

ZPAS Control Oversee

REMOTE SUPERVISING AND AUTOMATION SYSTEM

[2008]

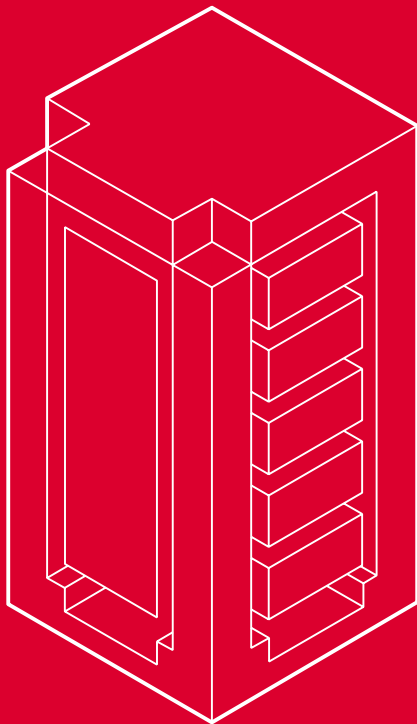


ZPAS
net

connections for you

ZPAS

GROUP



ZPAS Group

The ZPAS Group, pursuing shared goals and business philosophy, integrates the product offer of ZPAS S.A. and ZPAS-NET sp. z o.o. The idea is reflected in our motto “solutions for connections”, which refers to advantages of our products, benefits of using them, a superb system of communication with our customers, partnership, technical consulting and high level of customer service, from the moment of first contact until order fulfilment. The motto thus reflects our attitude to clients whose requirements we wish to satisfy, offering them top-quality services.

We have achieved a strong status in the industry over 35 years of our business activity. As a manufacturer, we operate in accordance with our well-established reputation as a reliable business partner providing customers with top-quality products, short lead times and very reasonable prices.

Electronic communication products (elements of IT, telecommunications and power systems) must demonstrate parameters and features capable of meeting rigorous high-tech requirements. Our primary goal is to supply such products.

Our capital is not limited to modern machines. We also boast of highly qualified staff. Our employees are young, creative and innovation-minded. They also make the best use of vast industry experience acquired over more than 30 years by specialists who have worked for our company ever since its beginnings. Advanced technologies and well-planned organisation of all manufacturing processes are supported by INFOR ERP LN, our IT system.

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ABOUT THE COMPANY



ZPAS-NET office building

ZPAS-NET sp. z o.o.

Since the very beginning of its business activity in 1973, ZPAS in Przygórze has manufactured enclosures and equipment for the power sector and other industry branches. Initially, the Company operated as the Experimental Department of the Power System Automation Institute (IASI) in Wrocław, to become a part of the Research and Manufacturing Centre for Power System Automation (CNPAE). After 1989, the management of the Company undertook actions aimed at privatisation, which resulted in the establishment of a private joint-stock company at the end of 1991.

ZPAS-NET sp. z o.o. was established on 1 June 2004 as a result of spinning off departments specialising in network solutions and power sector equipment from the general structure of ZPAS S.A. The name of the new company features the “net” element that stands for the line of products necessary to develop the infrastructure of modern networks and supervision/control systems. Another, equally important, product group comprises dedicated elements for the electric power industry incorporating intelligent IT solutions.

The two companies making up the ZPAS Group (ZPAS S.A. and ZPAS-NET sp. z o.o.) offer complementary products, marketing a broad range of articles performing important functions in electronic communications. ZPAS products are widely used as an infrastructural base for telecom and IT networks, as well as enclosures for the telecommunications and power equipment.

ZPAS-NET has been developing very rapidly, recently opening a new plant in Nowa Ruda-Drogosław, within the sub-zone of the Wałbrzych Special Economic Zone. The plant was officially put into operation on 5 October 2007. The new ZPAS-NET facility has an office area of 800 m² and the production area of 2500 m². Detailed information is available at www.zpas.pl.

Quality and the environment

The ZPAS Group holds the ISO 9001:2000 Quality Assurance System Certificate and the ISO 14001:2004 Environmental Management System certificate.

Sales agencies

The Company has around a dozen sales agencies all over Poland. A detailed list is available on the Company's website.

ZPAS products are also sold abroad through a distribution network in: Austria, Belarus, Belgium, Bosnia and Herzegovina, Cyprus, Denmark, France, Germany, Greece, Hungary, Iceland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Morocco, the Netherlands, Norway, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland and the Ukraine. Detailed information is available on request from the ZPAS Group Marketing Department.

ABOUT THE COMPANY



ZPAS-NET production facility



Assembly of electrical appliances



Assembly of power supply cabinets

ZPAS-NET offers:

- structural cabling systems
- fibre optic distribution frames and accessories
- telecommunications accessories
- ZPAS Control Oversee supervising system
- DataCenter integration of equipment and systems
- aluminium outdoor telecom cabinets
- dispatch and control desks
- mimic boards
- prefabrication of power supply, protection, control and automatics cabinets

ZPAS offers:

- 19" and 21" data communication enclosures (including server cabinets, telecommunications cabinets, EMC enclosures and others – both in free-standing and wall-mounted versions)
- empty power cabinets (without electrical devices)
- customised cabinets
- universal control desks
- products made of stainless acid-resistant steel

INTRODUCTION

Nowadays, the progress made thanks to the development of telecommunications, electronics and measuring technology, enables the creation and application of modern solutions within the scope of managing data acquired by monitoring the technical and environmental parameters of the facilities. Thanks to the internet, it is possible to implement less expensive and less complex systems for data acquisition and secured data sharing. As part of the ZPAS Control Oversee system, we offer two basic technological/hardware solutions for acquiring data from the facilities:

- **Oversee 1-Wire** – based on the 1-Wire bus and its elements
- **Control M-Bus System** – based on the M-Bus bus and the Modbus RTU transmission protocol

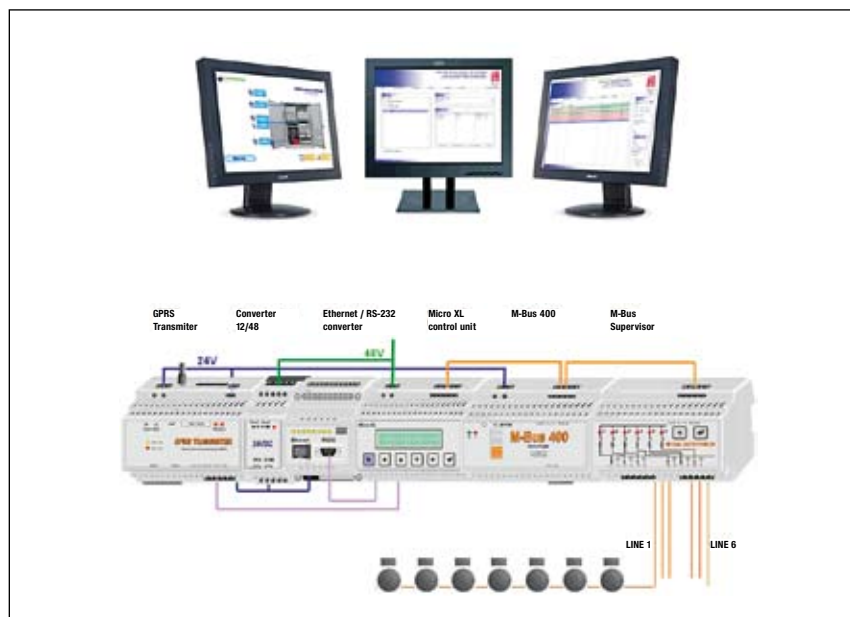
The above systems may be integrated into one ZPAS Control Oversee software platform. This solution was designed for computer system users to provide them with an overview of conditions available in given facilities. The simplicity of use and the ease of implementation make this ZPAS Control Oversee system a perfect solution for monitoring facilities (e.g. server rooms) scattered around distant locations.

