














Skamer®
Automation Control Measurement

*Your partner in the deployment
and use of automation*



Table of contents:

	Introduction	3
	Industrial automation and measurement	4
	Prefabrication of control cabinets and switchgear	7
	Automation catalogue	10
	Robotics	11
	Dew point, relative humidity and oxygen content measurements	13
	Energy efficiency	15
	Energy monitoring systems	16
	Industrial process and production efficiency visualisation systems	18
	Services to the industry	20
	Our partners	21

SKAMER-ACM is a reliable partner offering measurement, industrial automation and robotics solutions.

SKAMER-ACM is a proven partner offering measurement, industrial automation and robotics solutions. The company's activities include: prefabrication of control cabinets and switchgear; sale of automation and control devices and systems and industrial process visualisation systems; production and energy efficiency monitoring systems; measurements of gas humidity and oxygen contents; electrical, ICT and HVAC systems; energy recovery systems in industrial processes, renewable energy sources; comprehensive installation of fire detection systems in control cabinets; audits, expert studies and reports; adjustment of machines to the minimum OHS requirements, CE marking of machines. We perform the above in the following areas: design, programming, installation, start-up and maintenance.

The company organises training courses, symposia, conferences and is an exhibitor on Measurement and Automation and Gas Technology trade fairs.

The company cooperates with:

- technical universities, including: AGH University of Science and Technology in Kraków, Warsaw University of Technology, Rzeszów University of Technology, Silesian University of Technology, State Higher Vocational School in Tarnów,
- design offices, equipment manufacturers, assembly and installation companies,
- industry press and websites, including: Pomiary Automatyka Kontrola, Pomiary Automatyka Robotyka, Automatyka, Napędy i Sterowanie, Automatyka.pl, AutomatykaOnLine.pl, Control Engineering, Utrzymanie Ruchu, Ważenie Dozowanie Pakowanie, APA, Elektronika Praktyczna, Magazyn Ex, Industry Europe,
- various organisations, including: Polish Engineering Association (NOT), Association of Polish Electrical Engineers, ZETOM Product Quality Testing Centre, Polish Corporation for Sanitary, Heating, Gas and Air Conditioning Technology, Polish-Slovak Chamber of Commerce and Industry, Clean Energy Cluster of the Małopolska-Podkarpacie Region, Polish National Energy Conservation Agency, Committee on Automatic Control and Robotics of the Polish Academy of Sciences.

The company has implemented and applies a quality management system in accordance with **EN ISO 9001:2015** regarding: "comprehensive engineering services in the area of measurement and automation: design, technical advisory services, programming, order preparation and delivery, prefabrication, assembly, start-up, repair and maintenance, sale of equipment, improvement of energy efficiency (audits and utility monitoring systems)".

SKAMER-ACM has been awarded the **Certificate of Innovation** by the MSN International Scientific Network and the Institute of Economic Sciences of the Polish Academy of Sciences. In the competition organised by the Napędy i Sterowanie monthly, under the auspices of the Polish Agency for Enterprise Development and the AGH University of Science and Technology, SKAMER-ACM received two awards: for its contribution in implementing new technologies it was awarded with the Innovations 2012 medal, and its Automation Catalogue was named the Product of the Year 2012. Also, the Puls Biznesu daily recognised the rapid growth of SKAMER-ACM and granted it the Business Gazelle award multiple times.

The company also won the title of the **System Integrator** in the second edition of the competition organised by the Control Engineering Polska magazine. The company was qualified to participate in the competition following its recognition in the System Integrator of the Year contest organised by the US counterpart of the magazine – Control Engineering. The main criteria included: number of successful implementations; complexity of successful implementations; improvement in time efficiency, quality and profitability after the implementation; return on investment; feedback – both from customers and business partners; received awards and distinctions.

In 1996, the company launched a representative office in Poland of a UK company MICHELL INSTRUMENTS Ltd., a global leader in gas humidity and oxygen measurement solutions.



INDUSTRIAL AUTOMATION AND MEASUREMENT

Design:

Our services cover:

- measurement and automation, control and computer systems,
- electrical and ICT systems,
- industrial robotics.

In special cases, when the company acts as the general contractor under projects covering buildings and installations, it also provides services in other areas, i.e. mechanical, technological, construction, heating, sanitary installations and ventilation and air-conditioning systems.

For design purposes, we use CAE software: Engineering Base by AUCOTEC, SEE Electrical Expert by IGE+XAO and AUTOCAD, which ensures high quality and clarity of technical documentation.

Technical consultancy:

Due to our extensive experience in the measurement and automation industry, we offer technical consultancy on:

- application of optimal solutions,
- selection of replacements for equipment of virtually all manufacturers.

Equipment order preparation and delivery:

Based on our own and third-party designs, we provide the following services as part of comprehensive delivery of measurement and automation systems:

- purchase of devices, electrical equipment, industrial fittings etc.,
- prefabrication of designed elements, such as: control cabinets, desks, cabinets, venturi, etc.,
- complete delivery of equipment and materials.

