

Realtime process supervision

INGESYS 



Technical product information

Ingeteam



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SECTION I

Technologies applied



Presentation

- Powerful, built-in process control and supervision system.
- Wide range of services and functional features.
- Based on the latest software technologies and most common standards.
- Easy and user-friendly editing and configuration environment.
- Efficient information management.
- Robust security systems.
- Increased productivity and cost-effectiveness.
- Wide range of applications and business sectors.

INGESYS®IT is an in-house product developed by INGETEAM for creating applications in the field of industrial automation. **INGESYS®IT** is endorsed by INGETEAM's long list of references and more than 25 years' experience in carrying out Research, Development and Innovation projects in the process automation and control sector.

INGESYS®IT is a comprehensive package of software applications, specifically designed to develop Supervisory Control and Data Acquisition systems (SCADAs) and HMIs. It is based on the latest software technology and is composed of a collection of modules perfectly built into a common platform to provide you with a wide variety of services and functional features.

INGESYS®IT offers unique features for easy, user-friendly information management, with all the advantages of a truly object-oriented system (SmartOCSEObjects) together with a powerful, built-in configuration and display environment.

INGESYS®IT significantly reduces project times and costs. These substantial savings will directly result in hugely increased productivity and financial benefits for your company.

INGESYS®IT is ideal at any business level, from plant data collection to subsequent integration into ERP or MES tools with office IT applications (Microsoft Excel, Microsoft Word, etc.). To achieve this high level of compatibility, a set of standard technologies has been used, including the following:

- ActiveX
- COM and DCOM
- OPC
- ODBC and OLEDB
- HTML and XML
- Web Services (SOAP)

This standard-based product strategy guarantees the long-term security of your investment.

INGESYS®IT is the easiest and fastest solution for introducing, maintaining and building up an industrial automation system thanks to its flexible client/server architecture which enables it to cover a wide range of applications and business sectors. Its efficient architecture is easily scalable from a simple node to a complex redundant and multinode network.

INGESYS®IT can be run on the range of operating systems consisting of Windows 2000/XP, Windows 2003 Server and Windows Vista, which greatly facilitates its integration into any application currently installed or that may be installed subsequently either in the Windows environment or in any other environment accessible from it.

INGESYS®IT also includes robust security systems that can be adapted to your own specific needs.

Outstanding features

Modular and integrated solution

INGESYS®IT is a powerful set of perfectly integrated software modules that offers a unique, custom-made solution for controlling and supervising processes, whatever the size of your company or its sector of activity.

INGESYS®IT's architecture was conceived from the outset to provide a solution to each of our client's immediate needs as well as enabling it to easily, quickly and economically adapt to forthcoming market trends and technologies.

Versatility and Flexibility

INGESYS®IT offers a flexible, modular structure that enables it to be easily adapted to the needs of each client, covering a wide range of applications and business sectors.

Designed specifically to be used on an international scale, INGESYS®IT enables you to create multilingual projects since it offers an advanced system of automated translation and the possibility of switching between languages in realtime and according to your needs.

Continuous and Homogenous Scalability

INGESYS®IT is based on a flexible, open client/server architecture. It can be used to configure anything from a simple application, based on an isolated node, to a large supervision and management centre composed of multiple redundant nodes.

INGESYS®IT also caters for your long-term needs, offering solutions that can respond to any future market growth and expansion without the problems caused by technological ruptures and without having to resort to costly redesign processes.

High Availability

INGESYS®IT's client/server architecture makes it possible to configure redundant topologies for computers, networks and servers, guaranteeing total availability in critical installations.

Its extensive configuration options and robust redundancy systems contribute to assuring continuous functioning in any plant.

Distributed Platform

Depending on the complexity of your project and the volume of information that INGESYS®IT is to handle, you can develop anything from simple applications in which all of the modules are housed in one single machine to the most complex project where you configure a computer network with distributed software modules.

Each of INGESYS®IT's modules can be acquired separated. Therefore, the end user can configure their system according to their own needs. Subsequently, when new requirements arise, they can acquire new modules and easily add them without having to reinstall INGESYS®IT again.

Clock Synchronisation

INGESYS®IT includes a clock synchronisation client which complies with both NTP-SNTP and NT5DS protocols and which makes it possible to obtain millisecond precision in synchronising the machines in a local network.

Easily Expandable and Adaptable System

From the outset, INGESYS®IT was designed as an open, flexible system, making it easy to expand the system with options adapted to current and future market needs and to those of any given client.

The fact that INGESYS®IT is a product wholly developed by INGETEAM further reinforces and facilitates this capacity to expand and adapt the system.

INGESYS®IT can be adapted to your needs, offering you a solution that optimises and guarantees your investment.

Based on standards that guarantee integration and your investment's longevity

INGESYS®IT is based on highly-renowned standards such as COM/DCOM, OPC, ActiveX, XML and Web Services. Hence INGESYS®IT assures its ability to:

- communicate with a wide variety of industrial devices.
- facilitate integration with third-party software (such as ERPs and MES) and office IT applications (such as Microsoft EXCEL and Microsoft Word) in order to enhance functional features and services in specific technologies or sectors.
- guarantee the security of your investment in the long term.

Object-Oriented

INGESYS®IT allows you to manage all your information efficiently and intuitively, offering all the advantages of an object-oriented system (SmartOCObjects).

The SmartOCObjects technology developed by INGETEAM represents a huge leap forward in the design and development of supervision and control applications, offering a unified environment that integrates all of the system's information into one common infrastructure and one set of services, unique to its range.

The savings in time and costs in a project are obvious and immediate and results in hugely increased productivity and financial benefits for your company.

Easy and Efficient Configuration

INGESYS®IT offers a powerful configuration and display environment which you can use to model any type of process easily and efficiently.

Designing an installation with INGESYS®IT is fast and intuitive. You can forget about the tiresome, tedious task of programming scripts that other systems on the market need to implement all types of dynamics and actions. All that INGESYS®IT needs is one simple click. The system's abundant configuration options together with its SmartOCObjects technology make it possible

to drastically reduce your project's development time as well as making maintenance and training tasks much easier.

Minimal Administration Tasks

The maintenance of an INGESYS®IT plant hardly requires any administration tasks. The system has been specifically designed so that each module is able to regulate itself and efficiently manage assigned storage resources.

Web Access

INGESYS®IT WEB lets you manage and view plants via Internet or the company network, offering the same benefits as any local operation station without the need to make modifications to your project.

Based on Web Services technology and thanks to the use of digital user certificates, it offers a robust, secure solution.

Given its open, standard-based design, INGESYS®IT WEB offers custom-made web solutions, attractive accessibility options and integration into any type of application.

With these access solutions, INGESYS®IT makes managing remotely distributed plants much easier while hugely reducing business costs in terms of personnel, training, call outs, and stoppages.

Advantages

- Facilitates and simplifies the design and reuse of applications.
- Reduces operation and maintenance costs.
- Guarantees and optimises investment.
- Open development for custom-made applications.
- Integration into heterogeneous information management systems.
- System with a global business vision.

Facilitates and simplifies the design and reuse of applications

Thanks to its high level of configurability and its design based on an object-oriented technology (SmartOCSObjects), **INGESYS®IT** allows you to considerably reduce your project's engineering time.

Designing an installation with **INGESYS®IT** is fast and intuitive.

Configuration errors and test times are reduced to a minimum, both in commissioning a new plant and for projects involving expansion or adaptation to your new requirements.

These huge advantages in terms of reducing costs and engineering time are exponentially multiplied when building new plants as you can quickly and easily reuse applications already designed.

Reduces operation and maintenance costs

Using a control and supervision system like **INGESYS®IT** means considerably reducing operation and maintenance costs. Call-outs for monitoring equipment in remote locations become a thing of the past. Personnel, training, call-outs and breakdown costs are reduced to a minimum.

INGESYS®IT thus contributes to achieving the most demanding objectives related to quality, rapidity and efficiency in attending to and resolving incidents.

Guaranteeing and optimising investment

For any company considering increasing its availability and productivity for a reasonable price without having to forsake the sector's latest technology, **INGESYS®IT** is a strategic ally that offers an optimised supervision and control solution based on the latest technologies and standards.