ZPAS Control Oversee

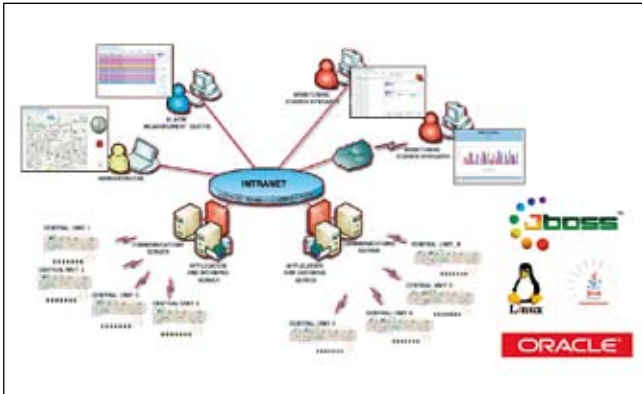
It is a comprehensive solution which enables the construction of inexpensive and reliable systems of remote supervision with measurement and control functions. The system is scalable and fully independent of hardware, database and system platform. Its structure can be easily expanded with new devices, communication technologies and presentation elements. The range of devices offered by ZPAS-NET working in the M-Bus and 1-Wire bus standard was designed for comprehensive supervision of the operation of industrial facilities equipped with digital automation device systems.

Oversee Software

This software is intended for remote supervision and control of industrial facilities fitted with digital automation device systems. It allows the integration of any number of independent, geographically scattered facilities, their organization into any network structure and their central management. Oversee Software may be used to create operator panels, making it possible to visualize current and archive states, the remote modification of settings and the configuration of local automation systems.



OVERSEE CONTROL CENTRE SOFTWARE

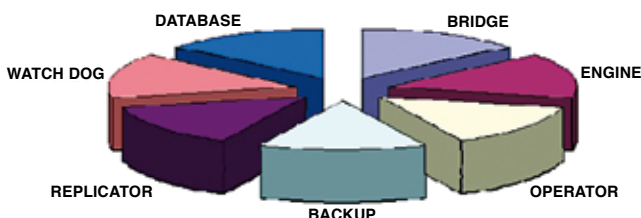
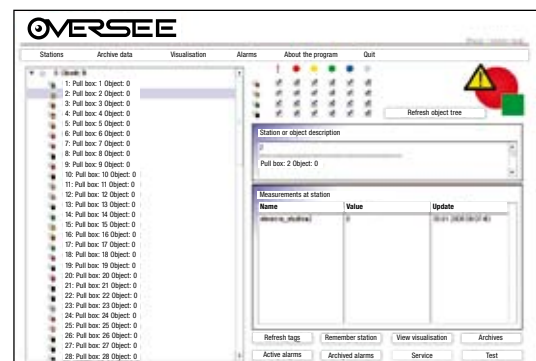
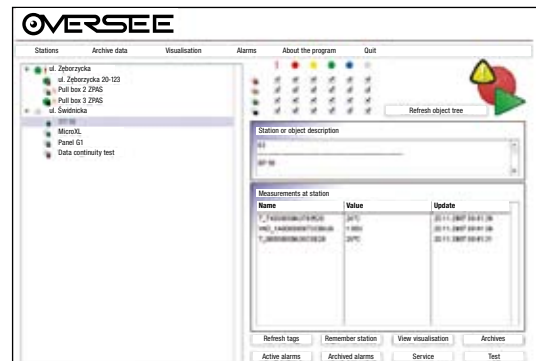


An essential part of the system is software which makes it possible to store, process and visualise data output by hardware. The user thus obtains a comprehensive remote control system accessed via a web browser. As a result, it is possible to monitor a number of objects from any location worldwide, create a practically unlimited range of visualisations and select among current and previously saved measurements only those which are of user interest. Settings can be adjusted to particular needs of each remote user. The software is also equipped with extended alarm functions. An alarm state is identified with a previously defined measurement and included in a group of predefined alarms which, in the event of alarms set off by a number of sensors, triggers off only one

alarm, not as many alarms as there are alarm-signalling sensors. The access control function restricting access to data saved in the control system allocates user rights with respect to user roles in the system and allowed access to monitored objects. The solution makes it possible to sort users and objects which they are authorised to view. Archived data can be displayed in the form of tables and graphs. Any data stored in the system can be printed. An additional advantage of the system is the fact that the number of system users is not licensed.

Data input into the system are visualised in specially prepared operator panels. The panels also feature simple tools for viewing archived data. Thanks to the implemented function of visualisation screen editing, the user of the system can create screens according to their own needs. The user is able to select data which are deemed the most essential and display them in one or several screens. In this way, even data concerning multiple objects can be displayed collectively in one visualisation screen.

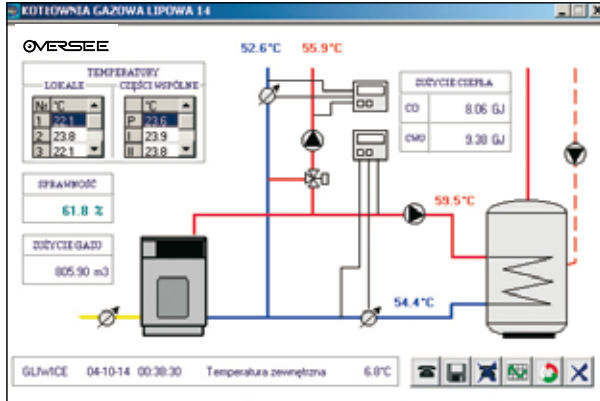
The figures below present sample window views featuring alarms reported in the system. Alarm messages may be marked by system users as handled and provided with notes, as appropriate.



VISUALIZATION SOFTWARE

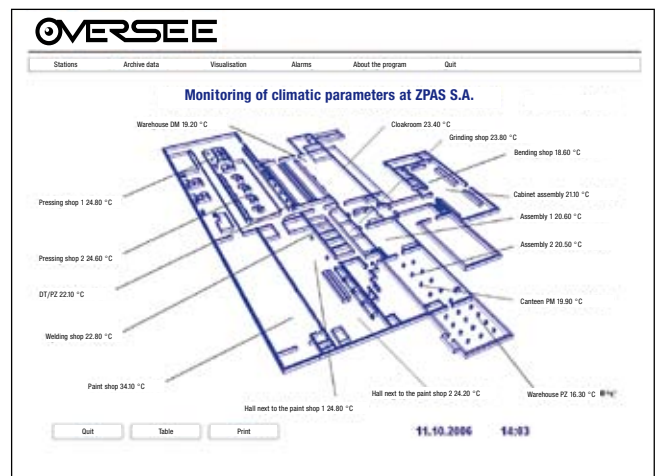
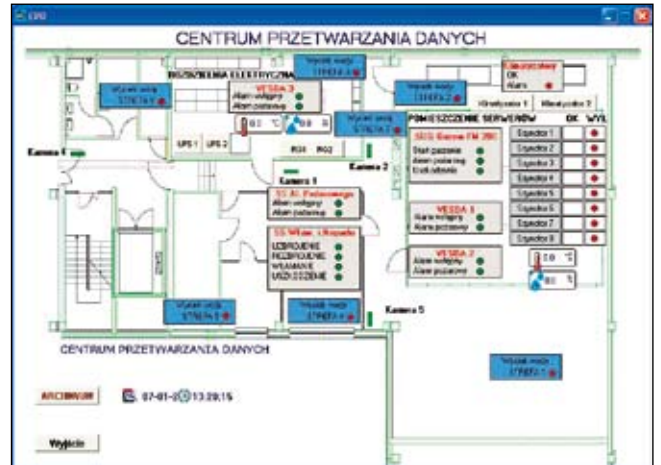
The graphical visualization software, working in the Windows environment, enables periodical access to process data using telephone lines or constant access to the facility.

It allows the creation of user's own customised operator panels, enabling the visualization and monitoring of control and supervision systems from any location.



