asix 4

See and get more ...

visualization system

ASKOM

RELIABLE SOLUTIONS OF AUTOMATION SYSTEMS

asix is a PC software for design and realization of visualization and monitoring for industrial processes, technological lines, machines and devices, monitored and controlled by programmable controllers and other measurement and control systems.

asix has been already successfully applied in many demanding branches e.g.:

- power industry (boilers, turbines);
- cement industry (mills);
- coal mining (transport lines);
- metal industry (presses);
- motor industry;
- food industry (diary, meat, confectionery);
- telemetry (gas, water).

asix belongs to Supervisory Control and Data Acquisition System (SCADA) software class and executes comprehensive functions of process data collection, processing and visualization, supervisory and direct control, alarm and event recording, data archiving, trend drawing, report generating, data analyses and making process data available within computer networks.

asix system fulfills requirements of both simple applications for single operator workstations and very complex multi-terminal systems allowing to serve entire manufacturing facility in one integrated environment. Operating in local and WAN computer networks is a standard **asix** feature.

Possibility of operating on dial-up and leased lines as well as wireless lines (radio links, GPRS) is the foundation for developing telemetry and telecontrol systems.

Client-server data exchange between stations within computer network is the guarantee of effective communication, so necessary in SCADA systems.

asix software system has been created and developed to operate under **MS Windows NT/2000/XP**. It's an open system supporting OPC interfaces (OLE for Process Control), DDE, OLE Automation, OLE DB, .NET and possibility of operating on Internet and WAN's (TAPI).

Thanks to the openness, process variables in many ways are available in Internet browser window, a spreadsheet, databases or in any User application – within the same computer or another network station.

Scalability of **asix** licenses ensures creation of applications matching in size – from local operator stations for a dozen of measurement points to multistation network installations with thousands of variables. There are licenses available for 32, 64, 128, 256 and 1024 variables and with unlimited number of process variables. Every package contains – application editor, Tag Database editor, trending and scripting.

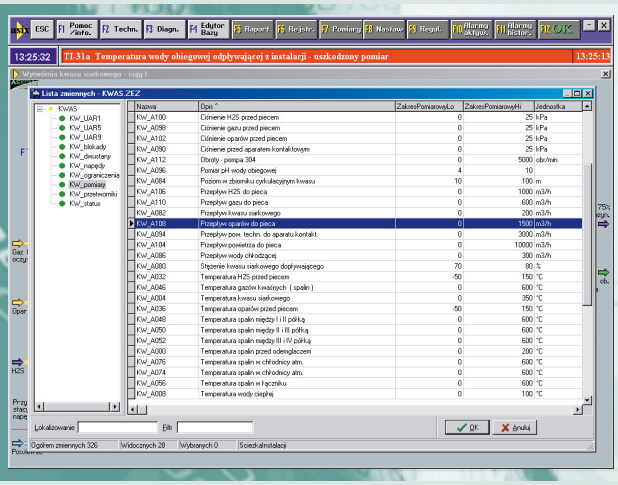
asix
remains a system open for new ideas!

asix overrides functional and technical limits

- Improved productivity of application design thanks to elements of batch and interactive on-line parameter setting
- Built-in application designer in every run-time license
- Extended library of technological symbols with built-in editor
- Recording of variables course with time resolution in seconds and automatic data archive compression without quantitative limitations
- Current, historical and pattern charts with dynamic parameter setting and scaling
- Scripts in **Active X Scripting** technology
- Alarm event log limited only by hard disk drive capacity
- Built-in interpreter of definable reports in effective language of expressions and formats
- Automatic alarm and data back-up on spare fixed or removable disk drives (back-up copies creation)
- Bi-directional access to relational databases
- Module for receipes and event data archiving **NEW in asix4**
- Built-in module for designing, displaying and printing of trends
- Context help
- Ready to operate in multimonitor configurations
- Network server for current and archive data exchange based on client-server technology
- Open system: access to current and archive data by OPC, OLE DB, OLE Automation, DDE, .NET servers, Web Services
- Built-in hot-redundancy operation mode which improves reliability of workstations
- Possibility of system development on the basis of LAN and WAN networks, Internet, modem links as well as wireless systems (radio links, GPRS)
- Portal of Process Information **NEW in asix4**
- Visualization on Internet **NEW in asix4**
- Multilingual applications with a capability of dynamic switching of SCADA operator language **NEW in asix4**
- Control of access to **asix** functions by password and user base

Tag Database

The design foundation of **asix** applications is the **Tag Database**, which is a place where all information on process variables is stored. Each variable, identified by a unique **Name**, is represented by one record in the Tag Database. The fields of the record contain values of the variable attributes. The list of attributes includes obligatory positions, i.e.: variable description, unit, measurement limits, name of communication channel, declaration of the processing method, format, etc., as well as optional items, e.g. variable name aliases, assembly data, and many others, which can be defined individually for a project.



Programs included in **asix** system retrieve variable attributes from the Tag Database when displaying technological masks. List of all attributes which a tag can posses is described in the Tag Attribute database. The structure is expandable and may be adjusted to the specific requirements of an **asix** application.

Tag Database makes possible to group chosen tags in the sets, giving them names and arranging into a hierarchical tree representing e.g. a structure of industrial process, plant department or of entire enterprise. Introduction of sets of tags makes to feel at home in a large tag database as well as to design and service an application.

Tag Database Editor is designed to manage a tag database of an **asix** application.

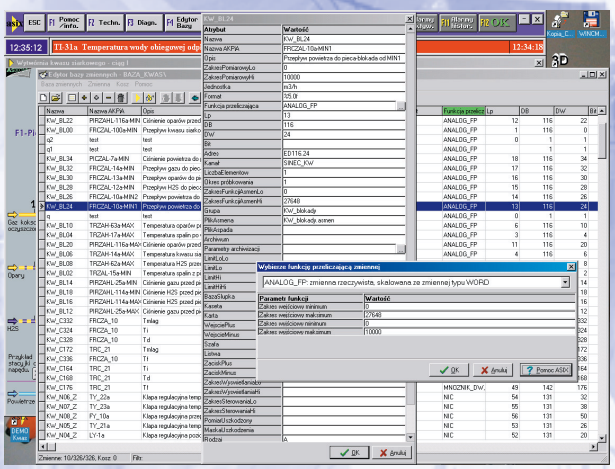
Tag Database Editor, On-Line Changes

The Tag Database Editor is a user-friendly, intuitive tool allowing for creation of the Tag Database and maintenance of the existing database by: inputting new variables, changing their attributes and deleting unnecessary variables.