Programming and start-up of industrial control and computer systems:

- our control and monitoring, control and measurement, and telemetry systems are based on controllers of such companies as: SIEMENS, BECKHOFF, OMRON, EMERSON, Mitsubishi, ALLEN-BRADLEY, SAIA, Schneider Electric; WAGO, and other as required by its customers,
- the offered visualisation systems (of industrial processes) use the following software: Asix, AVEVA, WinCC and other as required by the customer.

Installation, start-up and maintenance:

The scope of work includes:

- measurement and automation systems, control and computer systems, electrical and ICT systems,
- industrial robotics,
- provision of authorised repair and maintenance services with respect to frequency converters produced by ABB and Danfoss.

As part of our comprehensive service, we provide:

- Complete production lines,
- Electrical and ICT systems,
- HVAC systems,
- Sanitary systems,
- RES installations,
- Energy recovery systems used in industrial processes,
- Audits of industrial communication networks,
- Energy and energy efficiency audits – white certificates,
- Energy monitoring systems,
- Industrial process and production efficiency visualisation systems,
- Security audits,
- Implementation of Energy Management Systems in accordance with PN-EN ISO 50001,
- Adaptation of machines to meet the minimum OHS requirements,
- Preparation of operating instructions for power equipment,
- CE marking and declarations of conformity.



SALE OF AUTOMATION ELEMENTS, ELECTRICAL EQUIPMENT AND INDUSTRIAL FITTINGS

SKAMER-ACM is a technical and sales representative and authorised distributor of dozens of Polish and foreign companies – manufacturers of automation elements, electrical equipment and industrial fittings.

The major ones include:



SIEMENS



Honeywell



OMRON



Rockwell
Automation



Weidmüller





PREFABRICATION OF CONTROL CABINETS AND SWITCHGEAR

SKAMER-ACM can boast proprietary designs produced in series for a wide range of customers;

Pump control systems

- Wide power range – from 1.5 kW to 350 kW,
- Cascade control of up to eight pumps using an inverter,
- Visualisation using HMI,
- Wide range of additional options:
 - GPRS transmission,
 - dry-running protection,
 - valve control.

Measurement of gas humidity

Complete systems for dew point measurement in compressed air applications:

- Wide measurement range from -100 to +60 Cdp,
- Complete sample collection and preparation system with filtration and flow control,
- Data logging, various communication options.

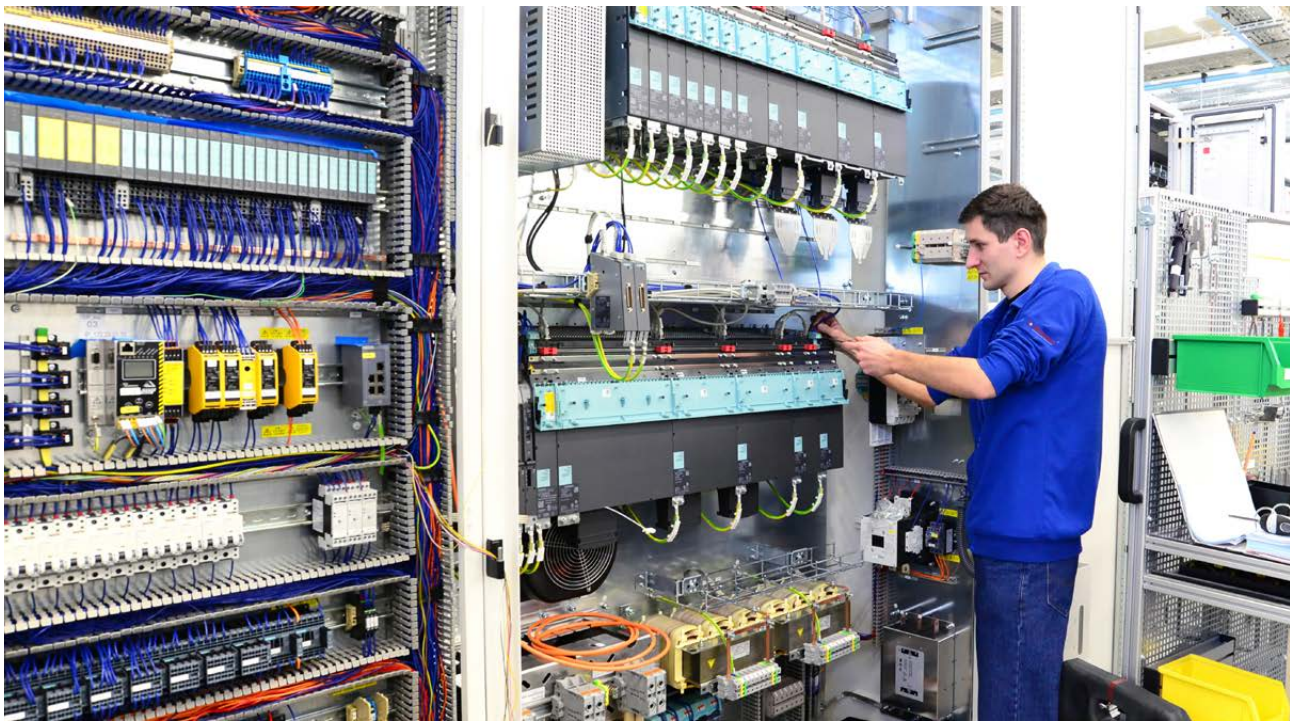
Dew point measurement in natural gas:

- Measurement range from -100 to +20 Cdp,
- Sample preparation with filtration and flow control,
- Suitable for explosive areas.

