electricity Monitoring Systemj (switchgear metering)



Electricity Monitoring System (visualization of measurements)



# Utilities Monitoring System

## Investor's problems

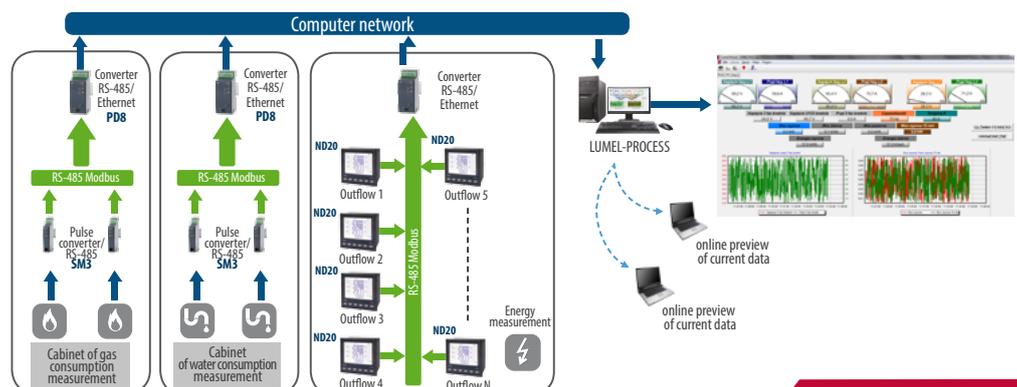
- Lack of fast and remote control of utilities consumption: gas, water, energy and compressed air in production processes.
- Inaccurate accounting of production costs
- Problems with fast identification of areas in which the failure occurred.
- High penalties for exceeding the 15 minute power,  $\cos\phi$  i  $tg\phi$ .
- High consumption of utilities

## Solution

The purpose of the system is to monitor the utilities used for the production. Appropriate communication outputs and I/O modules were added to the meters present in the facility (water, gas), and network meters and analyzers were used to measure the energy parameters. The factory computer network was used for communication. Special program allowed the operators to monitor and manage the utilities to ensure adequate supply of production.

## The effects and benefits of the implementation

- Reduction of production costs and quality improvement
- On-line utilities monitoring
- Precise identification and analysis of the cost of utilities
- Immediate identification of failures and disturbances
- Availability of management information
- Savings due to the lack of penalties for exceeding power
- Increasing the competitive advantage



# Measurement of Production Efficiency

## Investor's problems

- No information on the efficiency of production at 90 lines, scattered over a wide area
- Lack of control over the number and times of planned and unplanned periods of production downtime?
- Lack of clear visualization of the most important parameters of the production process (plan, execution, % of execution) for employees and managers
- High production costs