INGESYS®IT's standard-based product strategy promotes the reduction of maintenance costs and hazards while guaranteeing long-term investment.

INGESYS®IT's open design safeguards your investment against technological obsolescence, enabling it to meet new expansion and adaptation requirements using minimal costs in terms of both time and money. Hence, your company can define the pace at which it progresses according to its own needs.

Open development for custom-made applications

INGESYS®IT offers different APIs for access to all the information (data, alarms and historical data) contained in an installation, so that even the end user can develop their own applications.

Hence, INGESYS®IT lets you expand and adapt the system's capacity and functional features to each client's requirements.

Integration into heterogeneous information management systems

INGESYS®IT offers powerful integration mechanisms with ERP or MES type tools with which to face the growing needs for companies to unify heterogeneous and differing systems in order to manage process information.

INGESYS®IT thus helps ease the task of handling process information to optimise your product's quality and productivity.

System with a global business vision

INGESYS®IT offers a comprehensive solution for businesses that want to go the extra mile beyond the basic control and supervision tasks of a SCADA and that require a homogenous and continuous information flow throughout all levels and places in the company.

INGESYS®IT provides you with a unified information management platform so that each area and member of staff in your business can have a personalised picture upon which to base their daily tasks and decision making both at operational and business level.

With INGESYS®IT the geographical dispersion of places or staff is no longer an obstacle. INGESYS®IT offers your business a comprehensive solution that can be adapted to your needs in terms of analytical capacity and availability if and when necessary whilst providing the best advantages in terms of performance and security.

SmartOCObjects technology

SmartOCObjects technology represents a huge advance in designing and developing supervision and control applications. Having wholly been developed by INGETEAM, it offers a unified environment integrating all of the system's information under one common infrastructure and a set of services that is unique to its range.

SmartOCObjects technology allows you to manage all of your information efficiently and intuitively, offering all the advantages of an object-oriented system:

- Facilitates and simplifies the design and reuse of applications.
- Reduces configuration errors.
- Substantially reduces project development times.
- Notably reduces engineering and maintenance costs.
- Increases the productivity and quality of the product delivered to the client.

Direct Engineering

SmartOCObjects technology allows you to model a process's elements intuitively and directly in real terms, including basic elements managed by different modules within the INGESYS®IT environment (such as data, alarms and events).

One simple click and you have all of the information associated to the component at your fingertips, in a user-friendly format which you can browse through easily and intuitively.

Creating new applications or modifying existing ones thus becomes a quick and easy task. The savings in time and costs in a project result in hugely-increased productivity and financial benefits for your company.

Reusable and extendible

The greatest competitive advantage with SmartOCObjects technology lies in its versatility and wide range of tools, capacities and features, enabling you to create and reuse objects containing all of the graphical and functional information needed in an application environment.

The system also offers powerful browsing, searching and component management features.

Given the self-contained nature of the information in a SmartOCObject, the exchange process between engineering users is immediate, thus avoiding long and tedious import and export processes.

Customised View

SmartOCObjects technology lets you choose how you wish to see the process information that interests you. Thanks to the views and templates system that this technology offers, each user can select how they wish to see each object so that managing and processing it becomes easier.

Consistent, Unified Information

SmartOCObjects technology has been designed to offer you a unified environment for managing all of the system's information efficiently and intuitively.

This unified infrastructure results in many engineering advantages, beyond directly reducing configuration errors and development times. A common information platform enables you to share and benefit from the experience acquired in each project, unify design criteria and establish development guidelines aimed at speeding up and facilitating development and learning tasks.

Hence, SmartOCObjects technology makes it possible to optimise the consistency and accessibility of system information and contributes to achieving the most demanding integrity and efficiency objectives.

SECTION II

INGESYS®IT modules



INGESYS®IT

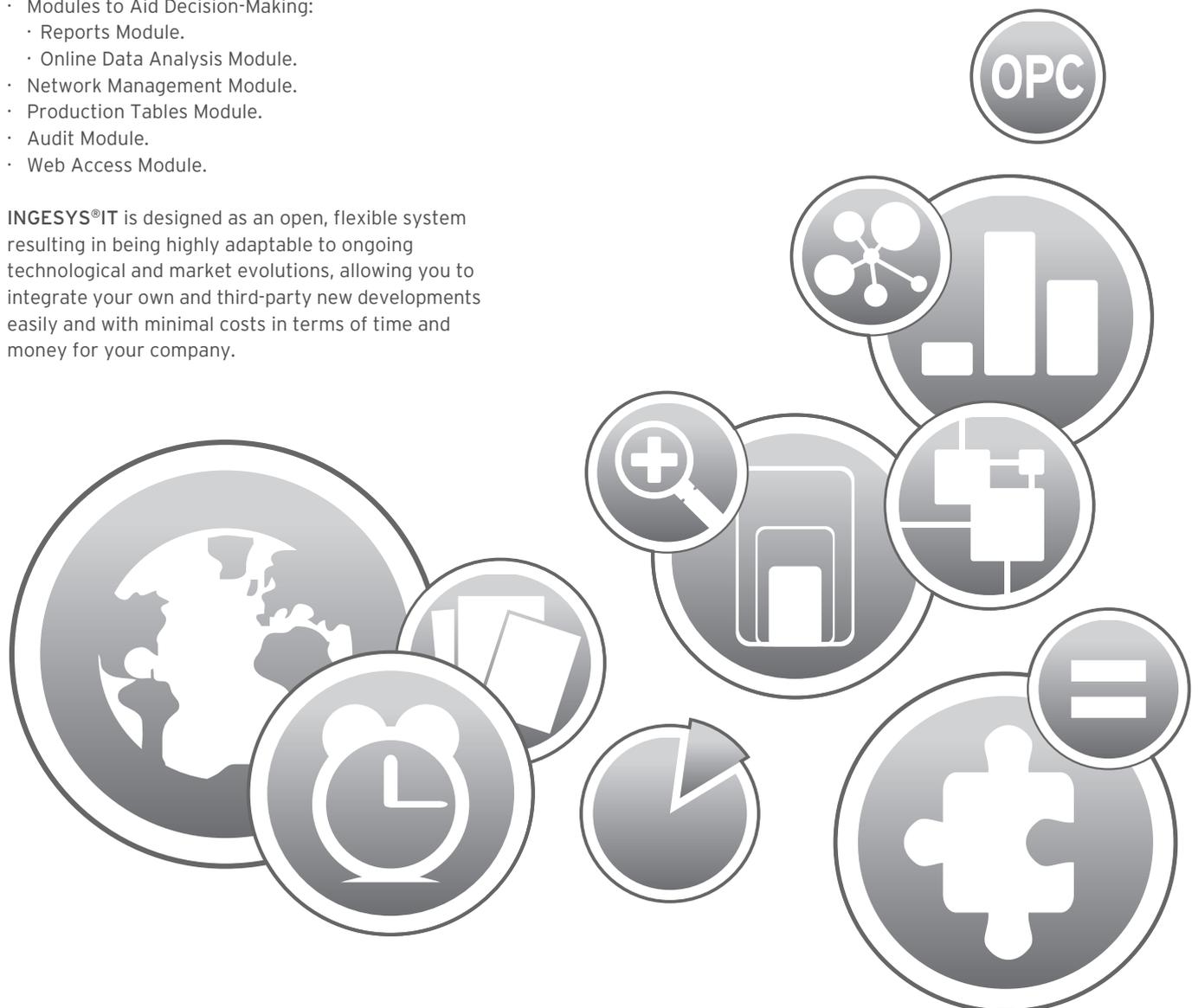
Modular architecture

INGESYS®IT integrates a powerful set of tools into a common platform with a unified information management system.

The modules that form part of INGESYS®IT respond to the most demanding supervision and control requirements in the current market, offering solutions that can be easily customised to your requirements. The modules currently available are as follows:

- Plant Management Module.
- Data Acquisition and Management Module.
- Editing and Display Module.
- Alarms and Events Module.
- Alarm Notification Module.
- Historical Data Module.
- Modules to Aid Decision-Making:
 - Reports Module.
 - Online Data Analysis Module.
- Network Management Module.
- Production Tables Module.
- Audit Module.
- Web Access Module.

