



Factory Database

IndustrialSQL Server™ 7.1

Product Position

IndustrialSQL Server™ is the world's highest performance, lowest cost real-time relational database for the factory. It provides the right information for improving product quality and production efficiency.

IndustrialSQL Server is an extension to Microsoft® SQL Server™ 7.0, acquiring plant data at dramatically increased speeds, reducing data storage volumes, and integrating plant data with event, summary, production and configuration data.

The FactorySuite™ database server leverages the open and flexible Microsoft platform to truly integrate the office with the factory floor. Production personnel can use Wonderware tools or hundreds of 'off the shelf' software packages to view, analyze and report on their production process. This release is fully backward compatible with existing v7.0 clients and custom applications.

IndustrialSQL Server™ 7.1

PRODUCT DATA SHEET

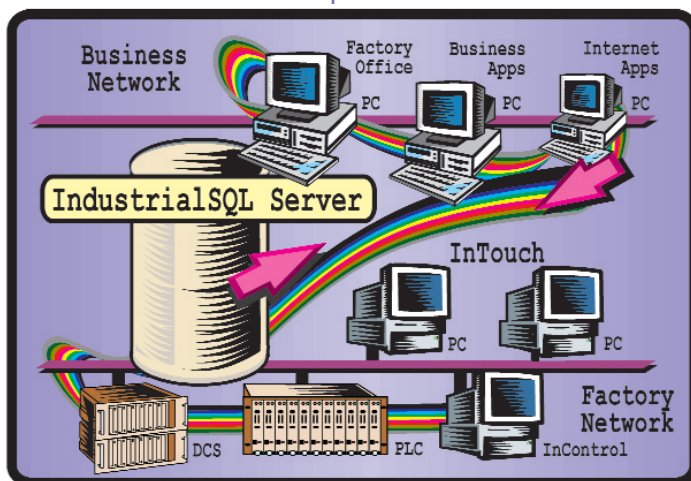
IndustrialSQL Server is the world's highest performance, lowest cost real-time relational database for the factory.

What's new in IndustrialSQL Server 7.1?

- Improved performance and data storage management
- Improved event system with integrated summary sub-system
- Delta re-import InTouch® Tags
- IndustrialSQL I/O Server

Applications

The objectives of production and manufacturing personnel are to improve product quality, improve production efficiency, and preserve capital investment in the plant. It is not possible to achieve these objectives without real-time and historic information about the plant and the products that it produces.



Control engineers need to understand the configuration and performance of the control and instrumentation system. IndustrialSQL Server provides configuration information like control setpoints, trip settings and alarm limits, and records control system behavior like control deviations, trips and alarms, providing the answer to questions like:

- Are the setpoints for this control loop optimized?
- Did the protection interlock cause a spurious plant trip?
- Did the alarm provide sufficient warning to the operator?

Process engineers need information on the behavior of the process under steady state and transient conditions. IndustrialSQL Server stores high-resolution process information and process events. Engineers can analyze process transients and abnormalities and answer questions like:

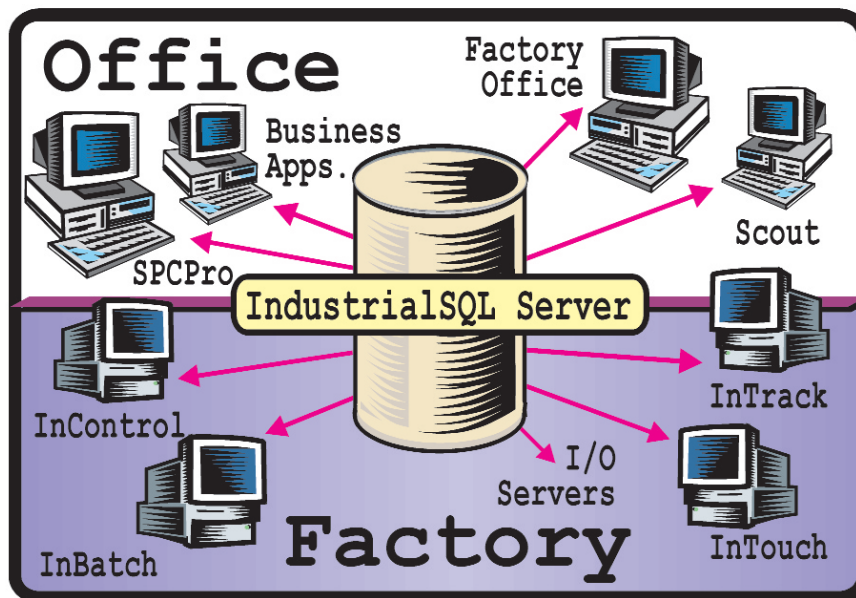
- Is this vessel subjected to metal stress?
- Is this machine a bottleneck?
- What caused this pump to fail?