It needs to be emphasized that the Editor enables performing of changes in the Tag Database during application run, and – with some minor exceptions – each change is immediately acknowledged by **asix** system **without the need to stop and restart the application**. For example, at any time one can – without interruption of application continuity – add a new measurement point to the Tag Database, enable it for visualization, add it to an archiving, show on trends or include in the report definition. The changes are updated on-line in the running application on all machines of the visualization system within the computer network.

The Tag Database Editor allows:

- creating a new Tag Database;
- reviewing variables stored in the Tag Database;
- editing attributes of any variable;
- adding a new variable;
- deleting a variable.



Tag selection is made easier due to searching and filtering functions. Declaration of attributes for archiving and processing functions is supported by dedicated dialogue boxes.

The Editor also enables:

- disabling a tag or group of tags from handling by communication or archiving modules;
- viewing of variable current values;
- data import into the Tag Database from Excel spreadsheet.

Application development

Design of applications in **asix** system is based on **DESIGNER**, a built-in module present in every system license without any additional charge, which includes editors of text, objects and graphic symbols (bitmaps).

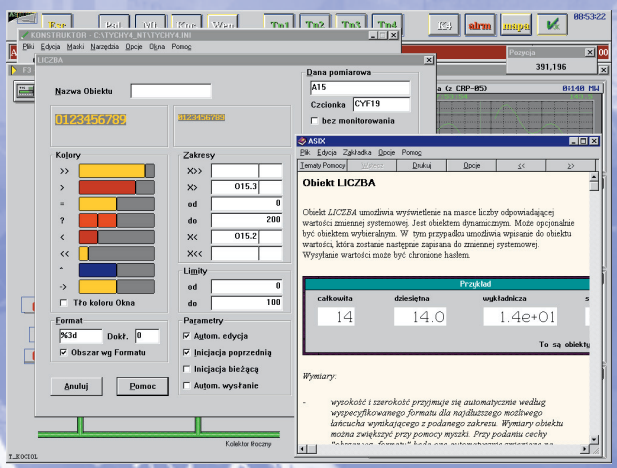
Designer allows to create, configure and run an **asix** application.

Visualization process uses so-called **objects**. These are elements of the application, which can change their attributes (e.g. appearance, color, value, etc.) in result of changes in technological process. Parameter setting for the objects is made basing on "dialog boxes" with parameter fields interactively filled with values got from Tag Database in accordance with key word – variable **Name**.

Setting of parameters consists in:

- preparation of the Tag Database – repository of information on all process variables;
- insertion of variable name into Variable field for other fields defining the object to be automatically filled with values loaded from the Tag Database.

Declaration of objects does not bring any problem and is very effective thanks to multifunction editor of the objects. This editor allows to place objects in windows, to manipulate them and create process windows, so-called pictures, which graphically depict the technology with measurements and control elements. After the object parameters have been declared, one can immediately evaluate result of parameter setting on the screen. Built-in **process data simulation** allows to observe dynamic function of designed pictures without need to connect computer to the PLC.



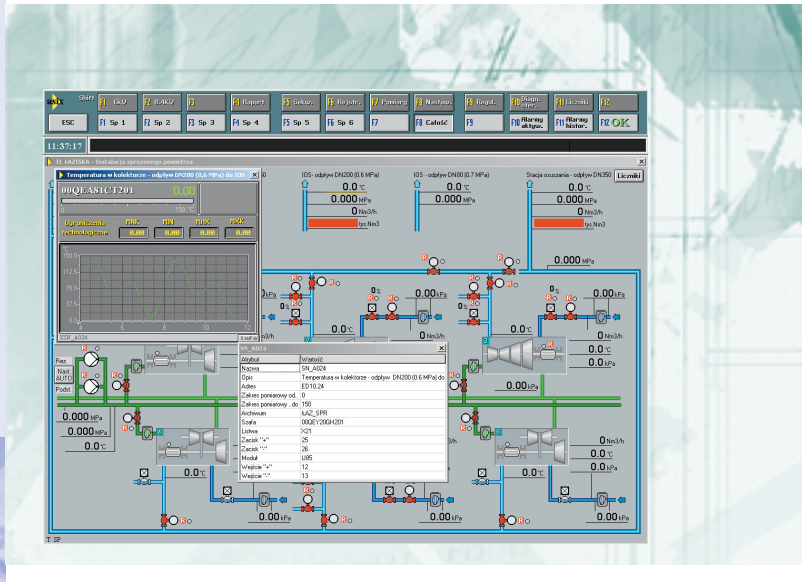
DESIGNER can be operated directly on operator station or on dedicated engineering station, which remotely (through computer network) impacts applications running on the operator stations.

DESIGNER allows interactive parameter setting for application also during current system operation at the factory floor. Advantages of such approach shall be appreciated especially by system designers during startup and users at system operation. Parameter setting for selected visualization windows shall be immediately presented in the system after edition of this window in designer module, without additional compilation. Selective parameter setting executed on separate engineering station shall be immediately reflected on operator stations connected via Ethernet network.

Visualization

asix offers an extended library of objects, which attributes are dynamically controlled by values of process variables. The library includes static objects like line, multiple line, text, rectangular, ellipse, bitmap, their dynamic equivalents and complex objects, e.g. number, chart, bar, button, drive, slide, alarm window, report window. Attributes, which determine dynamic behavior of the objects include color, size, location, value, style, etc.

Static objects allow to create schematic drawings of technology, which are a background plan for displayed values of process variables. Design of visualization system consists in presentation of process status in many windows of different size and location, which create a coherent picture using actions that control windows displaying and removal.



Design of process pictures consists in placing of selected objects in declared window on the screen and definition of the parameters which dynamically determine object appearance. For example, an object of number type shall display the value of declared process variable, while it is possible to select a font for value display (its size, style and colour) and background colour – depending on the sub-range, which the actual value belongs to.