INGESYS®IT is designed as an open, flexible system resulting in being highly adaptable to ongoing technological and market evolutions, allowing you to integrate your own and third-party new developments easily and with minimal costs in terms of time and money for your company.



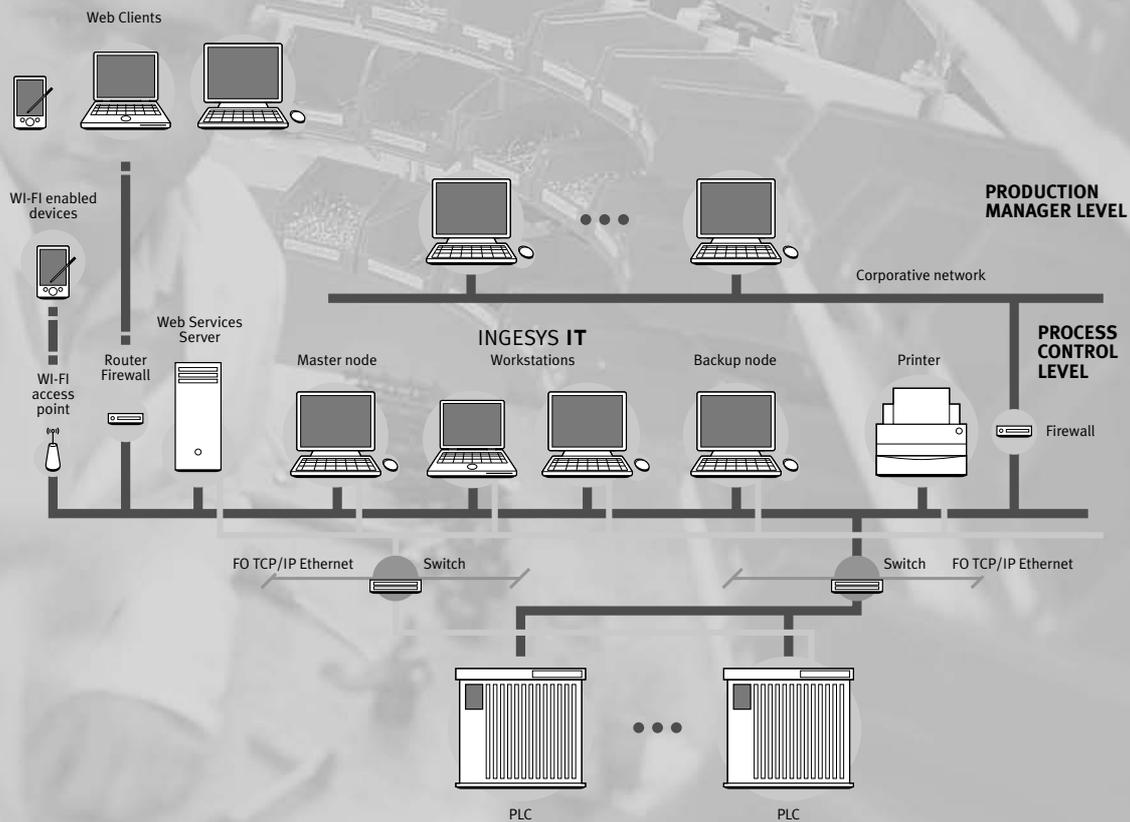
Plan Management

INGESYS®IT's configuration is based on installations, an installation being defined as a set of hardware and software components that compose a functional unit from the point of view of the supervision and control system.

The Topological Configurator supplies the necessary tools for configuring the structure of each plant from the point of view of the components that compose it, both at hardware and at software level. It therefore allows you to define and configure the following:

- Field Devices.
- Communication channels and channel access for each device.
- Security (application and user profiles).
- Redundancy.
- Third-party OPC module integration.
- License policy.
- Backup and restore mechanisms.

INGESYS®IT's Topological Configurator also lets you monitor the status of nodes, communications and servers in realtime directly and intuitively offering you updated information on the system's status at all times.





Plant Management

The Plant Management Module lets you easily perform operations such as creating, deleting, activating and deactivating installations.

It also lets you save and retrieve a plant's backup copies (backup/restore feature). This is a safety mechanism that lets you store and retrieve the configuration stored in the event of possible failures that may damage the current configuration.

The system also lets you parameterise the backup operation (selection of nodes to be copied or restored, place where the copy is to be stored, option to make a compressed copy, etc.). Hence, the backup copy is custom-made.



Node Management

The Topological Configurator lets you separately create, delete, modify, enable and disable nodes in an installation.

There are a set of configurable parameters related to each node in the installation: type of startup, initial panel loading sequence, language, etc.



Server Management

INGESYS®IT has been designed as a software application with servers distributed amongst the different nodes that compose the installation.

The Topological Configurator lets you perform different actions related to these servers, including creating, deleting, configuring, changing node assignment, status checking, activating, deactivating, etc.

The Topological Configurator also lets you integrate third-party OPC servers quickly and intuitively.

Once an OPC server has been integrated into the INGESYS®IT platform, it is available for almost all of the platform's functional features. For example, it can be configured from a normalised user interface; its elements can be referenced from historical data, alarms, operation panels, etc.



Channel Management and Access

The Topological Configurator lets you configure the characteristics of each communications channel defined, as well as channel access for each device.

Redundancy Management

The Topological Configurator also lets you assign each server with a redundant partner to assure availability in critical systems requiring this.

Security Management

INGESYS®IT includes a safety mechanism to monitor user operations. Users are configured such that they are associated to user groups, which in turn are assigned a level of access to software resources.

Each INGESYS®IT application has certain user profiles defined. Depending on the correspondence between the user level and the various profiles defined for each specific application, the user can have access to more or less menu options.



Licence Management

In order to meet the growing needs of each end user, INGESYS®IT includes an incremental license system per node and module which comes with a hardware key physically connected to the corresponding machine or node.

INGESYS®IT also offers a graphical interface for inserting, modifying and deleting licenses.



Clock Synchronisation

INGESYS®IT provides clock synchronisation services between different supervision nodes, the Master node acting as the Clock Master and the Backup node as its substitute in the event of a failure in the former.