Serial production for OEM clients

We deliver comprehensive start-up systems and control cabinets for machine manufacturers. Products tailored to individual requirements:

- Maritime certifications,
- Adaptation of products to European, US and Asian standards.



Fire detection systems in control cabinets of SKAMER-ACM

In view of the growing demand for fire detection systems in the automation market, SKAMER-ACM has extended its offer by adding comprehensive delivery of fire detection systems in control cabinets. The offer includes technical consulting, design, installation and maintenance of systems using Protec devices in collaboration with D+H.

Protec aspirating systems ensure very early fire detection – much faster than using a point type detector. This method of detection makes it possible to detect overheating integrated circuits or electrical cables in the cabinet, thus minimising any major damage and associated costs and production stoppages.



The detectors are designed to minimise false alarms caused by, among other things, electromagnetic interference. Also, the Protec alarm system will not cause any short circuit in the cabinet because no metal components are introduced directly into it. Quick installation, very easy maintenance in most cases does not require opening the control cabinet or switchgear. Protec devices ensure hassle-free operation in a wide temperature range.

Fire detection with aspirating detectors

Aspirating fire detection systems are gaining popularity and are more and more willingly taken into account by designers in the construction of new buildings or adapting existing ones to current fire regulations. This is owed to the versatility of this solution, which makes it suitable for almost any spaces – from elevator shafts, technical floors or ceiling voids, to large industrial and sports complexes. The advantage of aspirating systems is very early fire detection and easy installation, configuration and maintenance. D+H offers a wide range of detectors and accessories for designing complex Protec aspirating detection systems. The most technologically advanced aspirating detector is the Cirrus HYBRID model. The detector integrates two detection technologies: optical (Scatter Chamber Detector) and the Wilson cloud chamber (Cloud Chamber Detector).

Cloud chamber

Early fire detection is ensured by a cloud chamber, which continuously samples air with a built-in aspirating system and measures the number of particles per cubic centimetre. With relative humidity of about 100%, the sample is sent to a cloud chamber where, due to cooling, water droplets – as a result of the rapid increase in vacuum – condense on all airborne combustion particles. The thermally generated particles cause a cloud to be formed from the many droplets, which is then detected by the cloud chamber measurement system. This is the most effective method of fire detection – it sets off the alarm very quickly giving more time to react.

Optical chamber

Conversely, the optical detection chamber detects visible products of combustion, namely smoke. An optical detection measurement is expressed in percentage obscuration per metre (% obs/m). The two detection methods used in a single device are entirely independent of each other and thanks to the use of complex algorithms they work in tandem to detect fire quickly and efficiently. As a result of this synergy, the Cirrus HYBRID detector is able to verify the actual threat and, more importantly, is immune to unwanted or false alarms, for example caused by dust, water vapour or heavy dust.

Comprehensive solutions

The offer is complemented by conventional detectors: Cirrus Pro 200 and ProPoint PLUS, which are addressable once connected to the Protec repeater panel. The type of detector is always selected after an analysis of the environmental conditions in which it will operate. Installation, setup and activation of aspirating detectors is simple and intuitive. The sensitivity level can be changed to Class A, B or C. In addition, the aspirating fan speed, thus the airflow, can be modified, which makes it possible to install a detector with short or long sampling tubes. To create a complete aspirating system, sampling tubes and accessories are required to build extensive detection pipelines. D+H offers connectors, capillaries, tees and mounting brackets. The offer is supplemented by filters and humidity traps to prevent false alarms caused by e.g. water vapour or dust.

On a daily basis, Protec aspirating systems can work together with other building fire protection systems, such as a smoke exhaust system, to create complete fire safety solutions.





AUTOMATION CATALOGUE

www.katalogautomatyki.pl

An online IT system whose main goal is to automate the flow of technical and commercial information between SKAMER and partner companies.

The system consists of three modules:

- product catalogue
- training
- trade fairs

Automation Catalogue is a universal product configurator for various manufacturers, which can be used by simply ticking subsequent check boxes. The final result is the selection of a specific product execution, described by, among other things, the manufacturer's code, name and price. In effect, the system user does not have to configure the entire product specification and symbol using data sheets available on different manufacturers' websites.

The price listed in the Automation Catalogue helps assess costs of designing new and modernising existing measurement and automation systems.

With the Automation Catalogue, it is very easy to compare products with similar parameters offered by different manufacturers and choose the most suitable one, both in terms of technology and price.

A single window includes:

- clear descriptive product specification
- links to technical data
- product code
- product image
- list and offered price
- product availability
- contact details of the sales engineer
- check box for adding to the specification

Automation Catalogue enables you to generate requests for quotation, orders, offers from the system, export product lists to standard formats (CSV, XML, PDF). Each user can also create their own catalogues.

Products can be searched by:

- symbol (manufacturer's production code)
- name elements (descriptive specification of the product)
- manufacturer

Navigating the Automation Catalogue is easy, user-friendly and intuitive. In the catalogue, everybody is sure to find something for themselves.