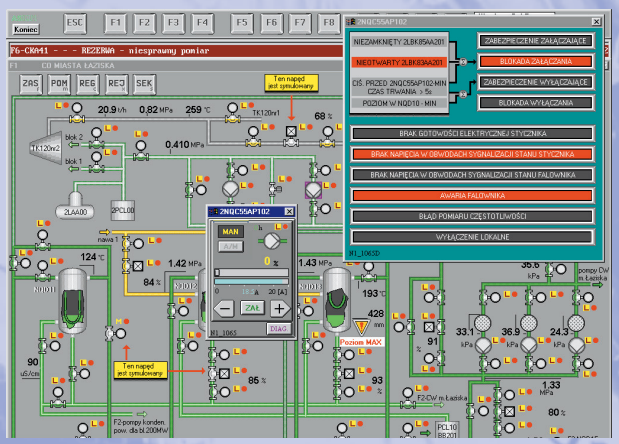
Visualization parameters:

- number of objects in a window ..... unlimited*;
- number of application windows ..... unlimited*;
- number of object types 42;
- refresh rate of object status ..... << 1s ;
- number of supported fonts: ..... 150 **asix** fonts + all system fonts;
- number of available symbols ..... > 1000.

** unlimited - means limited only by size of operating and disk memory*

Control

Objects do not only visualize current status of the process, but can also be used to change it, by setting process variable value in the PLC. In this case, operator's action to enter the value into an object field or to select an object itself causes transfer of specific value (command) to the PLC directly or after confirmation.

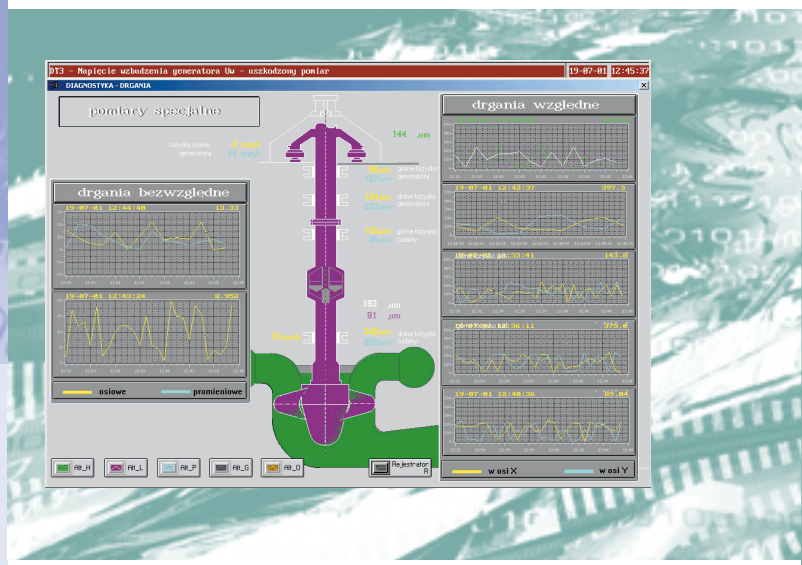


The command can cause e.g. the startup of specific device or the change of automatic controller settings. Command execution could be performed in two steps – with confirmation and also can be protected with password.

Real-time and historical charts

Objects of special meaning are charts of process variables.

A basic parameter for the chart is its screen window and initial range of time axis and value axis. During system operation, a displayed time interval of the chart and the range of values can be scaled dynamically by so-called zoom operations. It is possible to review the chart, shifting its time interval forward and backward the time axis. The chart can include historical curve, overlaid on the real-time curve e.g. to compare them. In this case, the historical curve is replayed with the motion speed of the real-time one. A special kind of diagrams are patterns i.e. charts defined by a formula (e.g. a table of values), which describes process variable trend arising from the requirements of the technology. The pattern charts are very helpful during machines and devices startup and turnoff of.



Parameters of the charts:

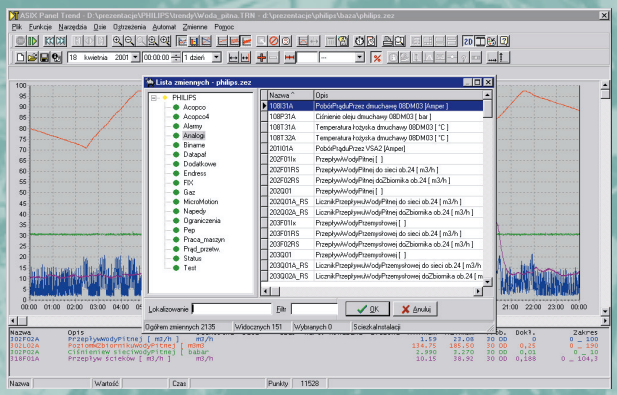
- number of curves on one chart, up to 16;
- curve types: linear, digital, bar, events;
- dynamic on-line chart composing; overlay of current, archived and pattern curves;
- dynamic scaling of time and value axis.

An important tool for data analysis in visualization system are trends. They allow to display, look trough and print time charts for selected sets of tags (variables) and are useful for preparation of a kind of “graphic reports” of process operation.

Trends can be used as an integral part of SCADA system or as a standalone program with access to **asix** database on local station or remotely through the network.

Full possibilities of **AsTrend** module can be used in a mode which is used mostly to analyze operation of the installation. The User can configure any set of interesting tag charts for purposes of the analysis by choosing tags in a simple and intuitive way from the list, which is suggested in selection window.

Set of items from the tag database is ordered in a structure of tree according to component installations of the plant or any freely chosen assignment of tags to the groups. Even at sporadic use of the system, the User can easily move within the Tag Database and search interesting items, even if the database includes all installations in a power plant or a factory.



Trends as an integral part of visualization system can be defined in advance by the developer and called out in a window for presentation of time charts, supporting process supervision. In such mode, trend functionality can be narrowed down to a certain sub-set selected by system engineer, regarding comfort of process operator and simple interface.