Maintenance staff need to analyze plant operating history and the condition of the plant. IndustrialSQL Server contains both long term operating history and current plant conditions, providing the answers to questions such as:

- How many times has this motor started?
- Have the bearing temperatures increased since the last overhaul?
- Is this heat exchanger fouled?

Operators need the ability to compare current operating conditions with historic conditions, and to diagnose abnormal process behavior. IndustrialSQL Server contains the current information and the historic perspective, providing the answer to questions like:

- Why will this pump not start?
- Is the furnace temperature slowly increasing?
- Is this start-up the same as the week before?



Client Applications

This range of users (with vastly different information requirements) needs to view, analyze and report on the plant and the products it produces in a multitude of ways. IndustrialSQL Server supports this diversity of requirements with the most comprehensive list of client applications in the industrial automation environment.

The hundreds of client applications include:

▼ **Wonderware client tools.** These powerful, easy to use applications include Trend, QuickLook, IndustrialWorkbook and a new Web Reporting tool bundled

as FactoryOffice™, IndustrialWorkbook and InTouch.

▼ **FactorySuite Partner and WonderTools clients.** These tools, developed by independent software vendors for use against IndustrialSQL Server, include statistical analysis tools, profiling tools, general reporting tools, mimic display tools, navigational tools, browser-based tools, replay tools, management reporting tools and additional trending, graphing and charting tools.

▼ **Generic SQL, ODBC or OLE DB compliant applications.** These applications include Crystal Reports and SQL Access in the FactorySuite, as well as generic tools like Microsoft Access, Excel, Word and Lotus, and more specialized statistical and mathematical analysis applications. Applications that leverage Microsoft's new universal data access initiative with OLE DB scripting can easily retrieve data from IndustrialSQL Server.

▼ **Custom applications.** These applications can be developed using any of the popular development environments including Visual Basic, Delphi, PowerBuilder and C++.

Production managers need summary production figures and information about major production events. IndustrialSQL Server provides summary and aggregate data that can be easily integrated with production events. Production managers can answer questions such as:

- What are the daily production totals?
- What were the major outages this month?
- Are the plant's emissions within the regulatory limits?

Quality Assurance personnel need information about product quality, non-conformances and deviations from specification. IndustrialSQL Server records product measurements and associates them with product numbers or batches. QA personnel can find the answers to questions like:

- Did the recipe change affect the product quality?
- What is the defect rate for this part number?
- Is there a correlation between this temperature profile and this type of non-conformance?



Hardware Platform	Analog Tags Ave. storage rate 5 sec	Discrete Tags Ave. storage rate 1 min	Storage GBytes/month
Pentium 166 64 MB RAM	4 000	4 000	4
Pentium 200 128 MB RAM	4 000	4 000	4
Dual Pentium 400 256 MB RAM	12 000	12 000	12
Quad Pentium 500 512 MB RAM	20 000	20 000	20

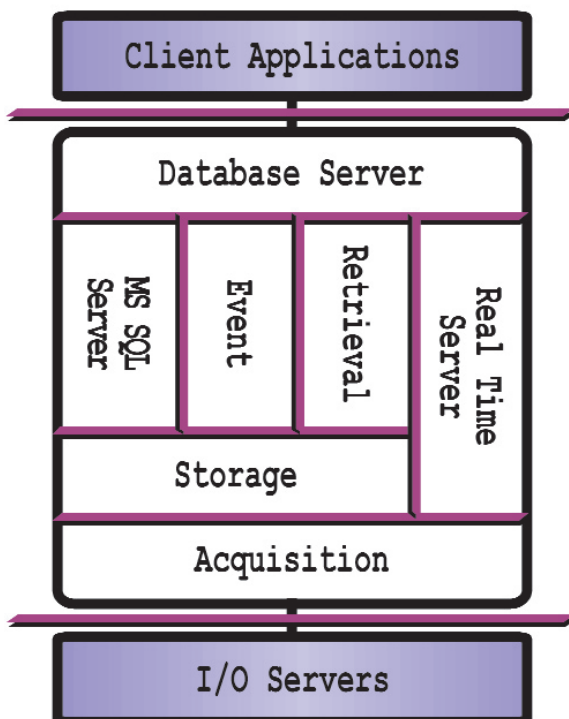
Note: Hardware selected to maintain processor load below 20% with no client and event activity. Actual figures may vary depending on hardware and plant configurations.

Features and Benefits

The Right Information

As the FactorySuite 2000 database server, IndustrialSQL Server contains the most complete production information available. IndustrialSQL Server acquires and stores high-resolution process history directly from over 600 control and acquisition devices using the comprehensive range of I/O Servers, and from multiple InTouch and InControl™ nodes. It integrates this information with configuration data, alarm data, event data, summary data, statistical data from SPC Pro, batch history from InBatch™, tracking data from InTrack™, and associated production data.

There is synergy in common data. Each type of data provides new context to the high-resolution process data, providing users with a richer mental model of the process.



This mass of information is only useful with a powerful query engine to filter and process the data.