ROBOTICS

In recent years, we have seen very rapid growth in the number of robots in industry. On the one hand, this is due to improved energy efficiency and increased productivity, and on the other hand, the trend is caused by changes in the labour market where employees are increasingly hard to find. Robotics is an indispensable part of control systems and for this reason SKAMER has also included robots in its offer. We are a long-term trading partner of ABB and also its robotics integrator.

With more than 400,000 robots installed worldwide, technologically advanced solutions from ABB help manufacturers improve productivity, product quality and safety of workers.

ABB is the only industrial robot manufacturer with as many as three production facilities. ABB is a leading supplier of industrial robots. It also offers robot software, modular manufacturing cells, systems, and maintenance services for tasks such as welding, moving/handling, assembly, cutting, painting and machining, pick and place, packaging, palletising, and machine operation.

The key markets where industrial robots are used are automotive, plastics, metal production, casting, electronics, machinery, pharmaceutical, and food industry. More than 300,000 ABB's robots are operated in manufacturing plants around the world, contributing to higher productivity and improved process quality. Robots are part of an integrated ecosystem: Internet of Things, Services and People.

ABB has partnered with Covariant to bring robotic solutions using artificial intelligence to market. Their first joint project is a fully autonomous installation for handling the order execution process.

The two companies have a similar vision for AI-driven robotics that is based on robots that learn with each task completed, working side-by-side with humans.

Given the fast pace of growth of the global e-commerce sector, there is huge potential in robotic solutions using artificial intelligence. These solutions could find wide application in logistics, warehousing services or sorting of packages and postal items, among other things.



SKAMER-ACM is also a partner and integrator of KASSOW Robots 7-axis industrial cobots.

The technology is based on a innovative design of the robot controller, user interface and arm mechanics. They were developed by a team led by Kristian Kassow (former co-owner and one of the founders of Universal Robots), who was also responsible for other ground-breaking designs in the field of robotics earlier in his career.

Kassow Robots exclusively produces 7-axis cobots with powerful drives: with movement speeds of up to 225°/s in all joints, payloads of 5 and 10 kg, reach of 850 mm, 1200 mm, 1400 mm and 1800 mm. It is the technological answer to the challenges of everyday business of SMEs – constantly changing tasks and the need for power, speed and ease of use. The 7th axis allows for more possible applications, greater flexibility and a higher effective reach.

Less than 2 years after its launch, Kassow Robots is selling collaborative robots in 14 European countries, Israel and 11 US states.

The parameters of Kassow Robots cobots are:

- KR810 (810 mm reach, 10 kg payload, 7DoF),
- KR1018 (1600 mm reach, 18 kg payload, 7DoF),
- KR1205 (1200 mm reach, 5 kg payload, 7DoF),
- KR1410 (1400 mm reach, 10 kg payload, 7DoF),
- KR1805 (1800 mm reach, 5 kg payload, 7DoF).

Facts about all cobots from Kassow Robots:

- 7 axes of flexibility,
- movement speed of up to 225°/s in all joints,
- all-aluminum construction,
- they fit into narrow spaces, even between machines, and do not obstruct workspace,
- they have a portable electrical cabinet that can be easily unplugged,
- programmable using drag and drop functions on a touch screen (tablet).

More about the 7th axis

7 axes of flexibility means:

- the robot's manoeuvrability is as close as possible to a human arm (our arms move in such directions),
- the ability to move an object in a straight line from A to B, but also to keep the vector of the tool/object held throughout the movement.

The 7-axis cobot reaches the work area from around the corner just as a human arm would. It enables:

- placing the robot in narrow spaces between other devices;
- the robot to work from a position offset to the side of the work area;
- the robot to work next to a machine while leaving free access to it for a technician;
- this eliminates the problem of dismantling the cobot each time access is needed to the work area or for adjustment purposes.

The additional movement of the cobot on the 3rd joint allows the tool path (end effector) to be maintained. This enables more possible applications:

- application of paint, glue or other surface treatment over a larger area;
- reaching its hard-to-reach areas;
- safe handling of fragile objects;
- safe handling of objects whose orientation in space cannot be changed during movement.





DEW POINT, RELATIVE HUMIDITY AND OXYGEN CONTENT MEASUREMENTS

For many years, Skamer-ACM has specialised in providing solutions for measuring gas humidity. Since the mid-90s the company has been an official representative of Michell Instruments, a UK-based manufacturer of high-end devices for measuring gas humidity and oxygen analysers. We provide technical consulting, sales, commissioning, warranty and post-warranty service of Michell Instruments equipment.

We offer devices that use different measuring technologies so that we can select the best measuring technology to the requirements of a given application.

Humidity meters

Available measurement technologies.

- Capacitive polymer sensors for relative humidity and dew point measurements
- Capacitive ceramic sensors for dew point measurements in dry gas and liquid hydrocarbons
- Chilled mirror sensors for precise and stable humidity measurement in a wide measuring range
- Chilled mirror sensors with dark spot technology for hydrocarbon dew point measurements in natural gas
- Laser sensors (TDLAS) for accurate and fast humidity measurement in natural gas and biomethane
- Quartz crystal microbalance (QCM) sensors for accurate and fast humidity measurement in a wide range of gases

Product groups.