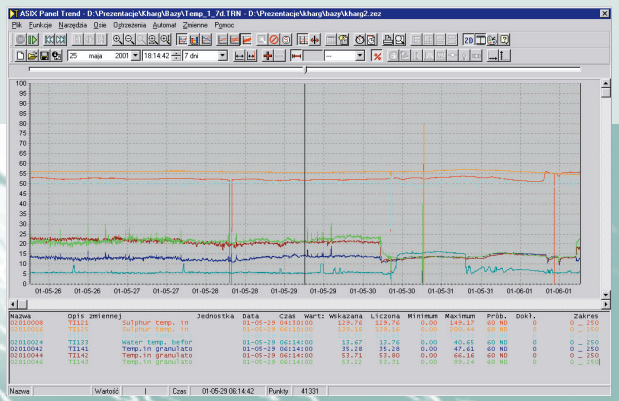
Innovative method of time charts browsing

AsTrend module allows fast finding of interesting fragments of time charts thanks to innovative, “intelligent” method of chart browsing , which displays the chart basing on average values saved in the archive (e.g. -hourly or 5-minute) when the search applies to the long time interval, e.g. several weeks, and when the interesting time interval has been found, it redraws the chart with its full resolution (e.g. 1-second). Thanks to this, the display time of trend is the same short for the interval of many weeks or few hours. Even if average values are missing in the archive, AsTrend can approximate “on the fly” the envelope of the time charts to minimize the number of pixels shown in the curves for a long time interval and shorten the display time to a dozen of seconds without significant limitation of “data information”.

Individual scaling of tag ranges

Analysis of curves for different physical quantities on the same chart is made easier in percentage axis mode, with a possibility of interactive, individual scaling of range of quantities. That way curves can be easily “displaced” against each other making easy evaluation of their dependences.

Those features are supplemented by functions like: reading line, operations of continuous zooming of selected chart area (also only in one selected axis direction), export of chart values e.g. to a table of spreadsheet for further analysis, printout, extended legend including, among other things, tags ranges, local minimum and maximum values etc.



Data archiving

The power of computer monitoring systems comes from capability to record process data trends and alarm events in long-term archive in the disk storage.

Data archiving module of **asix** automatically manages optimal recording of process variables, which have been declared in Tag Database to be archived. Archiving is performed in cyclic files, for defined period (e.g. several hours, days etc.) or in a long-term archive, divided onto daily, monthly or annual files. In second case, capacity of the archive which is available on-line on operator station or process supervisory station is limited only by size of the disk drive. Data archiving can be made also in a relational SQL database – in such a case it is possible to fill up the historical data backwards, which is required e.g.:

- in dispatcher systems with data collection through modem lines, in data packages gathered for a defined period,
- during communication with the devices which allow to buffer measurement data when the communication is broken down.

Archiving capabilities are enhanced by conditional archive mode, which allows to save information only when a logical condition is fulfilled. Conditional archiving allows to record only essential intervals of variables curves and save disk space.

asix system archives may also be processed by using standard software, thanks to OLE DB and ADO interfaces.

Archiving parameters:

- unlimited number of archived variables;
- maximal sampling rate = 1 sec;
- archive increase, 1 to 9 bytes per data (for cyclic and long-term archive);
- data compression;
- omitting of insignificant value changes;
- types of archive data: byte, single/double word, variable comma;
- automatic management of archive library.

System allows to back-up archives on removable drives (or a network server disk), to organize historical recordings used for documentation or analyze purposes.

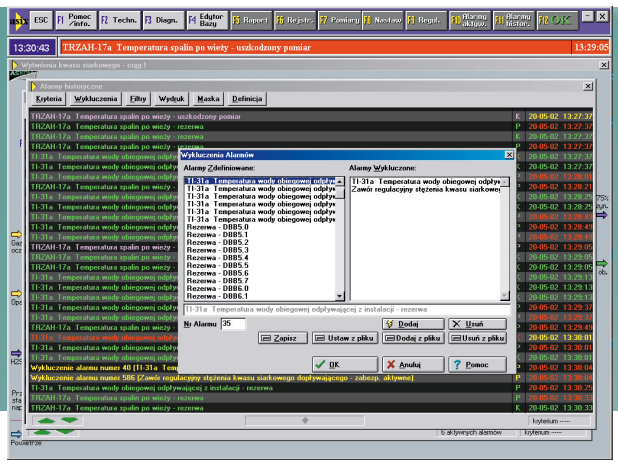
Important is the fact of recording by **asix** system the variables curves with sampling rate of up to one second, which is possible thanks to effective methods of recording buffering, specific structure of archive files and on-line data compression methods used. List of recorded variables and sampling rates may be dynamically changed during operation of the system. Unlike other archiving systems, **asix** does not limit in advance the type and number of information stored to the drive. Data processing tools can later calculate different data measures and characteristic values basing on saved complete curves. This might be not only typical average values. Archiving made by **asix** with effective methods allows, within the same computer station, to do visualization, process control and report generating even for a large number of variables. Access to archived data is very fast what is especially appreciated by the operator who views trend charts.

Alarm servicing

An important function of computer monitoring system is to signal to the operator an alarm situation and events going on inside the process. Within the **asix** system, alarm are signaled in special windows of active and historic alarms and registered in alarm log on the hard disk drive.

Active alarm window displays, in chronological order, alarm texts which are pending. This window allows fast signaling of process states which require reaction of the operator. Active alarms are saved to the computer memory practically without any limitations.

In practice, there are situation of too often appearance of the same alarms (e.g. during startup), which make analysis of the situation more difficult, and simultaneously fill up unnecessarily the alarm log file. Such situations in **asix** system, may be eliminated by filtering short-time alarms or transfer of selected alarms to the temporary list of excluded alarms.



The alarms are also recorded in a window of historical alarms, including all alarms and events, which occurred during system operation, with annotation on start and end time, confirmation status by the operator and optionally a value of selected process variable.

Historical alarm log is made in daily files on disk memory and its capacity is limited only by the size of this memory. A transfer of log files to another media supports extended analyses of failure situations. Alarm service is facilitated by a possibility of selective search by text, assignment to selected technological groups or limitation of the selection only to specific time interval. Specified alarm messages may be printed in real-time or off-line.

asix system executes several strategies of alarm recognition:
Bit strategy consists in assignment of alarms to bits of data block in PLC's memory, which are read in cycles by a supervisory computer. The PLC actively recognizes emergency states and events and notifies them by setting or resetting an adequate bits.
Limit strategy is implemented directly by the asix system program, which compares values for declared process variables with defined limits and generates alarms when detecting any overflow.
Active strategy is based on receiving from the PLC an ordered list of alarm numbers recognized by the PLC, optionally with time stamps.