Depending on the needs, the system allows visualization and archiving of data recorded in the supervision center. Thanks to the possibility of establishing remote communication with the facility, the software enables graphical visualization of the current state and the import of process data archived in the central unit, in order to supplement archives on the master system hard disk. Data from the facility are recorded as plain text files. They may be later imported to databases and spread sheets, where further processing may take place, according to user specification. The package includes also an excellent record graph browser with great capabilities.

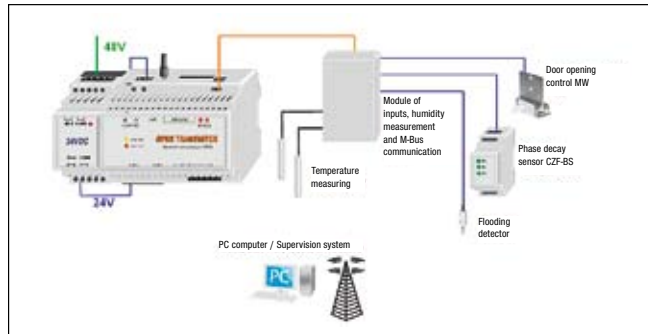
Mathematical processing and creation of new channels, based on available records and formulas, is a good example here. Connecting archives from various periods, which makes the analysis of changes in the technological process over long periods of time possible, is also available. The operator panels enable the evaluation of current state and behaviour of the facility from any location around the world.



OVERSEE SYSTEM COMMUNICATION SOLUTIONS

The Oversee system comprises devices and software. Due to the diversity of tasks to be performed, they differ from each other in the applied communication solutions.

With the Ethernet and Internet networks used by the software, the user is offered an inexpensive and quick access to the monitored facility. When the redundancy of connection with the facility is of importance, the system makes it possible to use the telephone network and the GPRS transmission. Given the diversity of devices, the system uses the ModBus RTU and 1-Wire transmission protocols.



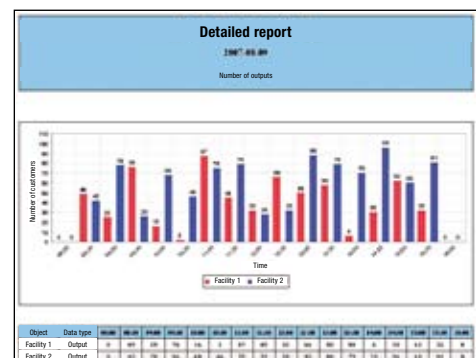
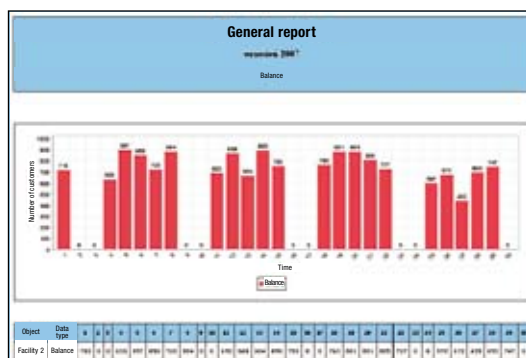
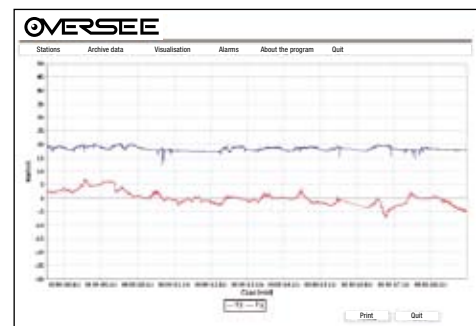
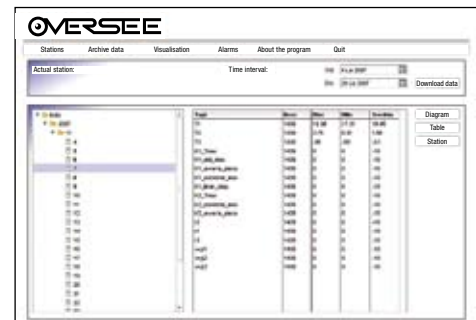
DATA RECORDING AND ARCHIVING

Thanks to the system's flexibility, the user may choose the method and manner of recording and archiving. When it comes to monitoring, where the priority is to ensure uninterrupted recording of events taking place in the facility, we suggest to record data using dedicated concentrators. In case the power supply of the concentrators in question is additionally secured with UPS devices, those concentrators will safely store readings in the internal memory in an uninterrupted manner to provide their values when a need arises.

When continuity of data recording is of less importance (e.g. in case of outside temperature monitoring), one may use the devices recording the last measurement only.

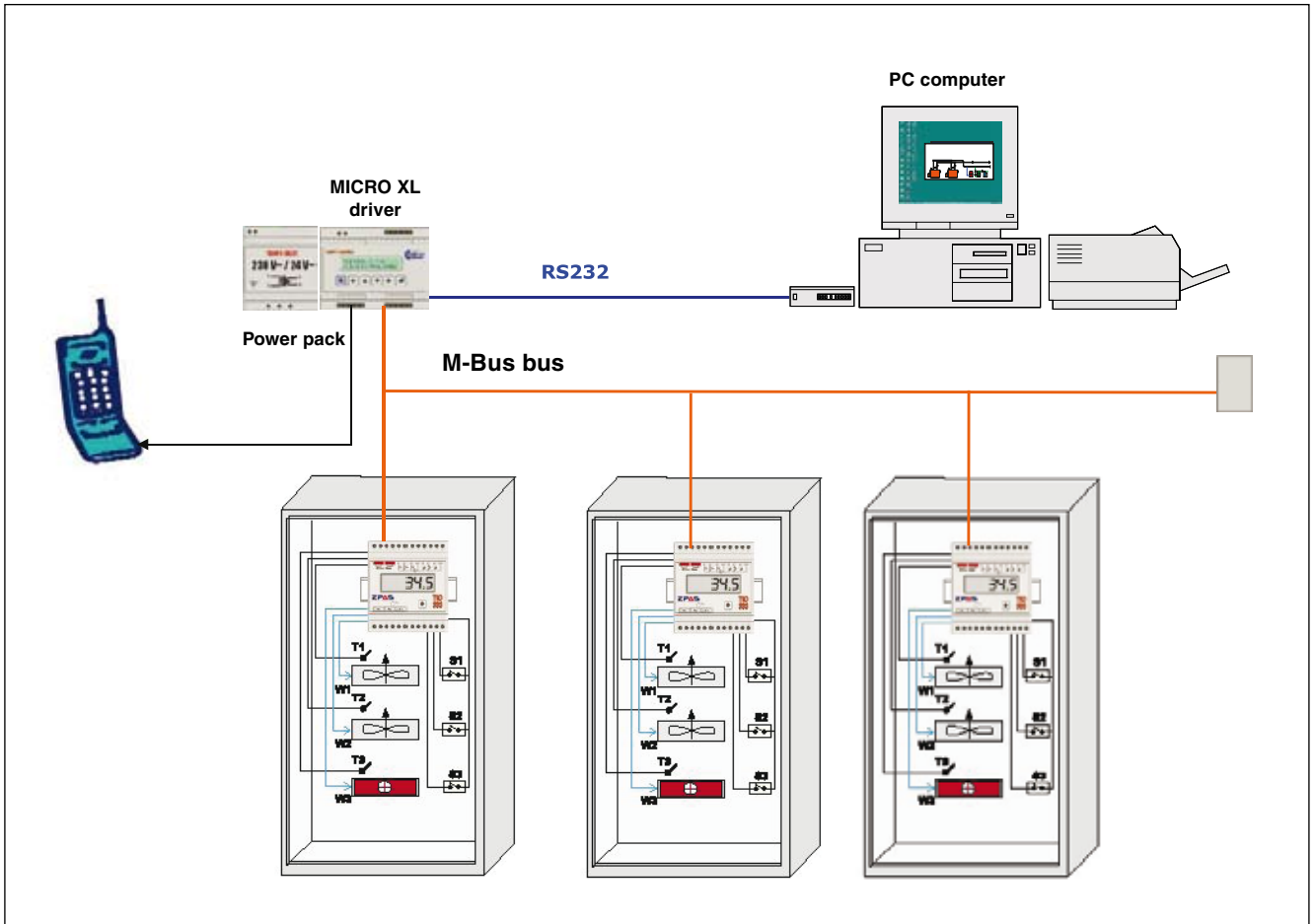
The data gathered by the devices may be stored in the system. Depending on the needs, measurement values, alarms or other parameters of interest to the customer are recorded in the database. Dedicated software may be used to provide the user with the archived data.