## Solution

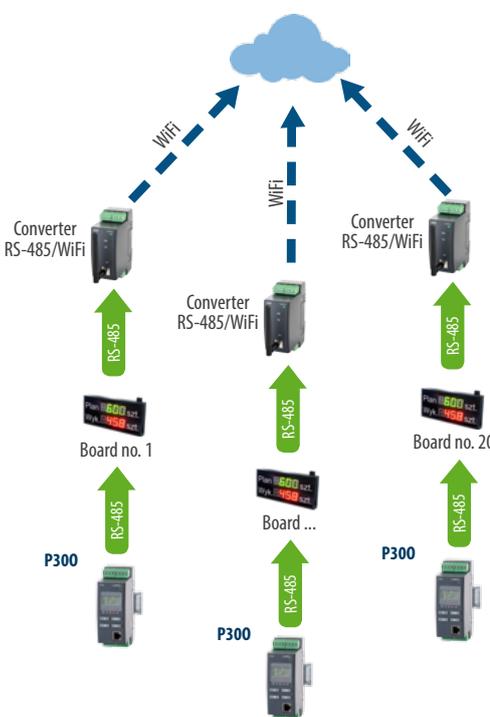
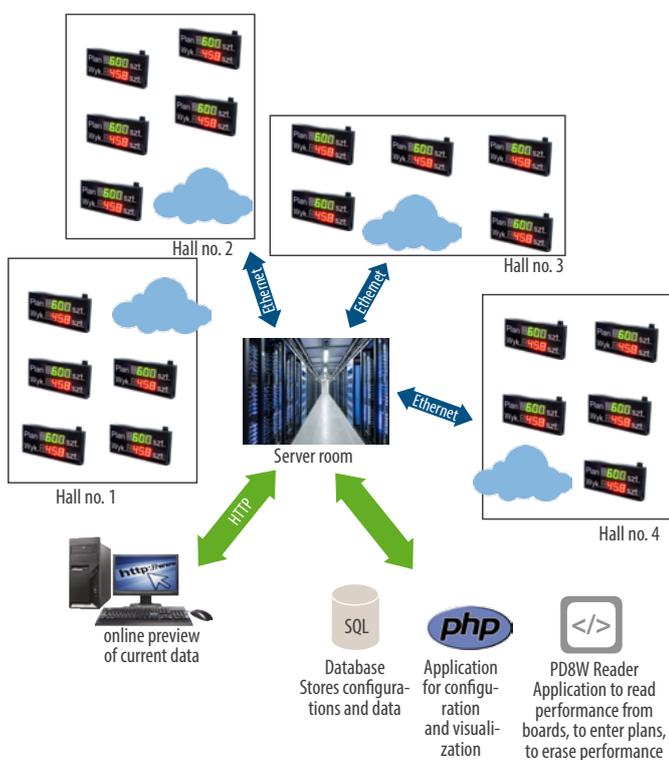
The system monitors the production capacity at 90 lines. The lines are located in several halls in a large plant. Data is collected over the network and stored on a corporate server in the client's database. Counters on each line measure the number of units produced. Using the RS-485 they communicate information with data onto displays. The displays using WiFi transmit the data to the server over the network.

## The effects and benefits of the implementation

- Access to the data in one place, despite scattered production lines
- Continuous monitoring of the production processes in the production hall and the computer network
- Archiving of process data
- Higher productivity

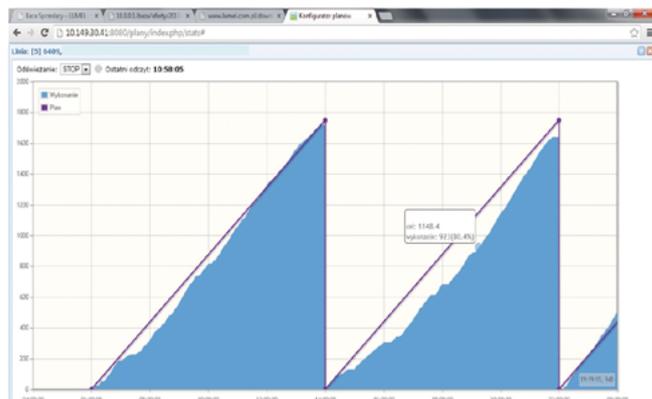
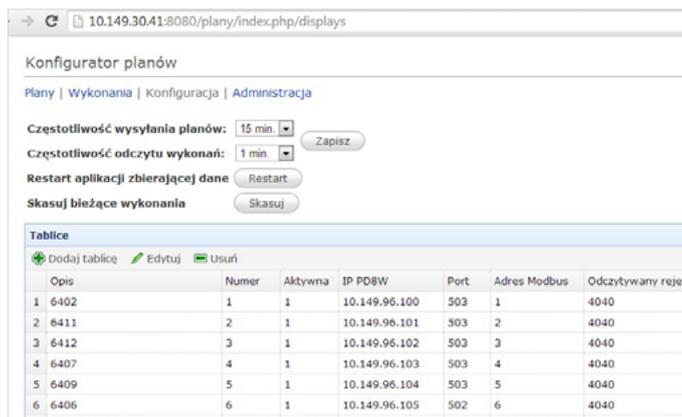
Production Efficiency Measuring System

Production Efficiency Measuring System (monitoring and date collection)



Production Efficiency Measuring System (configuration of process parameters)

Production Efficiency Measuring System (data visualization – plan, implementation)