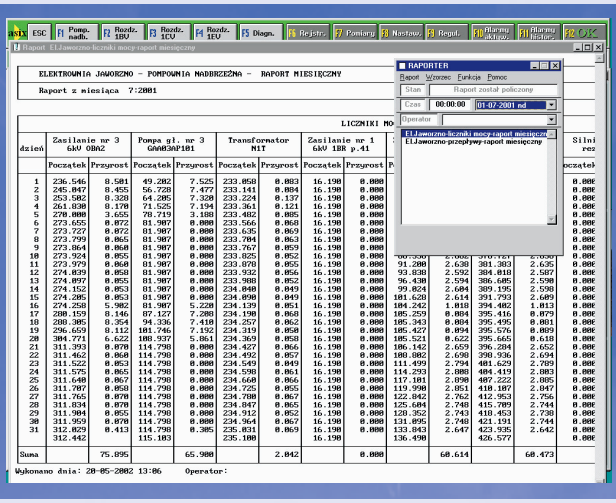
Reporting of process and production run is a requirement for each system of computer monitoring.

Typically, the range of reports is limited to tabular settlements of average values, temporary values or integrals. Reports beyond those standards must be created in a programming language and integrated with the system with many efforts. Thus often data processing is transferred to separate computer stations equipped with spreadsheet or database processing.

asix system is a way beyond this state. **asix** system reporter introduces simple, but effective language of evaluation expressions – such as average, variance, difference, maximal value, minimal value, gradient, sum, overflows, temporary value, trigonometric functions, etc. – operating on process variables (real-time and archive) and a language to define content and form of reports. Declaration of reports is stored as a plain text, which can be created or modified even on-line by built-in editor. Compactness of the language and formatting commands allows declaration of even complex reports in a dozen of text lines.

In specific case, the calculated report may be an object located within process visualization window, depicting its operation by e.g. qualitative factors of system run, current calculation of production volume, operational characteristics of drives, current energy and raw material consumption, "post-mortem" report. Calculated reports may be exported in formats accepted by spreadsheets, database processing or Internet browser.

In more specific cases, the reports can be created as scripts within the VBS or JScript language.



Reports defined that way may be calculated on operator's demand using special dialog box which allows to point at the report type and period. Selected reports might be calculated after pressing a selected button by the operator.

Thanks to built-in scheduler feature, the reports may be also processed automatically on certain times of the day and after defined events, e.g. alarms.

The report after calculation is saved on the disk as a text file. It is also possible to convert report text file so that the printer features could be fully utilized (fonts and font attribute control, rotation of the sheet of 90 degrees etc.).

The reports may be also created by means of outside tools like Excel spreadsheet (See item: Openness of the system).

In networked operation of many operator stations the alarm system of **asix** is described by the following features:

- synchronous alarm service on coupled operator stations;
- automatic alarm archive update during restart of a station;
- automatic negotiation of alarm system configuration;
- possibility to view alarms of many installations (servers) in check-up mode.

Extended services of alarming in **asix** system makes it a powerful SCADA system, which supports process operator during his supervision over trouble-free process execution according to the requirements of the technology.

Parameters of alarm services:

- number of defined alarms 64 536;
- recognized types of alarms ..... system, messages, warning, important;
- number of recognized alarm groups ..... unlimited;
- capacity of alarm log ..... unlimited;
- criteria of selection ..... text, group, status, type, date, time.

Alerter

AsAlert module is used for remote notification of selected persons about important events by means of e-mail or SMS messages. AsAlert can operate as an universal, general-purpose messaging system. Its true strength manifests itself during operation within **asix** system. AsAlert's integration with **asix**'s alarm detection and handling enables automatic sending of alerts in response to detected changes of statuses of selected alarms.

The messages can reach the addressees by means of different transmission methods:

- as standard e-mails through the Internet and SMTP protocol;
- as standard e-mails through a GSM mobile network with use of mail services provided by mobile carriers;
- as SMS messages for mobile phones through a GSM network;
- as SMS messages for mobile phones through the Internet.

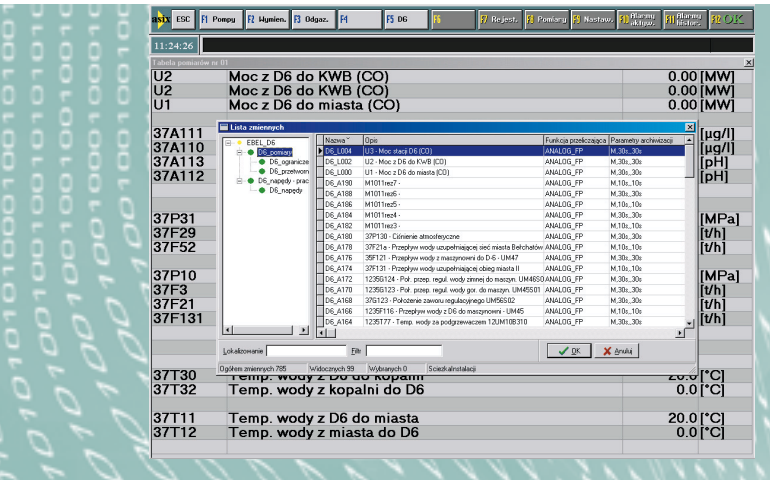
AsAlert supports three types of recipient's addressing:

- standard user, addressed by mobile phone number or e-mail address;
- user groups – allowing the sending of an alert to multiple addressees at one time;
- schedules – mechanism enabling selection of addressee depending on the time of alert sending.

Dynamic tables of measurements

Growing number of variables in temporary SCADA systems and connected with that a large number of possible sets of measurements viewed on one screen became a new challenge for **asix**.

A new **Tables** object makes possible on-line creation of unique data sets of analog measurements chosen from Tag Database to be visualized in tables.



Each operator has a possibility to configure list of measurements creating his very own sets in the selected tables. Content of the tables may be freely modified. After optional saving of the changes to the tables the system should restore last assignment while restarting.

Scripts

Script module is the extension of **asix** system which allows to run scripts in **Active X Scripting** ® technology like VBScript or JScript. Scripts allow to do non-typical calculations, to program special system reactions to events, to serve dedicated databases, to prepare reports.

Script module posses the following features:

- automatic execution by **asix** system when call to script functions is found in the application;
- script execution monitoring that ensures protection against its errors or indefinite looping;
- run-time detection of source change that invokes automatic script re-compilation and restart without system reload that ensures script execution according to the last confirmed definition.