Data acquisition and management module

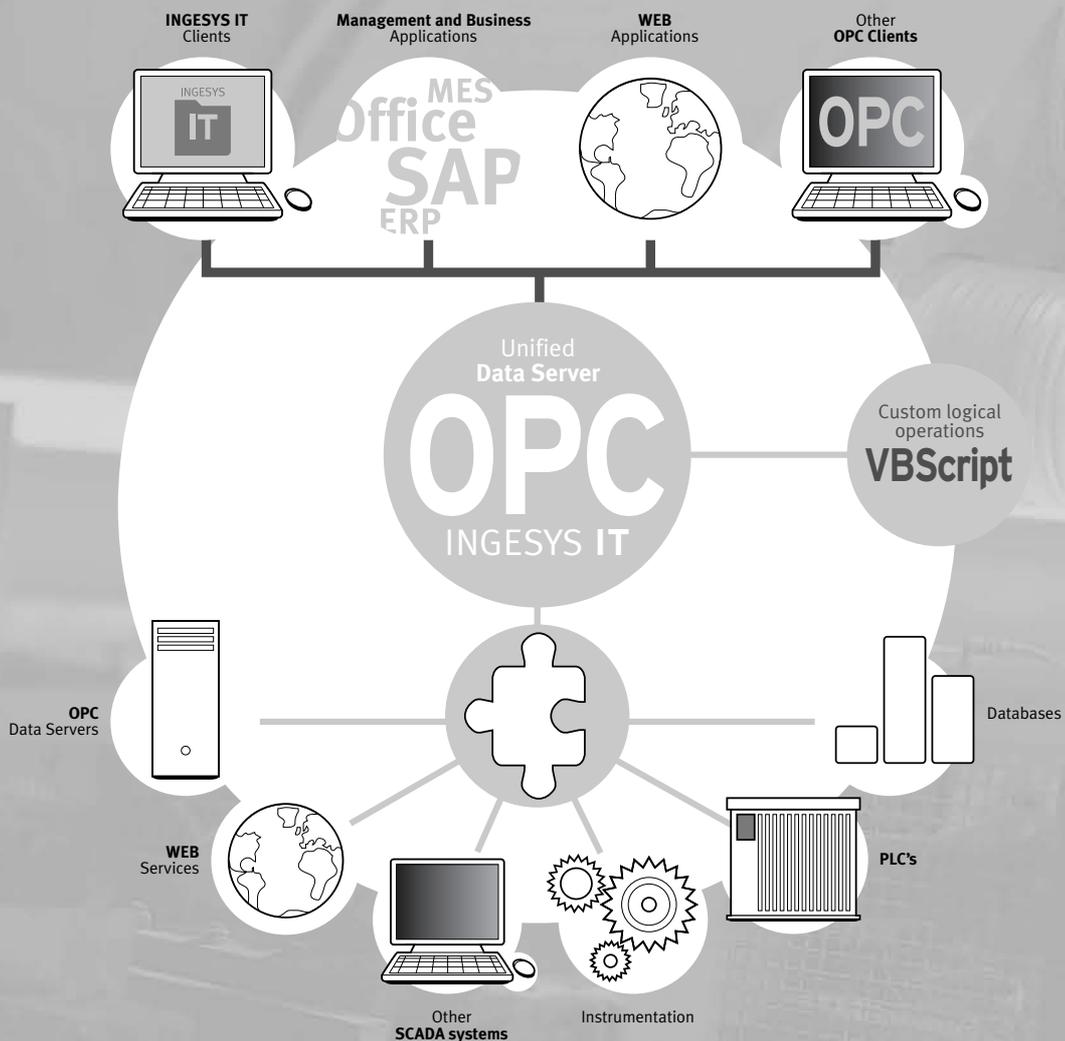
A real plant can consist of equipment made by different manufacturers that offer access to information via communication protocols and very diverse physical media.

INGESYS®IT's Data Acquisition Module lets you unify the information, which comes from different field sources, onto one single OPC-DA server with a powerful, realtime database. Thus, INGESYS®IT offers communication solutions that guarantee the reuse of infrastructure and the profitability of your investment whilst offering optimised data access capacity for each type of client.

Integrating Sources of Data

INGESYS®IT's Data Acquisition module comes with a complete list of communications drivers to enable integration and access to a wide range of commercial devices that communicate using specific protocols:

- Drivers for INGETEAM equipment protocols
- Drivers for standard protocols such as ModBus, IEC, etc.
- OPC-DA and OPC XML-DA drivers for facilitating the integration of hundreds of communication protocols on the market



This Data Acquisition Module has also been designed based on an open, flexible architecture, which enormously facilitates developing and integrating new communications drivers to meet our clients' requirements in terms of scalability and updating.

Structured Access to Information

The realtime database with which the module works has been carefully designed to optimise data management such that it offers unique features to efficiently handle information.

It allows you to structure data hierarchically so that the server can offer hierarchical browser functions that facilitate rapid searches and access to variables supplied by different sources.

Compliance with the OPC-DA Specification

The information contained in the database, unified in realtime, can be accessed via standard OPC-DA interfaces, with all the benefits of integration and guaranteed functioning offered by such a standard.

Integrating Distributed Plants

INGESYS®IT's Data Acquisition Module also provides data acquisition solutions for companies that have various distributed sources.

For example, businesses that have distributed plants in different parts of the world may wish, or indeed in many cases, may need to have realtime access to data from different plants in order to carry out maintenance or management tasks.

In these situations, INGESYS®IT's Data Acquisition Module offers a unique solution by concentrating the information stemming from different plants, thus facilitating data access and management globally via both private and public communication networks.

This architecture combined with INGESYS®IT's Web Services technology makes it possible to find a solution to any situation. INGESYS®IT has no barriers when it comes to accessing the information you need.

INGESYS®IT's Data Acquisition Module is therefore an ideal solution for organisations that need to acquire, consult and analyse information stemming from heterogeneous data sources that are absolutely distributed in different parts of the world.

The module can be configured in totally redundant architectures for critical installations requiring maximum availability. As regards large amounts of data, the system also offers scalability, allowing you to use various servers at the same time.

Scalability and Flexibility

INGESYS®IT's scalability enables it to offer personalised solutions when your volume and geographical distribution requirements involve a distributed system with several servers working simultaneously.

Integrating Advanced Services

Usually, the format in which the system receives data from different field devices does not match the format needed by the user to handle and analyse it.

With these requirements in mind and so as to adapt to your needs, INGESYS®IT offers you the possibility of adding advanced services quickly and easily (buffers, calculations, logical operations that can be customised with Visual Basic Script, etc.).

Integration into Business Applications

INGESYS®IT's Data Acquisition Module offers a powerful mechanism for integration into business applications (ERPs, MES, etc.) and other office applications used for analysing process applications. It facilitates the connection to and immediate availability of the information that you need at any given time, thus speeding up decision-making and subsequently improving productivity and your business's efficiency.

Edition and display module

Object-Oriented Design

Within its powerful editing and display environment, **INGESYS®IT** offers a tool specifically design for modelling any type of process item or object within the SmartOCSObjects object-oriented architecture.

The Classes Editor lets you easily and intuitively design the structure of categories, classes and settings that define each of the installation's elements, as well as relationships between them.

SmartOCSObjects technology lets you organise this information hierarchically to facilitate understanding and displaying the model and to offer each user the sort of information and detail that they need.

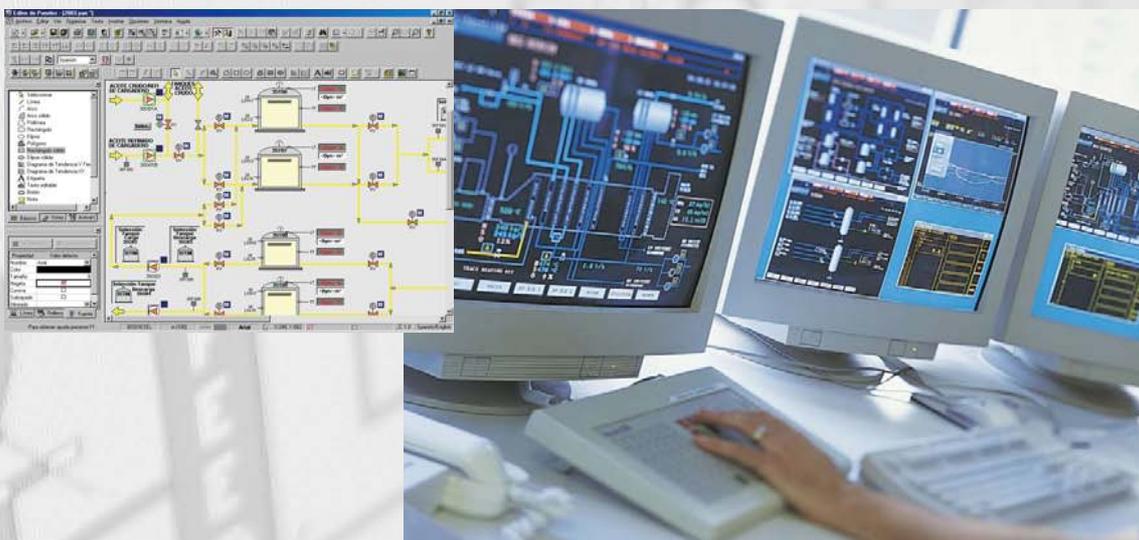
You can define different graphical views and templates associated to each element, with the help of the Panel Edition Module and a classes browser specifically designed to simplify and optimise project development.