There is also the possibility of establishing direct connection with data concentrators and exporting archives from them to text files or a spread sheet.



OVERSEE M-BUS

Network monitoring system using the M-Bus bus



A wide range of devices working in the ModBus RTU communication protocol is available. They allow the realization of a complete and autonomous control, monitoring and alarm system.

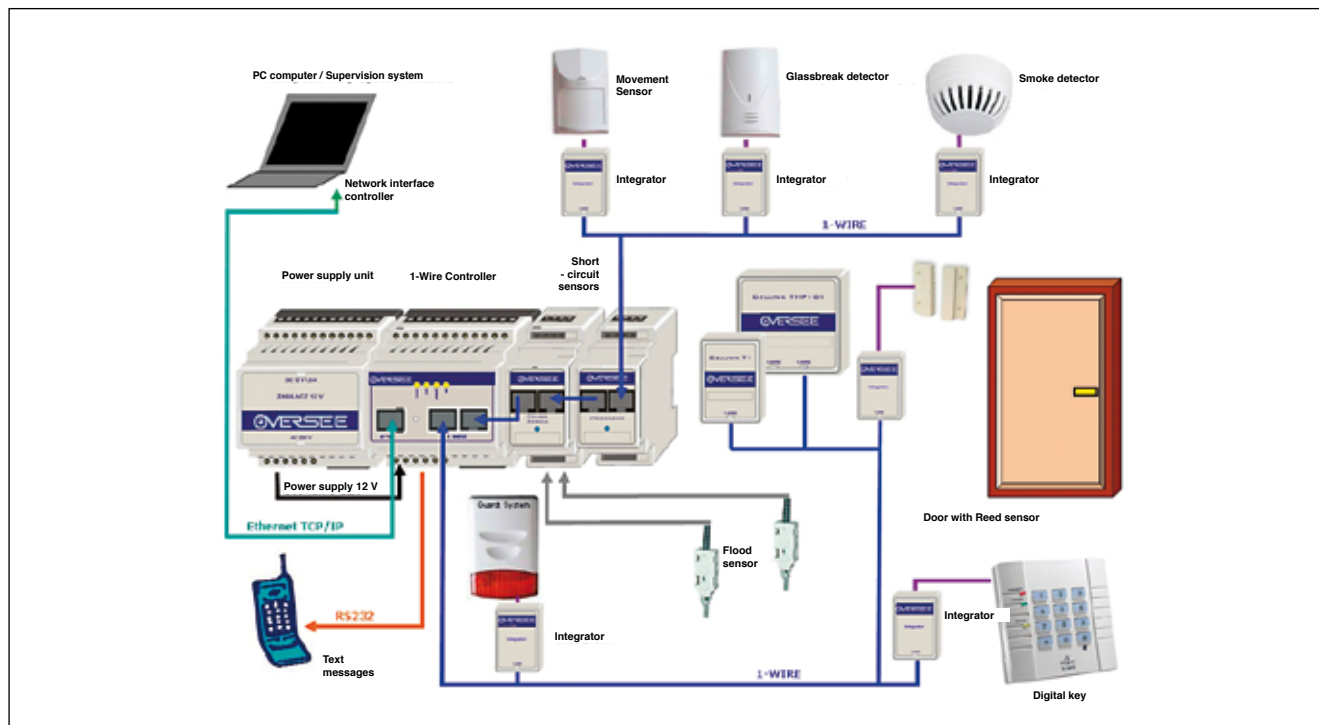
Oversee M-Bus is a system based on the elements of digital automation system, which enables the construction of efficient, inexpensive and reliable measurement/control systems. It is intended for use in professional systems for managing environmental conditions in server rooms, outdoor access cabinets, data communications enclosures, power cabinets, mimic boards and industrial facilities. The open and free configuration allows the Oversee M-Bus system to be used in an intelligent building, heat engineering, water and waste management, calculating individual costs of heat energy consumption in multi-family buildings and many other areas.

The design of automation systems based on the Oversee M-Bus system is easy, thanks to the use of universal hardware elements and software modules intended for control using typical performance devices. The system includes central units, data transmission converters, object modules, temperature and humidity sensors, smoke, motion, shock and access detectors, as well as performance modules. The communication between the central unit and object modules is based on the standard M-Bus bus with additional control feature.

The Oversee M-Bus system offers attractive software for graphical visualization in the Windows environment. The RAM memory used in drivers enables multi-channel recording and archiving of data in the facility. They may be read from the driver on demand or via the master system.

OVERSEE 1-WIRE

Network monitoring system using the 1-Wire technology



The following several factors convinced us to design a range of devices working on a common single-wire 1-Wire bus:

- the need to constantly monitor environmental conditions and electric quantities in facilities (e.g. server rooms, data communications cabinets and other facilities with electronic devices which need to be provided with appropriate working conditions),
- the possibility of quick and easy installation,
- the reduction of costs of the applied bus.

Multiple devices working in the slave mode may be connected to a single master bus. Each slave device has a unique 64-bit address, which ensures its easy identification, even in a large network. The 1-Wire type component network may be directly connected to a PC unit or a driver using a single communication bus.

Furthermore, this technology allows the construction of larger networks of any topology without the use of concentrators. In typical networks, the length is limited to 200 m. As a result, the separating system and the additional power system are needed if the network is to be expanded. This system allows the cable length to increase to ca. 500 m. In case there is a need to separate a sub-network, the 1-Wire switch devices may be used here.

Due to the diversity of used components, the availability of materials and their low prices, the 1-Wire networks are becoming extremely useful in the monitoring of server rooms, data communications cabinets and in the construction of intelligent building systems.

It should be emphasised that our technology is reliable and highly functional when cooperating with the ZPAS Control Oversee monitoring system, which enables data gathering, processing and sharing, with the use of available state-of-the-art solution

SAMPLE APPLICATIONS OF MONITORING SYSTEMS

Monitoring of telecommunication pull boxes

Telecommunications service providers have recently faced a major problem in how to ensure the safety of their pull boxes because of frequent thefts and acts of vandalism. If the network cannot be security-sealed and, consequently, no continuity in the provision of ICT services can be guaranteed, high costs arise as a result of interruptions in using the services, the need to reconstruct infrastructure and pay damages.

In order to ensure appropriate safety of pull boxes, ZPAS-NET has developed a solution based on a system of sensors signalling pull box opening. The sensors make it possible to constantly monitor the state of pull box covers and immediately raise an alarm in the event of attempted break-in.

An important problem in technology selection is to ensure suitable monitoring levels along long sections (up to 10 km) and in systems incorporating only a small number of cables. Owing to low power consumption levels of individual elements of the Oversee (<1 mA) system, it is possible (with few cables) to supply power and communication to sensors which are located at a very large distance from the central monitoring unit. Another worthwhile benefit is the fact that the same pair of cables can be used to provide power supply and communication of the entire line.