In **asix** system the scripts are executed on three ways.
Automatic scripts are declared in application file and are initiated at the application start. In script start-up code there are declared the functions which are executed on every process variable read, either at periodical intervals or at defined times.
Scripts called on operator actions are activated directly from visualization objects, by key short-cuts or from the task scheduler.
Scripts activated in report subsystem allow to calculate reports in place of Aster based report programs.

Apart from the whole set of standard services and data of operating system environment, the script module provides Users the services directly supported by **asix** which cover:

- access to current value of process variables, including control actions;
- access to archived process data;
- access to alarms state including alarm/event generation;
- **asix** run-time control including execution of standard operator actions.

Scripts are so capable that Users shall not be limited in any dimension while creating an application.

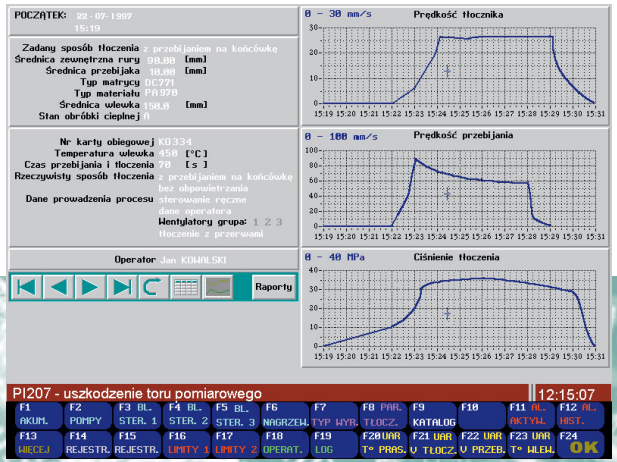
Recipes and Data Event Logging Module

There are some classes of applications, when archiving mechanisms described in the "Data archiving" chapter are insufficient; these are mostly the applications that use concept of recipes or applications related to monitoring of material flow, with the necessity of asynchronous logging of the entire sets of process variables at predefined events.

Execution of applications with such requirements in **asix** environment is made possible in a flexible and versatile manner through the use of scripting; the method requires users to show the knowledge of ADO objects handling, SQL query formulation and use of **asix** variables on the level of scripts. These demands are eliminated by **AsBase** module, which disguises all nuances of database access and provides a set of predefined operations and dialogue boxes, thus creating an environment for use of databases in a manner focused on definition and selection of recipes or archiving and review of the sets of parameters related to the occurrence of defined events.

The scope of the **AsBase** module functions includes:

- embedded interactive application-making system,
- access authorization integrated within an application,
- automatic archiving of process data launched upon time schedule or on the basis of process variable values,
- option of manual archive editing (supplementing),
- recipes management, including definition of recipe values, loading a recipe value into the process variable and logging of recipe loading operations,
- view of tag current values, with the option of manual launch of recording to the application database,
- system for analysis and printing of archived data and recipes,
- data export to text files or XLS, XML and HTML files,
- built-in database management system.



Communication

A communication between supervisory computer system and PLC's is usually performed through a serial bus, field network or local network. An adequate interface card and communication driver ensure bi-directional data transfer. In a simplest case it bases on a standard PC serial port or, within local or field networks – on intelligent interface card equipped with its own processor and special interface modules.

List of PLC's, which are supported by **asix** system still grows and includes PLC's of well-known companies like: Siemens, General Electric, Beckhoff, Wago, Omron, Modicon, Festo, Mitsubishi, SAIA, LG. Equally rich is the list of intelligent devices like: meters, analyzers or controllers supported by **asix** through standard protocols: MODBUS, LONWORKS, M-BUS or GAZMODEM and also DATAPAF.

The number and type of communication channels which are serviced on supervision computer at the same time is unlimited.

Communication parameters:

- number of variables ..... unlimited;
- sampling rate ..... multiple of 1 s;
- types of data ..... byte, single/double word, floating point, simple type table.

Apart from dedicated drivers for specific PLC's, **asix** includes open communication interfaces:

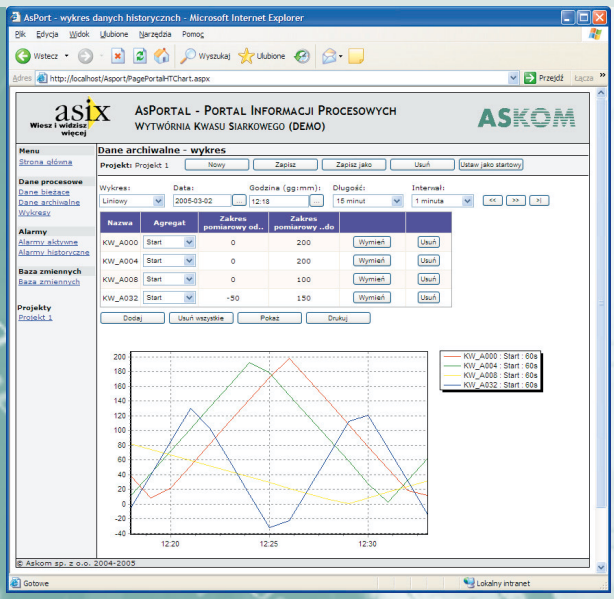
- OPC client,
- DDE/OLE Automation client,
- MODBUS RTU,
- MODBUS TCP,
- PROFIBUS DP,
- CANBUS,
- IEC 61107,

matching standards of the Windows environment and allowing connection of almost any PLC or measurement device, delivered by manufacturers with the appropriate data servers.

The list of the drivers is constantly under development.