IndustrialSQL Server incorporates the full power of Microsoft SQL Server with its powerful filtering, joining and processing capabilities.

- IndustrialSQL Server extends the power of the SQL language with filtering capabilities in the time domain.
- IndustrialSQL Server's event system detects and reacts to process events, and enables post processing of the data, such as snapshots of key process variables and data aggregation to enhance the information content.

Open Flexible Access

The hundreds of client applications allow users to choose the tools that meet their requirements. IndustrialSQL server further leverages the embedded Microsoft SQL Server 7.0 by using its interfaces to Exchange for e-mail, the Internet Information Server for publishing data on the Internet, and SQL Server's replication and distribution services for distribution of the information to other Microsoft SQL Server or Oracle database applications.

Although access methods are both standard and flexible, security is not compromised. IndustrialSQL Server integrates with Microsoft SQL Server and Windows NT security to restrict unauthorized access, and assure the security of the data.

IndustrialSQL Server provides a common point of access for production information, a single platform for the development of production applications and a single interface to business systems.

High Performance Server

Conventional relational database technology is not suited to high-speed acquisition and storage of plant data. IndustrialSQL Server acquires plant data hundreds of times faster than other relational databases, and stores the data in a fraction of the space, bringing the power of the relational database to the factory floor.

The multi-tier client server architecture acts as a firewall between business and manufacturing networks, preventing manufacturing networks from being flooded by requests originating from the business networks, yet providing full visibility to factory floor data in real-time.

The multi-tier architecture based on Windows® NT™ Server provides a scalable solution to meet your requirements. IndustrialSQL Server is suitable for small plants with hundreds of tags and large plants with hundreds of thousands of tags. Careful selection of hardware ensures high system performance and data integrity.

Extensibility

End users with specific viewing, reporting or analysis requirements can develop custom client applications with the application development environment of their choice. The published data model and the standard SQL or ODBC application programming interface provide a known, standard, mainstream development environment. The FactorySuite database is easily extended with additional tables, stored procedures and views to accommodate specific information requirements. End users can create their own detectors and actions using external programs, or using standard SQL, to extend and customize the power of the event system. Additional I/O Servers can be created using the I/O Server toolkit.

Integration with FactorySuite 2000 Components

As the FactorySuite 2000 database, IndustrialSQL Server is tightly integrated with FactorySuite 2000 at every level.

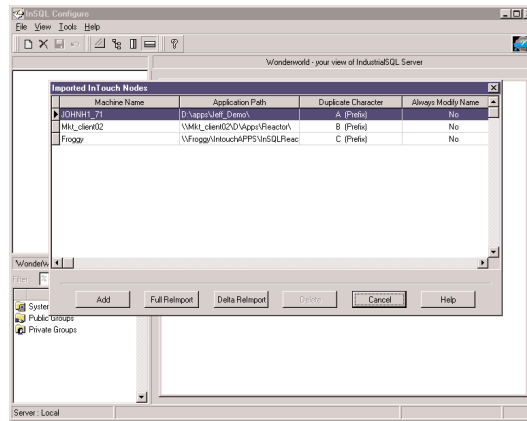
- InTouch configuration data is stored along with IndustrialSQL configuration data in the database.



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- IndustrialSQL Server acquires and stores data from DDE, FastDDE and SuiteLink I/O Servers, and stores InTouch, InControl, InBatch, InTrack and SPCPro history.

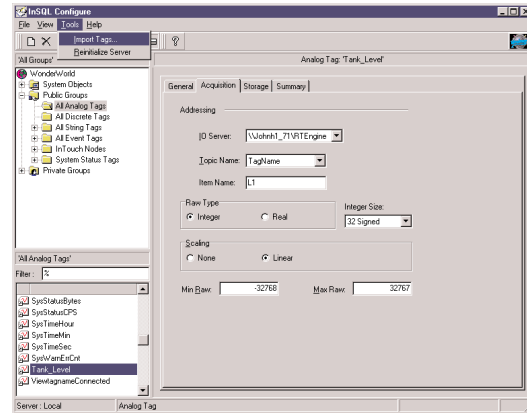


- The new IndustrialSQL I/O Server allows InTouch to monitor system health and view live data from multiple servers. ActiveTrend plus four new ActiveX controls, and growing third-party database controls are available for use inside the InTouch ActiveX container.
- InControl and InTouch can be used to detect IndustrialSQL Server events.

Ease of Use

No knowledge of SQL is needed to install, configure and use IndustrialSQL Server. IndustrialSQL Server features out of the box functionality. The system can be configured in minutes by simply pointing the configuration tool at existing InTouch configuration files, preserving the engineering investment in InTouch.

This tight integration with InTouch ensures database integrity, and allows one-time tag definition. IndustrialSQL Server has been designed as a zero administration database environment. Standard Microsoft BackOffice™ tools can be used to schedule backups. Users can select from the hundreds of



client tools to match their 'ease of use' and functionality requirements.

Specifications

Microsoft Windows NT Server 4.0 SP5