- ✓ Fixed relative humidity and temperature transmitters.
- ✓ Fixed dew point transmitters and meters. Designs for use in explosive atmospheres are also available.
- ✓ Portable relative humidity meters and portable dew point meters. Design for use in explosive atmospheres is also available.
- ✓ Process humidity analysers suitable for use in explosive atmospheres.
- ✓ Precision laboratory chilled mirror humidity meters.
- ✓ Humidity generators and calibration systems.



GPR-1200 Portable Oxygen Analyser



Optidew precision humidity meter

Oxygen analysers

Available measurement technologies.

- Zirconia sensors for measurement of both trace amounts of oxygen (ppm) and percentage oxygen content (up to 100% O₂)
- Thermo-paramagnetic sensors for the measurement of percentage oxygen content
- Electrochemical sensors for measurement of trace amounts of oxygen (ppm) and percentage oxygen content
- Sensors use thermal conductivity to measure binary gas mixes

Product groups.

- ✓ Fixed oxygen analysers. Designs for use in explosive atmospheres are also available.
- ✓ Portable oxygen analysers. Designs for use in explosive atmospheres are also available.
- ✓ Binary gas mixture analysers. Design for use in explosive atmospheres is also available.



Humidity measurement services

We also offer comprehensive solutions that take into account e.g. preparation of sample preparation systems for humidity or oxygen analysers as well as solutions combining humidity and oxygen measurement in a single measurement system.

Our service laboratory in Kraków is equipped with a humidity generator and reference meters, which allows us to verify the readings of relative humidity transmitters. Our generator is portable, which makes it possible to verify the transducers on the client's premises. In the case of transducers made by Michell Instruments, we can correct the readings of the verified transducers.

Apart from the humidity generator, we also have a precision chilled mirror meter, an Ex certified portable dew point meter and portable relative humidity meters. This allows us to perform on-site humidity measurements in various applications, including in explosive atmospheres.



ENERGY EFFICIENCY

The Polish economy is still characterised by excessive consumption of energy, raw materials and consumables in the creation of national income. Therefore, a very important issue is the reasonable use of energy in all industries and branches of the national economy.

The matter of improving energy efficiency is a priority in Poland's Energy Policy. Its main objectives are:

- striving to maintain zero-energy economic growth, i.e. economic growth without an increase of demand for primary energy,
- consistent decrease of the energy intensity of the Polish economy to the "old" EU levels.

SKAMER-ACM comprehensively performs tasks in the field of energy efficiency:

- energy and technological audits,
- energy efficiency audits – white certificates,
- assistance in finding sources of funding for energy-efficient solutions,
- integrated systems for measuring and monitoring of energy carrier consumption,
- design and implementation of projects improving energy efficiency in power and heat networks, lighting systems, industrial equipment and installations, local sources of electricity and heat – both at the design and execution stage,
- energy recovery in industrial processes, taking into account alternative energy sources,
- optimisation of: reactive power flows, reduction of network losses and losses in transformers, incorporation of alternative energy sources in the design.

Today, it is no longer sufficient to measure the parameters of energy utilities, but to actively manage them on a continuous basis using modern methods with optimal use of technical and organisational means.

To carry out tasks improving energy efficiency it is worth implementing an energy monitoring system.

During the 30 years of work with industrial automation, SKAMER-ACM's engineers have analysed virtually all visualisation systems available on the market. Drawing on our experience, we selected an optimal solution that combines comprehensive functionality, professional developer support and attractive price, which is often of key importance when designing large systems. All those features are offered by the SCADA Asix system, which in addition to the runtime version is also available in a development version in the basic package. A dedicated solution for energy monitoring is Asix Energy. This software helps implement, maintain and improve the Energy Management System. It supports the achievement of the goals and tasks of energy efficiency policies, and enables the actual effects of these policies to be measured.



ENERGY MONITORING SYSTEMS

The system enables the monitoring of any energy media, including:

- Electricity;
- Natural gas / coke gas;
- High and low pressure compressed air, vacuum;
- Industrial gases – hydrogen, oxygen, nitrogen, argon, etc.;
- Heat;
- Greywater, industrial water and waste water;
- Ventilation, air conditioning and ice water systems.

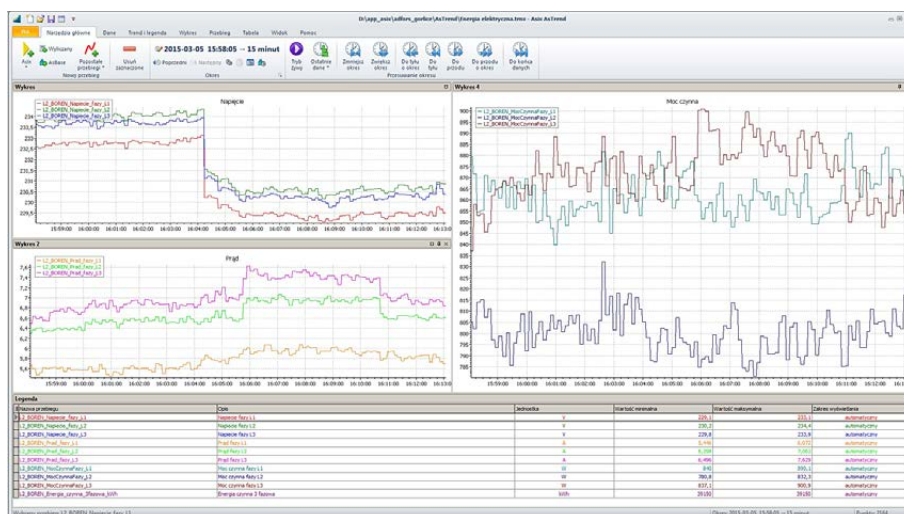
The basic function of Asix Energy is reading current and archive data from measuring devices, their archiving and visualisation. The data is clearly presented on synoptic screens, or on operator and managerial terminals. A wide range of graphical elements is available, such as numbers, bars, and rotation indicators, allowing you to choose the presentation method to suit the type of information and viewer. With the support of GIS mapping technologies, it is possible to clearly present the metering data of extensive power systems or plants against the background of map diagrams with all their benefits (zoom in and out, varying level of data detail depending on the map scale, etc.).