Process Information Portal

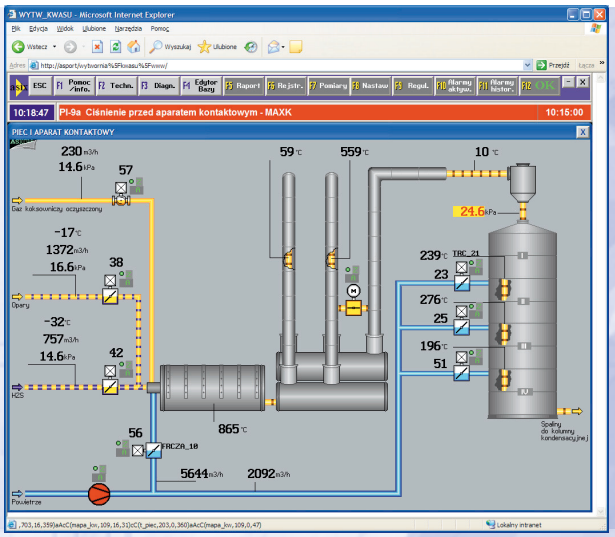
AsPortal – the Process Information Portal is an "out-of-the-box" application, ready for use that enables viewing process data from any application of the **asix** system on the Internet. The portal allows viewing the application tag database with variables attributes, reading the current values of particular process variables, insight into the list of active and historical alarms, as well as presentation of historical values of process variables as tables or charts, with an option of up-to-date calculation of defined data aggregates. With aid of the variable selection window, users configure sets and categories of the presented data on their own and enjoy an option of keeping the definition for multiple uses. Connection of the portal to the desired application is as simple as generation of **asix** tag database, with optionally created AsPortal database, declaration of its location as well as declaration of alarm server name in AsPortal configuration file.



Dynamic Applications on Internet

asix includes tools enabling creation of Internet applications with a view of technological process dynamically refreshed in the browser window. The starting point for creation of dynamic applications is the set of so-called web-services supported in the **asix** environment, which provide a full array of process data on the Internet application server – in particular the current data, archive data and alarms.

One of the tools for creation of dynamic applications is the **As2WWW converter**, which automatically converts a conventional **asix** application into an Internet application. The resulting application is run on the Internet server and can be viewed by users in the Internet Explorer 6.0 browser. The status of application elements in the browser window is refreshed dynamically.

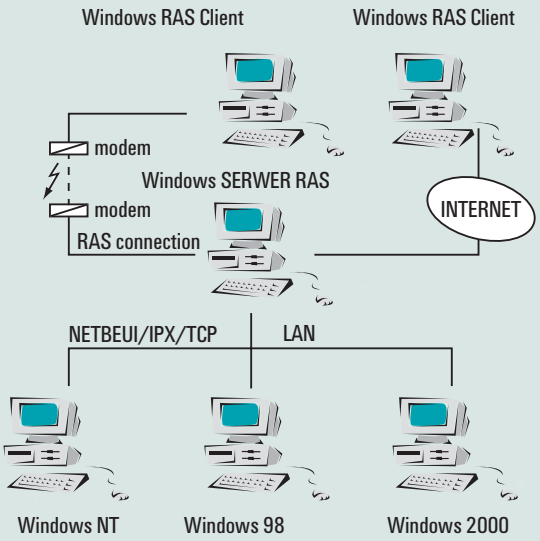


As2HTML library contains a set of scripts and CSS sheet styles that enable independent designing of an Internet application, dynamically mapping the technological process status in the IE 6.0 browser window out of predefined objects. The designer is only required to present a basic grasp of HTML page design.

Network operation

asix can co-operate on PC computers connected through Ethernet in order to make process information available from the PC workstations having direct interface to the PLC's into the remote PC stations. Data transmission follows **NETBIOS** protocol, also basing on **IPX/SPX, TCP/IP** and client-server technology. Network operation of **asix** does not require network operating system, just NETBIOS protocol stack. Supervisory computers connected directly with the PLC's are servers for process data (measurements, controls, trends, alarms, reports) for network stations. System time in **asix** network configurations is synchronized under time master, which optionally can be driven by radio clock source DCF77 or satellite GPS.

In Windows NT/2000/XP environment, basing on RAS (Remote Access Service) system software, it is possible to connect remote **asix** stations to the local networks equipped with **asix** servers.
A communication media may be any lines served by RAS module, e.g. telecommunication lines or **INTERNET**. Remote **asix** stations have in such configurations full possibilities of directly connected local stations e.g. in scope of process and archive data access or alarm log.

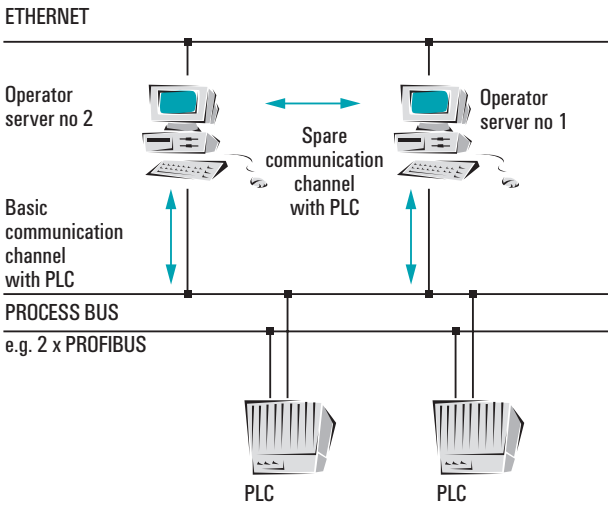


Network operating mode of **asix** and a possibility to connect remote stations using modem lines can excellently meet the requirements of modern MES (Manufacturing Execution) systems, which need, on many stations, an on-line access to process and production information.

Hot-Redundancy

On the basis of network configuration there is a special **asix** system installation to operate in so-called **hot-redundancy mode**. Hot-redundancy mode is especially important for processes, production lines and devices which require highest reliability of the operator system, working in uninterrupted mode (e.g.. in power industry or metallurgy) and in solutions of operator systems totally based on PC stations, without elements of traditional consoles.

To operate in hot-redundancy mode, the control system is made of pairs of "twin" computers, which operations are synchronized in time having, by independent communication channels, interfaces to the PLC's and executing independent data, alarm and report archives. When a malfunction of one operator computer occurs, the second computer makes possible to continue the process supervision. After the defect is fixed, the restarted unit automatically synchronizes with the "twin" computer and rebuilds content of its data archive. During normal operation, both computers are data servers for other Ethernet stations. If any supervisory computer detects malfunction of communication channel with the PLC, it switches automatically to alternative communication channel, which is Ethernet interface to the "twin" computer of its pair.