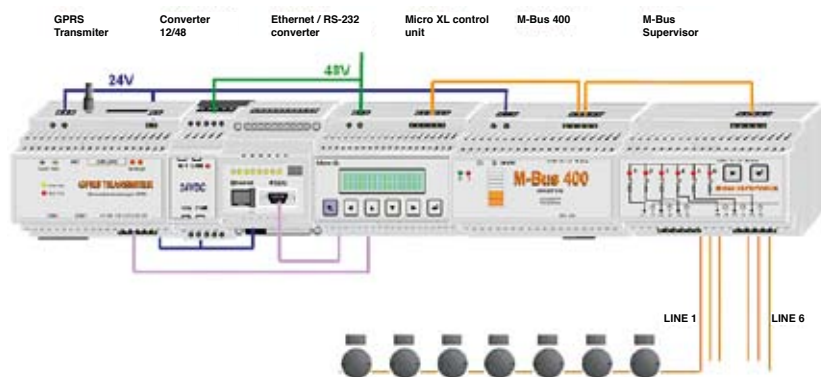
Each of the pull boxes is equipped with an addressable sensor with two memory cells. One is a bit denoting the state of the pull box cover, while the other – a counter of the number of cover opening actions. Based on these data, the system is able to distinguish between attempted break-ins and phenomena affecting the pull box cover under normal operating conditions. Building on the company's extensive experience, a sensor was constructed which eliminates the phenomenon of faulting and is resistant to harsh weather conditions, including humidity levels reaching 100% and temperature dropping below -20 °C. The central cable monitoring unit is capable of accommodating up to 240 sensors (pull boxes) and up to 6 independent lines with a maximum length of 10 km.

If the system is to be expanded in order to be able to monitor more lines or pull boxes, the existing central unit must be supplied with extra subunits. The maximum allowed number of subunits is 9. In extended systems, one central unit is capable of storing collective data output from as many as 2,400 pull boxes. If such requirements are not sufficient, another central unit should be installed and provided with the required number of subunits. This method of connection makes it possible to limit the number of installed elements, as subunits do not need to be equipped with transmission converters.

The subunit has safety devices protecting the unit from damage to inputs both in the case of line faults and foreign voltages. All constituent modules of the central unit are small-sized and can be accommodated within special 19" enclosures facilitating assembly in ICT cabinets. For typical solutions, the Company offers a compact version of the central unit which can be hung on the wall of the room or installed inside the access cabinet.

Data saved in the Oversee system can be viewed via previously prepared (in FlashWizual) visualisation screens and alarm handling panels.

Sample subunit layout



0:	Object: 0
1:	Pull box: 1 Object: 0
2:	Pull box: 2 Object: 0
3:	Pull box: 3 Object: 0
4:	Pull box: 4 Object: 0
5:	Pull box: 5 Object: 0
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SAMPLE APPLICATIONS OF MONITORING SYSTEMS

Monitoring of cable pathways

As opposed to pull box monitoring, in which problems with long lines and large number of sensors have to be resolved, the basic feature of cable pathway monitoring consists of long sensor-free cable sections. Monitoring is effected by an analyser installed at the beginning of the monitored network.

The central unit is capable of monitoring 16 independent lines, up to 10 km in length each. The lines can be heterogeneous, with any cross-section. Measurements are based on resistance and capacitance testing. The measurement method is perfect for applications in which devices based on reflectometric techniques are not usable. The central unit can be connected to a monitoring system to alert the user of sudden changes in network parameters which may result from cable theft. For the purpose of accurate interpretation of measured values and determination of location affected by a given phenomenon with an accuracy of 50 m, the system requires calibration and line measurements. The procedure is of particular importance if the line structure is heterogeneous.

The central unit is the size of the compact version of the pull box monitoring unit, i.e. around 30 cm².



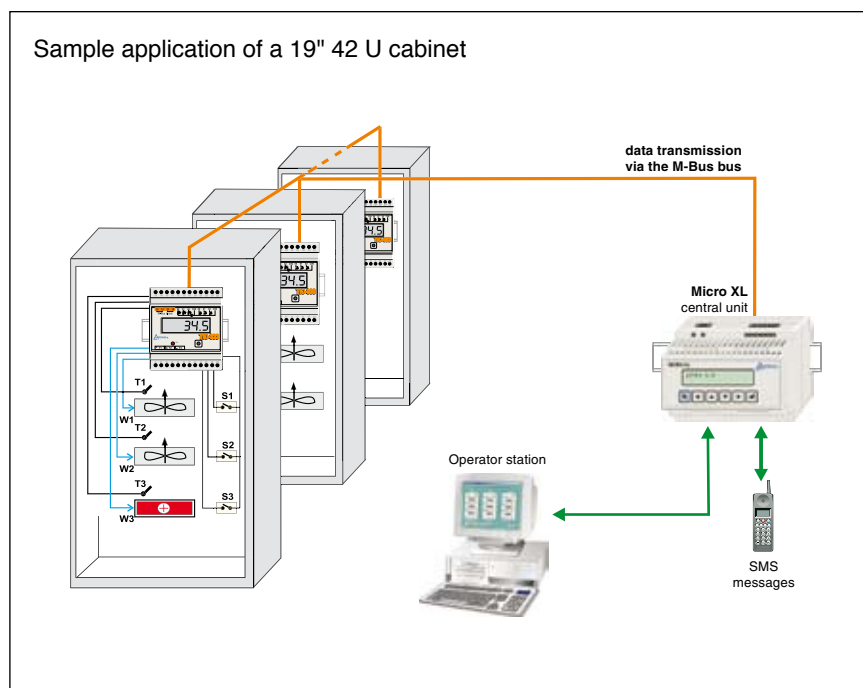
SAMPLE APPLICATIONS OF MONITORING SYSTEMS

System for monitoring environmental conditions in server rooms, data communication and power enclosures, and industrial facilities

The ZPAS Control Overseer system enables constant monitoring of environmental and technical parameters present in server rooms and notifying the administrators when set parameters and alarm states are exceeded. The microprocessor, a freely programmable Micro XL driver, records analog and two-state signals and once the limit parameters are exceeded, it notifies the administrator about the alarms and provides them via password-protected website.

System installation enables e.g.:

- monitoring of temperature and humidity values,
- monitoring of voltage values in the server room,
- monitoring of ventilation and air conditioning operation,
- flooding, fire and burglary detection,
- detection of other electrical and non-electrical values using measurement converters,
- notifying the administrator about alarms via SMS text messages and e-mail,
- optical/acoustic notification of alarm on the mimic board,
- communication with the facility, for example via the M-Bus bus, telephone network, GSM, GPRS, Ethernet, LAN, WAN,
- possibility of performing remote diagnosis,
- analysing archive data (event log),
- imaging of current and archive data, illustrating work states of the supervised facilities.



The administrator may preview conditions in the server room, using a normal web browser or dedicated software on the user's computer.

Depending on the application, the following may be monitored: temperature, humidity, presence of smoke, opening of doors, emergency battery voltage and so on, as well as auto-controlled devices (fans, air conditioners or heaters).

With its modular structure, the system may be expanded from the simplest application in a single (data communications or power) cabinet, through installations grouping numerous cabinets, to scattered systems equipped with broad communication mechanisms. Below several implementations of this solution are presented.

The above application, built using the TIO 333 module, enables constant measurement of temperatures, as well as the control of heater and fans in separate cabinet sections. This system may easily be expanded further. When supplemented with the M-BUS Master 10 Converter, it enables visualization and modification of values set using the PC computer.

Further expansion of the system may be continued by connecting it to the Micro XL central unit, which functions as a data concentrator. Micro XL may communicate with the master system using phone modem, GSM/GPRS modem, Ethernet converter or direct RS232 connection.

SAMPLE APPLICATIONS OF MONITORING SYSTEMS

Monitoring system in access cabinets

The offered system includes the ST-50 controller, temperature and humidity sensors, as well a smoke and short circuit detectors. Thanks to the use of a flooding detector, the system informs also about flooding or permeating the expensive equipment in the cabinet. All alarm events may be immediately sent to the system administrator's address, via GSM modem or mobile phone connection, as SMS or e-mail messages. The controller used is also equipped with an Ethernet output, which enables its inclusion in the network infrastructure and fixed connection with the supervision center. The way the system reacts using redundant lines, the promptness of reaction and independence from power supply are vital assets when the system is used in special working conditions, such as access cabinets – distant data communications facilities.