# Temperature Monitoring in Cold Storage

## Investor's problems

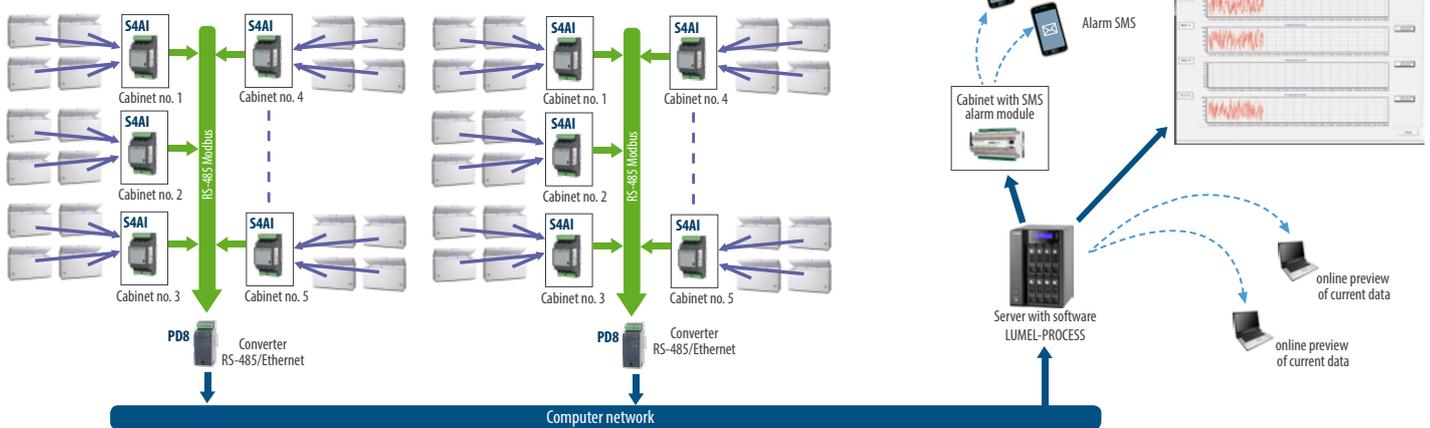
- How to ensure constant control of temperature in a number of chambers (300 freezers) - particularly at night and at weekends?
- Lack of data archiving to document products storage parameters
- Financial losses due to thawing products

## Solution

The purpose of the system is the monitoring of 300 freezers. For this purpose each freezer was equipped with a temperature sensor. Information about the temperature from 4 freezer is transmitted using the converters and Ethernet to the system on the corporate server. Information about uncontrolled temperature increases is transmitted - using sirens - messages to PC - via SMS.

## The effects and benefits of the implementation

- 24-hour control over the process
- Online monitoring via computer network
- Possibility of parameters reporting and archiving
- Financial savings



# Monitoring of Machine Temperature

## Investor's problems

- Lack of motors windings and bearings temperature monitoring
- Lack of current information on the nominal duration of work since the last inspection of the machine
- A large number of unplanned downtime and machine breakdowns

## Solution

The purpose of the system is to alarm in case of bearings overtemperature in production machines and to count their working time. We manufactured special measuring cabinets for visualization of parameters, equipped with meters with 3-color display or operator panel. When the bearing temperature increases, the meter displays a different color, and the panel displays a text message and an audible signal of a machine failure. In addition, the cabinet disengage the machine to protect it against failure. The solution allows to carry out measurements at several dozen of measuring points. The measured values can be read in Scada program (e.g. Lumel-Process) using Ethernet port built in the panels. This solution also enables the measurement of machines working time.

## The effects and benefits of the implementation

- Constant temperature control at key points of devices, e.g. the temperature of the motor windings, bearings
- Counting working time of machines
- Local and remote presentation of measurements
- Two threshold alarm states signaling
- Counting the time from or until the next inspection
- Reducing the number of failures and uncontrolled downtimes



# Measurement of Energy Efficiency

## Investor's problems

- Lack of information on the energy efficiency of water containers:
  - the amount of energy required to heat the water to a predetermined temperature)
  - the time of keeping the defined temperature of water after heaters are turned off
- Lack of recording of alarm events
- Lack of measurement data archiving in the memory of recorders and in supervisory system

## Solution

Special cabinet equipped with a data logger, temperature controller and meter of network parameters was installed at each station to test energy efficiency of water containers.