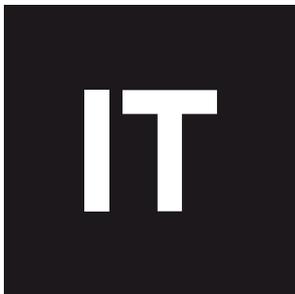
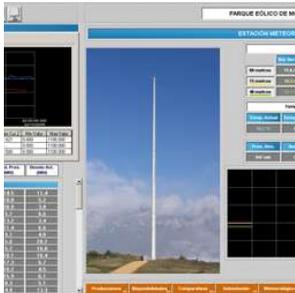
When it comes to designing operation panels, you can also make use of a palette in the shape of a tree, in the Panel Editor environment, with all of the classes defined in the model. By simply dragging and dropping, you'll instantaneously see the selected element with all of its functional features and graphical capacities assigned to the class.

Furthermore, any change or update made to a defined class is automatically sent to all of the instances of this element contained in the project totally transparently.

Creating new applications or modifying existing ones thus becomes a quick and easy task. The savings in time and costs in a project, both in engineering and maintenance phases, are obvious and directly result in hugely increased productivity and financial benefits for your company.

In the longer term, the advantages multiply given the ability to reuse the classes and models defined. Given the self-contained nature of the information in a SmartOCSObject, the exchange processes between engineering users is immediate, thus avoiding long and tedious import and export processes. With **INGESYS®IT**, your investment is guaranteed both in the long and short term.





Powerful Operation Panel Editing Environment

INGESYS®IT's Panel Edition Module offers a powerful environment of integrated development for designing operation panels.

Besides the functional features already mentioned associated to the SmartOCObjects object-oriented architecture, the Panel Edition Module offers a long list of features and functions for facilitating and speeding up project graphic design:

- Wide variety of basic components (line, square, circle, etc.).
- Image insertion (bmp, jpgs, etc.).
- ActiveX controls and built-in viewers of the other INGESYS®IT modules (historical data, alarms, etc.).
- Wide variety of dynamic facilities and actions applicable to different objects or groups of objects, configurable with a simple click.
- Continuous and unlimited panning and zooming, cluttering/decluttering, rotation, etc.
- VBScripts support, expanding the dynamic functional features offered by the INGESYS®IT environment.
- Graphics libraries.
- Advanced mechanisms for browsing between panels and work spaces.
- Ability to design parametric panels.
- Operations on panels: copy, delete, import, etc.
- Powerful functional features for managing information contained in operation panels (searches, crossed references, documentation, replacements, validations, batch processing, etc.).
- Advanced mechanisms for developing applications with multi-screen display requirements.

The Panel Edition Module increases operating capacities, allowing you to create and manipulate workspaces, in other words, logic groups of panels that let you simultaneously view different panels on the same screen, organised into frames without needing to browse from one to another.

Multilingual Support in Editing and Runtime Environments

INGESYS®IT makes it easier for you to develop international projects by offering multilingual support in both the editing and runtime environment.

INGESYS®IT lets you manage panels in different languages with its automated translation system. It also lets you dynamically change languages in runtime, depending on your needs.

Many Panel Display Functions

Switching between panel editing and panel display modes is quick and easy and hence hugely reduces testing and engineering times in projects.

Panels can be displayed on full screen or in dialog boxes. Both panels and actions associated to any element can be assigned to different access levels in order to ensure security and integrity in the supervision and operational tasks involved in the process taking place.

The runtime environment also offers you the realtime option of associating a comment to the force actions, which complementing the Audit Module register, facilitates and speeds up the subsequent management and analysis of logged process actions.

Extendibility Mechanisms

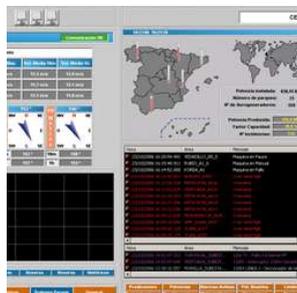
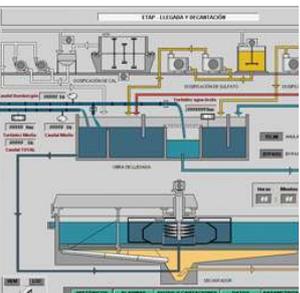
As with INGESYS®IT's other modules, the Panel Edition Module has been specifically designed as an open, flexible environment. Hence, you can immediately and transparently add functional features with new dynamics and actions.

Therefore, the end user can make the most of the latest system updates and new features without having to reinstall applications, thus reducing the time and complexity involved in updating and maintenance tasks.

Automatic Documentation Management

INGESYS®IT helps you automatically generate all of the documentation related to the engineering tasks in your project.

Hence, INGESYS®IT facilitates and simplifies project management and maintenance tasks, making it quicker to develop and update your documentation as well as ensuring that all your information is consistent.



Alarms and events module

INGESYS®IT offers a set of display and analysis tools for handling alarm situations quickly and efficiently, so that the operator can detect anomalies in the process and act immediately.

This Alarms and Events Module is characterised by its versatility and flexibility in terms of configuring, displaying and managing alarms.

Managing Alarms and Events Module

INGESYS®IT's Alarms and Events Module can efficiently manage different types of events and alarms:

- Logical Events and Alarms.
- External alarms detected by other devices.
- Time Events.

Events and alarms can be grouped into areas and have colours associated to them according to their severity.

Many Display Modes

You can graphically view the status of process alarms and events from different perspectives depending on your requirements.

To do this, there are three types of alarm viewers in any operation panel:

- Active Alarms Viewer.
- Alarms Pending Acknowledgement Viewer.
- Historical Alarms Viewer.

You can fully configure the graphical appearance of these viewers:

- Display alarms in lists or lines.
- Configurable fields.
- Show/Hide menus and toolbars.
- Wide range of filtering options.
- Assign colours according to an alarm's status.

Furthermore, if any of the system's alarms or events change status, you can configure it so that it is directly sent to a printer providing that user-defined filtering requirements are complied with.

Chronological Alarms

The Alarms and Events Module is able to manage alarms and events that come from the PLC. The resolution level is as high as the PLC's scan time. To achieve this, a communication protocol with the PLC has been established so that it is the PLC which sets the chronology of alarms and the alarms and events server which stores them so that they can be subsequently analysed from any of the viewers available.

Historical Alarm Record

The Alarms and Events Module also lets you temporarily store all of the status changes (both activation/deactivation and acknowledgement) of alarms and events in a database.

It also lets you store status changes of both numerical and logical variables chronologically so that they can be subsequently analysed. The application can store the log of these changes in any relational database management system, since the use of the OLEDB database access standard isolates the application from the user database.

You can configure the residence time in this database and the size of the log file and make a manual or automatic backup of the log file.

Exporting the Historical Alarms Record

INGESYS®IT's Alarms and Events Module lets you export the historical alarms record to a .csv file. You can configure this operation so that the server does it automatically or you can configure it manually from the viewer menu.

You can configure a filter to select the list of alarms whose information you wish to export and you can also store the complete configuration of the associated server (server name, colour configuration, colour associated to each severity level, etc.).

Dynamic Message Generation

The Alarms and Events Module can dynamically generate messages associated to any alarm transition (activation, deactivation, acknowledgement, etc.). These messages can be seen in any of the available viewers and can be configured to include field values in the text, captured by the Data Server upon activation.

Panel and Message Associated to an Alarm

The Alarms and Events Module lets you associate each alarm or event with a panel showing the user the location of the alarm, as well as giving them an informative message and directly offering them the associated information quickly and efficiently.

Dynamic Comment Association

You can also associate an alarm or event with a realtime comment related to its activation in order to facilitate and speed up the subsequent management and analysis of the breakdown or the situation of the detected alarm.

Compliance with the OPC-AE Specification

INGESYS®IT's Alarms and Events Module uses interfaces defined by the Alarms and Events OPC standard and extends them using a wide range of advanced functional features.

Solid Integration with the Data Acquisition Module

One of the most outstanding features of the Alarms and Events Module is its high integration with the Data Management Module. Just some of the functional features related to this area include its ability to:

- Inform the control device of the status (activation, acknowledgement, enabling) of each alarm.
- Inform the control device of the existence of alarms pending acknowledgement.
- Enable, disable and automatically recognise alarms according to process values.
- Use mechanisms for notifying alarm status changes from control devices.