The system itself is very flexible and easy-to-expand. As a result, it may be later expanded, along with growing demands of the user. What is more, devices from various manufacturers may be connected to the system, using the integrator module. The entire system may cooperate with the user's original software or a chosen monitoring system.



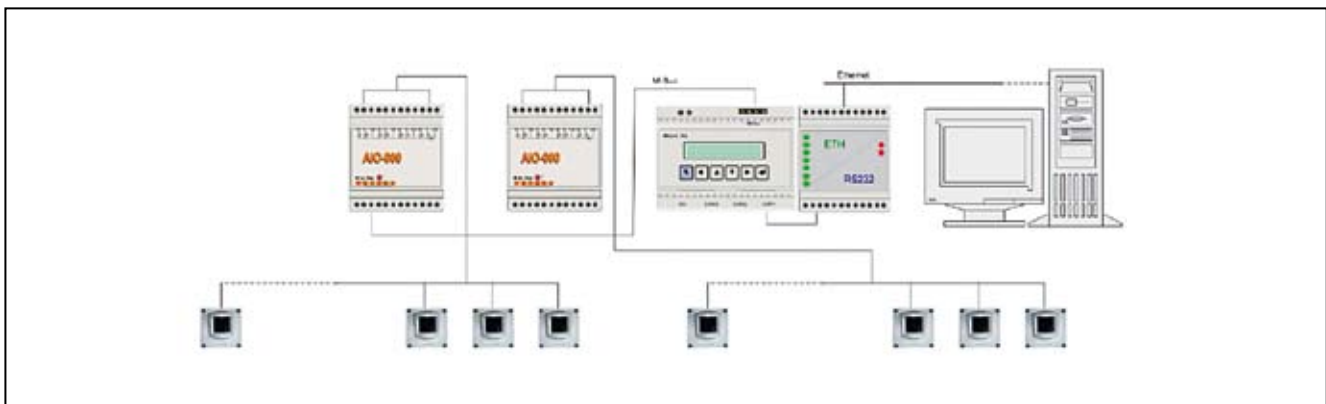
System for supporting facilities security and access control

The access control systems are a closed group of subsystems composed of modern office and residential buildings. The solutions in the area of system elements available on the market, starting from proximity card readers to central system units, are an exclusive product group and products from various manufacturers are not compatible with one another.

The Oversee M-BUS automation elements may be used to build a system which supports peripheral devices from various manufacturers, equipped with the RS232, RS485 or M-Bus interface.

Efficient data gathering and archiving mechanisms implemented in the Micro XL driver software enable a simple method of adding extra features, which are not found in other systems. Examples include staff traffic analyses and integration of the data with, e.g., heating or lighting control systems or systems supporting facility security.

The above figure shows the method of installing proximity card readers in the access control system. The readers are connected to the M-Bus bus via the RS485 bus. The proximity card readers available from ZPAS are equipped with additional outputs, which may be used to connect a device signaling open doors and an EMC lock.



SAMPLE APPLICATIONS OF MONITORING SYSTEMS

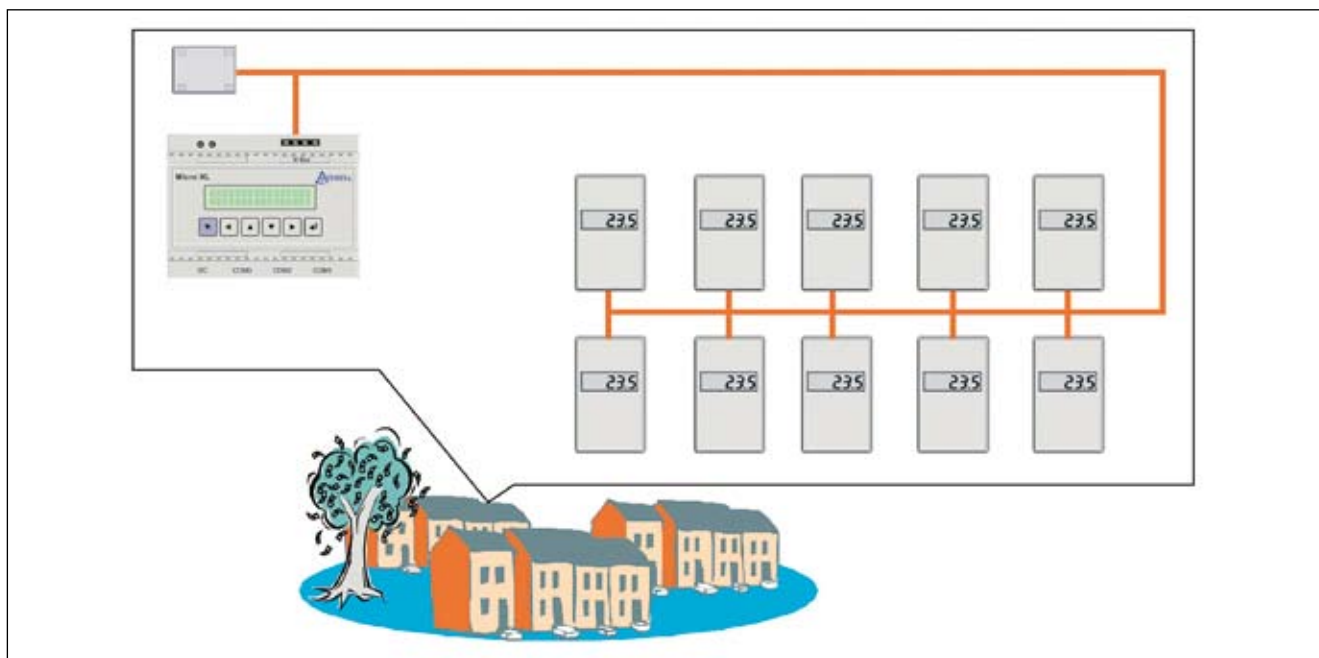
Utility billing system

Growing prices of utilities and people's dissatisfaction with the currently used billing systems, especially in the case of heating, encouraged us to design and implement an electronic system based on the M-Bus modules described in this catalog. The access to accurate data for both the supplier and the receiver of any utility, allows a number of problems arising from the conflict of interest to be avoided.

The system enables constant reading of utility usage and its recording with the Micro XL driver, as well as the processing of recorded parameters using dedicated software and presentation of the results directly in the apartments.

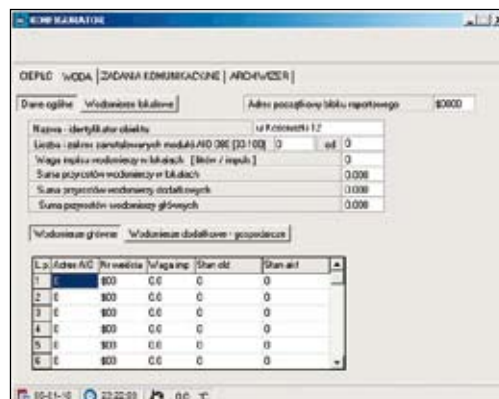
Sample functioning of a system composed of:

- temperature sensor with a display,
- outside temperature sensor (also for shared building parts),
- impulse signal computers for water, gas and electric energy meters, etc.
- central unit (Micro XL driver),
- administrator software.



The illustrated system enables independent calculation of heating costs, billing data archiving and documentation, remote maintenance and control using data communication network. Sending text messages concerning an apartment or another facility may be activated for mobile phone users. The system may be expanded to protect facilities and buildings against gas explosion.

The measurement, recording and billing processes take place continuously and independently of any external factors. The system administrator is notified with a proper message about each fault or unauthorized interference.