The cabinets were connected to the company network, and dedicated software allows the operators to collect data and control 14 independent processes.

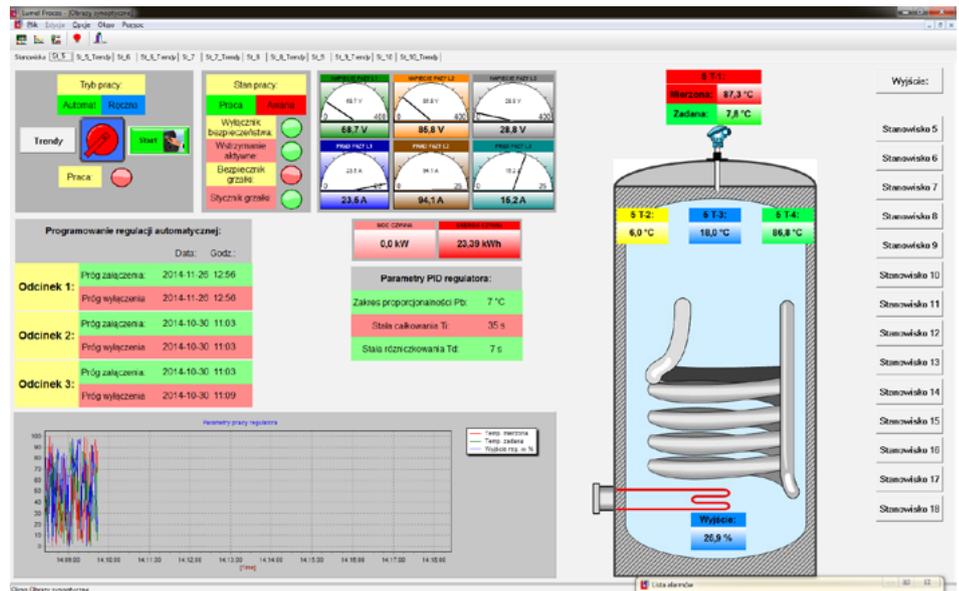
Universal design of the cabinets allows for connection of various types of containers.

## The effects and benefits of the implementation

- Providing precise measurement data on energy efficiency of the containers
- Continuous supervision over the process (on-line)
- Increased security during containers testing



The whole system is supervised by Lumel-process program that allows remote process control and archiving of measurement data and creation of reports from the data.  
View of measurements at an individual station.





# Extruder Control System

## Investor's problems

- Problems with the maintenance of temperature and pressure in the heating zones
- Lack of monitoring of key process parameters
- Lack of archiving and reporting of process data

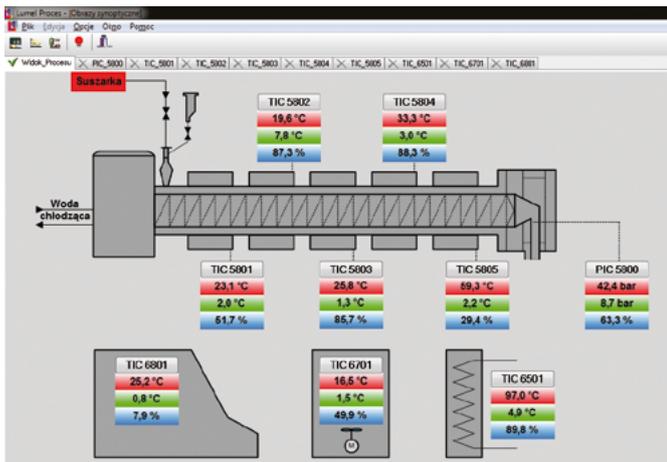
## Solution

Independent PID controllers were used for each controlled zone. The controllers were equipped with communication interface enabling remote reading and programming of process parameters. All devices are monitored using Lumel-process program installed on the server.