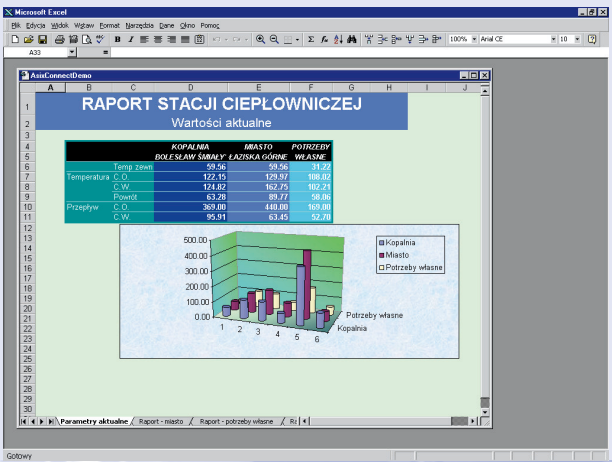


asix offers operation in hot-redundancy mode as a standard component of network packages!

Openness of the system

asix is an open system that means capability of direct, two-way access to data of other applications based on data exchange standards typical for MS Windows environment. Data transfer between **asix** applications and other applications of MS Windows system is realized by means of **AsixConnect** that makes all **asix** data – both current and archival – available in MS Windows environment through protocols: DDE, Automation, OLE DB, OPC, .NET and Web Services. Apart from the access to single variable **AsixConnect** services reference to variable groups, assuring the capacity of data exchange measured in several thousand variables per second. Configuring the data server by dialogue box as well as extended diagnostics make configuration and operation of **AsixConnect** easier.

Examples of applications, basing on direct access to process data through **AsixConnect**, are Microsoft Office package software like MS Excel, Access, Word and Power Point. Capability of their use is extended by macro language available in each of them. It is possible to exchange data also with applications written by User e.g. by means of any RAD type tools like MS Visual Studio 2003, Delphi, Borland C++ Builder or Visual Basic. **Asix Connect** gets data from **asix** application, basing on network protocols typically serviced by MS Windows, also on remote RAS links.



Multilingual Applications

asix system software can operate in Polish, English or Russian, but an application can be created in any language supported by an 8-bit alphabet.

The integral part of **asix** is a system of dynamical operator language switching during its operation. The application is designed in the basic language and all synoptical screens are created only once. The re-creation of the application in other languages only requires translation of all texts used in the application. The text database is built automatically based on data defining the application.

At run-time **asix** displays texts declared for the language currently selected by the operator.

Central application management

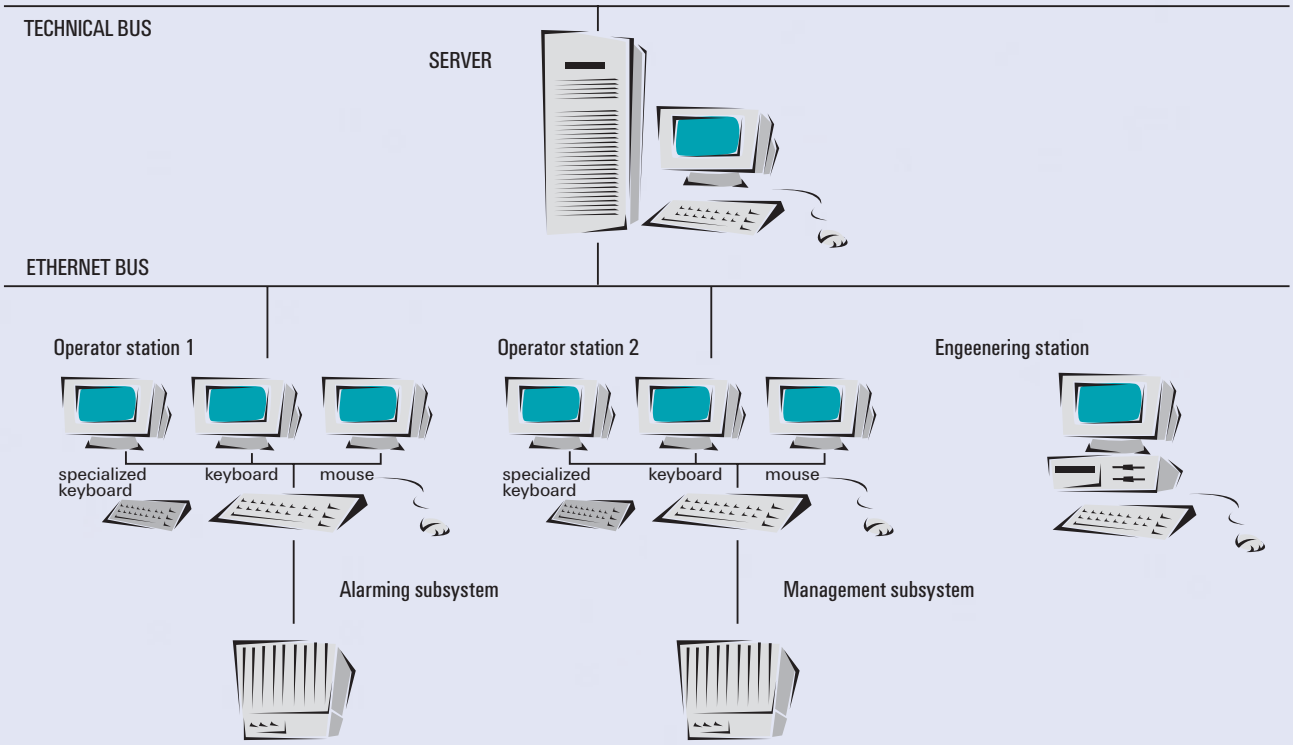
Applications requiring many co-operating computer stations and described by numerous sets of process variables become an inspiration for development of automatic **asix** system administration. The result: **asix** applications within the computer network operate always according to actual projects and versions, which are managed by the designer and engineer from one central location within the network, because they can automatically update – including system software version – to the declared location of pattern.

Also **asix** Tag Database may be developed on one central station and then all changes are broadcasted to the network to ensure coherent operation of remote stations.

All this mechanisms make managing the complex configuration easier and confirm the opinion that **asix** system is ready for even the most demanding projects, in every respect.

Systems with large number of variables require greater number of screens to show process pictures with information on process status.

asix has been enriched with a solution basing on standard features of Windows for multi-screen operation. Using one keyboard and a mouse, users can in an intuitive way call process pictures of SCADA systems on the screens of many monitors.



This solution lowers also cost of the system – the number of licenses, computers and communication cards required.

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