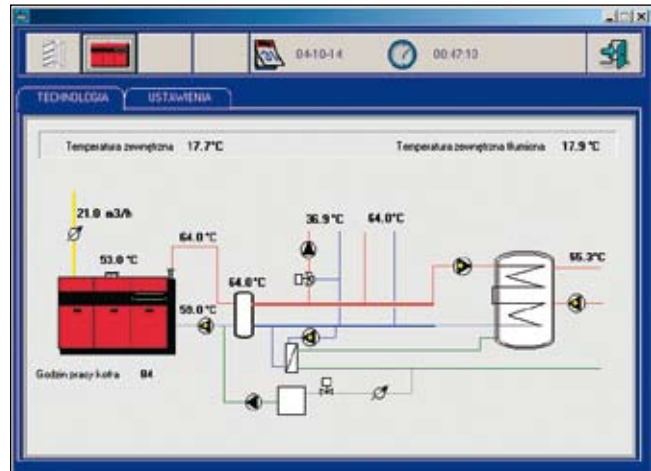


SAMPLE APPLICATIONS OF MONITORING SYSTEMS

System for controlling heating, ventilation and air conditioning inside modern office and residential buildings

Modern office and residential buildings are equipped with a number of installations. With their proper operation and mutual integration the users may enjoy high comfort and notable financial benefits.

Thanks to its modular structure, the Oversee M-BUS system is perfect for both single-family and large office buildings. The concept of controlling the above installations is based on the measurement and interpretation of temperature values – air temperature outside and inside the building. Depending on the building's thermal characteristics, technical parameters of heat source, air conditioners and ventilation devices, appropriate control settings are selected for individual installations and a proper event sequence is programmed. The top priority is to make the installations cooperate and not compete with each other. This will provide the users with notable savings. One may easily imagine where non-integrated heating and air conditioning installations operate simultaneously without any effect for the user whatsoever (except, of course, wasted energy).



In modern building systems, it is also important to provide the maintenance services with quick access to information on irregularities in the installation operation.

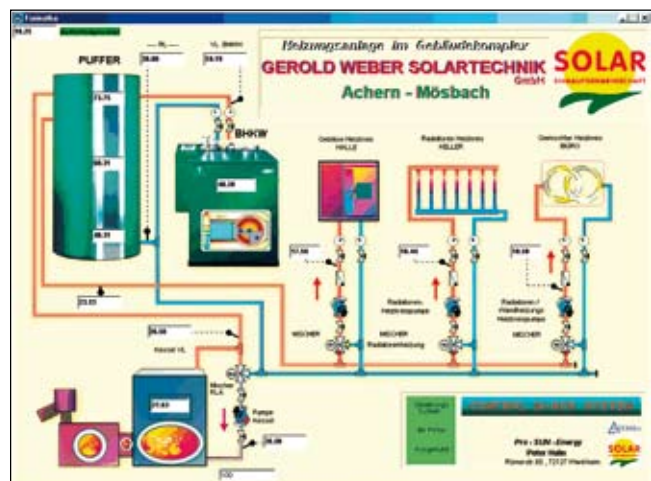
The system equipped with air quality sensor may turn the ventilation on when the air humidity level and the carbon dioxide content in the air has exceeded a set value.

The figure shows a visualization of local boiler room and ventilation system operation. The owner is notified about emergency states by SMS messages sent to designated responsible people and by mimic signaling on visualization displays.

Automation of unconventional renewable energy sources

One of the most interesting applications of the Oversee M-Bus system is the control of unconventional heat sources, including solar photovoltaic cells, being used as a source of electric power. Its excess may be sold to public power grid. The other application is the control of hybrid heating systems based on renewable energy sources.

The system which controls solar photovoltaic cells, used as a source of electric power, controls instantaneous user needs for electric power. If there is no demand, the excess power is "put" into public power grid. The electric power meter operates as follows: when the electric energy is transferred from public power grid, amounts due for the consumption of this utility are charged; if the power moves in the opposite direction, amount due are deducted from the user's bill accordingly. In many European Union countries, this method of settling accounts with the electric power supplier is very popular and the state subsidizes the construction of alternative energy sources. Oversee M-Bus has already been used in more than ten installations for photovoltaic cell control installations in Germany.

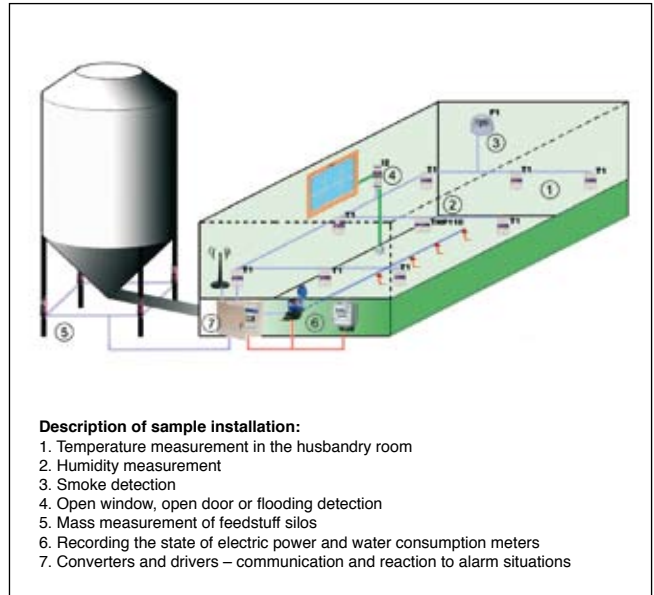


SAMPLE APPLICATIONS OF MONITORING SYSTEMS

Monitoring of facilities and devices for animal husbandry

Experience in optimum resource management in companies becomes more and more important in plant farming and animal husbandry. Knowledge on feedstuff, electric power or energy consumption, combined with constant supervision of temperature and humidity conditions, allows proper resource management, which may translate into animal health, low tax deductible expenses and, as a result, higher production profitability. The wide range of devices in our offer enables free expansion of monitoring to secure property and protect against fire and burglary. The software enables the consolidation of data from various facilities, even remote ones, and their quick processing for the purpose of visualization using properly prepared forms, graphs and tables.

Monitoring, in its broad sense, should be considered from the point of view of technical possibilities, selection of measurement elements and the method of processing the data, being gathered that way.

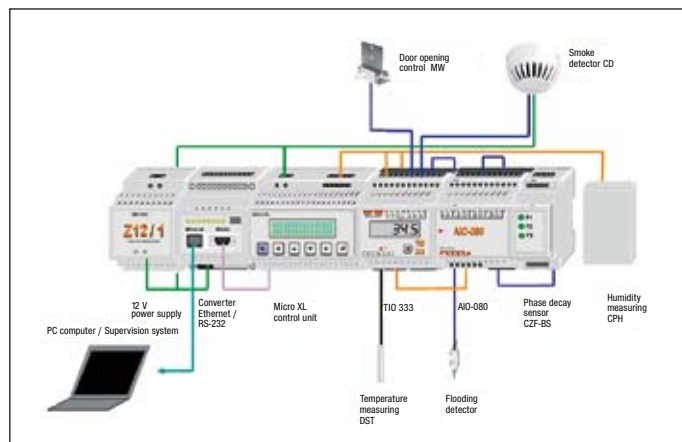


Sample monitoring areas:

Mass measurement of feedstuff silos. The issue of silo mass measurement should be considered from the point of view of installing proper measurement scale mechanics and electronics, i.e. extensometer sensor with converter system. In order to reduce costs incurred due to expensive extensometer systems of measurement sensors, a special truss was designed. The truss connects 8 silo supports and transfers silo weight to four support points. Two of the four points will be replaced with permanent bearings. As a result, the entire measurement will involve the installation of two extensometer sensors only.