Historical data is presented in the form of intuitively operated trends and reports created based on MS Reporting Services or MS Excel. The extensive alarm system notifies of any events or exceedance of the set parameters. Notifications may not only be displayed on the computer screen, but also sent by e-mail or text message.

Asix Energy software enables the recipient to:

- Monitor energy consumption by machines, process lines, departments, the entire plant or any group thereof in terms of energy efficiency with online calculation of EnPI indicators;
- Create "virtual" energy meters, i.e. values calculated based on mathematical formulas, e.g. aggregation, averaging of physical meter readings or calculating their difference.
- Monitor the assumed targets with notifications of any exceedance submitted through established communication channels (text message, e-mail);
- Create reports for both technical staff (charts, tables, histograms) and the management (management cockpits);
- Select the best tariff (or price list) – based on the analysis of energy consumption costs in the Industrial Plant or the entire Group;
- Select the most favourable contracted capacity, also based on an analysis of the cost of overruns;
- Monitor the use of contracted capacity (electricity, gas) to avoid unnecessary exceedance and the resulting penalties for excessive energy consumption (power guard module). This can be done by notifying operators in advance of the expected exceedance of contracted capacity and leaving them with the decision on what steps should be taken or by automatically performing predefined actions (e.g. switching off specific, less important receivers, temporary reduction of operating parameters of equipment, blocking activation of drives, etc.);
- Analyse the reactive power compensation in the plant, which will also help avoid heavy penalties;
- Analyse the distribution of costs of consumed energy to departments and process lines;
- Reorganise process operations by shifting the load to lower energy cost area with the avoidance of unnecessary consumption.

The Asix Energy system fully demonstrates its capabilities when provided with up-to-date information on current production and backlog. By juxtaposing information from two different worlds – production and energy carriers – one may obtain a lot of interesting information – KPIs (Key Performance Indicators), which help make strategic decisions

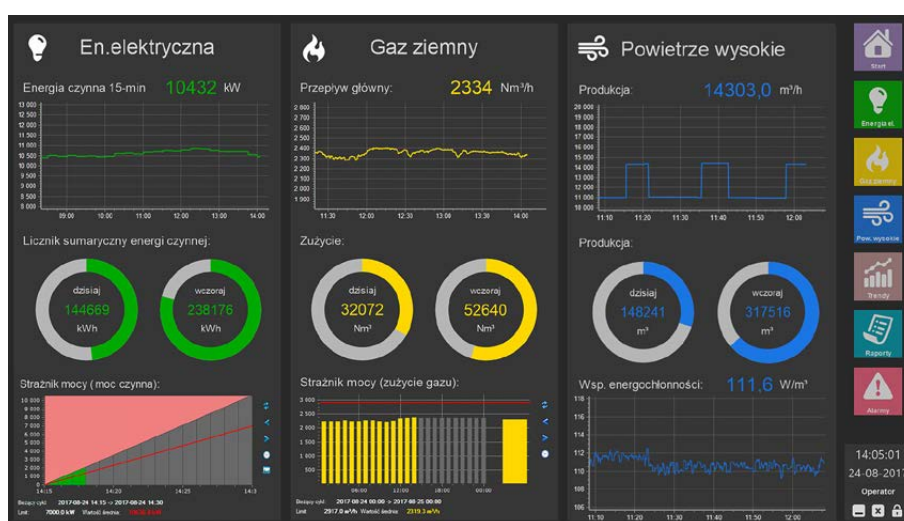


Historical trends in energy monitoring

on the optimisation of the production process. The most important of these include:

- The amount of energy consumed by a machine when running and when idle;
- The amount of energy consumed by a machine to produce a product unit;
- The amount of energy lost when adjusting a machine or process line;
- The amount of energy used by a machine for a complete one production cycle or task;
- The amount of energy consumed during a given shift;
- The amount of energy consumed by the entire plant during a shutdown (with an indication of where energy is lost);
- The ratio of energy consumption during uptime relative to downtime.

Asix Energy supports the implementation and maintenance of the energy management system in accordance with ISO 50001. It facilitates the achievement of the goals and tasks of energy efficiency policies, and enables the actual effects of these policies to be measured. These advantages make Asix Energy an indispensable tool for optimising production costs in any modern plant.