Advanced Alarm Management and Statistical Assessment

One of the features of INGESYS®IT's Reports Module is advanced alarm management to optimise processing.

This INGESYS®IT tool enables the end user to have information not only on alarms (mean and total activation time, confirmation time, etc.) but also all data related to them which facilitates analysis and protects the system's critical mechanisms.

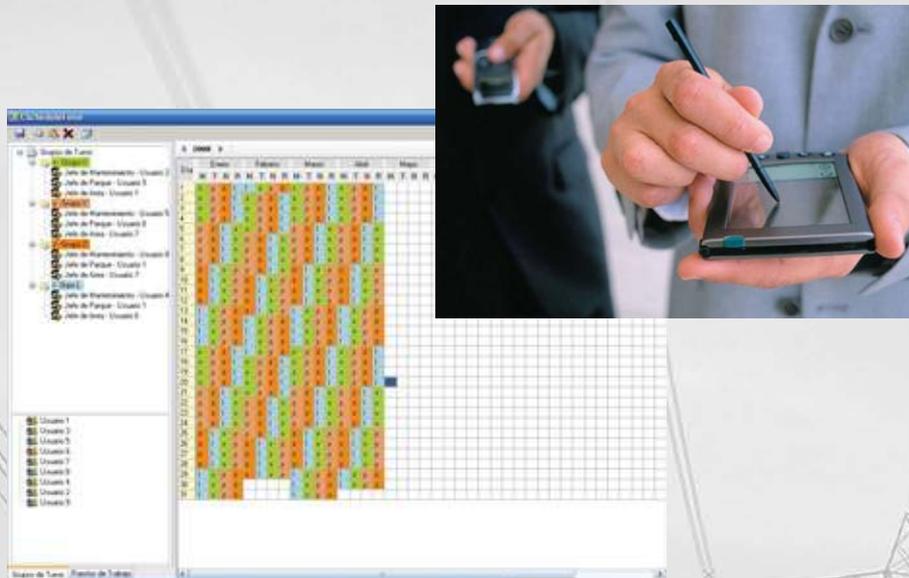


Alarm notification module

The Notifications Module is an extension to the features found in INGESYS®IT's Alarms and Events Module, offering you a quick and easy way for sending realtime notifications on alarms.

It is specially designed for application environments in which there is no permanent local operator, offering you a safe, fully-controlled environment. This results in huge savings in costs and reaction times when responding to alarm situations that may occur in the process.

The module also boasts an easy, user-friendly configuration environment that lets you define and manage all aspects related to sending these notifications: calendars and employee shifts, alternative notification media (E-mail, SMS, etc.) and the definition of rules and exceptions.



Historical data module

INGESYS®IT's Historical Data Module offers a powerful system for storing the values supplied by the Data Management Module in realtime for subsequent retrieval and analysis.

Integrating Heterogeneous Sources of Data

The Historical Data Module can store time-stamped samples of variables acquired not only by the Data Acquisition and Management Module but also by a whole variety of external applications and devices developed by other manufacturers (data loggers, etc.) or from the PLC itself.

Data to be registered can take the form of realtime values directly acquired by a field source or values calculated from it in configurable time intervals (minimum, maximum, average, arithmetical, etc.).

In any case, you can configure the parameter that defines the frequency with which data is acquired.

Chronology of the Data Stored

The Historical Data module can store historical data from a PLC with a resolution level as high as its scan time. The scans will be time-stamped from the control device itself.

The module also offers an API to access stored data to simplify integration into third-party applications.

Wide Range of Display Features

You can also take advantage of a comprehensive and wide range of display options for handling and analysing the data recorded, including the following:

- Tabular display.
- Variables graphics based on time.
- X-Y graphs up to 10 variables associated to the Y axis.
- Comparative graphs of the same variable during different periods of time.

Both the time graph displays and the X-Y ones let you see scans in realtime or values previously recorded in the historical record file.

The appearance of the graphs is totally parameterisable and hence, you can easily configure the following:

- Scale and size of the display window.
- Colours for the background, text, grid, cursors, etc.
- Visibility of headers, grid, variable lists, etc.
- Fields visible in variable lists.
- Height of the texts and number of horizontal and vertical separations.
- Display of a series of range percentages or real values.
- Graphic separation to improve the display of Boolean variable registers.
- Series drawing mode: interpolated or steps.

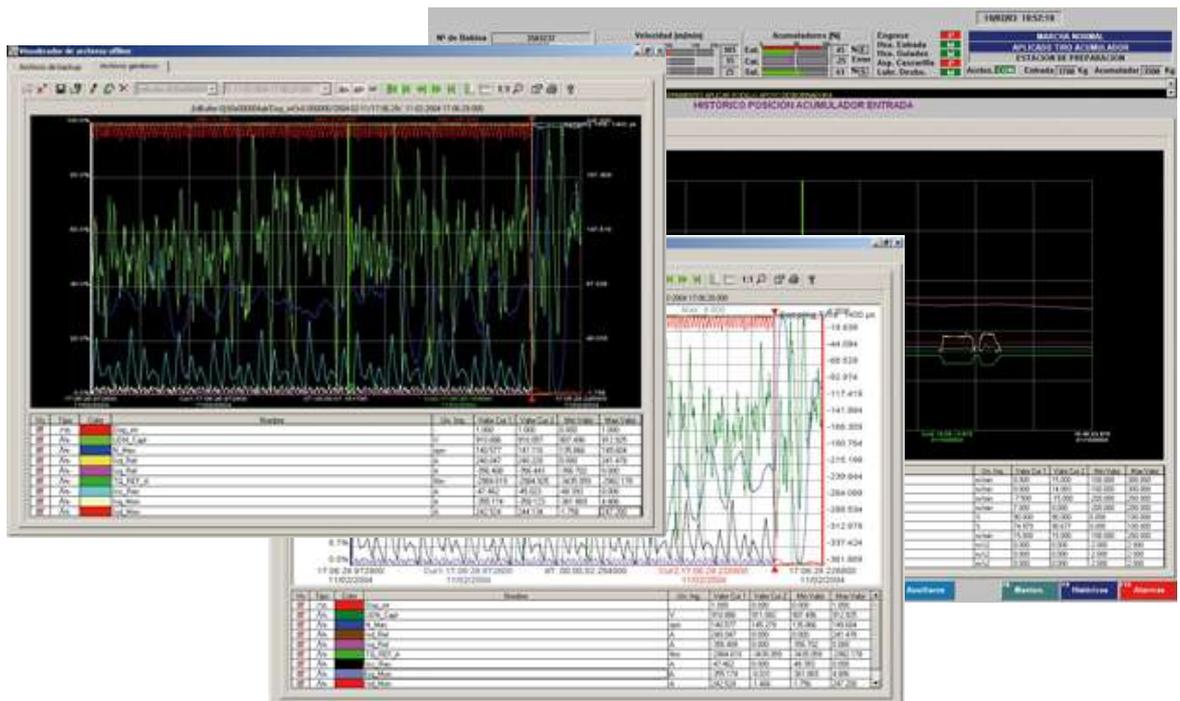
Each graph can simultaneously show references to separate historical register variables as well as also offering a wide range of realtime functional features:

- Select variables to show/hide.
- Position cursors to view real or percentual values.
- Area extension options: zoom in, zoom out and return to normal 1:1 view.
- Browse through the log according to axes set using buttons or by date selection.
- Apply statistical operations to the historical data to be displayed: mean calculation, maxima, minima in an interval, etc.

Adding historical graphs in realtime to applications is quick and easy.

Optimising Registered Information

The Historical Data Management module can store process data in an MSDE, SQL 2000 Server database or in an in-house file format offering enhanced compression features. **INGESYS®IT** thus offers an optimised solution for plants with demanding requirements related to storage and access to registered information management.



This module uses mechanisms to minimise both the space required to store each sample as well as the space on disk needed by the global historical register (definition of dead bands, assessment of statistics, etc.), without needing to modify the sampling frequency of process variables.

These compression techniques, together with the use of an intermediate caché with a configurable size makes it possible to reduce the scan processing time as well as the time needed to access information, without affecting the precision and coherence of the data registered whatsoever.