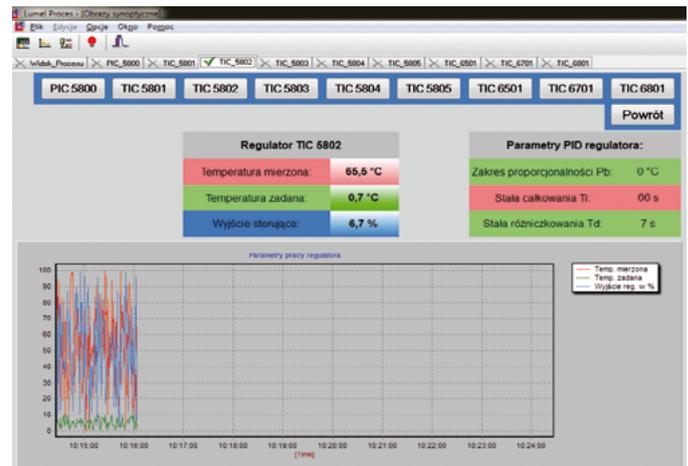
## The effects and benefits of the implementation

- Improving the quality of produced material
- Easy supervision over the process flow
- Lower production costs
- Possibility to document the progress of production process

Extruder Control System (process visualization)  
- general view of the most important parameters of the process.



Extruder Control System - view of a single control zone.



# Parts Washer Control

## Investor's problems

- Numerous complaints due to irregularities in the process of washing aluminum parts
- Large energy consumption for baths heating
- Lack of documentation with parts washing process parameters
- Low efficiency of employees.

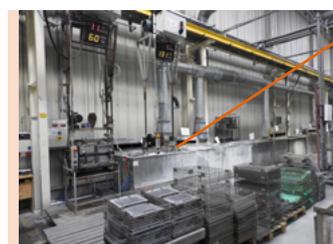
## Solution

GeFanuc controller was used to implement the process of control, and MT series operator panel for data visualization and archiving. The location of basket with parts is controlled by rotary transducers. The system was also equipped with a cassette allowing for manual control in the event of the control system failure.

## The effects and benefits of the implementation

- Automation of the washing process eliminating the problem of improperly washed parts
- Ease of use
- Recording and archiving of process flow
- Saving electricity

Part washing line control system  
(process visualization)



## Laboratory-testing Work Stations

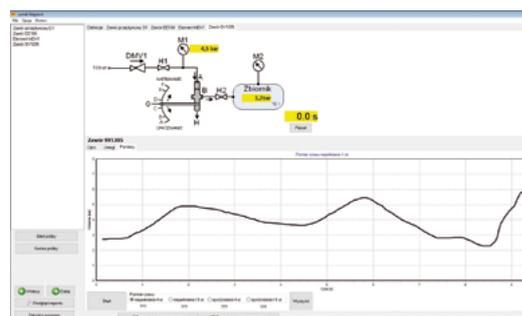
### Solution / Characteristics

- Dedicated equipment (set of measuring devices + software for data analysis)
- Data archiving in the internal memory
- Possibility of remote readout of data (GSM or WiFi)
- Robust, aesthetic and durable construction

### The effects and benefits of the implementation

- Avoiding failures and costly downtime
- The ability to document the test results
- The ability to analyze the data online
- One portable measuring set makes it possible to monitor multiple objects

Station for brake systems testing. Measurement of pneumatic parameters, such as pressure in different points in the system, the efficiency of the valves, the time of containers filling and emptying. The program was written specifically on the customer's request and includes the test procedure of the studied systems carried out by the operators.



## Portable Measuring Sets

### Solution / Characteristics

- Dedicated equipment (set of measuring devices + software for data analysis)
- Data archiving in the internal memory
- Possibility of remote readout of data (GSM or WiFi)
- Robust, aesthetic and durable construction

### The effects and benefits of the implementation

- Avoiding failures and costly downtime
- The ability to document the test results
- The ability to analyze the data online
- One portable measuring set makes it possible to monitor multiple objects

Example of a suitcase for measuring power parameters, temperature, pressure and flow at water treatment stations. Appropriate software enables easy data recording and analyzing, and GSM module online monitoring of the measured parameters.