Asix Energy



INDUSTRIAL PROCESS AND PRODUCTION EFFICIENCY VISUALISATION SYSTEMS

Monitoring production efficiency is an important function of MES systems. Asix OEE is software offered by ASKOM for monitoring the effectiveness of machines, production lines and entire plants. Assessing machine productivity, the number, duration and causes of downtime and losses is the key to improving productivity and competitiveness. Asix OEE helps locate and assess bottlenecks and identify the root causes of downtime and underperformance, and after all, that is where production improvement starts. As it is an “out of the box” solution, Asix OEE can be implemented efficiently and its benefits can be observed quickly.

The standard functionalities of the system include:

- Monitoring and analysis of actual machine and equipment uptime;
- Identification of stoppages and micro outages;
- Notification of downtime by way of an alarm system, e-mail and text messages;
- Automatic and manual identification of causes of stoppages and rejects (manufacturing waste);
- Ongoing calculation of KPIs (Key Performance Indicators) for individual machines, production lines and production areas;
- Automatic and manual entry of production data;
- Data exchange with ERP, APS and CMMS master systems;
- Support for scheduling of production orders;
- Support for quality control procedures.

Asix OEE uses a pre-defined set of KPIs, calculated on the fly, which measure the utilisation of production equipment:

- OEE (Overall Equipment Effectiveness); $OEE = Availability * Production * Quality$;
- OE or machine Availability and Production performance;
- Quality of manufactured products;
- MTTR (Mean Time To Repair);
- MTTF (Mean Time To Failures);
- MTBF (Mean Time Between Failures);
- Current amount of products manufactured; Current amount of production waste.

The value of each indicator can be calculated and analysed in the selected context of Time (production shift, days, weeks, months, years), Equipment (machines, machine types, lines, production areas), Products (symbol, product group), and Staff (operators, teams, shifts).

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- KPI business cards – presenting current values of indicators in graphic form;
- meters – graphical presentation of current and recorded measurement values and KPIs – in the form of radial, half pie, doughnut, linear, thermometer (bar) chart, progress bar and a scatter plot. They can refer to time frames such as the last hour, production shift, day, week, month, quarter, year;
- Gantt charts – illustrating work, stoppages, micro outages and machine shutdowns;
- time charts – presenting measurements and KPIs as a function of time (year, month, week, day, production shift), in the form of bar, line and area charts;
- category charts – showing measurements and KPIs against a selected category (e.g. line, production area, machine type, operator, product, etc.). This group includes bar charts, pie charts, and funnel charts.



- OE machine availability reports;
- Pareto reports of causes of stoppages;
- Pareto reports of causes of rejects;
- Production goal guard reports for a machine in a given shift;
- OEE production efficiency ratio reports.





SERVICES TO THE INDUSTRY

SKAMER-ACM's offer is complemented by other activities required in the implementation of investment tasks. The following offer components make us well positioned for providing all auxiliary services:

- Energy audits;
- Energy efficiency audits;
- Security audits;
- Audits of industrial communication networks;
- Adaptation of machines to meet the minimum OHS requirements;
- Preparation of operating instructions for power equipment;
- CE marking and declarations of conformity;
- Implementation of energy management systems in accordance with PN-EN ISO 50001;
- Specialist expert reports;
- ESCO formula for financing projects that improve energy efficiency in an industrial plant;
- Comprehensive services in project implementation in the RES sector;
- Preparation of sample preparation systems for humidity and gas oxygen content analysers;
- Verification of readings of dew point and relative humidity transmitters in our service laboratory;
- On-site verification of readings of dew point and relative humidity transmitters;
- Performance of on-site humidity measurements in various applications, including in explosive atmospheres.

Power engineering SYSTEMS INCREASED efficiency *Expert opinions*
INVESTMENTS Projects Wind power plants Energy savings **ADMINISTRATION**
 Audits Environmental protection CE marking **Technical supervision**
MEASUREMENTS Hybrid power plants Communication Subsidies
Test laboratories Guarantee COOPERATION **ANALYSES SECURITY**
RENEWABLES TECHNOLOGY Photovoltaics Innovation **Optimisation**
 Future **Coordination** Comprehensive services **RELIABILITY** Certificates Profit
 Effectiveness Analyses **Smart building** Consultancy Growth **Automation** Grid codes
 Power engineering SYSTEMS INCREASED efficiency *Expert opinions*
INVESTMENTS Projects Wind power plants Energy savings **ADMINISTRATION**
 Audits Environmental protection CE marking **Technical supervision**
MEASUREMENTS Hybrid power plants Communication Subsidies

Our partners

Metallurgical industry:

ArcelorMittal Poland S.A.
Celsa Huta Ostrowiec Sp. z o. o.
Huta Stalowa Wola S.A.
ISD Huta Częstochowa Sp. z o. o.
Stalprodukt S.A.

Chemical industry:

Air Liquide Polska Sp. z o.o.
Alwernia S.A.,
Cellfast Sp. z o.o.
Firma Oponiarska Dębica S.A.
FUCHS OIL Corporation Sp. z o. o.
Gamrat S.A.
Grupa Azoty S.A.
Izolacja Matizol Sp. z o.o.
LERG S.A.
Michelin Polska S.A.
CIECH Sarzyna S.A.
Orion Engineered Carbons Sp. z o.o.
Sanok Rubber Company S.A.
Sanwil Polska Sp. z o.o.
SGL Graphite Solutions Polska Sp. z o.o.
Siarkopol S.A.
Splast Sp. z o.o.
Synthos S.A.
ŚNIEŻKA S.A.
Tikkurila Polska S.A.
Tokai COBEX Polska Sp. z o.o.
Zakłady Magnezytowe „ROPCZYCE” S.A.
ZPS GAMRAT Sp. z o. o.