Compliance with the OPC-HDA Specification

The Historical Data module complies and extends the OPC standard's specification for Historical Data, facilitating its integration with both third-party field devices and supervision systems applications.

Exporting History to File

The Historical Data Management module lets you export the log of one or more series of data to a .csv file, with many configuration options. The user can select the following:

- The list of variables whose log is to be exported.
- The initial and final times of the historical record to be exported.
- The period of time between exported scans.
- The name of the file containing the scans with exported chronology to be stored in a dedicated directory created in the installation directories structure.

Monitoring Actions and Users

A user's right to perform certain actions with historical data (create it, modify it, etc.) depends on the access level assigned to them with respect to the one configured for enabling this option.

In any case, as with INGESYS®IT's other modules, actions carried out by each user will be registered and can be referred to using the tools provided by the system's Audit module.

Manual and Automatic Backup

The Historical Data Management module lets you manually and automatically make backup copies of the historical data contained in a server.

To make a copy manually, there is a tool that helps you do so more quickly, conveniently and easily, allowing you to select the list of variables that you want to back up. To make automatic backups, simply enable this option when configuring the server.

The copy is made in the native format in which the information was stored in order to optimise the process and facilitate subsequent data retrieval. The copy made is stored on the local disk of the node in which the backup is made and does not modify the current stored information (online) whatsoever.

Offline Historical Data Display

This is a very useful application since it graphically (Value-Time) lets you view historical data (scans) contained in the log file from different sources:

- Historical data backup files.
- Exported historical record files.

The display window is composed of two tabs. Each one contains a window with a different historical data viewer, specifically for viewing each of the two types of file that it is able to manage.

Moreover, this tool is totally separate from the rest of the operational environment. Hence it can be used by maintenance and operational staff from any work station without having to install INGESYS®IT.

Print Features

Using the Historical Data Management module, you can print the window selected in the viewer.

In this respect, the module offers an optimised graphical configuration to preview the print, which is completely separate from the on-screen view.

Distributed Storage System

The Historical Data Management Module also offers attractive solutions for distributed installations. Using the OPC HDA Gateway server, INGESYS®IT offers quick, secure and direct access to information stored on servers with historical data distributed amongst several nodes.

With INGESYS®IT, access to information has no limits.



Modules to aid decision-making

By integrating different specialised modules, **INGESYS®IT** provides an advanced analysis environment aimed at optimising the operation and management of information from all business spheres and profiles.

The integration of these powerful Online Data Analysis and Reports Management modules strengthens the versatility of the **INGESYS®IT** system, making it possible to intelligently maximise information, in order to:

- improve processes,
- reduce costs and reaction times,
- facilitate decision making,
- increase efficiency,
- guarantee the performance and profitability of your business investment, both in the short and in the long term.

INGESYS®IT thus offers you a unique solution responding to the current requirements of your business and is ready to embrace any needs that may arise in the future in a business world which is continuously changing and developing.

From an graphical, user-friendly environment, **INGESYS®IT** is an integrated solution, adapted to the different profiles that form your business structure and is capable of responding to the needs of each user profile, while adapting to their requirements in terms of information presentation and content.

INGESYS®IT has two specific modules for offering solutions adapted to the needs of each business profile:

- The Report Module, for creating and distributing all types of reports. This module complements the features of Microsoft Excel, to create reports from data, historical records and process alarms. You can easily automate the creation and printing of these reports from the module's editing environment.
- The Online Data Analysis Module is an advanced solution aimed at offering engineering businesses an interactive tool for detailed process analysis.

With this module **INGESYS®IT** provides interactive reports using a selection of different views on sets of structured data, captured in real time. Hence, any member of your staff can have a personalized view of the information they need to analyse the process in detail and take business decisions at the highest level.

User-Friendly

In order to facilitate the process of editing, generating and distributing reports, INGESYS®IT's Online Data Analysis and Reports modules are internally structured into two clearly differentiated areas:

- A simple, user-friendly editing module for defining the content and graphical appearance of reports.
- A runtime module for generating and distributing reports according to requirements specified by the client.

Advanced Data and Alarms Management

The Online Data Analysis and Reports modules offer advanced features for managing data and alarms. Their objective is to facilitate the analysis of production, failure cases, and process anomalies, providing an efficient tool not only for optimising process productivity and troubleshooting, but also for preventing this type of situation.

This advanced management of process information results in substantial savings in terms of time and money which of direct benefit to your business.

INGESYS®IT thus contributes to making your investment more profitable and reduces accidental losses, damage to equipment, stoppages, manufacturing errors and incidentals to a minimum.

Total Availability - Anytime, Anywhere

Giving the growing demands in terms of mobility and availability in the business world, INGESYS®IT's Online Data Analysis and Reports modules include exciting web access features; reports created can be accessed from any part of the world under the strictest security conditions and with the highest levels of performance. Accessing stored information is easily extendable and scalable, given the open, flexible architecture with which this module has been designed.

INGESYS®IT hence offers a comprehensive solution for businesses that want to go that extra mile beyond the basic control and supervision tasks of a SCADA and that require homogenous and continuous information flow throughout all levels and places in the company.

Open programming standards and interfaces

Open, modular, standard-based architecture

INGESYS®IT aims to offer custom-made solutions. Hence, it is designed to be a system with an open, modular architecture based on highly-recognised standards (COM/DCOM, OPC, ActiveX, XML, and Web Services) to ensure compatibility with third-party equipments and applications.

This product strategy, based on standards and an open architecture also guarantees the security of your long-term investment as well as adaptation to the forthcoming requirements of an ever-changing market.

System Autonomy

INGESYS®IT has been designed in accordance with the criteria stipulated by Microsoft DNA's multi-level architecture.

This design concept, together with the use of third-party communications protocols such as those specified in the OPC standard (OPC DA and OPC XML-DA for data, OPC HDA for historical data and OPC A&E for alarms and events) make INGESYS®IT a 100% open standard in which the application layer is completely separate from the information sources and from the storage system used for historical data records.

The standardisation of communications protocols also enables you to transparently and directly have all the system information and all the control and supervision functional features of a SCADA. For the user, it's like working with a single data source even though in reality this information may be distributed in different physical and even geographical locations.

Integration into heterogeneous information management systems

Thanks to this multi-layer, standard-based architecture, **INGESYS®IT** also provides powerful mechanisms for integration with advanced management tools (ERP, MES, etc.) and office IT applications (Microsoft Excel, Microsoft Word, etc.) in order to meet the growing demands of companies to unify heterogeneous information systems to expand the functional features and services of the SCADA in the area of specific technologies and application sectors.

INGESYS®IT thus contributes to facilitating process information management to optimise the productivity and quality of the product, thus offering a comprehensive solution for businesses wishing to excel beyond the basic control and supervision tasks of a SCADA and require homogeneous, continuous flow of information at every level and in every area of their company.

Custom-Made Application Development

By adhering to objectives for achieving integration and adaptability, **INGESYS®IT** offers powerful expandability mechanisms, including different APIs, facilitating access to all of the system's information (data, alarms and historical data) so that the end user can develop their own applications.

Hence, **INGESYS®IT** lets you easily expand and adapt the system's capacity and functional features to each client's requirements.

Network management module

Administrating Integrated Networks

Within the control and supervision system, the Network Management Module lets you manage the physical equipment and devices that form part of the INGESYS®IT system: system nodes, printers, network devices and any device which has an SNMP agent. In this sense, each node in an INGESYS®IT installation includes an SNMP agent so that you have all of the diagnostics data on the elements in your plant at your fingertips.

The main objective is to facilitate and speed of the network administrator's task of supervising the performance of the network, find and resolve its problems and plan its growth.

Data to be integrated is related to both hardware and software features and settings.

This diagnostics data will be available for any network administration application via the SNMP (Simple Network Management Protocol), a protocol based on UDP, specially created for data network administration and which has been established as a standard for TCP/IP devices.