Signal from the extensometer sensor is sent to the MW1 extensometer input module and then to converter module 0-20 mA. The converter is equipped with a communication output to the 1-Wire bus, which enables the extensometer measurements to be included in the network of 1-Wire interface devices. The figure shows a sample truss. The silo weight installation will require a calibration only once.

Thanks to the special structure of the sensors, changes in environmental conditions (high and low temperatures, humidity) do not influence the conducted measurements.



Monitoring of industrial facilities for environmental conditions available there is another sector where we provide our services. It is a well-known fact that appropriate microclimate in husbandry rooms and feedstuff storage conditions, preventing the formation of micro-toxins and fungi, have a significant influence on the husbandry process.

The measurement system was designed on the basis of temperature sensors and humidity sensors, which communicate via the 1-Wire bus. Supplying power to connected devices and the communication between them was possible with the use of a two-wire bus. The sensors are connected using the RJ45 contacts. Their connection may be parallel or of different topology, e.g. bus or star.

The measurement devices are read out by the ST-50 controller. Equipped with the 1-Wire bus communication input for reading 1-Wire measurement devices out, it enables alarm definition, SMS and e-mail message sending, as well as configuration via the internet. With the ZPAS Control Oversee master system connected, it is possible to create extensive mechanisms for supervising conditions, for example, inside husbandry room, in feedstuff storehouses and finished product warehouses.

SAMPLE APPLICATIONS OF MONITORING SYSTEMS

Monitoring of temperature and humidity in transport



When Poland joined the European Union, the number of regulations requiring the manufacturer and the distributor to ensure proper storage and transport conditions for the products increased. In addition, good production practice necessitates constant monitoring of environmental state in production and storage facilities and also during the transport of offered products. Particular restrictions concern the sales of food and pharmaceutical products, as well as animal slaughter and meat storage, where people's health and life are at stake.

The measurement and recording of environmental conditions are among the most important tasks in the following sectors: pharmaceuticals, food industry, chemical industry, textile industry, petrochemical industry, founding, as well as plastic and rubber processing.

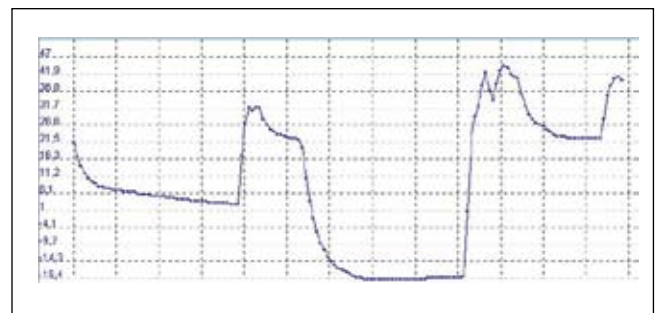
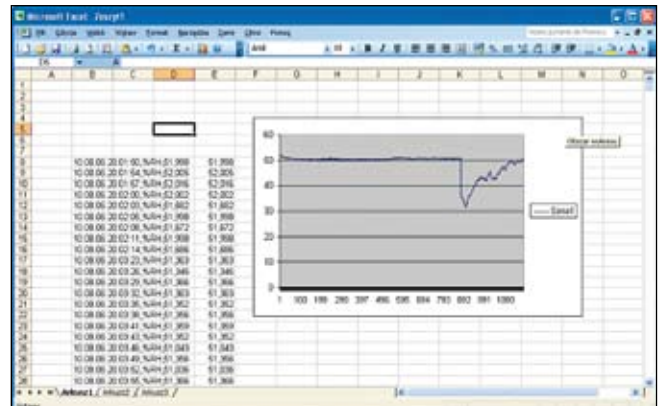
Although the examination of non-electric values using electronic measurement devices is not a problem in itself, their recording, further processing and archiving has been troublesome until recently. The currently available recorders are difficult to install and they often cannot operate without additional external power supply. Their sizes are also still large, which, consequently, hinders their "discreet" operation.

In order to meet the expectations, ZPAS-NET company offers temperature recorders and temperature/humidity recorders which are small in size (diameter of just 15 mm), equipped with their own power supply, which lasts 10 years or a million measurements. Moreover, the mechanical, thermal and chemical resistance of the enclosure is high. The devices offer wide configuration possibilities for the conducted measurements and their protection via user password. Access to information recorded in the sensor is secured by a special 1-Wire converter being connected to the USB or RS232 input of a PC-class computer, depending on the version.

All data may be quickly visualized and archived using simple software. Export of data to any text editor or spread sheet is also available.

The recorders comply with requirements of appropriate legal acts concerning the food and pharmaceutical sector:

- The Minister of Health's order dated February 28, 2000 on the sanitary conditions and hygiene regulations to be observed in relation to production and sale of food, substances and additional permitted substances,
- The Ministry of Health's order dated July 26, 2002 on the Good Distribution Practice procedures,
- The Ministry of Health's order dated December 19, 2002 on the sanitary requirements concerning means of transport of food, substances used in processing, additional permitted substances and other food ingredients.



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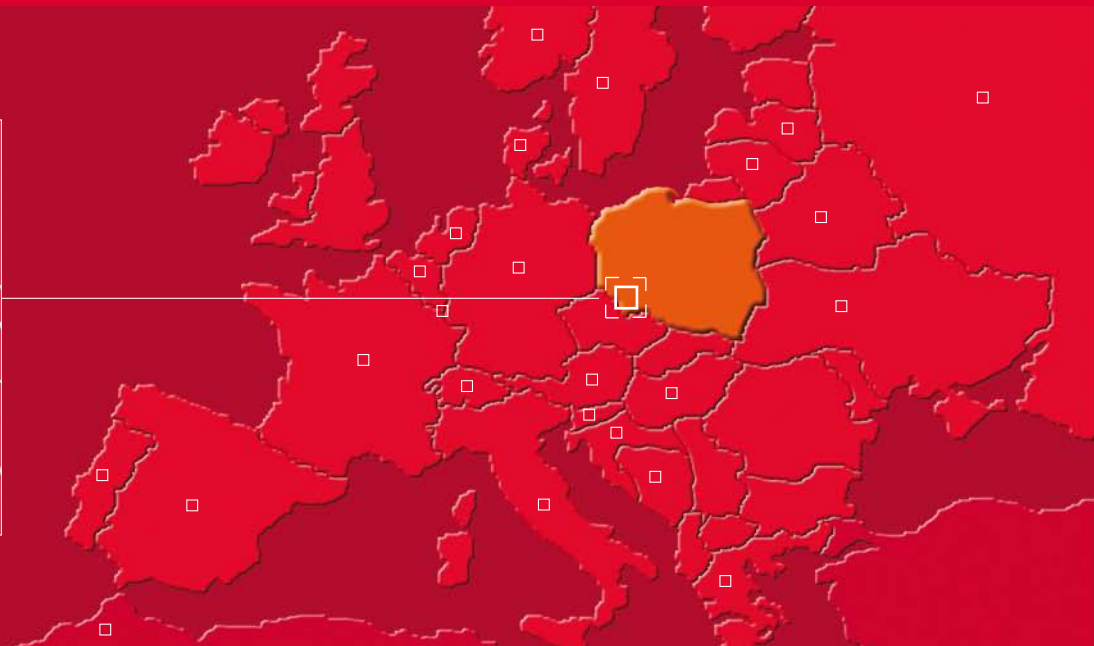
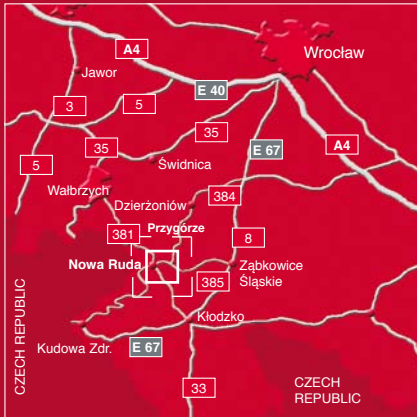
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