Pharmaceutical industry:

ICN POLFA Rzeszów S.A.
KRKA-Polska Sp. z o.o.
OLIMP Laboratories Sp. z o.o.
Teva Operations Poland sp. z o.o.
Zakłady Farmaceutyczne Polpharma S.A.

Mineral industry:

Bruk-Bet Sp. z o. o.
CEMEX Polska Sp. z o.o.
Ceramika Paradyż Sp. z o. o.
Dyckerhoff Polska Sp. z o.o.
Grupa Ożarów S.A.
Krosglass S.A.
KROSNO Glass S.A.
Leier Polska S.A.
O-I Produkcja Polska S.A.
Pilkington Automotive Poland Sp. z o.o.
SAINT GOBAIN HPM Polska Sp. z o. o.

Electromechanical industry:

ALFA LAVAL Polska Sp. z o. o.
DEZAMET S.A.
Federal-Mogul Gorzyce Sp. z o.o.
IGLOO Sp. z o.o.
Newag S.A.
Pratt & Whitney Rzeszów S.A.
UTC CCS Manufacturing Sp. z o.o.
BorgWarner Poland sp. z o.o.
Goodrich Aerospace Poland Sp. z o.o.

MTU Aero Engines Polska
Safran Transmission Systems Poland
Polskie Zakłady Lotnicze Sp. z o.o.
W.S.K. „PZL-Świdnik” SA
WUCH PZL-Dębica S. A.

Fuel and energy industry:

CEZ Polska Sp. z o.o.
CEZ Skawina S.A.
ELSEN S.A., Enea S.A.
EuRoPol GAZ S.A.
FENICE Poland Sp. z o. o.
GAZ-SYSTEM S.A.
Grupa LOTOS S.A.
JSW KOKS S.A.
MPEC w Kielcach
MPEC w Krakowie
MPEC w Mielcu
MPEC w Rzeszowie
MPEC w Tarnowie
PGE S.A.
PGNiG S.A.
PGNiG Technologie S.A.
PGNiG TERMIKA ENERGETYKA Przemysł
PKN ORLEN S.A.
Polenergia Elektrociepłownia Nowa Sarzyna Sp. z o.o.
Tauron Polska Energia S.A.

Food industry:

Carlsberg Polska S.A.
Coca-Cola HBC Polska Sp. z o.o.
Grupa Żywiec S.A.
Kompania Piwowarska S.A.
Krajowa Spółka Cukrowa S.A.
MONDELEZ Polska Sp. z o. o.
Mlekovita
Naturex Polska Sp. z. o. o.
Nestlé Nutrition-Alima Gerber S.A.
Philip Morris Polska S.A.
ROLESKI Sp. J.
SOKOŁÓW S.A.
SÜDZUCKER Polska S.A.
UNILEVER Polska S.A.
Van-Pur S.A.
VORTUMNUS Sp. z o.o.

Wood and paper industry:

Baltic Wood S.A.,
Kronospan HPL Sp. z o. o.
Kimberly Clark Polska Sp. z o. o.
Kronospan Mielec Sp. z o. o.
Nowy Styl Sp. z o. o.

Water supply and sewage system companies

MPWiK S.A. w Krakowie
PWiKOCz S.A. w Częstochowie
MZWiK Sp. z o.o. w Myślenicach
Wodociągi Niepołomickie Sp. z o.o. w Niepołomicach
Wodociągi Tarnowskie Sp. z o.o. w Tarnowie
Sądeckie Wodociągi Sp. z o.o. w Nowym Sączu
ZWiK Sp. z o.o. w Skawinie

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Vice-President of the Management Board, CTO

Andrzej Fraś

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Mirosław Sarzyński

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Monika Pabian

Economic Director

Paweł Tomaszewski

Marketing Director

Dariusz Turak

E-Communications Manager

Daniel Derus

Design Studio Manager

Tomasz Pyrda

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Offer

- Sale of automation elements, electrical equipment and industrial fittings
- Automation catalogue (www.katalogautomatyki.pl)
- Design
- Technical consultancy
- Equipment order preparation and delivery
- Programming and start-up of industrial control and computer systems
- Programming and start-up of SCADA systems
- Installation, start-up and maintenance of installations
- Prefabrication of control cabinets and switchgear
- Measurement of humidity and analysis of oxygen in gases
- Implementation of energy management systems in accordance with PN-EN ISO 50001
- Energy and energy efficiency audits – white certificates
- Energy carrier monitoring systems
- Industrial process and production efficiency visualisation systems
- Audits of industrial communication networks
- Project implementation in the RES sector
- Security audits
- Professional risk analysis and assessment
- Adaptation of machines to meet the minimum OHS requirements
- Preparation of operating instructions for power equipment
- CE marking and declarations of conformity

industry 4.0



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