Diagnostics Data Available via the OPC Standard

The power of this INGESYS®IT Network Management Module lies in its ability to offer you the possibility of accessing this diagnostics data as OPC items managed by an OPC SNMP Server which is included in the installation like any other OPC data server. Hence, the information contained in these items can be seen and processed from an operation panel, form part of an alarm condition or be stored in a historical record.

The OPC SNMP Server also lets you access SNMP devices from any OPC client. The information provided can be read only or read/write. This makes it possible to diagnose anything from a single device to a whole system, as well as actively control the settings of devices in any administrated network.

Production tables module

The Production Tables Module provides an easy method of uploading and downloading process parameters.

This module responds to the needs of plants with subprocesses in which the production of different product batches, which need different set point values from the application, are alternated cyclically.

The definition of each subprocess's parameters is called "production table" and the set of set point values associated to each batch is called "configuration".

This module lets you manage tables and configurations defined with multiple configuration options.

It lets you associate actions, such as sending an SMS or an email, to downloading parameters and offers you the possibility of processing data before saving or sending it to field devices.

Likewise the module lets you order data uploading or downloading manually or it can be done as a response to the activation of a specific event configured previously.

The screenshot displays the 'TREN DE LAMINACION' (Rolling Line) interface. At the top, it shows 'EN PROC.' (In Process) and 'ACABADO' (Finished) status for various parameters like 'CAJA TERM. T.C.' and 'CAJA TERM. S.T.B.'. Below this, a 'PARAMETRIZACION TREN DE LAMINACION' table is visible, listing configurations (C.A.1 to C.A.14) with columns for 'Temperatura', 'Velocidad', 'Espesor', and 'Configuración'. A 'NO PERM. CAMBIO DIAM.' (No Diameter Change Allowed) warning is present. The interface includes navigation buttons like 'Inicio', 'Actualizar', and 'Eliminar'.

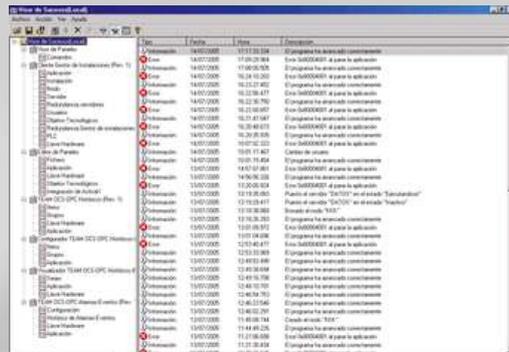
Audit module

The Audit Module lets you register and centrally manage both all of the actions carried out by users as well as events related to the modules in the INGESYS®IT system.

It offers a viewer with a configurable user interface for displaying these stored events, with mechanisms for filtering events both by module and by date.

The many features offered by this module include the following:

- Three diagnostics levels: Information, Warning and Error.
- Different sources of information:
 - A node's own events.
 - XML file import.
 - A remote node's events.
- Hierarchical view of Modules.
- Detailed information on each event, including chronology.
- Filtered by:
 - Type of Event.
 - Module.
 - Date and Time.
 - User.
 - Combinations of the above.
- Export of events to CSV and XML files.



WEB access

INGESYS®IT WEB lets you manage and view plants via Internet or the company network, offering the same benefits as any local operation station without the need to make modifications to your project.

Total Availability - Anytime, Anywhere

In order to meet the growing demands for mobility and availability in the business world, INGESYS®IT offers custom-made solutions to meet the needs of each company.

INGESYS®IT WEB lets you extend your control and supervision system beyond the barriers of your local network, giving you remote access to your plant or to current or logged process information, anytime and anywhere in the world with rapid update rates.

Complete Functionality and Advanced Performance

INGESYS®IT WEB supports complete control and supervision functional features without the need to make modifications in the project.

It offers the same display, control and access to files in locally-operated stations. This means that all of the system's capacity, such as dynamics, scripts support and language switching is available for any remote operator, anytime, anywhere.

It also offers you the option of customising different views of the process so as to adapt to the wide variety of professional profiles needing to access process information in your company.



Total Security

Based on Web Services technology and thanks to the use of digital user certificates, **INGESYS®IT WEB** offers a robust, secure solution. The management of users at web operation posts is integrated into the set of web server data in the local installation. Hence, access rights and levels of authorisation are managed in a centralised and unified manner. Additionally, the system supports the most common security mechanisms for working via Internet (routers, firewalls, encryption, SSL, proxy server, etc.).

Separating web functionality from data servers also contributes to achieving an even more secure and scalable global system.

With all of these mechanisms, **INGESYS®IT WEB** ensures the security and the protection of your installations but not at the expense of the functional features and performance of the whole control and supervision system.

Variety of Integrated Web Services

The Web Services included in this module provide access to items, alarms and historical data managed by OCS Servers configured in the installation, as well as displaying compiled panels.

These are autodescriptive services that offer a wide range of functional features and with a great capacity for system integration, scalability and extensibility.

Currently, **INGESYS®IT WEB** includes the following services accessible for all types of **INGESYS®IT WEB** clients as well as for third-party applications:

- **INGETEAM XML-DA Web Service** for realtime Data Access (compatible with the OPC XML-DA standard). It lets you access process data in read and write mode, with synchronous and asynchronous readings, as well as providing configuration browsing services.
- **INGETEAM XML-AE Web Service** for Accessing Alarms and Events. This permits access to the active alarms list, the alarms historical record, alarms acknowledgement and configuration browsing.
- **INGETEAM XML-HDA Web Service** for Accessing Historical Data. This lets you access the historical data of several OPC Historical Servers as well as providing configuration browsing services.
- **HTML Files Service** that provides access to the operating panels configured in the installation.

Advantages of a Web Services-Based Solution

Since INGESYS®IT WEB is based on Web Services technology, it offers many more advantages than solutions based on remote control or terminal servers:

- It provides organised information, unlike other solutions that only capture screens in bitmap mode.
- It allows you to customise data displays according to user profile requirements (maintenance personnel, engineering staff and laboratory staff).
- Reinforced security in terms of client access.
- Option for custom-made end user development.
- It facilitates connectivity with higher-level applications for advanced information management (MES and ERP).
- A key component for integrating elements in distributed configurations.

Client Adapted to the Needs of Each User

INGESYS®IT WEB offers customised client solutions:

- Web Client, with all the features of a locally operated station.
- Light Clients, for remotely supervising the process from a standard web browser, without needing to install anything.
- Mobile Clients, for secure and reliable access from any latest-generation mobile terminal.

INGESYS®IT WEB Clients can also communicate with SCADAs and third-party devices by means of the INGESYS®IT WEB Services or using third-party OPC XML-DA Web Services.

Wide Range of Integration and Extendibility Options

Given its open, standard-based design, INGESYS®IT WEB offers attractive features:

- so that data provided by the SCADA system can be easily accessed and integrated from external applications such as Microsoft EXCEL, ERPs, LIMs, MES, etc.
- for including functional web features in other commercial SCADA systems that lack these types of solutions.

New Horizons

Technological and market progress has resulted in new horizons appearing in which information access and mobility requirements are becoming more demanding.

INGESYS®IT WEB offers solutions adapted to all of these situations in which to date the user has had to resort to communicating by telephone to outsourcing operation and maintenance tasks. INGESYS®IT not only provides remote display and operation features but also offers the security, consistency and reliability required by these functions.

In this field of new applications, INGESYS®IT WEB's Mobile Clients is one of the most innovative solutions on the market, due to its portability and compatibility with your installation's general control and supervision system.



SECTION III

Applicable areas





IT

Applicable areas

Thanks to its versatility and open, flexible architecture, the INGESYS®IT control and supervision system lets you have multiple configurations to respond to the needs of a wide range of activity sectors, including:

- Process control.
- Assembly lines.
- Control and supervision of transport and electricity networks.
- Transport and logistics systems.
- The food industry.
- Mechanical industry.
- Chemical and petrochemical industry.
- Environmental industry.
- Pharmaceutical industry.
- Water treatment and distribution.
- Wood, paper and glass industry.
- Energy sector.
- Robotic systems.
- Remote control.
- Domotics.

And generally all application fields requiring an interface between humans and the process information that needs to be managed.





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